

István György Tóth and Márton Medgyesi: Income distribution in new (and old) EU member states

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Abstract

The paper, based on recent EU-SILC data, investigates the patterns of income inequalities in “old” and “new” EU member states. Alternative measurement concepts are tested, followed by sensitivity analyses. Our results show that the group of new member states is no less heterogeneous than the EU15 was at the time of the EU enlargement. The most important difference between the two country groups is found in their GDP levels and in some measures that are directly related to economic development. Using different measures to characterize NMSs may be justified to characterise poverty rates of subgroups, but keeping the metric standard for a comparison of overall inequalities is an allowable compromise. The differential role of incomes in generating overall welfare of households warns, however, for caution in interpretations.

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INTRODUCTION¹

The paper is divided into six parts. The first sets out the basic research questions and describes the data and methods. The second examines the distribution of income in EU Member States, with the standard concepts and assumptions. Part three is devoted to an analysis of the resulting country differences with respect to the use of alternative inequality measures and alternative equivalence scales. Part four analyses components of the variance in income distribution patterns across various groups of European countries. Part five goes beyond monetary accounts and attempts to assess the relative importance of incomes play in various European countries. The sixth part concludes.

1. RESEARCH QUESTIONS, DATA AND METHODS

Research questions: what we do and what we do not cover. This paper presents comparative estimates of income inequality based on data from the 2006 wave of the European Community Survey on Income and Living Conditions 2006 (EU-SILC). It draws attention both to the inter-country differences in income inequality across the European Union and investigates if the ranking of countries in terms of inequality is sensitive to the choice of measurement and to the choice of equivalence scales.

The paper builds on some of our earlier assessments of European income distribution (Tóth and Gábos, 2006, Medgyesi, 2008, Medgyesi and Tóth, 2008) and also reflects the work within the frame of the European Observatory on the Social Situation, Network on Social Inclusion and Income Distribution (see European Commission, 2008a which is an input to European Commission 2008b).

The extent of poverty and degree of inequality is shaped by a wide range of factors including the level of economic development, structural factors (employment levels) and social policy factors like the scale of social expenditure and the way that this spent in a given country. There is a great deal of variation among European countries in terms of the mix of institutional factors (and not only in terms of the factors which are capable of being captured in the analysis). The specific circumstances prevailing in any country suggest a need for caution in interpreting the results, especially when drawing policy conclusions. The same policy measures may lead to different results in different countries because of differences in the national context. Saying more on this would go well beyond the scope of our current paper. Therefore, though we produce and reproduce a number of descriptive statistics on income distribution and poverty in this paper but we refrain from making any far-reaching policy suggestions.

¹ The underlying research of this paper is part of the TARKI (Budapest) research project on income distribution in international comparisons. This version of the paper builds partly upon a longer contribution to the Annual Monitoring Report 2008 of the Network on Social Inclusion and Income Distribution of European Observatory on the Social Situation (SSO) contracted by DG Employment, Social Affairs and Equal Opportunities Unit E1 (CONTRACT NO. VC/2005/0780) to the consortium of Applica (Be, leader), Essex University (UK), Eurocentre (Vienna) and Tarki. We thank Terry Ward for his generous professional help with the previous drafts. Also we thank András Gábos and Tamás Keller who had contributed to previous versions of the analysis. The data used here is taken from EU-SILC (Contract No. EU-SILC 2006/23, signed between TARKI and Eurostat, on 31 January 2007). Appropriateness of the statistical methods of analysis applied to the data and the conclusions drawn from the analyses are the sole responsibility of TARKI; Eurostat and the statistical authorities of individual member states cannot be held responsible. The analyses used the 01/03/2008 version of the EU-SILC 2006/1 database.

Data, concepts and methods. The core of the analysis is based on data from the 2006 EU-SILC, which covers all Member States, except Malta, for which the ‘microdata’ necessary for the analysis are not available and Bulgaria and Romania, which initiated surveys only in 2007². The data relate to the population living in private households in the country in question at the time of the survey. Those living in collective households and institutions are, therefore, generally excluded. The income concept used in the analysis is annual net household disposable income, including any social transfers received and excluding direct taxes and social contributions. The reference period is the year 2005 except for Ireland where it is the twelve-month period before the date of the interview³. Incomes of all household members and other household incomes are aggregated together and total household disposable income is adjusted for differences in household size and composition by use of an equivalence scale to take household economies of scale in consumption into account. As a baseline, we use the so-called modified OECD, or OECD II, scale, which assigns a value of 1 to the first adult in the household, 0.5 to additional members above the age of 14, and 0.3 to children under 14. The equivalised income thus calculated is then assigned to each household member. The inequality indices reported here are estimated on the basis of these figures, except where noted otherwise.

Non-positive income values - which result from the way that the income of the self-employed is defined, i.e. essentially in terms of net trading profits – have been excluded from the analysis. In order to tackle the problem of ‘outliers’ (i.e. extreme levels of income reported), a bottom and top coding procedure (or ‘winsorising’) has been carried out. (Specifically, income values at the bottom of the ranking of less than the 0.1 percentile were replaced by the value of the 0.1 percentile, while at the top of the ranking, values greater than the 99.95 percentile were replaced by the value of this percentile.)

From among the several indices proposed for inequality measurement⁴ we use Gini index⁵ a baseline for comparisons, in parts of the analysis we also test other indices with differential capacities to capture various distributional characteristics (P90/P10, Atkinson and SCV measures). In our analysis of decomposition of inequality the Mean Log Deviation (MLD)⁶ index will be used because as a member of the Generalised Entropy family of inequality indices, it shares the property of additive decomposability.

For measuring monetary poverty, we use the central “laeken” measure: those are considered to be poor whose person equivalent income in the household does not exceed sixty percent of the median equivalent incomes.

In order to draw policy conclusions from inequality and poverty data, it is essential to take account of the fact that they are derived from surveys of a sample of households and inevitably, therefore, involve some margin of error. To make meaningful comparisons between countries or over time, it is necessary to allow for the margin of error arising from sampling, which can be done by calculating the standard error of the estimates and taking confidence intervals around this.

² For these countries, at certain points of the analysis, we utilise the inequality figures available in the Eurostat Newcronos website as of June 2008.

³ We refer to the surveys by their fieldwork year (2006) and mention in tables what reference year do they cover (2005)

⁴ For reviews of inequality measurement, see for example Cowell (2000). For applications and sensitivity in some CEE countries, see Tóth (2005).

⁵ $Gini = (1/2n(n-1)) \sum_{i=1, \dots, n} \sum_{j=1, \dots, n} |y_i - y_j|$, where y_i are individual incomes, n is sample size.

⁶ $GE(0) = \text{Mean Log Deviation index} = (1/n) \sum_{i=1, \dots, n} \log(\mu/y_i)$, where y_i are individual incomes, n is sample size, μ is sample mean income.

Standard errors for Gini coefficients were derived by the linearization method based on Kovacevic and Binder (1997) and implemented in Stata program “svylorenz” (see Jenkins 2006)⁷.

2. INEQUALITY IN THE EU COUNTRIES: GENERAL OVERVIEW

Overall Gini rankings. Figure 1. shows the ranking of countries according to the Gini index with standard errors at 95% confidence intervals around the estimates.. The confidence intervals overlap significantly for many countries, partly because differences in the index are relatively small but also because for some countries, the standard errors for the index are large. Overlapping confidence intervals make it difficult to establish a precise country ranking. The most that is possible is to define groups of countries, which differ from each other but within which levels are similar.

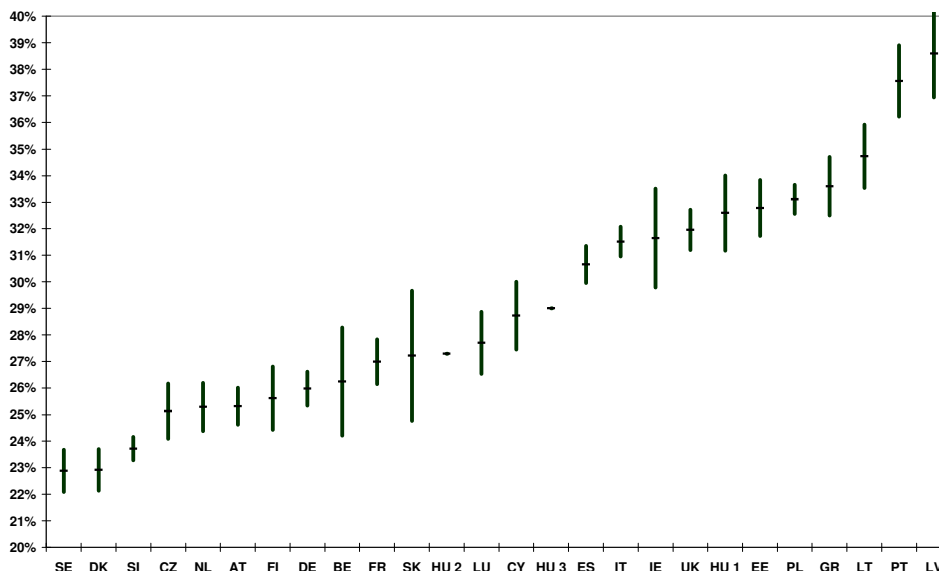
As Figure 1 shows, Latvia and Portugal stand out as the countries with the highest inequality with a Gini index of 38-39%. Lithuania is the third country in the ranking with a 35% Gini index. Another group of eight countries have Gini indices higher than 30%. Greece, Poland, Estonia and Hungary have Gini indices 33-34%, while the United Kingdom, Ireland, Italy and Spain are characterised by Gini coefficients around 31-32%. Thus among high inequality countries we find the Baltic states, some transition countries from Central and Eastern Europe (Poland, for example), the Southern European countries (with the exception of Cyprus) and the Anglo-Saxon countries. At the other extreme, countries with lowest inequality by this measure are Sweden, Denmark and Slovenia with Gini indices of below 25%. Between the low and high inequality countries there are a number of countries with Gini indices above 25% but below 30%. It is difficult to determine the precise ranking of countries within this group because confidence intervals around our Gini estimates overlap considerably. The Czech Republic, Netherlands and Austria are at the lower end of this group, while Cyprus, Luxembourg and Slovakia are at the upper end. The estimates have an especially high margin of error for Slovakia, Belgium and Ireland.

It must also be noted at this stage, however, that in addition to statistical errors, there can be sources of errors of non-statistical nature in the case of some of the countries. Just to serve as an example, we put our own country (Hungary) three times on the chart. It is seen that when observing SILC results from two consecutive surveys, one could think of a huge one-year jump in the level of inequality. While in 2005 Hungary shows up in the upper third of the “inequality league”, the 2004 Gini index was 6 percentage points lower and Hungary ranked among the middle-inequality countries together with Belgium, Germany and France. In an alternative survey (the Tarki Household Monitor) the Gini in 2005 is measured to be 29%, which would rank the country among countries with middle-level inequality (Tóth 2008). This may warrant for caution in case of other countries as well⁸.

⁷ In an earlier version of our paper we estimated the sampling distribution via thousand replication bootstraps to compute standard errors and confidence intervals (Mooney and Duvall 1993). A comparison of the confidence intervals, we found the linearized confidence intervals significantly higher for most countries (though in some of them this does not hold).

⁸ As for Hungary, we exclude the 2005 figure from some of the bivariate analyses and use the 2004 figures instead (most notably, in figures 4 and 5). This is reassured by consultations with CSO officials notifying us on pending revisions of the 2006 survey dataset, to be presented when the 2007 survey release becomes available.

Fig. 1. Gini indices with 95% confidence intervals for EU countries, 2005



Source: EU-SILC 2006. Note: Hu 1: EU-SILC 2006. Hu 2: U-Silc 2005. Hu 3: Tarki Household Monitor 2005.

It is important to note that NMS countries appear across the whole inequality league in Figure 1., with Slovenia and the Czech Republic belonging to the most equal grouping, the three Baltic states belonging to the most unequal grouping and the others taking place in between. This shows that there is a considerable heterogeneity within the NMS group, being no smaller than the heterogeneity of the EU15 was at the time of the enlargement.

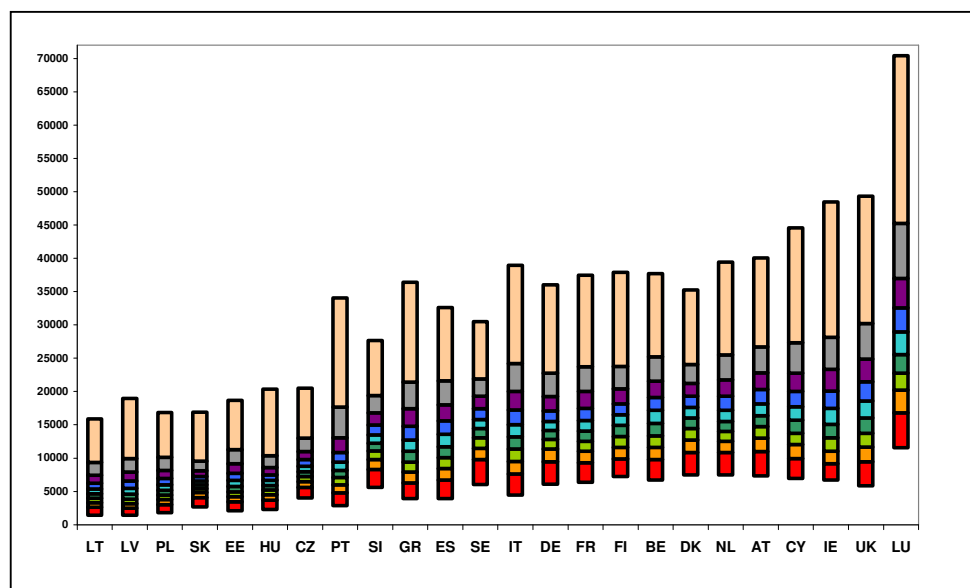
The distribution of incomes in individual European Union member states. The income distribution of the countries is represented by the average income of each income decile in Figure 2. The income values are shown in Euros at purchasing power parity (PPP), i.e. with cross-country price differences taken into consideration, allowing direct comparisons to be made. The countries are arranged in increasing order of average income.

As shown in Figure 2, there are significant differences in income levels between the EU member states, and a substantial proportion of the income inequality between the citizens of the European Union can be explained by differences in incomes from country to country. Of the EU countries, Lithuania has the lowest income level, with an average equivalised disposable income of EUR 5,304 per person, while Luxembourg has the highest level (EUR 29,153 a year). The former socialist countries cluster together at the bottom of the scale, with average disposable incomes of under EUR 10,000. As is evident, people in the top decile of the income distribution in the former socialist countries have an average income that is typical of the middle-income earners class in most Western European countries (France, Germany). There are three Southern European countries, Portugal, Greece and Spain, where average incomes fall between EUR 10,000 and 15,000, with one of the former socialist countries, Slovenia, being grouped with them. The largest group of European countries has average incomes between EUR 15,000 and EUR 20,000, and, apart from Luxembourg, the only country where the average level exceeds EUR 20,000 Euros is the UK.

The figure also gives an indication of income inequalities in the various countries. In countries with relatively high inequality, the average income of people in the ninth and tenth deciles (i.e. with

income in the top 10% and 20% of households ranked by their person equivalent incomes) is substantially higher than those in the bottom deciles. In Portugal, for instance, the average income of those in the top decile is more than twice that of those in the ninth decile and 12 times more than that of those in the bottom decile.

Fig. 2 The income distributions of the countries of the European Union (Euros, PPP)



Source: EU-SILC (2006)

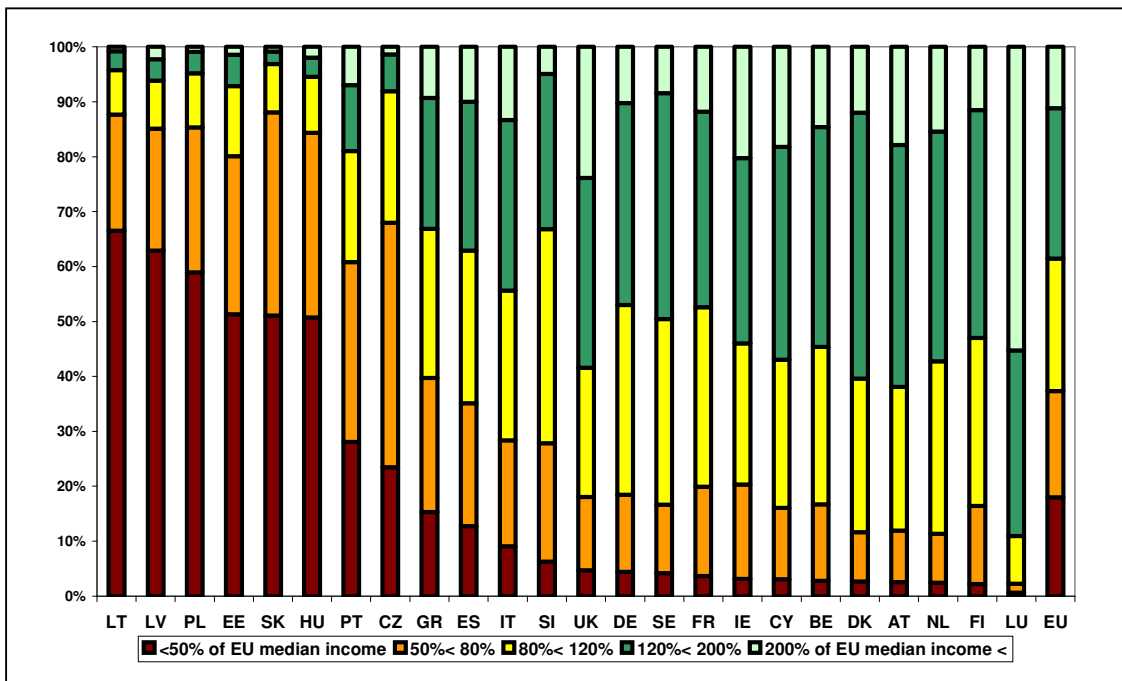
Note: The bottom of the data bars represents the first decile, the top represents the tenth decile and the marks in between show the average incomes of the individual deciles.

Population shares belonging to various brackets of the all-European income distribution – by country. Income inequalities and the risk of poverty in the EU can also be measured by pooling the respondents of the Member States together, weighting them to represent (almost) the whole EU⁹ and comparing the income of people measured in purchasing power parity to the median income in the EU as a whole, measured in the same terms. No further adjustment of regional price differences has been made and no attempt has been made to adjust country mean incomes to national accounts¹⁰. Figure 3 shows the distribution of equivalent income in the different countries relative to the EU median income

⁹ The qualification refers to the missing data for Malta (which was already a member state at the time of the survey) and for Romania and Bulgaria (who, not being member at the time, did not subscribe for the first full-EU SILC). Due to these data shortcomings, our exercise can only be regarded as a first experiment with incomplete data to simulate the “whole” EU income distribution.

¹⁰ Brandolini (2008) discusses the consequence of these methodological choices on the extent of income inequality in supranational entities, like the EU.

Fig. 3 The distribution of the population among the different categories of the overall European income distribution by country (%)



Source: EU ILC (2006)

A fifth of the EU's population, have an equivalised income of less than half the EU median, while some 18% have an income of between 50% and 80% of the median and 23% one of around the median. At the same time, some 28% of those living in the EU have an income of between 20% and 100% of the median, while 12% have an income of twice the median or more.

With the exception of Slovenia and the Czech Republic, the majority of people in the former socialist countries are in the bottom fifth of the European income distribution. Around 70% of the population of the Baltic States have incomes of less than half the EU median, while more than half the people in Luxembourg and a quarter of those in the UK have incomes of more than double the median.

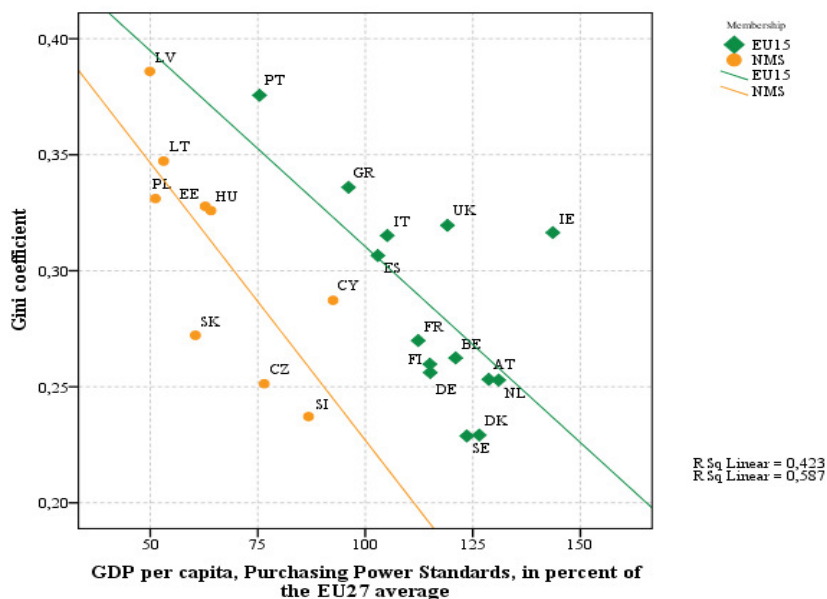
Inequality and level of economic development. Both Figure 2 and Figure 3 show, to some extent, the combined effects of the levels and variance of incomes in the various European Union member states. This line of reasoning goes further in Figures 4 and 5, presenting bivariate correlations between relative GDP levels on the one hand and inequality/poverty levels as measured by Gini indices and by the at risk of poverty rates on the basis of disposable person equivalent incomes of households on the other hand.

Income inequality is relatively strongly and negatively related to GDP per head across the observed EU countries¹¹. The slope of the relationship is negative for both the EU15 countries and the New Member States¹². There is clearly a large difference between the levels of economic development of the two groups while the internal variance by the level of inequalities is also large in both subgroups of the EU.

¹¹ See Tóth and Gábor 2006 for a more detailed account on this.

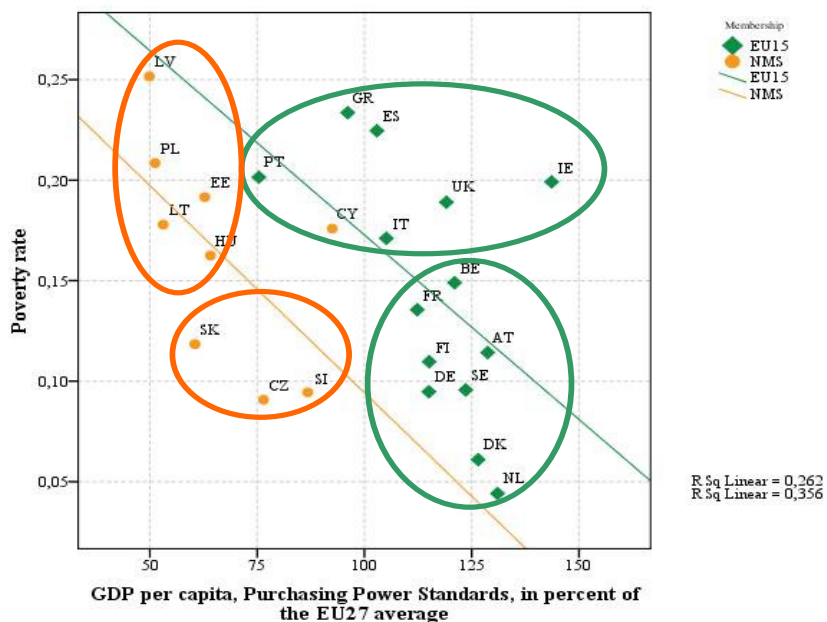
¹² Luxembourg is so much an outlier that we left out from the chart for reasons of convenience.

Fig 4. GDP per capita (EU27=100) and income inequality in 2005



Source of data: for Ginis: EU-SILC 2006 and for GDP: EUROSTAT NewCronos Database, download: 1st of June 2008. Variables: GDP PPS 2005 (EU27=100), Gini: 2005 (except for Hungary (2004)). "EU15" regression excludes LU.

Fig 5. GDP per capita (EU27=100) and income poverty in 2005



Source of data: for poverty rates: EU-SILC 2006 and for GDP: EUROSTAT NewCronos Database, download: 1st of June 2008. Variables: GDP PPS 2005 (EU27=100), At risk of poverty rate (after social transfers) 2005 (except for Hungary (2004)). "EU15" regression excludes LU.

While the overall risk of poverty is also negatively associated with GDP per head, the pattern of variation across countries is somewhat different. Four groups can be identified¹³. The first group, containing the Scandinavian countries and most of the EU15 countries with conservative social welfare regimes, has a relatively low overall risk of poverty and relatively high GDP per head. The second group, comprising the EU15 Member States with liberal and Mediterranean social welfare regimes, has more variable levels of GDP per head and a relatively high risk of income poverty (around 20%). The other two groups contain the new member states with, in general, lower level of economic development, but varying levels of relative poverty (some like Czech Republic, Slovenia, and Slovakia with lower poverty levels and some like Poland and the Baltic States with lower higher relative poverty levels)¹⁴.

3. SENSITIVITY ANALYSES

Inequality rankings and the choice of inequality measures. Some inequality indices are particularly sensitive to income changes at the tails of the income distribution. The SCV index is known to be sensitive to high incomes, while the Atkinson index calculated on the basis of the inequality aversion parameter $\epsilon=2$ is very sensitive to low incomes in the distribution (Cowell and Flachaire, 2006). Therefore, we can expect that indices particularly sensitive to the tails of the distribution would produce rankings that are different from the Gini ranking. We present in Fig 6. the ranking according to the P90/P10 index (the ratio of the ninetieth to the tenth percentile of the income distribution), the Squared Coefficient of Variation (SCV)15 index and one member of the Atkinson family of inequality indices¹⁶, in addition to Gini ranking.

We present the various inequality rank scores of individual countries by various inequality measures in Table 1. The departure from the Gini based to the ranking based on P90/P10 (the ratio of the 90th and the 10th percentile values) does not make a real difference for most countries. If we set a threshold for an important change in the ranking at the movement by at least four steps on the ladder, it is only Spain and Hungary for whom the rankings based on Gini and on P90/P10 would differ from each other. This indifference is not very surprising, however, as both Gini and P90/P10 are “symmetrical” measures, assigning the same weights to the upper and lower tails of the income distribution. As for the two other measures with “asymmetric” focus, the changes would be larger. Replacing Gini with SCV would show Czech Republic, Finland, Slovakia, Cyprus, Ireland and Hungary more unequal while under the same SCV ranking Luxembourg, Spain, Estonia, Poland and Lithuania would show significantly less unequal. Using Atkinson ($\epsilon=2$) instead of Gini would place Sweden, Austria, Germany, Spain and Italy as more unequal while France, Cyprus, Estonia and Greece as less unequal (as compared to the Gini ranking).

¹³ ... and, as a fifth “group”, Luxembourg is an extreme with its high per capita GDP.

¹⁴ We recall here that our current analysis focuses on cross section correlates. In our earlier (Medgyesi and Tóth, 2008) analysis of growth-inequality spells in the EU we concluded that the distributional effects of growth may vary greatly, depending on the nature of growth itself (which sectors drive it, how it affects employment, etc) and the assumed role of the social systems (the extent and structure of social expenditure as well as perhaps the social and labour market legislation in place) This accords with the results of recent studies suggesting that the performance of various European social models differ in terms of efficiency and equity (Boeri, 2002; Sapir, 2005) and also with other studies showing that the relationship between growth and inequalities is far from conclusive (Ravallion, 2001, 2004).

¹⁵ $GE(2)=SCV=var(y_i)/\mu^2$, where notations are the same as above, and *var* stands for variance.

¹⁶ Atkinson-index: $A_\epsilon = 1 - [(1/n)\sum_{i=1,\dots,n} (y_i/\mu)^{1-\epsilon}]^{1/(1-\epsilon)}$, if $\epsilon \geq 0$ and $\epsilon \neq 1$ and $A_\epsilon = 1 - \exp[(1/n)\sum_{i=1,\dots,n} \ln(y_i/\mu)]$, if $\epsilon = 1$, where the notations are the same as above. $\exp(.)=e^{(.)}$, and ϵ is the inequality aversion parameter.

We interpret this sensitivity exercise as a useful way of getting a more balanced picture of inequality patterns across countries. It warns us, for example, that inequality patterns are driven by upper tail changes in some countries like Finland, Ireland and Slovakia, while the inequality is characterised less by the uppermost incomes but rather by the lowest incomes in (say) Sweden or Italy, while in case of Spain both the upper and lower tails are important in determining the actual inequality patterns. However, changing the measure from one to the other does not have a systematic effect on the “old” and of the “new” member states: some new member states would look more unequal while some others would look less unequal when the metric is changed.

Table 1 Rank order of countries by the level of inequalities as measured by top, middle and bottom sensitive inequality measures

COUNTRY	GINI	P90/P10	SCV	ATKINSON (2)
SE	1	2	1	14
DK	2	1	3	2
SI	3	5	2	3
CZ	4	3	8	1
NL	5	4	6	5
AT	6	8	4	10
FI	7	6	13	4
DE	8	9	11	12
BE	9	10	<u>5</u>	11
FR	10	11	9	<u>6</u>
SK	11	7	20	7
LU	12	12	<u>7</u>	9
CY	13	13	17	<u>8</u>
ES	14	18	<u>10</u>	24
IT	15	16	12	19
IE	16	15	21	13
UK	17	17	18	20
HU	18	<u>14</u>	22	16
EE	19	19	<u>14</u>	<u>15</u>
PL	20	21	<u>15</u>	18
GR	21	20	19	<u>17</u>
LT	22	23	<u>16</u>	22
PT	23	22	23	21
LV	24	24	24	23

Note: Cells in grey show an at least 4 rank move compared to the baseline Gini ranking. (bold: towards higher, underlined: towards lower ranks, when higher rank means larger inequality/poverty).

Inequality rankings and different equivalence scales. Countries differ in terms of typical household size, the number of children per household as well as in terms of the correlation between household size and household income. Changes in the equivalence scale is expected to affect countries to a different extent. For a simple sensitivity analysis, we compare inequality (Gini) rankings and poverty rate¹⁷ rankings when different equivalence scales are applied. Simple

¹⁷ With a threshold set at sixty percent of the national median income.

equivalence scales can be defined by raising household size to power e , where parameter e expresses the elasticity of scale in consumption in the household. If $e=1$ we assume that there is no shared consumption in the household, therefore well-being of household members can be measured by per capita income. An equivalence scale parameter $e=0$ equals to the assumption that all consumption in the household is shared between members, and well-being of individuals can be measured by total household income. Values of the e parameter closer to zero express stronger elasticities of scale in consumption. We experiment with values of the elasticity parameter equal to 1, 0.75, 0.5, 0.25 and 0. We also compare estimates obtained by using the OECD II equivalence scale. First we present sensitivity of the Gini coefficient and the poverty rate to the choice of the equivalence scale in different country groups. Finally we compare country rankings according to the Gini coefficient and poverty rate calculated using the OECD II equivalence scale and Figure 6 shows values of the Gini index as the equivalence scale is changed. The graphs show a U-shaped pattern, the Gini coefficient being relatively high for $e=1$, then lower at $e=0.75$ equivalence scale. Further decreasing of the elasticity parameter causes the Gini to rise, and generally highest values are obtained when assuming full consumption sharing in the household ($e=0$). Estimates with the OECD II equivalence scale are closest to those obtained with the $e=0.75$ equivalence parameter. Despite the general U-shaped pattern, the magnitude of changes in the Gini coefficient differs between countries. Among the EU15, the Mediterranean countries seem to be the less sensitive to changes in the equivalence scale. Moderate changes can be detected in the case of France, Luxembourg, the Netherlands and the Anglo-Saxon countries. In the Nordic states and Continental countries such as Germany, Austria and Belgium changing the equivalence scale brings about more pronounced changes in the Gini: highest Gini exceeds the lowest by at least 20%. The effect of changing the equivalence scale is also different among the NMS. The Czech Republic, Slovakia and Slovenia show more pronounced change, while for the Baltic States, Hungary and Poland changes are moderate.

Patterns of changes in the poverty rate are more heterogeneous (see Figure 7.). In the case of countries like Belgium, Austria, and most of the Western European countries, but also NMS of Central-Eastern Europe the U shaped pattern is observable in this case as well. In other countries, like Ireland, Latvia and Portugal we see pattern of monotonic increase, while in the case of Luxembourg the poverty rate decreases as the equivalence parameter is decreased. Countries also differ in the magnitude of change in the poverty rate. The Netherlands is the country where the poverty rate changes the most with the modification of the equivalence scale. The highest poverty rate, 11,4% (obtained when $e=1$), is more than the double of the lowest value, 4,4% (obtained with the OECDII equivalence scale). In Ireland, Denmark and the Czech Republic the poverty rate is also quite sensitive to changes in the equivalence scale. Less sensitive are Spain, Greece and Italy where the difference between the lowest and the highest poverty rate is below 20%.

We can conclude again that the sensitivity to changes in the equivalence scales is not systematically related to the membership status (it affects the old and the new member states as well, without any systematic pattern in this respect).

In Table 2 we examine the change in the ranking of countries by the Gini coefficient and the poverty rate when the equivalence scale is altered. We compare the rankings obtained with the OECDII and $e=0$ equivalence scales. When the ranking according to the Gini coefficient is examined, the ranking of countries resembles to a great extent in the two cases. We see important changes only in the case of Austria, Germany and Italy who all move towards the top of the ranking by four-five places. In the case of the poverty rate, Belgium and Estonia move towards the top of the ranking when we switch from the OECDII to the $e=0$ equivalence scale, while France, Ireland, Lithuania and Greece move towards the bottom of the ranking. Thus changes in country rankings are moderate and important changes can both be found among EU15 countries and the NMS.

Figure 6. Sensitivity of Gini estimates to the choice of equivalence scale

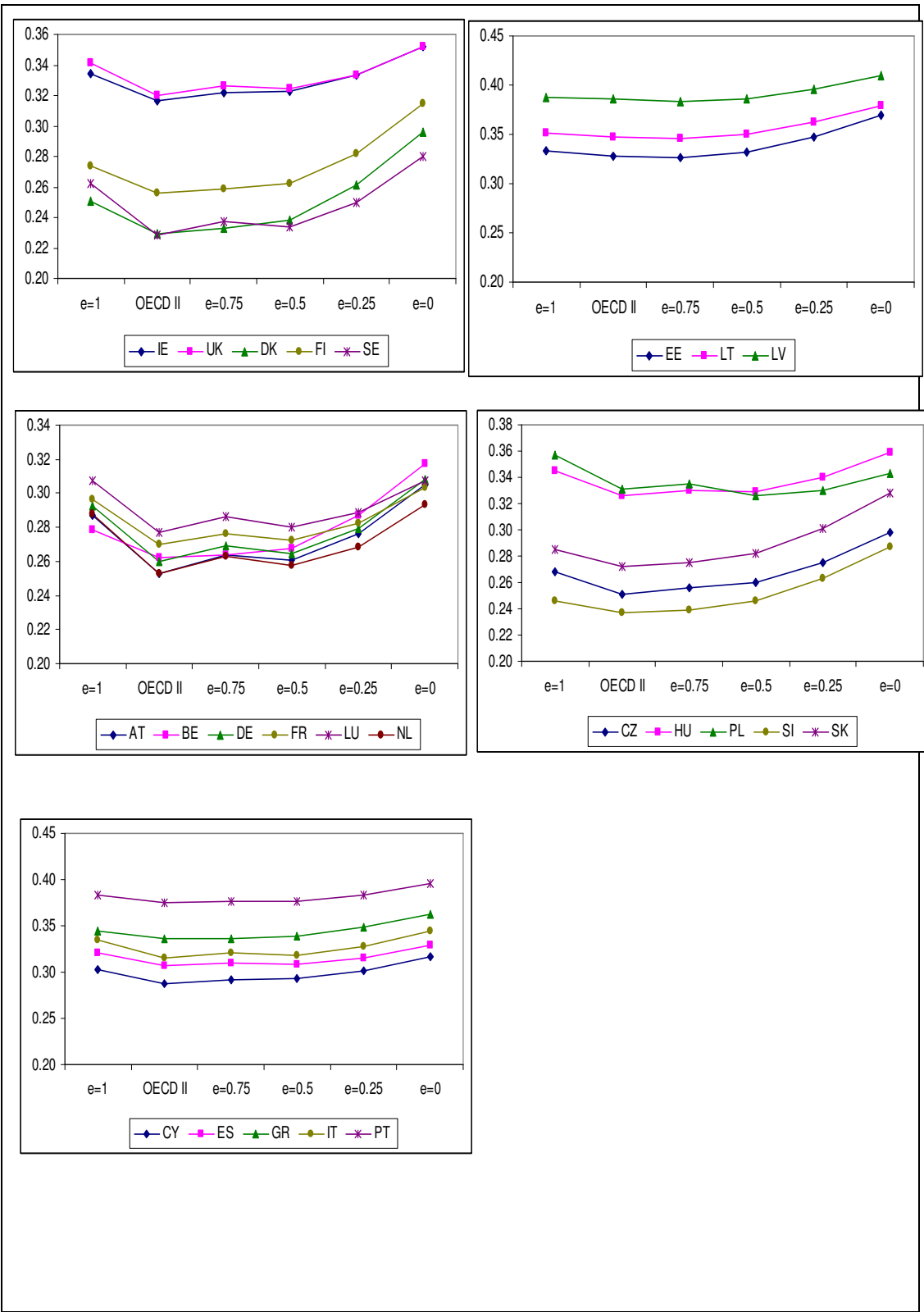


Figure 7. Sensitivity of the poverty rate to the choice of equivalence scale

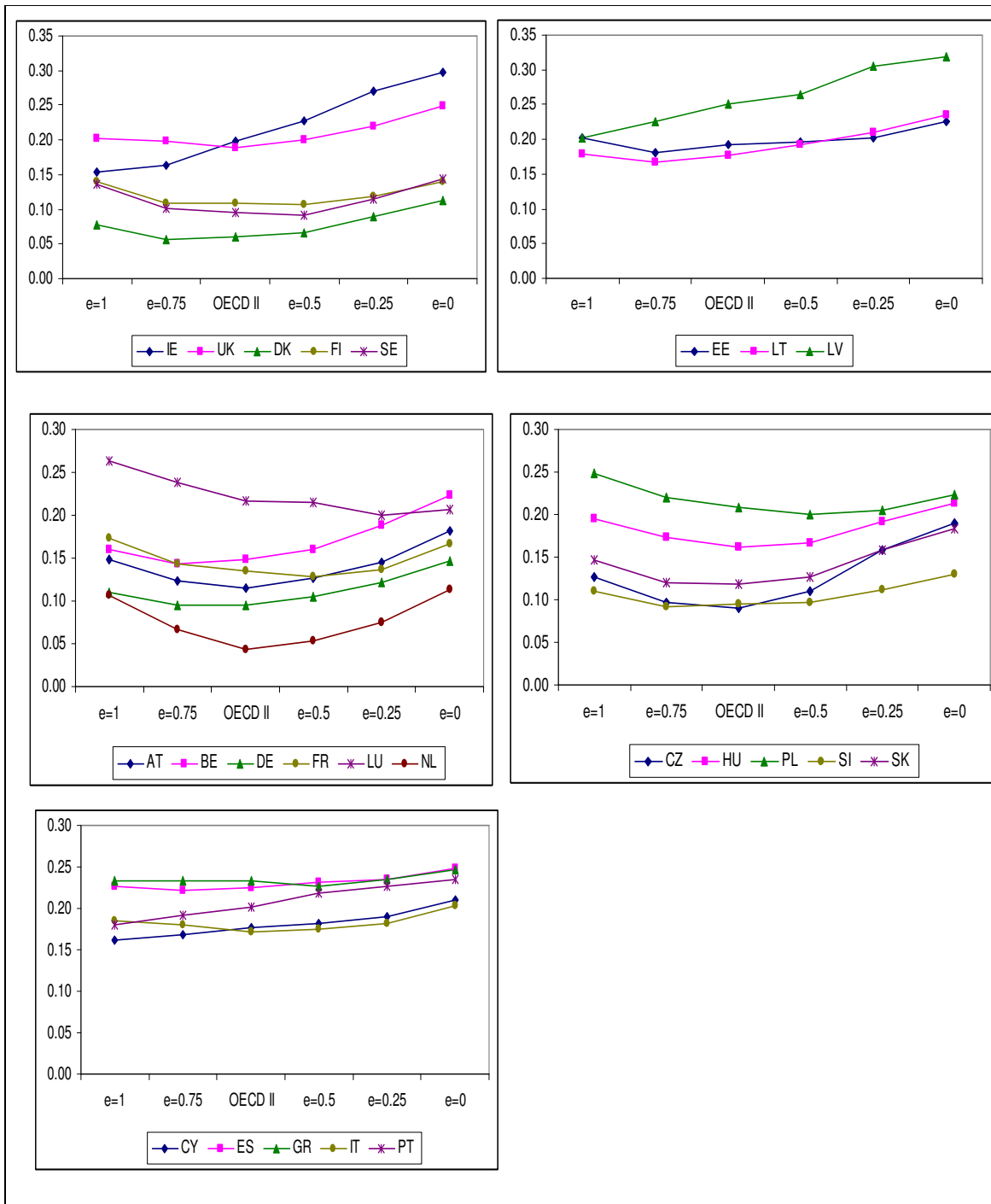


Table 2 Rank order of countries by the level of inequalities and poverty as measured by incomes adjusted by different equivalence scales

COUNTRY	GINI: OECD II EQSCALE	GINI: E=0	COUNTRY	POVERTY RATEI: OECD II EQSCALE	POVERTY RATEI: E=0
SE	1	1	NL	1	2
DK	2	3	CZ	2	1
SI	3	5	DK	3	4
CZ	4	2	SE	4	7
NL	5	4	SK	5	6
AT	6	10	SI	6	5
FI	7	6	DE	7	10
DE	8	12	FI	8	8
BE	9	8	AT	9	9
FR	10	7	FR	10	<u>3</u>
SK	11	13	LU	11	13
LU	12	9	BE	12	21
CY	13	11	HU	13	14
ES	14	14	CY	14	12
IT	15	20	EE	15	20
IE	16	15	IE	16	<u>11</u>
UK	17	17	PT	17	17
HU	18	16	UK	18	15
EE	19	18	PL	19	19
PL	20	21	IT	20	23
GR	21	19	ES	21	22
LT	22	22	LT	22	<u>16</u>
PT	23	23	GR	23	<u>18</u>
LV	24	24	LV	24	24

Source: own computations based on EU- SILC (2005).

Note: Cells in grey show an at least 4 rank move compared to the baseline ranking (bold: towards higher, underlined: towards lower ranks where higher rank means larger inequality/poverty).

4. CROSS-COUNTRY DIFFERENCES IN DETERMINING FACTORS OF THE INCOME

DISTRIBUTION

Without going into a detailed analysis of the structural differences between countries, it is important to acknowledge that some of the sensitivities to the use of different measures and to the use of different equivalence scales stem from the fact that there are large differences between countries in household patterns, age structure and family size as well as employment patterns and education structure. This section focuses on inter-country differences in the role of these factors in explaining the distribution of incomes.

Methods of inequality decomposition. The concern is to investigate the effect of employment status, age group and education level on the distribution of income. The relevant question to

consider in this regard can be formulated in two ways. The first is how much inequality would be observed if age (or education or employment) were the only source of income dispersion. The second is by how much would income inequality be diminished if, starting from the actual distribution, income dispersion due to age (or education or employment) were to be eliminated by making age group means identical while preserving within-group inequality. The MLD index is selected here to perform the calculations because, as argued by Shorrocks (1980), in this case, answers to the two formulations coincide¹⁸. In this case, decomposition weights are simply population shares of different groups; the within group component is, therefore, the sum of within group MLD indices weighted by the population shares of the respective groups¹⁹. The same methodology has been used by a number of authors to investigate the effect of various individual or household attributes on income inequality (for example, Jenkins, 1995, Jenkins and Kerm 2004). Since the sum of between group and within group inequalities equals total measured inequalities, the various components can be expressed in percentage terms. While this method is not suitable for uncovering true, causal relationships, it is a first step and gives intuitive results, which can then be confirmed by more elaborate analysis.

The analysis is carried out on the basis of equivalised household income using the OECD II scale and variables used for grouping in the decomposition analysis are based on the attributes of the (assumed) head of the household in which people live.²⁰ We will be considering two demographic attributes: age of the household head and household structure. Age of household head is grouped in four categories: 18-35 years old, 36-49 years old, 50-64 years old and over 65 years of age. Household structure is a five category variable: households with a working age head (between 18 and 64 years of age) were grouped according to the number of children (no children, one child, two children, three or more children) and households with a retirement age head constitute the fifth category. Among labour market characteristics of the household we investigate the effect of the education and employment of the household head. Education of the household head is coded on a three-point scale (lower than upper secondary, upper secondary, tertiary education), employment status is also grouped in three categories (employed, active age inactive, retired). We perform static decompositions, the results of which are presented below.

Age of household head. With the exception of five countries, age differences account for less than 5% of total inequality as measured by the MLD index. Age differences are most important in the Nordic countries, Cyprus and Estonia. In Denmark, the between-age-groups component of inequality amounts to 12% of the total, in Sweden, to 8% and in Finland and Cyprus to 7%, while in Estonia, age accounts for 6% of total inequality. On the other hand in Poland, Portugal, Hungary and Italy, the age of the household head explains less than 2% of overall inequality. (Fig 9)

¹⁸ The two approaches have the same between-group effect only if the decomposition weights do not depend on the group means, as in the case of the MLD index.

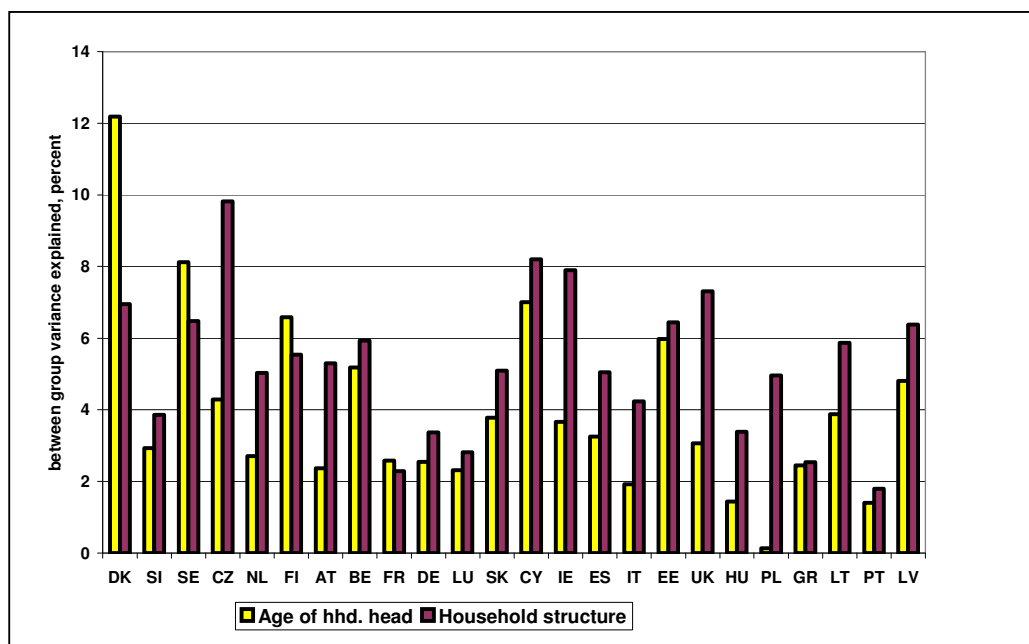
¹⁹ Formally, v_k refers to the share of k subgroups in total population, $v_k = n_k/n$, and λ_k to the ratio of average incomes of a k subgroup to the average incomes of the total population, $\lambda_k = \mu_k/\mu$, and θ_k to the share of k subpopulation from total incomes in the population, $\theta_k = v_k \lambda_k$. Total inequality, as measured by the MLD index, can be decomposed as the sum of two components: $MLD = \sum_k v_k MLD_k + \sum_k v_k \log(1/\lambda_k)$. The first part of the right hand side of the equation relates to the "within group" inequalities: it denotes the weighted average of inequalities within the subgroups. The second part of the expression relates to "between group inequalities": the part of inequalities, which would remain if the income of each individual in a subgroup were replaced by the average of the subgroup.

²⁰ Since no household head is defined in the EU-SILC, this is taken to be the oldest man of working age (18-64). If there is no man of working age, then the oldest woman of working age is taken as the household head instead. If there are no members of the household of working age, the oldest man of 65 or older is taken as the household head or the oldest woman if there are no men.

The effect of age might arise from income differences among those of working age and from differences between the working age and those aged 65 and over. In countries where the effect of age is important, both type of age-related differences are significant. In Denmark, the average income of those between 50 and 64 years of age is 20% higher than the country mean, while the average income of those between 18 and 35 and of those aged 65 and older is 20% lower than the overall mean. The pattern in Sweden is similar. In Cyprus, the effect is mainly due to the low incomes of those aged 65 and over, whose relative income is much less than in the other countries covered. Relative incomes of the elderly are also low in the Baltic States, Ireland, Spain and Belgium. In contrast, the elderly enjoy a relatively favourable level of income in Austria, France, the Netherlands, Luxembourg and Poland where their average income is close to the national average.

Household structure Household structure explains 10% of total inequality in the Czech Republic. In Cyprus and Ireland this variable accounts for 8% of inequality as measured by the MLD index, while Denmark and the UK show between group effects over 7% (Fig 9). Countries where the explanatory role of household structure is low are Luxembourg, Greece, France and Portugal, where differences between average incomes of different groups account for less than 3% of total inequality. Income differences by household structure partly mirrors income differences between the working age (those between 18 and 64 years of age) and the retirement age (those over 65 years of age), which we have discussed before. The other part of income dispersion by household structure is income differences according to the number of children among families with a working age household head. Average income of households with three or more dependent children is lower than the overall mean income in every country. The relative income situation of these families is the worse in the Baltic states, Poland, the Czech Republic and the United Kingdom, where average income of these families is less than two third of the mean income of childless households. Income differences according to the number of children is the least pronounced in Slovenia, Denmark, Finland, Luxembourg, Belgium and Portugal where the average income of households with three or more children is “only” 10-20% lower than that of childless households.

Fig. 9 Fraction of inequality explained by demographic factors: age and household structure



Note: Countries are ranked according to the MLD index of total inequality.

Education level of household head. In general, education is more important in explaining income differences than age or household structure, but the effect differs markedly among the countries covered²¹. In some countries – in particular, in Denmark, Sweden Germany, France – education accounts for less than 10% of income inequality as measured by the MLD index. On the other end of the scale, in Portugal income differences between education groups account for 30% of total inequality, but also in countries like Hungary, Lithuania, Poland, Cyprus, Luxembourg and Slovenia it accounts for around 20% of the MLD index. Countries characterised by a between group effect around 15% are Spain, Finland, Belgium, Greece while other in countries education explains between 10 and 15% of inequality.

Income differences between those with different education levels can be important at both the lower and upper ends of the distribution. Relative incomes of those with low education levels are lowest in the UK, Lithuania, Estonia, Latvia, the Czech Republic and Poland. Average incomes of those with tertiary education are highest in relative terms in Portugal, but relative incomes of those with tertiary education are also high in Poland, Latvia, Lithuania, Hungary, Slovenia and Italy.

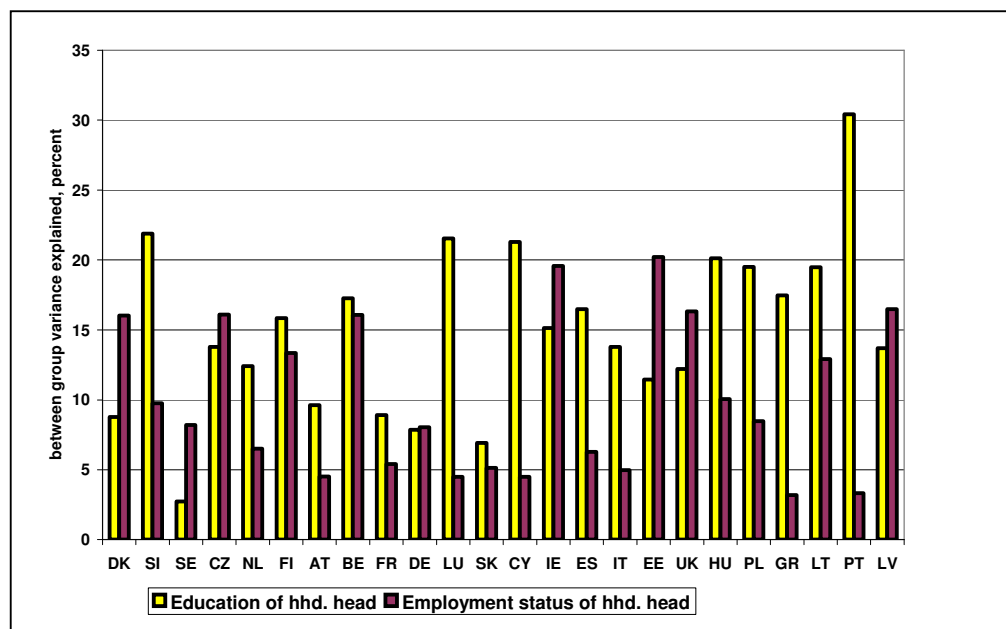
Employment status of household head There is also a great variability in the effect on inequality of the employment status of the household head. In some countries, income differences as regards employment status account for less than 5% of income inequality. These are Austria, Luxembourg,

²¹ In such decompositions it is generally not recommended to compare between-group effects across variables with different number of groups, since a higher number of subgroups obviously leads to more dispersion between groups and less dispersion within groups. In our case labour market variables are all coded on a three-point scale, thus between groups effects can be safely compared. When comparing the effect of demographic and labour market variables it should be kept in mind that demographic variables comprise four and five subgroups. This however does not weaken our conclusion that labour market effects are stronger.

Italy, Greece, Portugal and Cyprus. In Estonia, Latvia, Ireland, the UK, Denmark, Belgium and the Czech Republic income differences according to employment status account for over 15% of total inequality, but also Hungary, Lithuania and Finland show a between group effect over 10%.

The biggest difference between the average income of those employed and those not employed can be found in Ireland, the UK and the three Baltic States. Incomes of those employed are also relatively high in the Czech Republic, Germany, Denmark, Finland and Poland, while incomes of those not in work are also low in the Czech Republic, Belgium and Denmark.

Fig. 10. Fraction of inequality explained by education and employment status

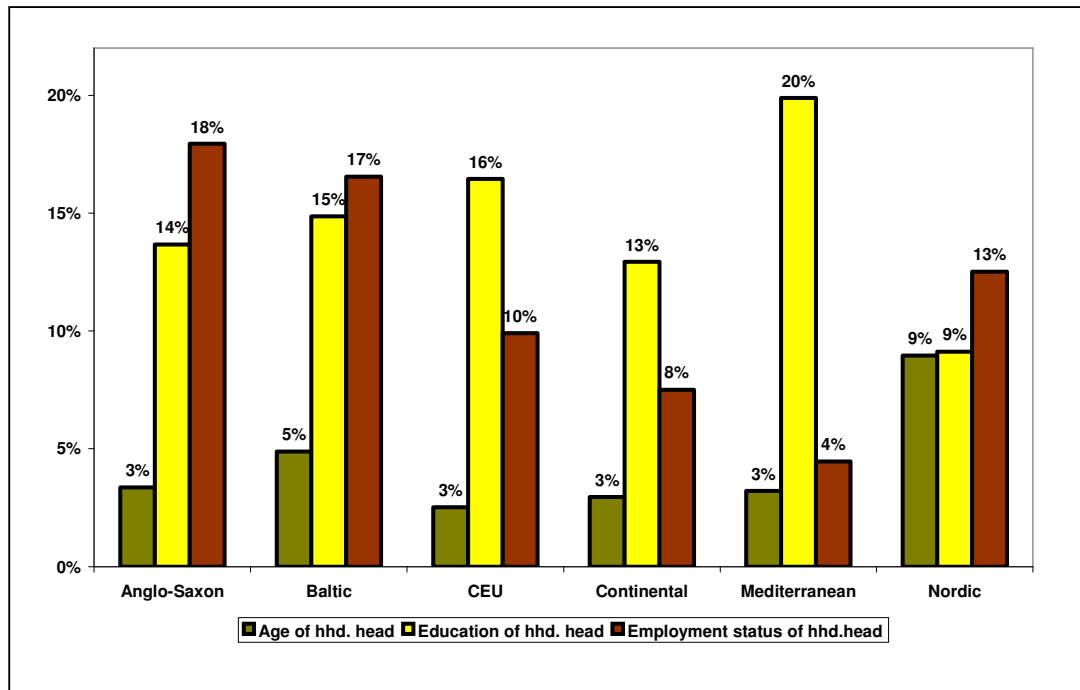


Note: Countries are ranked according to the MLD index of total inequality.

Summary of the decomposition analysis The results of the static decomposition analysis can be summarised by creating six country-groups and calculating averages of between-group effects for each of these. The groups in question are the Nordic countries (Sweden, Denmark, Finland), the Mediterranean countries (Portugal, Spain, Italy, Greece and Cyprus), the Continental countries (France, Germany, Belgium, Netherlands, Luxembourg and Austria), Anglo-Saxon countries (the UK and Ireland), the East-Central-European countries (Poland, the Czech Republic, Slovakia, Slovenia and Hungary) and the three Baltic States (Lithuania, Estonia and Latvia). The average over country-groups of between-group components of inequality according to age, education and employment status of the household head are shown in Figure 10.

The Anglo-Saxon and the Baltic countries have a similar structure of inequality. In these countries both education and employment explain around 15% of total inequality, and this effect is stronger than the effect of age (around 5%). The Nordic countries show different structure of inequalities, since age, education and employment all have broadly similar effects on income inequality. In the Continental, East-Central European and Mediterranean countries, education is the most important factor among the variables considered in this analysis. Employment also has an important effect in the Continental and East-Central European countries but among the Mediterranean countries, the effect of employment status has a similarly small effect to that of age.

Fig. 11 Percentage of inequalities explained by different factors in the country groups, 2005



Note: Percentages are simple country averages.

5. THE ROLE OF INCOMES IN OVERALL WELFARE OF HOUSEHOLDS

In this section we make an attempt to investigate if there is a differential role of incomes in determining the well being of households between the various European countries. Ideally, this would involve creating an all-encompassing wealth (or well being) indicator and then we could observe the correlation between income and well-being or wealth. However, the variable structure of the EU-SILC, unfortunately, is not ideal in this respect. Although there are some variables on various household goods possessed by the respondents, there are serious limitations to using them as components of a “wealth” index. The information on the (lack of) ownership of car, washing machine, flushing toilet, etc, in a European context is good to identify deprivation (i.e. for those NOT having these goods) but it does not help us further differentiating between those having these goods (in a European context, these are large segments even in lower income societies). Therefore, we tried to experiment with a second best solution to this problem.

We created two indices and called them household wealth capacity index and consumption capacity index. The first (the wealth capacity) index contains information on the housing conditions²² and on some durables²³.

Our first predicted variable (the potential household wealth index) is then constructed as a simple, unweighted sum of the z-scores²⁴ for the possession of the above mentioned (thirteen) items about

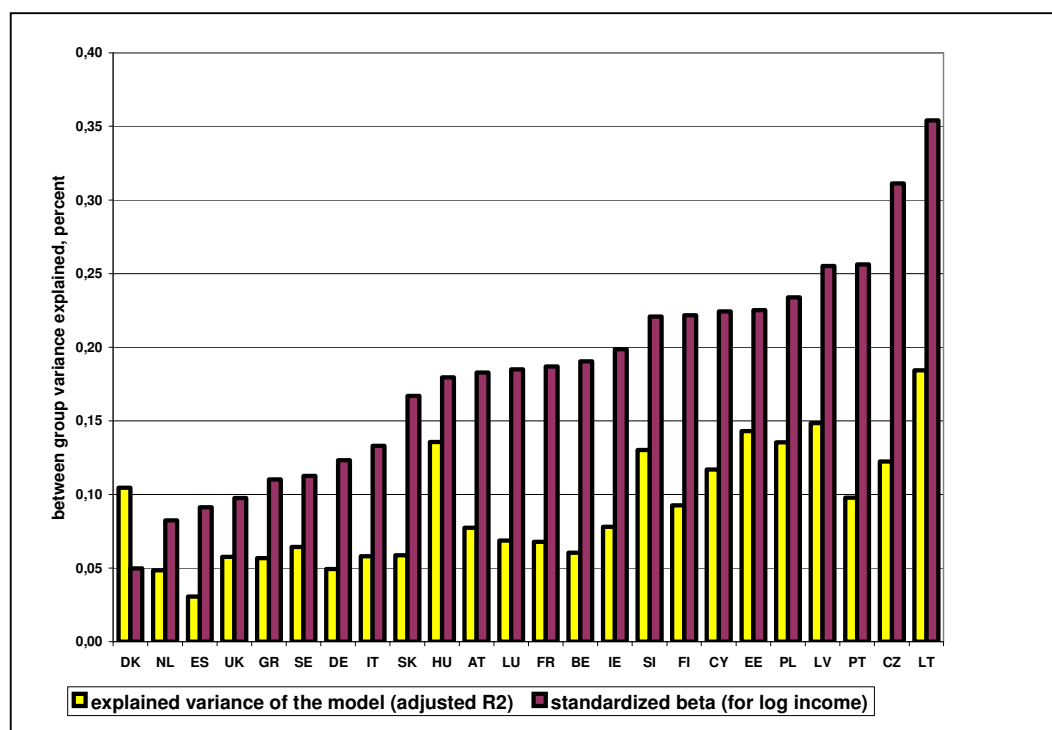
²² Rooms per persons (variable HH030/HX040) , bath (HH080) , flushing toilet (HH090), no leaking roof (HH040), lack of problems with environment (HS180), flat darkness (HS160), crime in surroundings (HS190), noise in the neighbourhood (HS170).

²³ Telephone, colour tv, computer, washing machine and car (in variables HS070 HS080 HS090 HS100 HS110, respectively).

²⁴ They have an expected value of 0 and a variance equal to 1

housing conditions and possession of durables. The further away will an individual be from the center of the distribution, the higher the (positive or negative) value of the index will be. We assumed that higher parameter estimates of (natural logarithm of net person equivalent) disposable income would signal that income has stronger explanatory effect on the wealth capacity. While running the OLS regressions for the predictions, we controlled for age (four brackets: -35, 36-49, 50-64 and 65+), education (less than secondary, secondary and tertiary) and gender of household head²⁵. Standardized beta coefficients of income and the explained variance of the models are shown in Fig 12.

Fig 12. The role of incomes in explaining the variance of the wealth capacity index in the EU countries (adjusted R2 and standardized beta for income)



Note: countries are ranked by the value of the standardized beta values. Controls: age, education and gender of household head. All beta estimates are significant at $p < 0.01$

We see from the Fig 12. that lower level of GDP (in the “West” and the “East” as well) tend to be associated (with some exceptions though) to larger role of incomes in explaining the variance of our the wealth capacity index.

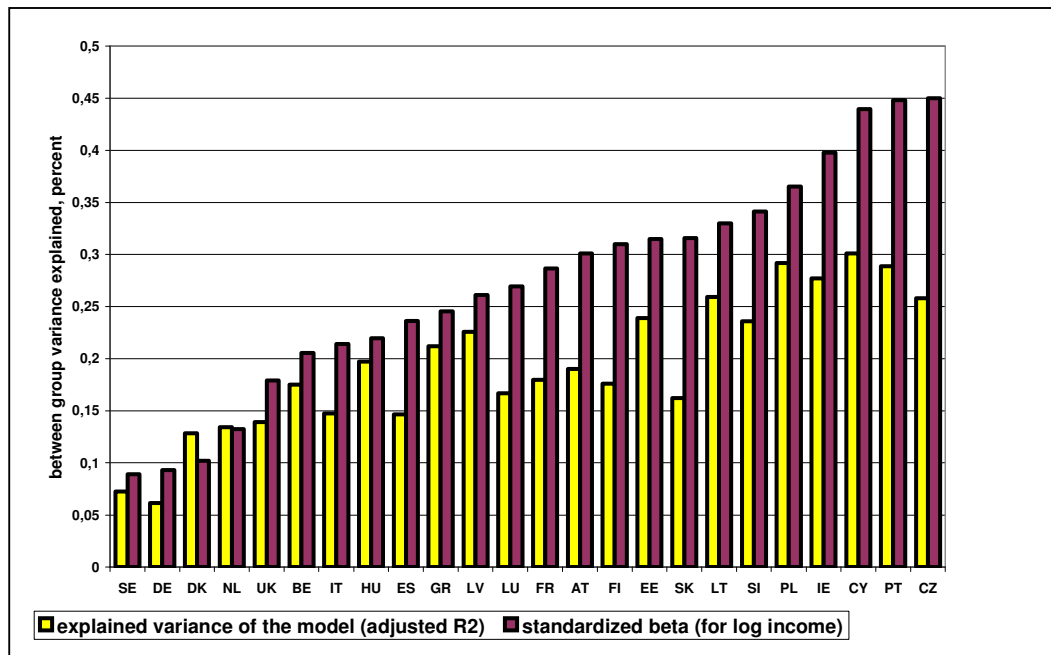
The other predicted index variable we constructed comprises several consumption ability items²⁶ of which we constructed the same type z-score based indices and predicted these in the same type

²⁵ The regressions were run taking households as units.

²⁶ The answer to the question on ability to make ends meet (variable HS120, six category, from very easily to “with great difficulty”), the ability to pay for an unexpected expense (variable HS060 at the level of 1/12 of the poverty threshold for a household on average), or the ability to pay for a week of holiday away from home (HS040) and an ability to keep home adequately warm (HH050).

OLS regressions (using the same controls) as above. Standardized beta coefficients for the consumption capacity index are shown in Fig 13.

Fig 13. The role of incomes in explaining the variance of the consumption capacity index in the EU countries (adjusted R2 and standardized beta for income)



Note: countries are ranked by the value of the standardized beta values. Controls: age, education and gender of household head. All beta estimates are significant at $p < 0.01$

The conclusions are very similar as the figure shows similar country ranking but slightly higher parameter estimates. We again see new member states with relatively high explanatory power of income on the consumption capacity index and also the explained variance of the models are larger.

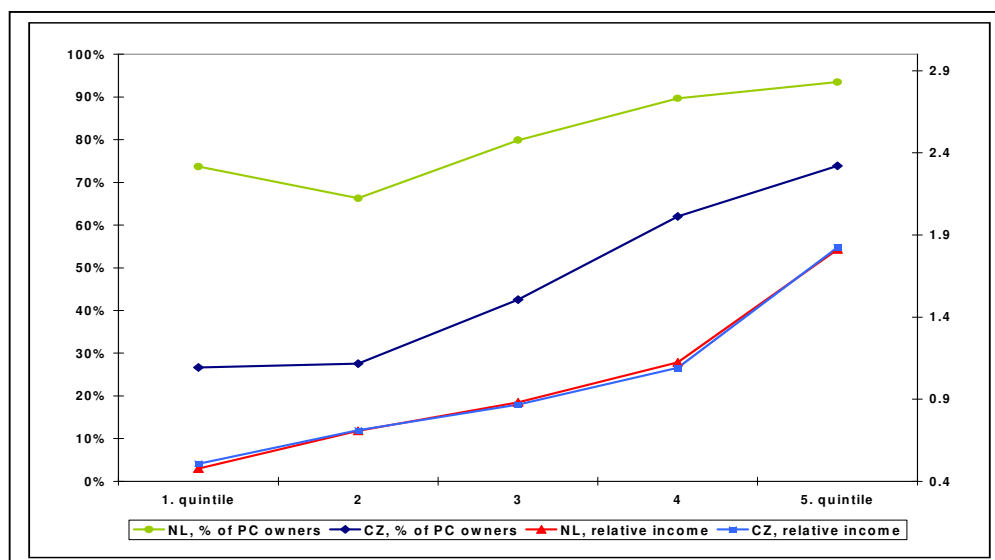
Our hypothesis to explain the above findings includes both methodological and substantive comments. The first come largely from the fact that the index we constructed is made of those goods and housing conditions that are designed to measure deprivation, The higher the GDP in a country, the higher the penetration of the ownership of these durables. With higher penetration, the variance of the wealth capacity index is lower by nature. Therefore, the correlation with incomes tends to be higher in lower GDP countries. As an illustrative example, we show on the following graph (Fig 14.) the percentage of households having a personal computer in the different income quintiles, in the case of a country with a high penetration ratio (Netherlands) and in a country with relatively low penetration (Czech Republic). In the high penetration country differences in PC ownership according to income are much smaller, than in the country with lower penetration. This difference is not a consequence of greater income differences among the quintiles in the lower penetration country. The two countries, the Netherlands and the Czech Republic are quite similar with respect to the extent of income inequalities, as the similarity of the relative income lines show. Thus in the case of the Netherlands, higher absolute income level results in higher penetration, which leads to a weaker relationship between income and durable ownership. We assume this holds for many items that are included in our index and hence in countries with lower level of GDP

(and consequently, lower level but higher variance of penetration of various goods) the relationship between the index (as constructed this way) and incomes will appear higher.

Further sources of deviations could be found in the differential role of in kind benefits in household welfare in the various countries. We assume that the higher the share of state redistribution (especially if in kind) the lower the share of the household budget that should be spent on marketed health, education, food, etc, This allows the households to have more expenditure potentials for the durables listed in the questionnaire.

Also, participation in the informal economy may lead to some distortions in this respect. The direction of the distortions, however, is uncertain, as received informal pay may render measured income underestimated while informally bought goods (like used car or television) may mean cheaper access to durables. The whole thing is further complicated if we take the different income brackets and different countries with different GDP levels into account. However, at current stage we cannot go further in elaborating on these speculations (due to lack of adequate data on both in kind and informal payments).

Fig 14. Why can a wealth (durables) index more closely relate to household incomes in countries at lower level of economic development? (Percentage of households having a personal computer (left axis) and relative income (right axis) by income quintiles in the Netherlands and in the Czech Republic)



Note: Income quintiles are based on the household-level distribution of household equivalent income. Relative income is calculated relative to country mean income.

6. SUMMARY AND CONCLUSIONS

We analysed income distribution patterns of the European Union countries, based on a recent release of data from the EU-SILC survey (reflecting incomes in 2005) . We first charted overall distributional patterns, followed by sensitivity analyses with respect to various inequality measures and two different equivalence scales. The major findings of our paper can be summarised as follows:

- There is a considerable degree of heterogeneity among the EU countries both in the level of GDP and in the measured dispersion of incomes. While the NMSs have much lower GDP per head, even in PPS terms, there are, in general no significant differences between old and new Member States in terms of the variance of overall income inequalities and relative poverty rates within the two groupings.
- However, as new member states cluster in the lower end when European countries are ranked by their level of economic development, a large share of the population of the new member states appears to be living on less than half of the all-European median income.
- In terms of poverty, it seems that four groups of countries can clearly be distinguished. Continental European EU15 countries and the Scandinavian countries belong to the group that is characterised by high GDP levels and relatively low poverty rates. Anglo-Saxon countries and the countries of the Mediterranean tier represent a group with lower levels of GDP and higher levels of poverty rates. Relatively more well-off New Member states constitute the third group, with relatively low poverty rates while the other New Member States have the lowest GDP levels and the highest poverty rates. This pattern will, obviously correspond to welfare arrangements in the various countries as well as economic factors and historical traditions.
- From a methodological point of view, an interesting finding of our paper is that changing the measurement tools (applying different inequality measures that are sensitive to the top, to the middle and to the bottom of the income distribution) is not systematic for the “old” and the “new” member states. Applying different measures may change the country rankings but the incidence of this does not correspond to membership status.
- Similar can be said when different equivalence scales are applied. Measuring poverty an inequalities on the basis of equivalent incomes (OECD II scale) or by per capita incomes makes a real difference, but, again, not systematically related to membership status.
- It may, however, well be that when taking different portfolios of expenditures (on housing, food and other goods into account), a different consumption weights would more properly reflect the situation of the households in the EU10 and the EU15. Nevertheless, we in this paper did not make an attempt to identify these specificities though we think doing this exercise would be very important to be done.
- We also attempted to identify determinants of the variance of incomes in the individual member states. Notably, between group variance for age of the household head, household structure, employment status of the household head and education was presented in the article. In this respect we found that the Anglo-Saxon and the Baltic countries have similarities in the structure of their inequalities. In these two country groupings both education and employment explain a relatively large share of inequalities and this effect is stronger than the effect of age. In the Nordic countries age, education and employment all have broadly similar effects on income inequality. In the Continental, East-Central European and Mediterranean countries, education is the most important factor among the variables considered in this analysis. Employment also has an important effect in the Continental and East-Central European countries but among the Mediterranean countries, the effect of employment status has a similarly small effect to that of age.
- Finally, we investigated the role of incomes in explaining well-being of households. Although the data for a full account of wealth distribution is far from adequate, we found systematic differences between the old and the new member states in this respect. Explaining the variance of the indexes constructed from the available material deprivation

items have shown a stronger effect of income and higher explanatory power of the models in the case of the new than in the old member states. It is not clear however, whether this can be attributed to the design of the index, to lower absolute income levels or to differential role of state redistribution in kind or further, to the different importance of the informal economies.

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