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Department of Economics, Leiden University

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Jinxian Wang, Koen Caminada, Kees Goudswaard and
Chen Wang

Correspondence to

Faculty of Law
Department of Economics
P.O. Box 9520
2300 RA Leiden
The Netherlands
Phone ++31 71 527 7756 / 1571
E-mail: conomie@law.leidenuniv.nl
Website: <http://www.economie.leidenuniv.nl>

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Dr. B.C.J. van Velthoven

Decomposing income polarization and tax-benefit changes across 31 European countries and Europe wide, 2004-2012*

Jinxian Wang, Koen Caminada, Kees Goudswaard and Chen Wang**

Leiden University, Department of Economics
PO Box 9520, 2300 RA Leiden, The Netherlands

Abstract

Polarization is an interesting additional social indicator for analyzing income inequality and poverty across countries, as it captures the phenomenon of 'clustering around extreme poles'. Rising income polarization can be harmful since it is closely linked to poverty, social exclusion, social tension and social unrest (Brzezinski, 2013). However, so far little literature has been devoted to the changes in income polarization across countries over time, especially within Europe. Moreover, not much is known about whether and to what extent market income and the tax-transfer system contribute to changes of polarization. This paper provides theoretical and empirical insights into a relatively new dimension of income distribution: polarization. Rising income polarization has been observed outside Europe, but within the EU, polarization is relatively unexplored. We therefore broaden the analysis using micro-data from EU-SILC to 28 EU countries and 3 non-EU countries over the period 2004-2012. The paper estimates income polarization and decomposes the estimated polarization by country clusters, and Europe-wide, using a decomposition technique we developed.

The main conclusions are:

- (1) Income polarization is rather stable over the decade in European countries, and Europe-wide. It was rising among West-EU15 countries in the sub-period 2004-2008, but declining afterwards. The opposite development is witnessed for CEE New Member States. Despite the Great Recession we do not find a sizeable increase in income polarization.
- (2) The causes of changes in polarization between 2004 and 2012 vary to a large extent across countries – no general pattern is found, although polarization was upward driven by market income (mainly capital income), while tax-benefit systems were polarization-reducing.

JEL Classification: I32, H53, H55

Key-words: income polarization, inequality, poverty, social inclusion, welfare state reform, EU-SILC

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** All authors are from Leiden University. Wang and Wang are funded by Chinese Scholarship Council. Goudswaard and Caminada are fellows at Leiden Law School and Netspar. Correspondence via j.wang@law.leidenuniv.nl.

1. Background and motivation

It is one of the main objectives of the European Union to enhance economic and social cohesion both between and within member countries (Article 2 of the Treaty on European Union). On 17 June 2010 the European Council agreed to reduce the number of Europeans at-risk of-poverty or social exclusion by at least 20 million. The Open Method of Coordination (OMC) on social exclusion should be transformed to improve national policy making towards this common goal (Cantillon & Vandenbroucke, 2014; Van Vliet and Wang, 2015). However, what is known about the period since the early 2000s shows a mixed experience across EU countries in terms of changes to the risk-of-poverty rate and, closely related, levels of income inequality. The explanations for this are many and various (Nolan et al., 2014). There are sizeable differences across member states in the levels of within country income inequality and poverty, especially since the enlargements of the EU in 2004 and 2007. With respect to the recent EU enlargement it is particularly interesting to see how the new member states compare to the well-established welfare states of Western Europe.

The growing interest in national and cross-national differences in earnings and income inequality has produced a wide range of studies (see Gottschalk & Smeeding, 1997; Caminada & Goudswaard, 2001; Brandolini & Smeeding, 2007; OECD, 2008, 2011 and 2015; Lambert et al., 2010 and Immervoll & Richardson, 2011). It is now widely acknowledged that from the mid-1990s onwards poverty outcomes in EU and OECD countries have been rather disappointing. Despite a continuous dynamic of economic growth, increasing employment rates, and high levels of social spending in the pre-crisis period before 2008, poverty either rose or stayed stable, with only few countries reporting a significant fall (OECD, 2008, 2011 and 2015). Even the Scandinavian model has generally been unapt to counter this trend. For example, poverty increased significantly in Sweden and Finland but remained unchanged in Denmark (Morelli et al., 2015). In seeking to understand the disappointing progress on EU-agreed upon social indicators, existing research has partly focused on what has happened at the lower end of the income distribution (poverty rates). Many other empirical studies have relied on popular inequality measures as the Gini index, which is most sensitive to changes in the middle of the distribution. In this paper we shift focus by applying an income polarization indicator. Several authors argue that the relevant distributional phenomenon is not inequality, but polarization (Duclos et al., 2004; Duro, 2005). Intuitively, polarization (defined formally below) is related but distinct from inequality and poverty and aims to capture the distance or separation between clustered groups in a distribution. Income polarization might be harmful, as it is closely linked to social exclusion, social tension, and social unrest (Esteban & Ray, 1994, 1999 and 2011; Duclos et al., 2004). Traditional indices such as poverty and inequality, cannot describe properly the level of potential conflict underlying the income distribution (Duro, 2005; Gasparini et al., 2008). In this sense, polarization of income appears to be a better measure, since it captures the phenomenon of

'diminishing middle class' or 'clustering around extreme poles', which can be associated with a 'divided society' (Zhang & Kanbur, 2001; Edward, 2006; Whelan & Maitre, 2009). Recently, attention has been paid to the phenomenon of job polarization. The OECD indicates that the employment shares of middle skill, often routine-tasks jobs have declined significantly in all OECD countries (OECD 2015: 147). This phenomenon may be related to technological advancements, but also to other factors, such as the growth of non-standard employment. In this paper we focus on income polarization.

The contribution to the literature we make is twofold. First, income polarization has attracted increasing attention outside the EU. Overall, the conclusion of the current state of the art literature seems to be that in general income polarization has grown over the past few decades, but that there is considerable variation across countries (Seshanna & Decornez, 2003; Duro, 2005; Brzezinski, 2013). Instead, research on income polarization in the EU is relatively rare.¹ To the best of our knowledge, there is no study addressing income polarization considering Europe as a whole or the trends in income polarization in most recent times. Therefore, the first contribution of this study is to track the trends in income polarization in EU member states, thus adding another perspective to the comparative research on income distribution. We analyze the period 2004-2012, so we also capture period of the Great Recession. We further split the period into two, using 2008 as the mid-point to investigate effects before and since the Great Recession. Economic factors strongly affected incomes and employment, and hence inequality and poverty, over this decade. But countries also took different policy routes since the Lisbon Treaty, so experiences may provide lessons on the different tax-benefit policies to achieve the European Union's ambitions for social inclusion.

The second contribution lies in the decomposition of the changes of income polarization. Specifically, we are interested in how work income, capital income, social transfers, and taxes are related to the changes of income polarization. It has been pointed out that there has been pervasive job polarization in EU, resulting in unequally distributed and polarizing market income (Goos et al., 2009; Massari et al., 2013). Since market income is the main component of disposable income, polarization of market income may also lead to polarization of disposable income. In addition to labor income, business and property income also contribute to unequally distributed income (Paul, 2004). The tax-transfer system is the other driving force behind the disposable income distribution (Wang et al., 2012; 2014). Differences in the form and structure of welfare provision or changes in taxation might also contribute to the trends in polarization

¹ Based on analysis of Dutch cities, Burgers (1996) points out that the number of individuals and households at the top and bottom ends of the income distribution have grown considerably and this trend has been paralleled by increasing unemployment and greater insecurity in the labor markets. In a case study for Spain, Gradín (2000) observes a declining polarization between 1973 and 1991. So far, most of the existing literature on income polarization is based on a limited number of cities or regions (see also Castro, 2003; Ezcurra et al., 2005).

(Hamnett, 1996). The impact of the tax-transfer system on income inequality measures as the Gini coefficient has been widely studied, but not the impact on polarization.

The paper is structured as follows. Section 2 defines the polarization indicator, describes its characteristics (also in relation to other popular indicators of the distribution of income) and our decomposition technique. Section 3 describes our data (EU-SILC). Section 4 contains empirical analyses on both the level and change of polarization in 31 European countries, and Europe wide, for the period 2004-2012. Section 5 decomposes the change of polarization over time and across countries by income source. Section 6 concludes.

2. Characteristics of the polarization indicator

2.1 The polarization indicator

Polarization describes the degree to which a population is segregated into groups in a society (Gradín, 2000). Polarization is an important issue but has largely been neglected in 'mainstream' economics until recently. This is remarkable since the income distribution has polarized and the middle class has shrunk in a number of countries (Atkinson and Brandolini, 2013). Polarization detects the presence or disappearance of groups in a distribution and captures the phenomena of 'diminishing middle class' or 'a divided society' (Zhang & Kanbur, 2001). High polarization may lead to less social mobility. In a highly polarized society, individuals in each cluster feel closer to each other but distant to other groups, causing barriers for mobility between groups. Consequently, the relatively poor face difficulties in moving up the income ladder (Motiram & Sarma, 2014).

The literature on measurement of income polarization can be traced back to Foster & Wolfson (1992, 2010). Focusing on two income groups, they developed a bi-polarization index.² More recent efforts go beyond two groups to an arbitrary number of income groups. Especially, Esteban & Ray (1994) and Duclos et al. (2004) derive the 'identification-alienation' framework to assess individuals' identity with one another belonging to the same group and alienation from those belonging to other groups. According to Esteban & Ray (1994), polarization can be characterized by three features: high degree of identification (homogeneity) within groups; high degree of alienation (heterogeneity) across groups; and a few groups of significant size but not captured as significantly sized groups (e.g., isolated individuals) carry little weight. Based on this framework, more polarization arises in case of stronger identification among people within a group or more alienation between groups.

Suppose v_i denote the population share of group i and μ_i denotes the average income. Esteban & Ray (1994) express polarization as:

² The bi-polarization index can be expressed as $P_{FW} = (G^B - G^W) \frac{\mu}{m}$, where G^B , G^W , μ , and m are within group inequality, between group inequality, the mean and the median income of the distribution.

$$ER = K \sum_{i=1}^s \sum_{j=1}^s v_i^{1+\alpha} v_j |\mu_i - \mu_j|,$$

where K is accounted for normalization and α is the sensitivity parameter with $\alpha \in [0, 1.6]$. ER equals to Gini coefficient when $\alpha = 0$ or only one individual exists in each group.

ER is based on a discrete, finite set of income groups which suffers from the limitation of discontinuity in a continuous ambient space of possible income values. In this paper we apply the following family of polarization estimators refined by Duclos et al. (2004)³ for continuous distributions:

$$DER = \left(\frac{1}{n}\right) \sum_{i=1}^n \hat{f}(y_i)^\alpha \hat{a}(y_i)$$

$$\text{and } \hat{a}(y_i) = \hat{\mu} + y_i \left[\left(\frac{1}{n}\right) (2i - 1) - 1 \right] - \left(\frac{1}{n}\right) [2 \sum_{j=1}^{i-1} y_j + y_i]$$

where $\hat{\mu}$ captures the sample mean, $\hat{f}(y_i)^\alpha$ is estimated by non-parametrical kernel estimation. The axioms introduced by Duclos et al. (2004) require that α must be bounded: $\alpha \in [0.25, 1]$. When $\alpha = 0$, the polarization index DER is equal to the popular Gini coefficient of inequality. Taking into account this relationship between DER and Gini, we may expect that low values for α should produce the values of the DER indices that are close in practice to the values of Gini, while setting α to 1 leads potentially to the highest disparity between Gini and the DER indices. In what follows, DER will be estimated for the whole set of European countries, divided by West-EU15 and CEE NMS countries. The division is asked for by different geography, different resource endowments, different initial conditions and regional social policies. These have resulted in different income levels and distributions across regions.

2.2 The relationship between polarization and income inequality

The polarization index lies, as the Gini coefficient, between 0 and 1. Polarization and Gini equal 0 for a perfectly equal distribution of incomes. However, polarization is fundamentally different from inequality.⁴ Regarding the concept, inequality concerns the distances of different individuals in a society from the population mean. Polarization, on the other hand, is closer to the notion of segregation than income inequality (Esteban & Ray, 1994). Polarization places both emphasis on income differences and income clusters, comparing the homogeneity within a group with the overall heterogeneity of a given population (Castro, 2003). As such, polarization depicts the extent of similarities among members in a group and the distances between groups. In practice, polarization and income inequality may not go hand in hand. Both inequality and

³ The DER is refined to decompose the identification ingredient and alienation ingredient additively.

⁴ The main differences between the three notions of inequality, bipolarization and polarization are also discussed by Deutsch et al. (2013).

polarization will decline if there is an 'equalizing transfer' of income from an individual above the median to an individual with income below the median. However, inequality and polarization might diverge when there are equalizing transfers entirely on one side of the median (Wolfson, 1994; 1997). The difference between inequality and polarization can be best described by a hypothetical example where one individual owns the total income and all others none. In this case, inequality reaches the upper bound but the society is hardly polarized.

Polarization and income inequality can even move in opposite directions; see Table 1 (see also Atkinson and Brandolini, 2013). Assume that the multiple-peaked distribution evolved from the uniform distribution; some middle incomes have disappeared, while both low and high income groups grew. Total income of the whole population has remained the same. Note that the multi peaked distribution is more polarized than the uniform distribution. However, the more polarized multi peaked distribution is also more equal (the Lorenz curve of the multi peaked distribution lies closer to the egalitarian than the Lorenz curve of the uniform distribution). As a result the Gini coefficient of the multi peaked distribution is lower than the Gini of the uniform distribution. The same holds for the s80/s20 ratio. In this example, higher polarization is accompanied by lower income inequality. Overall, income inequality and polarization are two different concepts that should be examined separately when analyzing income distributions (Ezcurra, 2009). Phenomena such as 'the disappearing middle class' or 'clustering around extremes' do not appear to be easily captured by standard measures of inequality such as the Gini coefficient. But would conclusions drawn from comparisons of inequality measures (Gini and poverty rates) be reversed or significantly changed if we use polarization measures in comparing societies over time? Empirical evidence is mixed. Zhang & Kanbur (2001) find that, contrary to theoretical expectations, the new measures of polarization do not generate very different results from the standard measures of inequality. Ravallion & Chen (1997) performed a cross-country comparison of the Gini coefficient and the bi-polarization index, and concluded 'there is a surprisingly close correspondence between them for these data'. Duclos et al. (2004), Vega et al. (2006), and Brzezinski (2013) on the other hand provide evidence that inequality and polarization indices differ empirically and in significant ways. So the issue of whether polarization and inequality (poverty rates) can be distinguished empirically has been a matter of some debate. For this reason we compare both levels and trends for the Gini index of inequality, poverty rates and social exclusion with levels and trends for the polarization indicator.

Table 1: A numerical example on the relationship between polarization and Gini

	Uniform distribution		Multi-peaked distribution	
	# households	income	# households	income
	3	25	1	25
	3	50	7	50
	3	75	1	75
	3	100	3	100
	3	12	1	125
	3	150	7	150
	3	175	1	175
	21	2,100	21	2,100
Gini coefficient		0.29		0.26
Ratio S80/S20		5.40		3.57
Polarization index		0.38		0.43

2.3 Decomposition

To estimate the contributions of income sources to income polarization over time, this study relies on Shapley decomposition and on growth redistribution decomposition⁵. With the Shapley decomposition, the marginal contribution of each income component is calculated on the basis of all possible routes considering the combination of changes in all other components. For instance, supposing disposable income consists of n components $x_k \in \{x_1, x_2, \dots, x_k, \dots, x_n\}$, the marginal effect of x_k on polarization over time is thus the average of $\Delta p(x_k)$ obtained from all routes with all possible combinations of changes in other components. More specifically, for each of the other determinants, there are two statuses in period t and $t + 1$ with or without change. Therefore, there are 2^{n-1} combinations of changes with regards to the other $n - 1$ determinants. Using Shapley decomposition, all contributions can be added up to 100% of the total changes in polarization with no residual left.

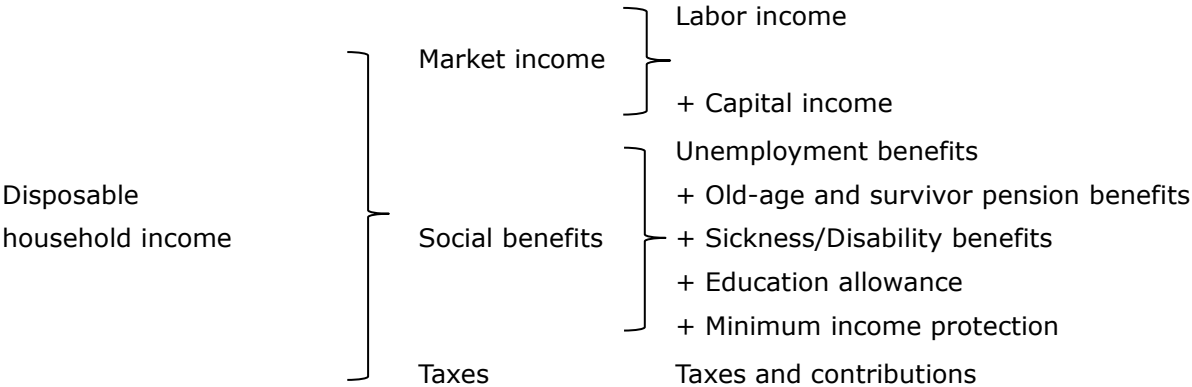
Following, the partial effect of each income component on polarization can be divided into a growth effect and a redistribution effect; see Wang & Wan (2014). The growth effect shows changes in polarization led by the changes in the average income component. The redistribution effect represents polarization changes due to resource reallocation. In the Appendix E, we present the growth effect and the redistribution effect of each income component in detail, both mathematically and empirically.

Table 2 presents the components composing of disposable household income in our dataset (described in section 3). All incomes are expressed in gross values and converted into euros of 2005 (deflating by a country-specific consumer price index taken from World Bank, 2013). In this paper, disposable income will be decomposed into three main income components, namely market income from labor and capital, social benefits and taxes. To decompose the effects of

⁵ Araar (2008) provides another way to decompose the level of polarization by population group and income source.

market income, social benefits, and taxes on changes of polarization, we use Shapley decomposition which considers all possible sequences of changes of income sources, and growth and redistribution decomposition which shows the effects of income growth and redistribution on polarization separately. For the three main income components, we present the partial effect of each income component which is the sum of the partial growth effect and the partial redistribution effect; see Appendix E for details.

Table 2: Composition household disposable income



3. Data

The European Union Statistics on Income and Living Conditions (EU-SILC) is the EU reference source for micro income data. Many EU indicators designed to monitor income inequality, poverty and social inclusion in the EU are based on EU-SILC. The reference population of EU-SILC consists of private households residing in the participating countries at the moment of selection. Currently 31 countries are involved in the EU-SILC process, namely all 28 EU Member States plus 3 non-EU members Iceland, Norway, and Switzerland. For the analysis presented in this paper, EU-SILC 2004-2012 data of 31 countries are taken into account.

EU-SILC contains detailed information on individual and household characteristics as well as income by source. Disposable income is defined as the sum of gross market income and cash benefits, net of direct taxes and social insurance contributions; it is adjusted for differences in household size and composition using modified LIS' equivalence scale.

EU-SILC is unique since it provides information on a wide range of social indicators. It should however be noted that considerable differences between participating countries in EU-SILC exist in terms of sample design, sample frame and data source (e.g. Goedemé, 2013).

In this paper we assess the effect of tax-benefit income components on the polarization of household disposable income, on poverty and income inequality in 31 EU countries in 2004-2012. We further split the period into two using 2008 as the mid-point to investigate effects before and since the Great Recession. We computed the polarization measure (for a range of values of α ;

see Appendix D for details) for household disposable income, equivalized using the square-root scale, and weighted with EU-SILC household sample weights multiplied by the number of persons in the household. Following common practice (see, e.g. Duclos et al., 2004), we excluded non-positive incomes. In line with Eurostat practice, no top-coding of income has been applied. All incomes are expressed in gross values and converted into euros of 2005 (deflating by a country-specific consumer price index taken from World Bank, 2013). Available countries and data years are presented in Table 3.

Table 3: Available countries and data years in EU-SILC

<i>West-EU15</i>			<i>CEE NMS-13</i>		
AT	Austria	2004-2012	<i>BG</i>	<i>Bulgaria</i>	<i>2007-2012</i>
BE	Belgium	2004-2012	CY	Cyprus	2005-2012
DE	Germany	2005-2012	CZ	Czech Republic	2005-2012
DK	Denmark	2004-2012	EE	Estonia	2004-2012
<i>ES</i>	<i>Spain</i>	<i>2004-2012</i>	<i>HR</i>	<i>Croatia</i>	<i>2011-2012</i>
FI	Finland	2004-2012	HU	Hungary	2005-2012
<i>FR</i>	<i>France</i>	<i>2004-2012</i>	LT	Lithuania	2005-2012
<i>GR</i>	<i>Greece</i>	<i>2004-2012</i>	<i>LV</i>	<i>Latvia</i>	<i>2005-2012</i>
IE	Ireland	2004-2012	<i>MT</i>	<i>Malta</i>	<i>2008-2012</i>
<i>IT</i>	<i>Italy</i>	<i>2004-2012</i>	PL	Poland	2005-2012
LU	Luxembourg	2004-2012	<i>RO</i>	<i>Romania</i>	<i>2007-2012</i>
NL	Netherlands	2005-2012	SI	Slovenia	2005-2012
<i>PT</i>	<i>Portugal</i>	<i>2004-2012</i>	SK	Slovakia	2005-2012
SE	Sweden	2004-2012			
UK	United Kingdom	2005-2012	<i>Other</i>		
			<i>CH</i>	<i>Switzerland</i>	<i>2008-2012</i>
			IS	Iceland	2004-2012
			NO	Norway	2004-2012

Note: No time-series analyses for countries presented in *italic* due to lack of quality of data (no gross incomes) for ES (2004-2005), FR (2004-2006), GR(2004-2006), IT (2004-2006), LV (2005-2006), PT(2004-2006), or missing data for BG (2004-2006), HR(2006-2010), MT(2004-2007), RO(2004-2006), and CH(2004-2007).

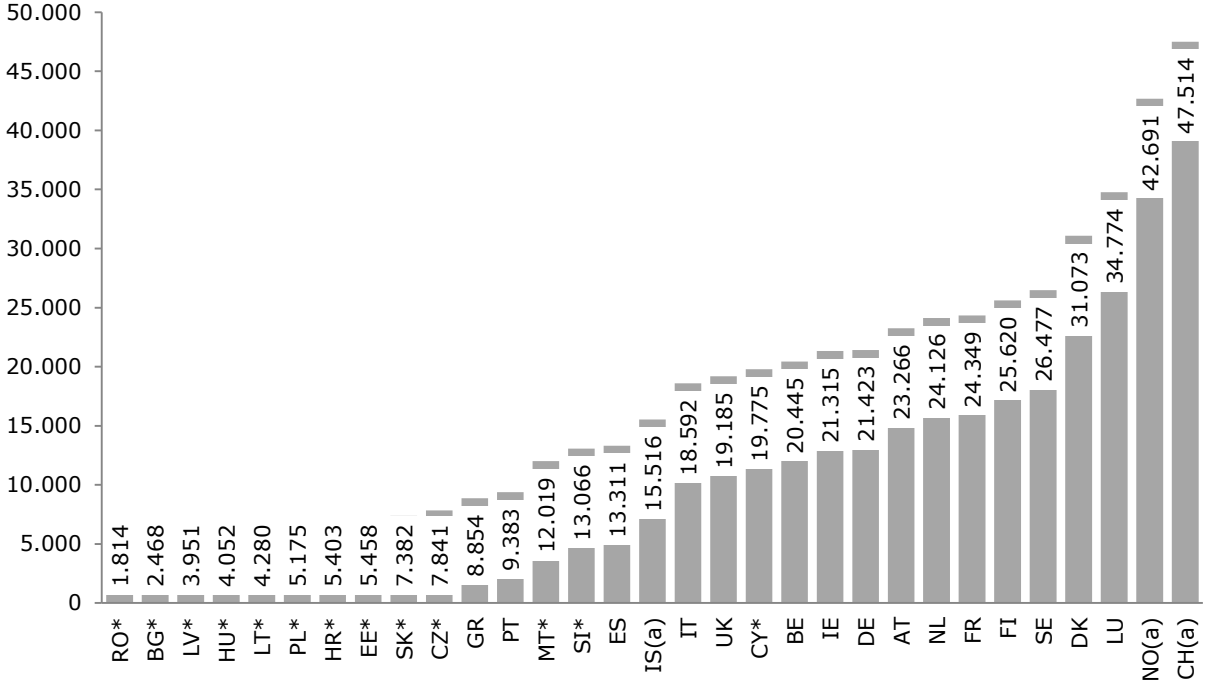
4. Empirical analysis

4.1 Descriptives around 2012

In what follows, polarization will be estimated for the whole set of European countries, divided by West-EU15 and CEE NMS countries. The division is asked for by different geography, different resource endowments, different initial conditions and different social policies. These have resulted in different income levels across regions; see Figure 1. The highest mean equivalized

disposable income is found in Switzerland, Norway, and Luxembourg while Romania, Bulgaria, and Latvia have the lowest average income. In general, the West-EU15 countries have higher disposable incomes than the CEE NMS countries except for Portugal.

Figure 1: Mean equivalized disposable income, 2012

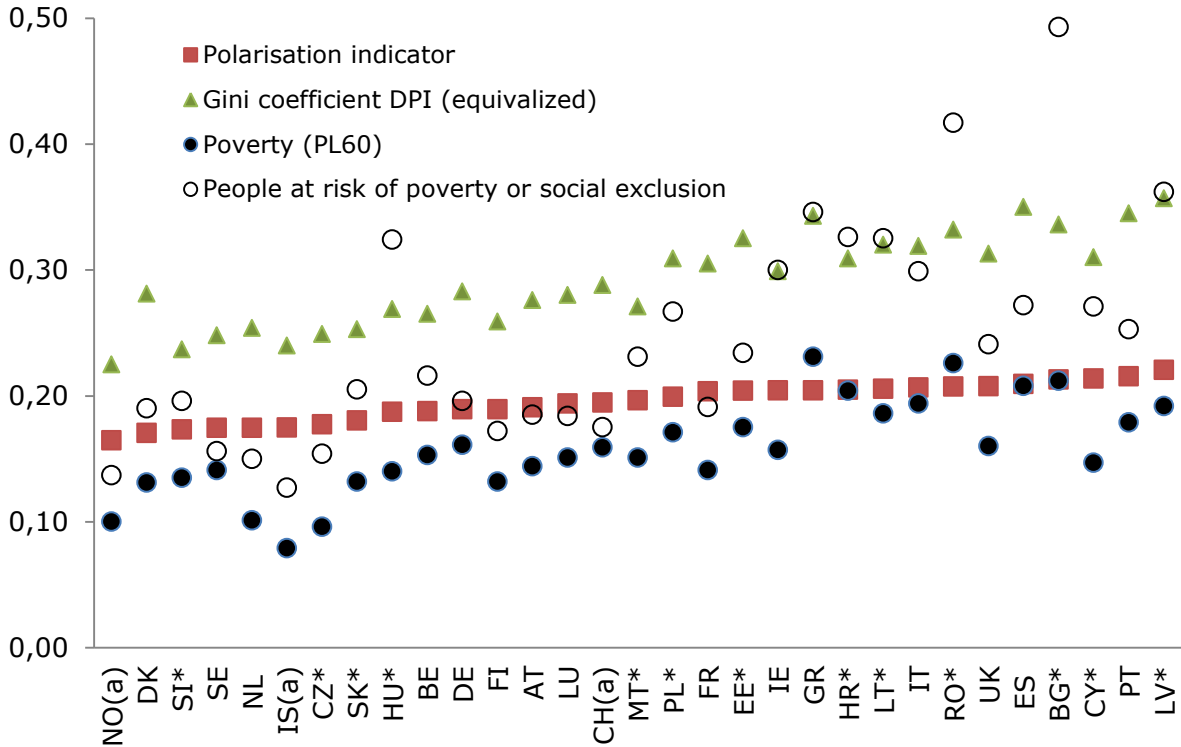


Notes: * = CEE NMS (a) = Non-EU countries

Source: own calculations EU-SILC; All incomes are expressed in euros of 2005

Figure 2 depicts the point estimates around 2012 for several social indicators: the polarization indicator, the Gini coefficient of equivalized disposable income, the at-risk-of-poverty rate (threshold 60% of the median income for each country) and the EU-agreed upon indicator for people at-risk-of-poverty or social exclusion. People at-risk-of-poverty or social exclusion consists of not only people at risk of poverty but also those who are severely materially deprived or living in households with very low work intensity (Eurostat, 2015). Table 4 provides the numbers behind Figure 2 and also shows how the country ranking differs between the social indicators. Countries are ranked in order of their level of the polarization indicator from smallest (Norway) to highest (Latvia). Polarization is relatively low in Norway, Denmark, Slovenia, Sweden and the Netherlands, while relatively high figures are found for the United Kingdom, Spain, Bulgaria, Cyprus, Portugal and Latvia. The rank of polarization is not linked to the ranks of other social indicators. For example, Norway ranks low in polarization index but also in other social indicators. Denmark, however, ranks low in polarization in polarization index but relatively high in Gini.

Figure 2: Polarization indicator and other social indicators, 2012



Notes: * = CEE NMS (a) = Non-EU countries

Source: own calculations EU-SILC

The comparisons presented in Figure 2 and Table 4 illustrate that income polarization is empirically distinguishable from income inequality, poverty and social exclusion in our sample. In our data for 2012, the correlation between polarization and the Gini index is rather high (Pearson correlation = 0.92); see Table 5. However, the correlation between polarization and indices on poverty or social exclusion is notably lower (0.78 resp. 0.72; see Appendix B and D for details).

Table 4: Polarization indicator and other social indicators, 2012

	Polarization index		Gini coefficient equivalized disposable income		Poverty rate (PL60)		People at-risk-of-poverty or social exclusion	
	<i>Level</i>	<i>Rank</i>	<i>Level</i>	<i>Rank</i>	<i>Level</i>	<i>Rank</i>	<i>Level</i>	<i>Rank</i>
Norway	0.165	(1)	0.225	(1)	0.100	(3)	0.137	(2)
Denmark	0.170	(2)	0.281	(14)	0.131	(5)	0.190	(10)
Slovenia	0.173	(3)	0.237	(2)	0.135	(8)	0.196	(13)
Sweden	0.174	(4)	0.248	(4)	0.141	(11)	0.156	(5)
Netherlands	0.175	(5)	0.254	(7)	0.101	(4)	0.150	(3)
Iceland	0.175	(6)	0.240	(3)	0.079	(1)	0.127	(1)
Czech Republic	0.177	(7)	0.249	(5)	0.096	(2)	0.154	(4)
Slovakia	0.180	(8)	0.253	(6)	0.132	(7)	0.205	(14)
Hungary	0.187	(9)	0.269	(10)	0.140	(9)	0.324	(25)
Belgium	0.188	(10)	0.265	(9)	0.153	(16)	0.216	(15)
Germany	0.189	(11)	0.283	(15)	0.161	(20)	0.196	(13)
Finland	0.189	(12)	0.259	(8)	0.132	(7)	0.172	(6)
Austria	0.191	(13)	0.276	(12)	0.144	(12)	0.185	(9)
Luxembourg	0.194	(14)	0.280	(13)	0.151	(15)	0.184	(8)
Switzerland	0.195	(15)	0.288	(16)	0.159	(18)	0.175	(7)
Malta	0.197	(16)	0.271	(11)	0.151	(15)	0.231	(16)
Poland	0.199	(17)	0.309	(20)	0.171	(21)	0.267	(20)
France	0.204	(18)	0.305	(18)	0.141	(11)	0.191	(11)
Estonia	0.204	(19)	0.325	(25)	0.175	(22)	0.234	(17)
Ireland	0.204	(20)	0.299	(17)	0.157	(17)	0.300	(24)
Greece	0.204	(21)	0.343	(28)	0.231	(31)	0.346	(28)
Croatia	0.205	(22)	0.309	(20)	0.204	(27)	0.326	(27)
Lithuania	0.206	(23)	0.320	(24)	0.186	(24)	0.325	(26)
Italy	0.207	(24)	0.319	(23)	0.194	(26)	0.299	(23)
Romania	0.207	(25)	0.332	(26)	0.226	(30)	0.417	(30)
United Kingdom	0.208	(26)	0.313	(22)	0.160	(19)	0.241	(18)
Spain	0.209	(27)	0.350	(30)	0.208	(28)	0.272	(22)
Bulgaria	0.213	(28)	0.336	(27)	0.212	(29)	0.493	(31)
Cyprus	0.214	(29)	0.310	(21)	0.147	(13)	0.271	(21)
Portugal	0.216	(30)	0.345	(29)	0.179	(23)	0.253	(19)
Latvia	0.221	(31)	0.357	(31)	0.192	(25)	0.362	(29)
<i>Mean-31</i>	<i>0.195</i>		<i>0.292</i>		<i>0.158</i>		<i>0.245</i>	

Table 5: Pearson correlation between polarization and other social indicators

	Polarization indicator	Gini coefficient	Poverty (PL60)	Social exclusion	Mean disposable income
Polarization indicator	1				
Gini coefficient	0.915**	1			
Poverty (PL60)	0.778**	0.863**	1		
Social exclusion	0.717**	0.745**	0.823**	1	
Mean disposable income	-0.436*	-0.454*	-0.458**	-0.647**	1

** Correlation is significant at the 0.01 level (2-tailed); * significant at the 0.05 level (2-tailed)

4.2 Cross-country time-series analyses

We split the period 2004-2012 into two using 2008 as the mid-point to investigate effects before and since the Great Recession. Table 6 shows estimates for the polarization indicator for each country and the direction of movement in the indicator in the two sub-periods 2004-2008 and 2008-2012.

Table 6: Polarization indicator 2004, 2008 and 2012

Country	Available in EU-SILC	Polarization indicator			Change over time			
		2004	2008	2012	2004-2008	2008-2012	2004-2012	
<i>West-EU15</i>								
AT	Austria	2004-2012	0.183	0.188	0.191	2.9%	1.6%	4.3%
BE	Belgium	2004-2012	0.188	0.194	0.188	3.1%	-3.0%	0.0%
DE	Germany	2005-2012	0.191	0.193	0.189	1.4%	-2.1%	-0.8%
DK	Denmark	2004-2012	0.166	0.191	0.170	15.3%	-10.7%	2.9%
FI	Finland	2004-2012	0.187	0.189	0.189	1.0%	0.3%	1.3%
IE	Ireland	2004-2012	0.216	0.215	0.204	-0.5%	-4.9%	-5.7%
LU	Luxembourg	2004-2012	0.189	0.212	0.194	11.9%	-8.4%	2.5%
NL	Netherlands	2005-2012	0.172	0.181	0.175	5.5%	-3.4%	1.8%
SE	Sweden	2004-2012	0.164	0.169	0.174	3.0%	3.4%	6.1%
UK	United Kingdom	2005-2012	0.223	0.217	0.208	-2.8%	-4.2%	-7.3%
<i>Mean-10</i>			<i>0.188</i>	<i>0.195</i>	<i>0.188</i>	<i>3.8%</i>	<i>-3.3%</i>	<i>0.3%</i>
<i>Coefficient of variation</i>			<i>0.098</i>	<i>0.075</i>	<i>0.062</i>	<i>-24%</i>	<i>-17%</i>	<i>-37%</i>
<i>CEE NMS-13</i>								
CY	Cyprus	2005-2012	0.199	0.200	0.214	0.7%	6.8%	7.0%
CZ	Czech Republic	2005-2012	0.186	0.178	0.177	-4.2%	-0.4%	-4.8%
EE	Estonia	2004-2012	0.220	0.200	0.204	-9.1%	2.1%	-7.8%
HU	Hungary	2005-2012	0.188	0.182	0.187	-3.0%	2.7%	-0.3%
LT	Lithuania	2005-2012	0.219	0.214	0.206	-2.5%	-3.8%	-6.5%
PL	Poland	2005-2012	0.217	0.203	0.199	-6.7%	-1.8%	-9.1%
SI	Slovenia	2005-2012	0.172	0.171	0.173	-0.4%	1.1%	0.6%
SK	Slovakia	2005-2012	0.186	0.177	0.180	-4.6%	1.9%	-2.8%
<i>Mean-8</i>			<i>0.198</i>	<i>0.191</i>	<i>0.193</i>	<i>-3.9%</i>	<i>1.0%</i>	<i>-2.9%</i>
<i>Coefficient of variation</i>			<i>0.087</i>	<i>0.075</i>	<i>0.073</i>	<i>-14%</i>	<i>-3%</i>	<i>-16%</i>
<i>Other</i>								
IS	Iceland	2004-2012	0.177	0.191	0.175	7.8%	-8.4%	-1.2%
NO	Norway	2004-2012	0.188	0.173	0.165	-7.9%	-5.0%	-14.3%
<i>Mean-20</i>			<i>0.191</i>	<i>0.192</i>	<i>0.188</i>	<i>0.2%</i>	<i>-1.9%</i>	<i>-1.7%</i>
<i>Coefficient of variation</i>			<i>0.094</i>	<i>0.076</i>	<i>0.074</i>	<i>-20%</i>	<i>-3%</i>	<i>-22%</i>

Note: no data for ES (2004-2005), FR (2004-2006), GR(2004-2006), IT (2004-2006), PT(2004-2006), BG (2004-2006), HR(2006-2010), LV (2005-2006), MT(2004-2007), RO(2004-2006), and CH (2004-2007).

Source: own calculations EU-SILC

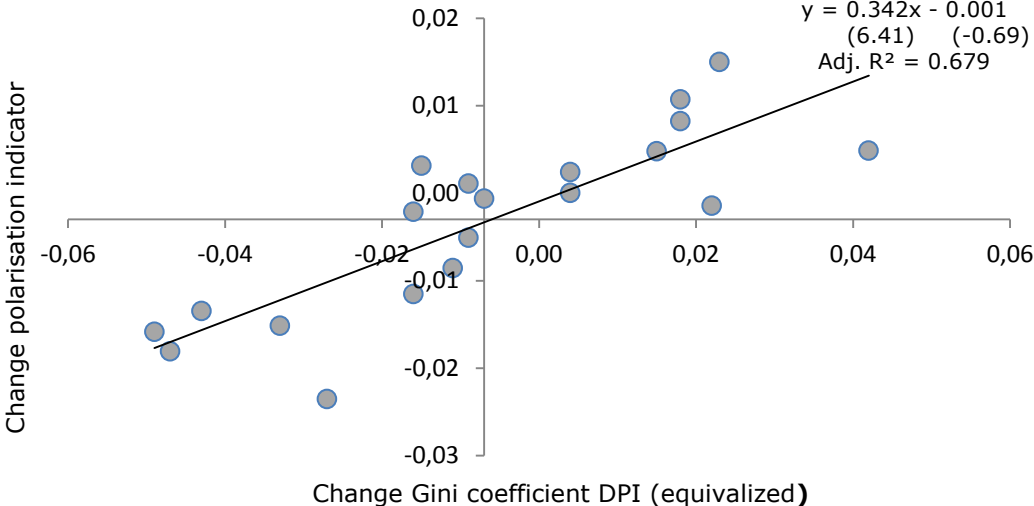
Table 6 shows a rise of income polarization from 2004 to 2008 for seven out of 10 West-EU15 countries, but a decline afterwards (with the exception of three countries). The opposite development is witnessed for CEE New Member States: a decline of income polarization from 2004 to 2008 for seven out of eight CEE NMS countries, but a slight increase afterwards (with the exception of three countries). So the pattern for West-EU15 countries differs from CEE NMS countries. However, differences between countries became smaller over time. The coefficient of variation declined from 0.094 to 0.074 across these countries (-22%), indicating convergence of income polarization outcomes.

4.3 Other social indicators

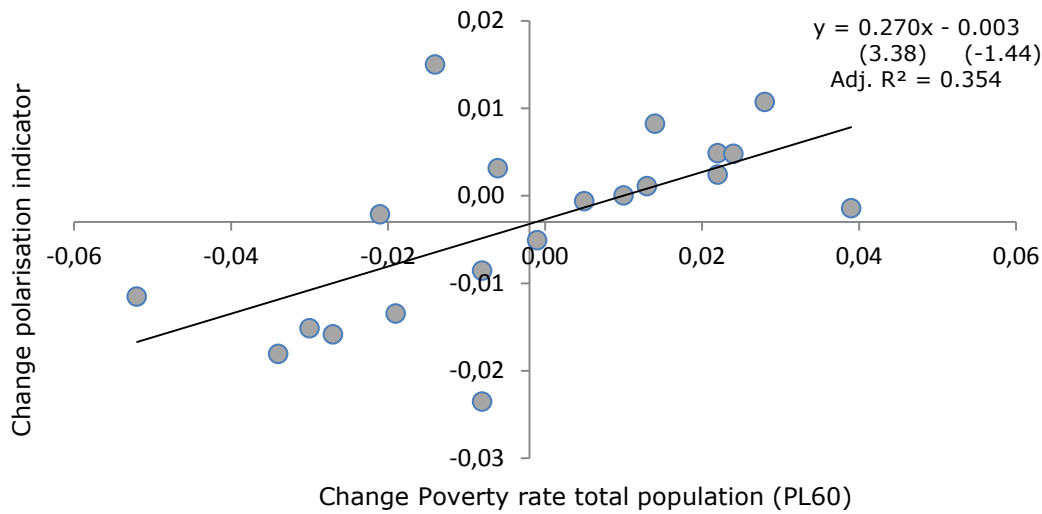
Figure 3 and Appendix C show results for the polarization indicator and other indicators for the 20 countries covered by this study for the period 2004-2012. Note that eight out of 20 countries combined a decline of their polarization indicator with a lower Gini coefficient. In another eight countries both indicators increased, indicating more unequal and polarized societies, while in the remaining four countries one of both social indicators showed improvement in the direction of a more equal distribution. Including at-risk-of-poverty-rate and/or social exclusion does not alter the number of countries that contribute to the objective of the European Union (EU) to enhance social cohesion, namely: Norway, Poland, Estonia, the United Kingdom, Lithuania, Czech Republic, Slovakia, and Iceland. All other countries experienced a less equal distribution of income as measured by one or more of our social indicators applied.

Figure 3: Correlation between changes in the polarization index and other indicators, 2004-2012

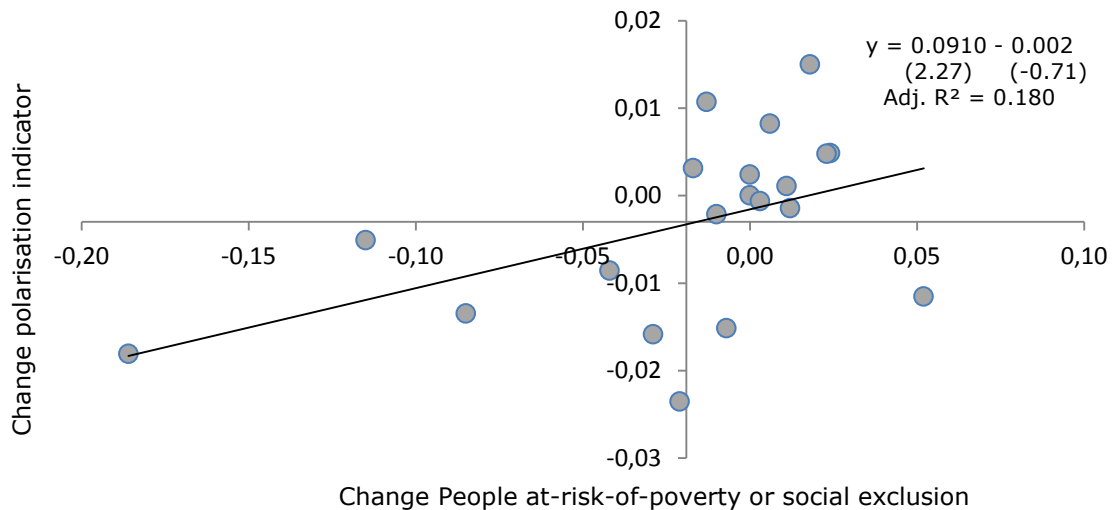
3a): Correlation between changes in the polarization index and changes in Gini coefficient



3b): Correlation between changes in the polarization index and changes in poverty



3c): Correlation between changes in the polarization index and changes in people at-risk-of-poverty or social exclusion



Note: simple OLS regression; t-values between brackets.

Source: own calculations EU-SILC

4.4 Polarization EU-wide

The Lisbon strategy led to the adoption in 2001 of social indicators. These indicators are deemed to monitor and compare the social performance of each EU member state. The picture of the Union emerges only by aggregation of the national evidence, and no attempt is made to directly estimate EU-wide values: these are typically computed as (population-weighted) averages of available national values (European Commission 2006: 77). Progress is monitored considering the performance in each member country on the basis of national indicators. If income inequality

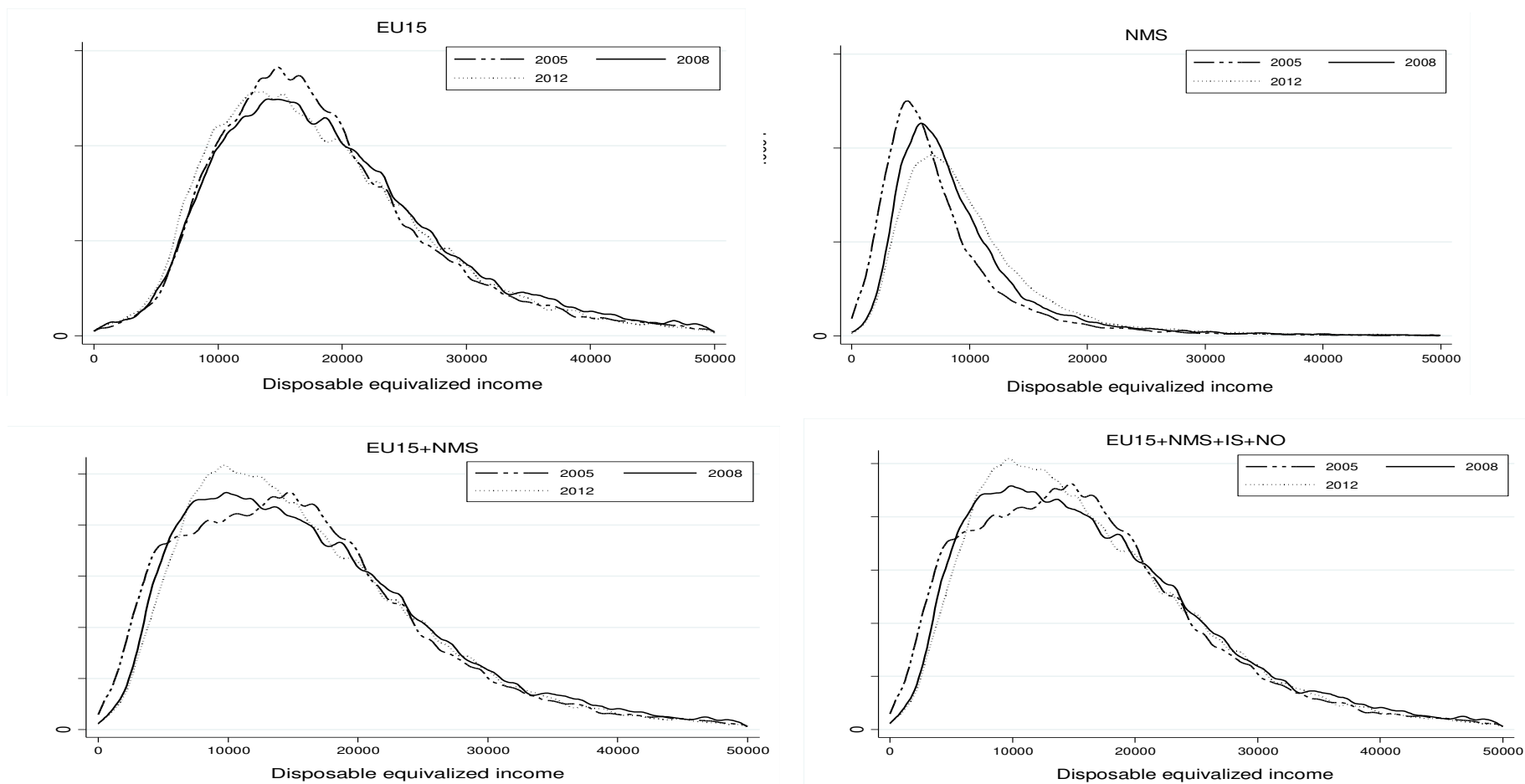
and poverty indicators are calculated as the weighted mean of national values, between-state inequalities as a major source of inequalities in the EU are excluded (Fredriksen, 2012).

Instead of calculating kernel densities and polarization for each country individually, this section groups countries together and shows the income distribution for Europe-wide, for West-EU15 and for CEE NMS countries. Kernel density estimation gives us an impression of the probability density of the equivalized disposable income in our sample. We are able to cover 20 countries for this analysis. When calculating kernel densities and polarization Europe-wide, it is necessary to make incomes comparable across countries in terms of purchasing power. Incomes are adjusted to take account of price level differences between countries, using purchasing power standard estimates taken from Eurostat (2015). The use of PPPs is not a perfect solution for making incomes cross-nationally comparable. For instance, they do not easily allow for a consistent comparison over time, as PPPs are (by necessity) constructed for a certain moment in time (Goedemé et al., 2014). Hence, when comparing incomes both cross-nationally and cross-temporally, we also have to take into account the differences in price levels (both over time and between countries). All incomes are therefore converted into euros of 2005 using country-specific consumer price indexes taken from World Bank (2013) and purchasing power standards from Eurostat (2015, EU28=1).

The graphs in Figure 4 below could be interpreted as the population-weighted income distributions of the countries belonging to the respective groups (West-EU15 countries, CEE NMS countries or Europe-wide, in line with the work of Bönke & Schröder, 2015).⁶ Within our grouped West-EU15 countries, a single pole in the distribution is found around 15 thousand equivalized disposable income, while this peak is much lower in CEE NMS countries (around 5 to 7 thousand euro); see Figure 4. While there is only one single pole in the distribution in West-EU15 countries, small multiple poles seem to be present in the distribution of the group with the West-EU and the CEE NMS countries (between around 5 to 7 thousand and around 17 thousand euro), generating higher polarization in this latter grouped countries compared to West-EU15 group. Multiple peaks are also present in our EU-wide distribution covering 20 countries in our sample, with peaks between around 5 to 7 and 18 thousand euro. Adding both Norway and Iceland does not alter the picture much.

⁶ In all the cases we use disposable income, the LIS equivalence scale, the weighting factor (RB050) and the conversion rates from EU-SILC and purchasing power parities from Eurostat (2015).

Figure 4: Kernel densities of disposable equivalized income Europe-wide, 2005-2012



West-EU15 (10): Austria, Belgium, Germany, Denmark, Spain, Finland, Ireland, Luxembourg, the Netherlands, Sweden, and the United Kingdom.

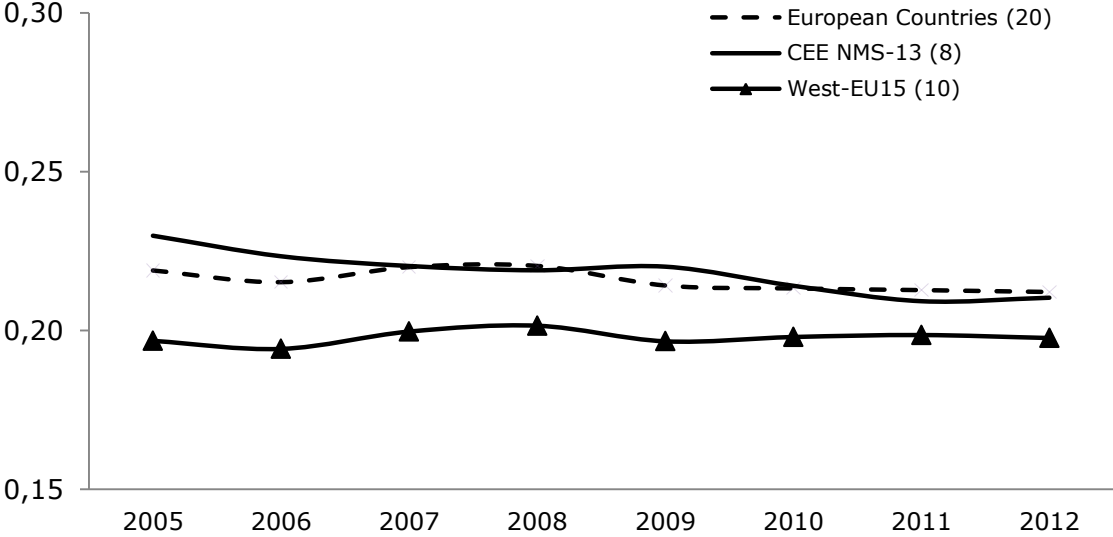
CEE NMS-13 (8): Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Poland, Slovenia, and Slovakia.

Non-EU countries (2): Iceland and Norway.

Source: own calculations EU-SILC

The level of polarization in West-EU15 countries is rather low compared to CEE NMS as can be seen from the summary statistics for income polarization; see Figure 5 (see also Table 7). Figure 5 confirms a stable income polarization in West-EU15 countries and the 20 European countries as a whole. The polarization indicator declined significantly within our grouped CEE NMS countries in the period 2005-2012.

Figure 5: Trend polarization indicator EU-wide, 2005-2012



Source: own calculations EU-SILC

4.5 The EU-wide income distribution versus country-average social indicators

The level and evolution of inequality and poverty measured for the EU as if it was a single country can be regarded as basic information in evaluating the progress of the Union toward greater social cohesion (Brandolini, 2007). The degree of inequality or poverty measured for the EU as a whole is always higher than the average of national values; see Table 7. For example, the expansion of the EU population in the mid-2000’s to include a considerable number of households with much lower real incomes has led to a fall of the EU median income, and hence of any poverty line which is based on it. Thus, in comparing the poverty rates for the EU15 and the EU25 (in 2007), it should be taken into account that the EU-wide poverty line drops by 9 per cent as a result of the enlargement; as a fifth of the people that were classified as poor using the EU15 line are no longer poor according to the lower EU25 line, the headcount poverty rate in the EU15 countries falls from 17.3 to 13.7 per cent (Brandolini, 2007).

This is a warning against using a country-average as a proxy whenever real income differences are large. More generally, this exposes the weak justification of such a measure: it is unclear what the average of within-country relative inequality indices tells us about the distribution of income in Europe.

In this section, we provide a picture of income polarization, income inequality and at-risk-of-poverty or social exclusion in Europe as if it was a single country. It is, however, important to be clear about the meaning and implications of such EU-wide measures. For

example, the risk-of-poverty is still being defined in relative rather than absolute terms, but calculating the income of each household in the EU relative to the EU median level of income means that, in countries with the lowest income levels, the majority of the population may have an income below an EU poverty threshold, while most of these households are clearly not socially excluded in national terms. Nevertheless, reducing the proportion of the EU's population with income below the threshold of 60 percent of median EU income might also be important for social cohesion across the Union. In this study, we take four country groups: the group of the West-EU15 countries, the group of the CEE NMS countries, the group of the 20 EU countries, and the group of all European countries. For each country group, the poverty line is set at the 60 per cent of the median income within the group.

Table 7 presents our results. First note that polarization in Europe as a whole is higher than the simple average of national polarization indicators (right panel Table 7) since the latter method does not take into account the between-country component of European inequality. Polarization is lower in the West-EU15 countries as a whole than that in the CEE NMS group. Over the period 2005-2012, polarization remains stable in the West-EU15 countries and the 20 European countries while it declined significantly in the group of CEE NMS countries.

Second, the Gini coefficient of 2012 for West-EU15 countries is around 0.3 and for all European countries around 0.33. Again, the results obtained are higher than inequality calculated as a simple average of national Gini indexes. Inequality in Europe as a whole is slightly lower than in the United States (0.39 around 2012).⁷ The difference appears to be in both ends of distribution, as both the top and bottom deciles are closer to the median in Europe (Frederiksen, 2012). Lower inequality in Europe than in the United States is also what the literature tends to find, despite the scarce literature that exist on European-wide inequality; see e.g. Goedemé et al (2014), Bönke & Schröder (2015), Frederiksen (2012) and Brandolini (2007).

If we measure poverty with a European-wide poverty line instead of national thresholds, poverty is generally higher. For instance, the poverty rate reached 22 per cent in 2005 with a European-wide poverty line at 60 per cent of the median income, whereas it was only about 14 per cent with poverty lines equal to 60 per cent of the national median income. At the same time, the poverty trend looks rather similar. Both Europe-wide poverty and the average of national poverty rates decreased between 2005 and 2012, although poverty rose in West-EU15 countries. A similar trend can be observed if Iceland and Norway are included in the calculations. Over the entire period, the decline in Europe-wide poverty and income inequality is quite substantial. This is confirmed by simple linear regression analyses reported in Table 7.

⁷ Data taken from OECD.Stat referring to the year 2012.

Table 7: Trend several social indicators Europe-wide, 2005-2012

	<i>EU-wide</i>			<i>Country-average</i>		
	Level social indicator		Change	Level social indicator		Change
	2005	2012		2005	2012	
<i>Polarization Indicator</i>						
West-EU15 (10)	0.197	0.198	0%	0.190	0.188	-1%
CEE NMS-13 (8)	0.230	0.210	-8%**	0.197	0.193	-2%
West-EU15 + CEE NMS	0.219	0.212	-3%*	0.193	0.190	-1%**
European Countries (20)	0.219	0.212	-3%*	0.192	0.188	-2%**
<i>Gini coefficient</i>						
West-EU15 (10)	0.295	0.296	0%	0.274	0.276	1%
CEE NMS-13 (8)	0.384	0.328	-14%**	0.298	0.286	-4%
West-EU15 + CEE NMS	0.357	0.333	-7%**	0.284	0.280	-1%*
European Countries (20)	0.357	0.333	-7%**	0.283	0.275	-3%**
<i>Poverty rate (PL60)</i>						
West-EU15 (10)	0.151	0.172	14%**	0.136	0.143	5%**
CEE NMS-13 (8)	0.202	0.180	-11%	0.156	0.148	-5%
West-EU15 + CEE NMS	0.249	0.217	-13%**	0.145	0.145	0%
European Countries (20)	0.248	0.217	-12%**	0.141	0.140	-1%

Note: simple OLS regression; ** significant at 0.01 level; * significant at 0.05 level

Source: own calculations EU-SILC

5. Decomposition of the change of polarization by income source

Former, extensive literature on 'welfare state retrenchment' that has emerged over the last decades seems to imply that welfare states have become less redistributive (Immervoll & Richardson, 2011, also published in OECD, 2011). Recent studies and data, to the contrary, show that most welfare states became more redistributive (see also Kenworthy & Pontusson, 2005; Wang et al., 2014). Welfare states have not compensated completely for the rise in inequality of market income among households, but most have done so to some degree. By and large, welfare states have worked the way they were designed to work. It is markets, not redistribution policies that have become more inegalitarian. It should be noted here that because tax-benefit systems are generally progressive, one could expect that higher market income inequality automatically leads to more redistribution, even without policy actions (Immervoll & Richardson, 2011; Wang et al., 2014). But what about income polarization?

This section examines changes in polarization across 20 European countries for the period 2004-2012 decomposed into three income components: market income (labor and capital), social benefits (sum of unemployment benefits, old-age and survivor pension benefits, sickness

and disability benefits, education allowances, and minimum income protection), and taxes and social contributions to households.

Figure 6a-6c show the changes of income polarization, further splitting the countries into West-EU15, CEE NMS-13 and other European countries. Countries are ranked in order of their change in polarization from largest to smallest. Between 2004 and 2008, the West-EU countries observed an increase in income polarization (see Figure 6a). Market income contributes to this increase to a large extent. Surprisingly, also social benefits and taxes added to more polarization. CEE NMS states, on contrary, saw a decrease in income polarization on average, where the redistribution effects of social benefits and taxes offset the polarization-increasing factor of market income.

Opposite trends can be found for the period 2008-2012 (see Figure 6b). Polarization decreased in the West-EU countries and this was mainly because of the more redistributive effects of social benefits and taxes. The effect of market income is insignificant. The CEE NMS states, on the other hand, experienced an increase in polarization since the Great Recession. Market income and taxes both have a positive impact on polarization, which has not been offset by the effects of social benefits.

Figure 6c shows the decomposition for the entire period 2004-2012. Polarization increased in most of the West EU countries, while it declined in most of the CEE NMS states. Taken together, polarization slightly decreased for the 20-country average. Market income was polarization-increasing on average (mainly in West-EU15 countries), while the redistributive effect of social benefits and taxes appears to be polarization-reducing, on average. Across countries the redistribution effect of social benefits and taxes is more than offsetting the polarization-increasing effect of dispersion of market incomes in 20 European countries in the period 2004-2012. However, cross-country variation is rather large.

Figure 6a: Change in polarization 2004-2008 due to market income, social benefits and taxes

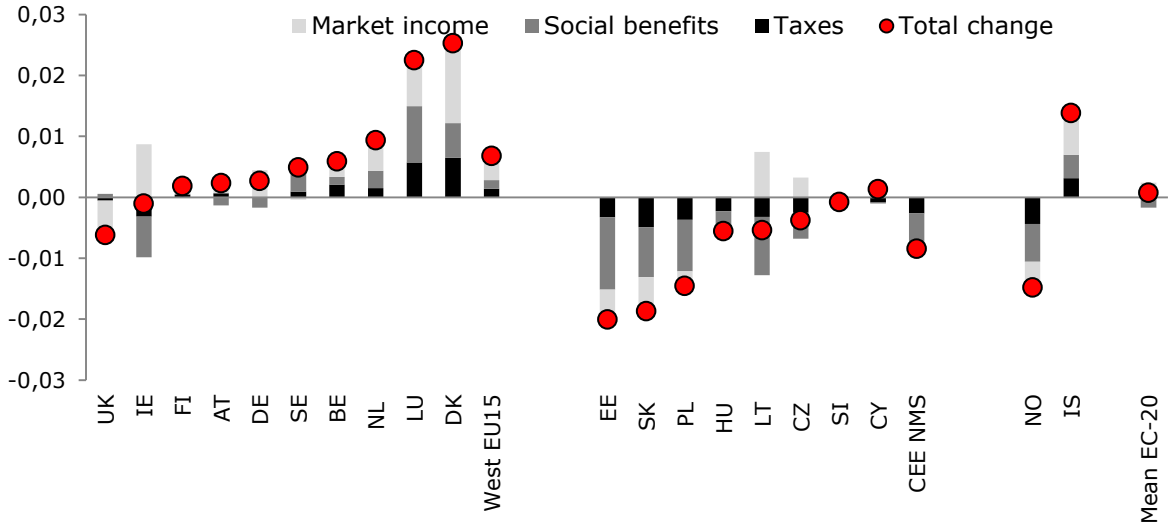


Figure 6b: Change in polarization 2008-2012 due to market income, social benefits and taxes

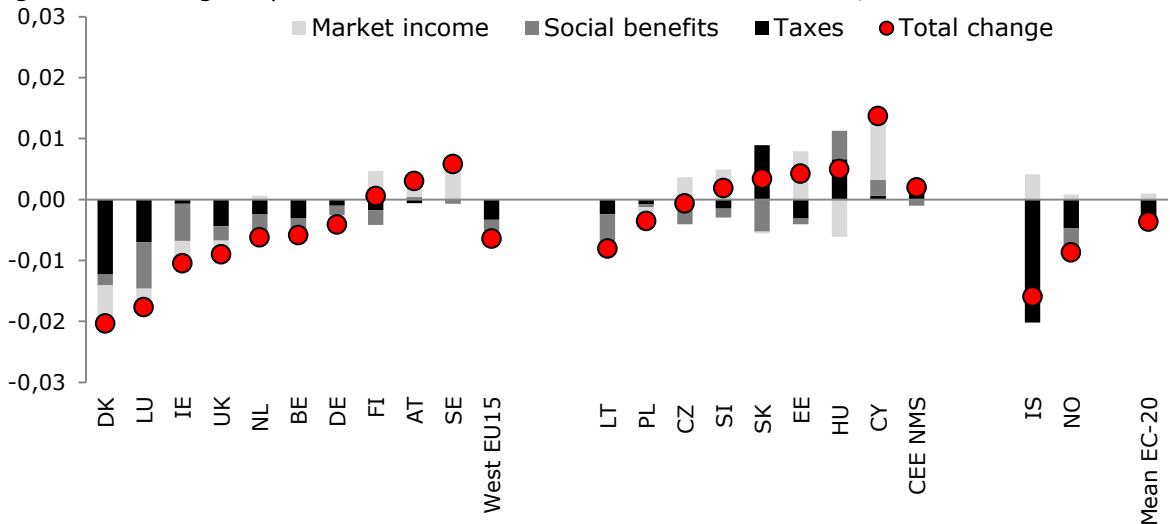
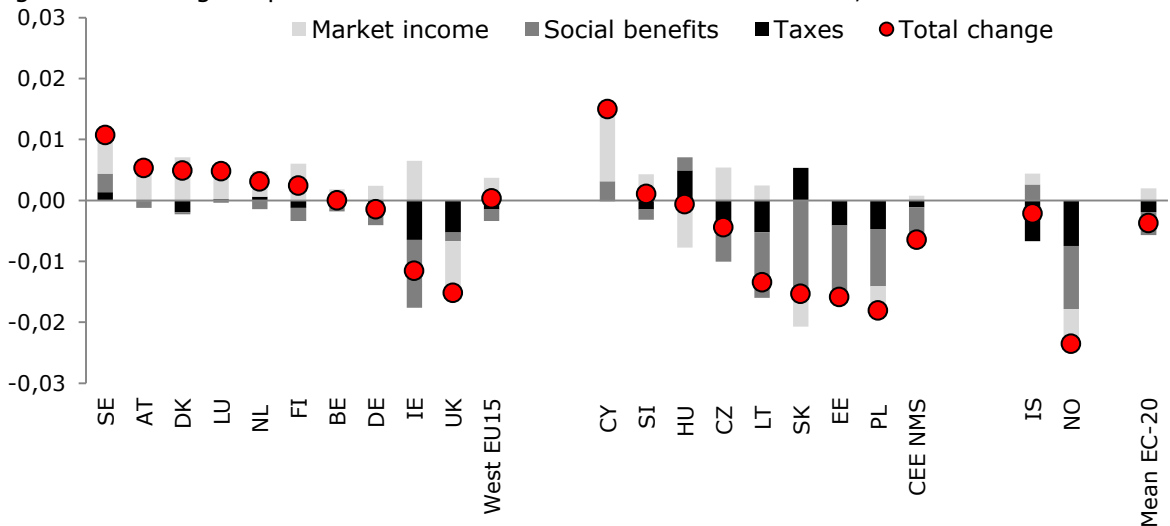


Figure 6c: Change in polarization 2004-2012 due to market income, social benefits and taxes



Source: own calculations EU-SILC

The polarization-mitigating effect across our 20-country-average is mainly the result of the social-benefit systems in European countries, and to a lesser extent of tax systems. Tax-benefits-systems were more effective in offsetting income polarization in 2012 than in the mid-2000's in all countries, with Sweden, Cyprus and Hungary as exceptions. So, welfare states in the other 17 European countries did have an anti-poverty and equalizing effect in the period 2004-2012, even if other factors as market incomes were pushing in the other direction and the overall results were disappointing (e.g. in the case of poverty reduction).

We do not find that tax-benefit policies had become less effective before or after the Great Recession. Among the total population in European countries, both market income polarization (labor and capital) and redistribution from social benefits and taxes rose on average. This finding is in line with the work of Hills et al. (2014). Decomposition results including the (partial) growth effect and the redistribution effect for the (sub) periods 2004-2008 are presented in Appendix E.

6. Conclusion

Vast literature relies on traditional social indicators such as the Gini coefficient and relative poverty rates to analyze national and cross-national differences in earnings and income inequality. Little attention has been paid to income polarization, especially within Europe. This is remarkable since polarization is closely linked to social exclusion, one of the important elements of the Lisbon Agenda and the Europe 2020 Strategy. More polarization can be associated with a divided society and may lead to increased social unrest. This study provides theoretical and empirical insights into this a relatively new dimension of the income distribution. We rely on micro-data from EU-SILC to explore the development of polarization in 31 countries, and Europe as a whole over the period 2004-2012. We compare changes in polarization with changes in the traditional inequality indicators. Furthermore, we disentangle the change in polarization into effects due to changes in market income (from labor and capital), social transfers, and taxes. The results can be summarized in three conclusions.

First, although polarization is closely linked to other social indicators, namely the Gini coefficient, the poverty rate, and the relative number of people at-risk-of-poverty or social exclusion, polarization is conceptually and empirically distinguishable. There is considerable variation in the rankings of the countries regarding polarization and other popular social indicators. Polarization and Gini may not go hand in hand: an increase of income inequality does not necessarily relate to an increase of polarization.

Second, polarization in West-EU15 countries is much lower than that in the CEE New Member States. Over the period 2004-2012, income polarization is rather stable in European countries, and Europe as a whole. Polarization was rising among the West-EU15 countries in the sub-period 2004-2008, but declining afterwards. The CEE NMS countries witnessed an opposite development. Overall, several social indicators show a converging pattern over the decade, indicating convergence at lower levels of income polarization, inequality, at-risk-of-poverty, and social exclusion in Europe as a whole.

Third, to explore the effects of market income, social benefits, and taxes on changes in polarization over 2004-2012, this paper relies on Shapley decomposition and growth redistribution decomposition. The results vary to a large extent across European countries. On average, polarization was upward driven by market income. Conversely, both the tax and social benefit systems were polarization-reducing. As a result - despite the Great Recession - our polarization indicator does not point at a sizeable increase in household inequality in 20 European countries over the last decade, because tax-benefit systems have offset the increase of market income inequality in European countries. We do not find that tax-benefit policies had become less effective before or after the Great Recession.

However, our empirical analysis does not show why benefits and taxes have become more (or less) redistributive over time in European countries. It can be expected that, as market income inequality rises, the tax-benefit systems will automatically have a more redistributive impact because of the progressivity built into these systems. But also policy changes and demographic changes will certainly explain a part of the changes in redistribution. A wide range of factors influence the overall income distribution and poverty. Many of these, such as demographic change or the distribution of work across households, are not under the direct control of policy makers. In assessing the performance of government social policy in terms of (income) poverty or inequality reduction it is important to isolate the impact of the most relevant factors that policy makers are able to control, which is not done exhaustively in this paper. This might be an important omission if the policy changes introduced in the period considered were specifically designed to alter the incentive e.g. to increase labor force participation. An extension of the work here could attempt to further isolate policy effect from the total change in the levels and distribution of incomes across European countries.

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Appendix A: European Union Statistics on Income and Living Conditions (EU-SILC)

Table A1: Descriptives composition disposable household income EU-SILC, 2012

West-EU15 countries

Austria - AT (# Obs: 13,904)	Mean	Std. Dev.	Min	Max	Share DPI
Work income	22,122	23,784	0	415,457	95%
Capital income	950	5,140	0	185,771	4%
Unemployment benefits	427	1,330	0	21,416	2%
Old-age and survivor benefits	5,867	11,428	0	143,341	25%
Sickness/Disability benefits	614	2,487	0	56,211	3%
Education allowance	47	389	0	12,893	0%
Minimum Protection	1,341	1,743	0	11,855	6%
Taxes	-8,103	11,113	-289,223	37,055	-35%
Disposable equivalized income	23,266	13,892	0	483,745	100%
Belgium - BE (# Obs: 13,905)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	19,894	19,368	-594	320,028	97%
Capital income	671	2,587	0	67,929	3%
Unemployment benefits	1,105	3,216	0	84,911	5%
Old-age and survivor benefits	3,518	7,424	0	93,665	17%
Sickness/Disability benefits	636	2,200	0	21,060	3%
Education allowance	28	284	0	16,091	0%
Minimum Protection	1,127	1,585	0	12,969	6%
Taxes	-6,534	7,183	-109,960	14,609	-32%
Disposable equivalized income	20,445	11,184	25	280,207	100%
Germany - DE (# Obs: 27,895)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	20,681	22,015	-8,879	763,945	97%
Capital income	966	4,328	0	173,945	5%
Unemployment benefits	416	2,543	0	101,715	2%
Old-age and survivor benefits	5,380	9,953	0	294,215	25%
Sickness/Disability benefits	379	1,829	0	44,397	2%
Education allowance	63	529	0	15,983	0%
Minimum Protection	1,099	1,559	0	13,645	5%
Taxes	-7,561	9,260	-494,463	69,189	-35%
Disposable equivalized income	21,423	13,154	135	443,428	100%
Denmark - DK (# Obs: 13,300)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	37,246	29,272	-33,106	488,060	120%
Capital income	421	9,515	-74,790	441,374	1%
Unemployment benefits	1,748	5,442	0	247,638	6%
Old-age and survivor benefits	4,459	11,050	0	159,631	14%
Sickness/Disability benefits	1,905	6,204	0	216,021	6%
Education allowance	312	1,115	0	18,511	1%
Minimum Protection	796	925	0	8,024	3%
Taxes	-15,814	12,035	-255,944	7,746	-51%
Disposable equivalized income	31,073	16,189	1,092	341,276	100%
Spain - ES (# Obs: 33,059)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	10,851	11,321	-11,306	127,886	82%
Capital income	310	1,666	0	47,989	2%
Unemployment benefits	543	1,395	0	26,901	4%
Old-age and survivor benefits	3,099	5,292	0	45,572	23%
Sickness/Disability benefits	323	1,478	0	33,322	2%
Education allowance	42	285	0	7,979	0%
Minimum Protection	171	927	0	35,343	1%
Taxes	-2,026	2,678	-37,731	16,737	-15%
Disposable equivalized income	13,311	8,595	0	127,785	100%

Finland - FI (# Obs: 25,350)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	25,049	22,427	0	376,955	98%
Capital income	2,204	20,832	0	1,900,721	9%
Unemployment benefits	809	2,255	-2,070	40,784	3%
Old-age and survivor benefits	3,805	8,750	0	186,221	15%
Sickness/Disability benefits	980	3,139	-1,283	49,674	4%
Education allowance	158	835	-2,349	45,334	1%
Minimum Protection	1,293	2,094	-2,323	19,580	5%
Taxes	-8,677	9,793	-426,385	12,436	-34%
Disposable equivalized income	25,620	21,193	9	1,573,952	100%
France - FR (# Obs: 28,251)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	19,036	20,870	0	665,439	78%
Capital income	3,369	28,775	0	2,738,561	14%
Unemployment benefits	661	2,236	0	91,400	3%
Old-age and survivor benefits	5,487	10,202	0	113,561	23%
Sickness/Disability benefits	184	1,019	0	20,724	1%
Education allowance	29	218	0	4,333	0%
Minimum Protection	1,276	1,831	0	23,156	5%
Taxes	-5,691	13,177	-988,665	42,401	-23%
Disposable equivalized income	24,349	26,830	311	2,099,837	100%
Greece - GR (# Obs: 13,656)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	7,553	10,318	-22,300	198,701	85%
Capital income	451	2,145	0	63,692	5%
Unemployment benefits	153	651	0	10,006	2%
Old-age and survivor benefits	3,316	4,669	0	46,500	37%
Sickness/Disability benefits	150	785	0	15,578	2%
Education allowance	2	63	0	2,440	0%
Minimum Protection	211	509	0	5,109	2%
Taxes	-2,982	4,775	-103,592	10,642	-34%
Disposable equivalized income	8,854	6,031	10	96,917	100%
Ireland - IE (# Obs: 11,861)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	18,699	38,830	0	1,776,488	88%
Capital income	374	2,486	0	70,572	2%
Unemployment benefits	1,743	6,472	0	293,044	8%
Old-age and survivor benefits	3,486	9,418	0	323,264	16%
Sickness/Disability benefits	759	2,346	0	39,119	4%
Education allowance	81	567	0	21,437	0%
Minimum Protection	2,305	2,844	0	20,882	11%
Taxes	-6,132	26,840	-1,380,535	38,640	-29%
Disposable equivalized income	21,315	16,165	12	413,586	100%
Italy - IT (# Obs: 47,083)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	17,180	24,940	-9,116	1,747,717	92%
Capital income	996	3,846	0	216,923	5%
Unemployment benefits	525	1,969	0	86,487	3%
Old-age and survivor benefits	5,748	9,702	0	162,727	31%
Sickness/Disability benefits	246	1,318	0	84,656	1%
Education allowance	40	590	0	25,783	0%
Minimum Protection	189	471	0	15,126	1%
Taxes	-6,333	10,840	-788,324	52,477	-34%
Disposable equivalized income	18,592	15,901	3	976,742	100%

Luxembourg - LU (# Obs: 16,110)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	30,524	31,646	-7,647	419,277	88%
Capital income	1,610	7,347	0	433,157	5%
Unemployment benefits	673	3,367	0	59,871	2%
Old-age and survivor benefits	7,728	15,945	0	179,200	22%
Sickness/Disability benefits	904	3,553	0	47,568	3%
Education allowance	225	876	0	9,268	1%
Minimum Protection	2,950	3,601	0	27,114	8%
Taxes	-9,840	13,311	-325,392	62,097	-28%
Disposable equivalized income	34,774	20,624	33	450,338	100%
Netherlands - NL (# Obs: 24,909)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	30,011	24,699	-19,594	446,413	124%
Capital income	1,010	6,133	0	492,779	4%
Unemployment benefits	461	2,256	-7,513	42,593	2%
Old-age and survivor benefits	4,621	10,857	-684	141,701	19%
Sickness/Disability benefits	700	3,054	-1,286	55,779	3%
Education allowance	180	643	0	7,611	1%
Minimum Protection	804	1,782	-1,570	90,908	3%
Taxes	-13,661	11,920	-243,759	31,388	-57%
Disposable equivalized income	24,126	12,600	167	432,133	100%
Portugal - PT (# Obs: 15,956)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	8,054	10,890	0	369,797	86%
Capital income	235	1,403	0	51,690	2%
Unemployment benefits	229	849	0	10,914	2%
Old-age and survivor benefits	3,043	6,318	0	113,411	32%
Sickness/Disability benefits	226	1,044	0	33,253	2%
Education allowance	20	200	0	11,294	0%
Minimum Protection	143	409	0	4,183	2%
Taxes	-2,567	4,692	-189,014	12,849	-27%
Disposable equivalized income	9,383	7,223	149	180,783	100%
Sweden - SE (# Obs: 16,547)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	26,922	22,967	-16,734	792,976	102%
Capital income	1,194	5,915	0	211,882	5%
Unemployment benefits	418	1,673	0	22,838	2%
Old-age and survivor benefits	4,729	10,194	0	128,904	18%
Sickness/Disability benefits	940	2,583	0	31,726	4%
Education allowance	474	1,301	0	15,149	2%
Minimum Protection	1,317	2,224	0	14,197	5%
Taxes	-9,517	9,725	-463,433	5,716	-36%
Disposable equivalized income	26,477	13,091	44	433,713	100%
United Kingdom - UK (# Obs: 23,281)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	18,293	28,261	-13,999	963,099	95%
Capital income	502	2,841	0	117,426	3%
Unemployment benefits	105	651	0	39,956	1%
Old-age and survivor benefits	3,731	7,599	0	192,571	19%
Sickness/Disability benefits	404	1,408	0	15,580	2%
Education allowance	46	536	0	28,091	0%
Minimum Protection	1,771	2,845	0	16,952	9%
Taxes	-5,668	12,442	-482,871	83,947	-30%
Disposable equivalized income	19,185	14,989	41	485,838	100%

CEE NMS-13 countries

Bulgaria - BG (# Obs: 14,580)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	2,003	2,180	0	52,955	81%
Capital income	41	366	0	15,928	2%
Unemployment benefits	28	119	0	2,161	1%
Old-age and survivor benefits	552	663	0	4,117	22%
Sickness/Disability benefits	72	190	0	2,415	3%
Education allowance	2	25	0	662	0%
Minimum Protection	55	132	0	1,918	2%
Taxes	-285	583	-23,547	7,197	-12%
Disposable equivalized income	2,468	1,837	61	35,866	100%
Cyprus - CY (# Obs: 13,376)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	16,594	17,998	0	431,071	84%
Capital income	747	4,456	0	189,514	4%
Unemployment benefits	479	5,691	0	301,240	2%
Old-age and survivor benefits	3,355	9,304	0	225,728	17%
Sickness/Disability benefits	316	1,309	0	17,933	2%
Education allowance	227	590	0	6,451	1%
Minimum Protection	709	1,585	0	32,227	4%
Taxes	-2,653	4,323	-61,174	35,969	-13%
Disposable equivalized income	19,775	17,583	251	429,119	100%
Czech Republic - CZ (# Obs: 20,228)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	6,694	6,385	0	102,090	85%
Capital income	99	1,085	0	100,747	1%
Unemployment benefits	27	149	0	3,526	0%
Old-age and survivor benefits	1,748	2,482	0	21,765	22%
Sickness/Disability benefits	344	902	0	9,571	4%
Education allowance	3	60	0	2,850	0%
Minimum Protection	198	524	0	5,265	3%
Taxes	-1,271	1,677	-26,246	8,866	-16%
Disposable equivalized income	7,841	4,033	17	104,518	100%
Estonia - EE (# Obs: 14,229)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	4,952	4,666	0	51,244	91%
Capital income	30	248	0	9,215	1%
Unemployment benefits	30	184	0	3,894	1%
Old-age and survivor benefits	921	1,395	0	8,467	17%
Sickness/Disability benefits	204	454	0	4,500	4%
Education allowance	23	154	0	6,549	0%
Minimum Protection	341	888	0	9,677	6%
Taxes	-1,044	1,129	-20,282	4,350	-19%
Disposable equivalized income	5,458	3,311	51	46,093	100%
Croatia - HR (# Obs: 15,127)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	4,636	5,053	0	79,077	86%
Capital income	72	415	0	7,538	1%
Unemployment benefits	46	236	0	9,473	1%
Old-age and survivor benefits	1,212	1,846	0	25,921	22%
Sickness/Disability benefits	437	1,169	0	24,960	8%
Education allowance	9	78	0	1,734	0%
Minimum Protection	150	372	0	4,610	3%
Taxes	-1,159	1,670	-35,606	6,510	-21%
Disposable equivalized income	5,403	3,256	106	43,470	100%

Hungary - HU (# Obs: 28,420)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	3,347	3,545	-461	48,869	83%
Capital income	31	450	0	27,840	1%
Unemployment benefits	67	209	0	6,381	2%
Old-age and survivor benefits	906	1,460	0	10,229	22%
Sickness/Disability benefits	163	465	0	6,049	4%
Education allowance	10	78	0	2,552	0%
Minimum Protection	324	474	0	6,379	8%
Taxes	-797	1,141	-13,954	5,513	-20%
Disposable equivalized income	4,052	2,302	251	44,093	100%
Lithuania - LT (# Obs: 12,631)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	3,499	3,569	0	25,836	82%
Capital income	69	844	0	26,506	2%
Unemployment benefits	33	130	0	2,483	1%
Old-age and survivor benefits	919	1,201	0	7,375	21%
Sickness/Disability benefits	224	511	0	4,796	5%
Education allowance	5	41	0	1,124	0%
Minimum Protection	181	519	0	8,551	4%
Taxes	-649	857	-7,215	4,205	-15%
Disposable equivalized income	4,280	2,685	16	32,160	100%
Latvia - LV (# Obs: 15,137)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	3,499	4,033	0	72,707	89%
Capital income	34	461	0	17,034	1%
Unemployment benefits	42	273	0	16,133	1%
Old-age and survivor benefits	931	1,314	0	18,900	24%
Sickness/Disability benefits	146	446	0	9,301	4%
Education allowance	10	81	0	3,349	0%
Minimum Protection	141	410	0	8,667	4%
Taxes	-853	1,293	-23,599	7,105	-22%
Disposable equivalized income	3,951	2,940	17	49,324	100%
Malta - MT (# Obs: 11,922)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	10,974	11,152	-1,645	239,448	91%
Capital income	429	1,592	0	55,675	4%
Unemployment benefits	120	2,013	0	84,543	1%
Old-age and survivor benefits	2,046	3,334	0	69,311	17%
Sickness/Disability benefits	225	732	0	7,904	2%
Education allowance	113	302	0	6,911	1%
Minimum Protection	429	856	0	10,436	4%
Taxes	-2,316	3,271	-80,747	9,494	-19%
Disposable equivalized income	12,019	7,586	0	158,774	100%
Poland - PL (# Obs: 37,110)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	4,827	4,773	0	81,314	93%
Capital income	50	800	0	61,080	1%
Unemployment benefits	37	206	0	6,461	1%
Old-age and survivor benefits	1,396	2,085	0	24,723	27%
Sickness/Disability benefits	153	485	0	6,314	3%
Education allowance	7	64	0	2,366	0%
Minimum Protection	116	295	0	4,043	2%
Taxes	-1,411	1,430	-33,632	11,707	-27%
Disposable equivalized income	5,175	3,309	11	89,264	100%

Romania - RO (# Obs: 17,643)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	1,425	1,655	0	28,636	79%
Capital income	4	63	0	3,117	0%
Unemployment benefits	1	16	0	504	0%
Old-age and survivor benefits	661	939	0	19,253	36%
Sickness/Disability benefits	56	218	0	2,634	3%
Education allowance	6	46	0	814	0%
Minimum Protection	42	103	0	2,104	2%
Taxes	-382	478	-7,240	2,909	-21%
Disposable equivalized income	1,814	1,135	7	22,004	100%

Slovenia - SI (# Obs: 28,064)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	12,972	10,831	0	124,480	99%
Capital income	227	1,575	0	38,779	2%
Unemployment benefits	192	643	0	6,932	1%
Old-age and survivor benefits	2,153	3,552	0	22,048	16%
Sickness/Disability benefits	733	1,565	0	19,317	6%
Education allowance	167	455	0	9,596	1%
Minimum Protection	655	1,263	0	17,173	5%
Taxes	-4,034	4,608	-57,583	3,904	-31%
Disposable equivalized income	13,066	5,966	588	83,637	100%

Slovakia - SK (# Obs: 15,457)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	6,284	4,735	0	43,116	85%
Capital income	16	158	0	5,701	0%
Unemployment benefits	41	213	0	4,772	1%
Old-age and survivor benefits	1,252	1,844	0	9,577	17%
Sickness/Disability benefits	210	591	0	6,337	3%
Education allowance	14	167	0	5,482	0%
Minimum Protection	224	395	0	4,129	3%
Taxes	-659	910	-10,133	2,923	-9%
Disposable equivalized income	7,382	3,508	5	42,212	100%

Other countries

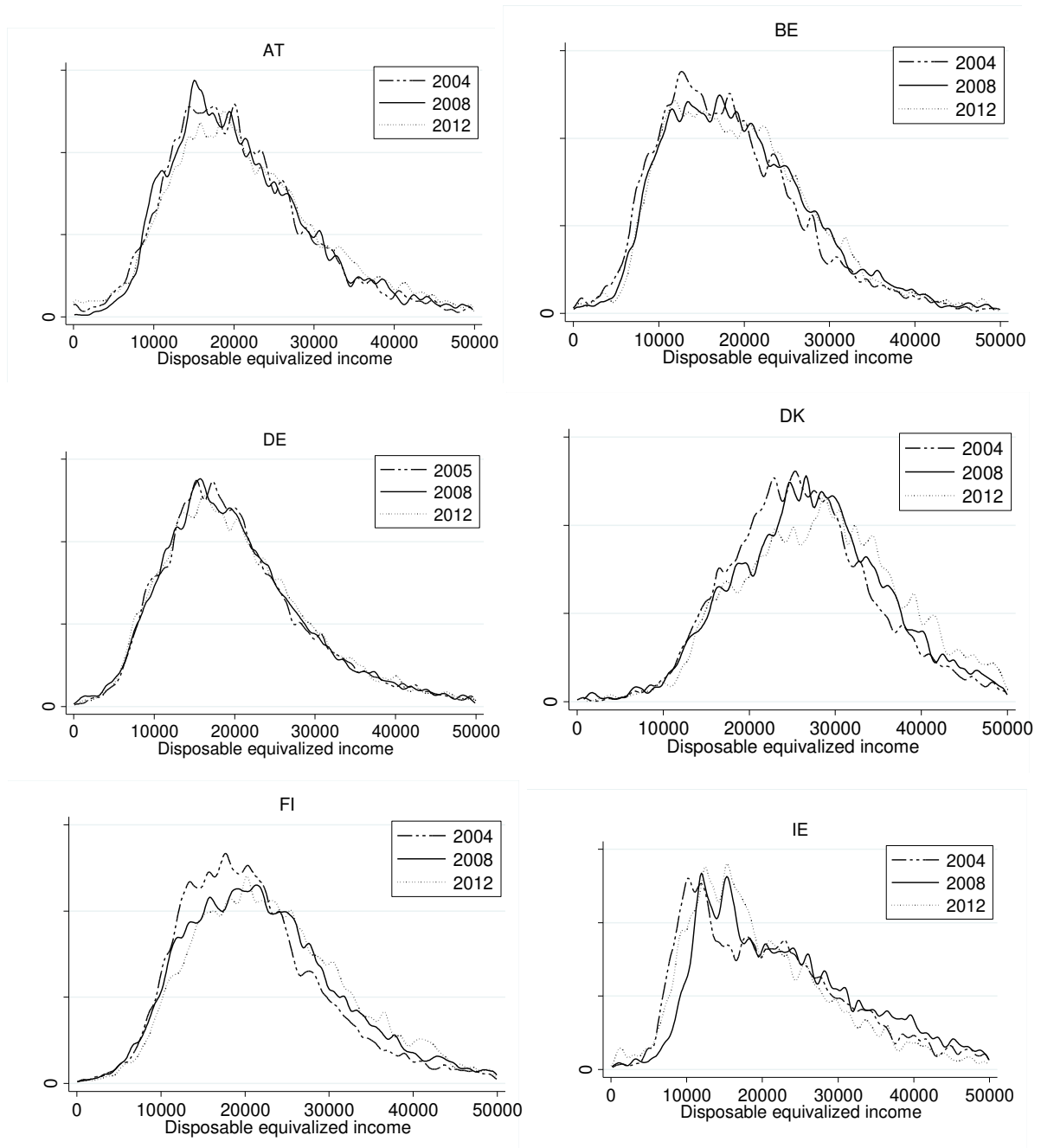
Switzerland - CH (# Obs: 17,449)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	51,927	45,710	0	641,761	109%
Capital income	2,757	12,025	0	623,889	6%
Unemployment benefits	505	2,944	0	64,905	1%
Old-age and survivor benefits	8,219	17,046	0	260,150	17%
Sickness/Disability benefits	893	4,372	0	60,298	2%
Education allowance	80	734	0	18,717	0%
Minimum Protection	1,767	2,596	0	74,867	4%
Taxes	-18,632	17,136	-338,881	66,611	-39%
Disposable equivalized income	47,514	29,067	319	493,796	100%

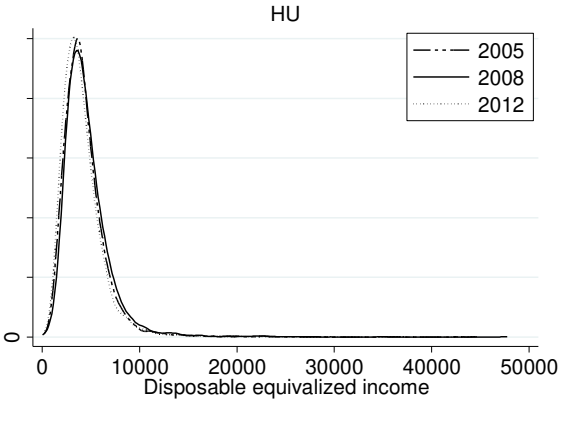
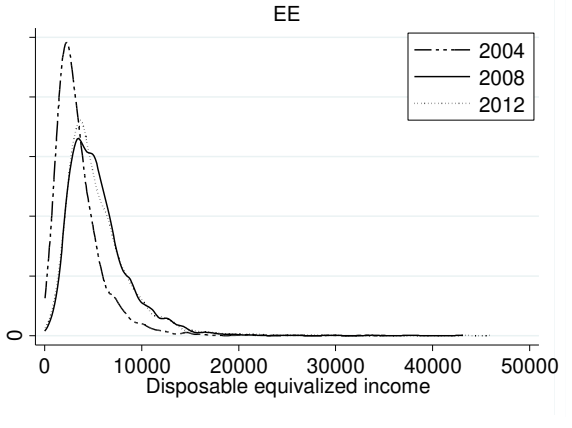
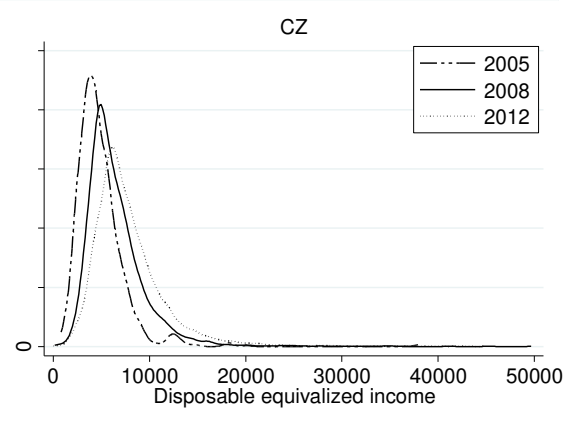
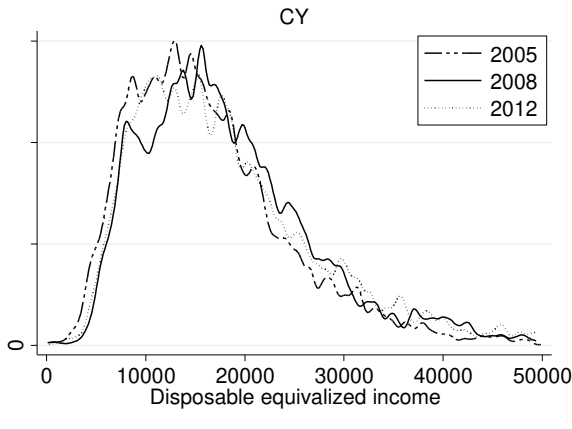
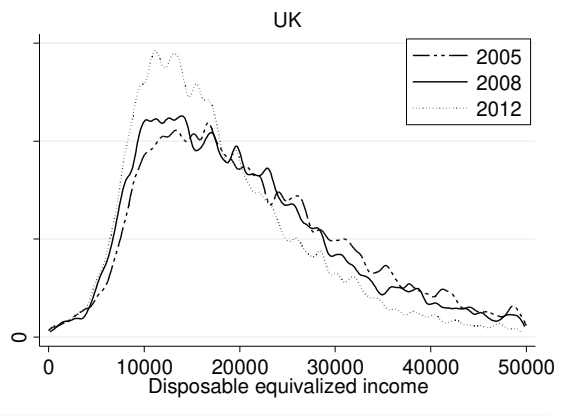
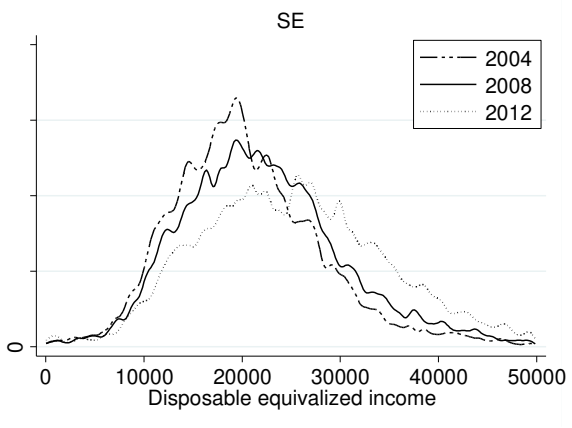
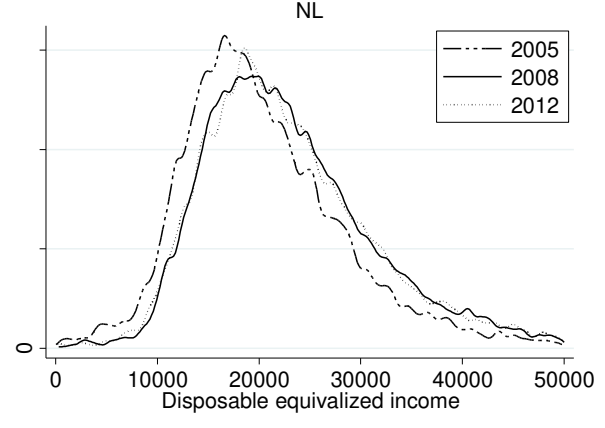
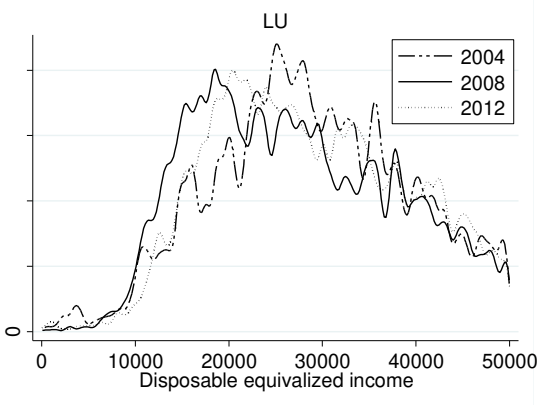
Iceland - IS (# Obs: 8,966)	Mean	Std, Dev,	Min	Max	Share DPI
Work income	17,558	12,012	0	126,396	113%
Capital income	1,078	6,028	0	166,458	7%
Unemployment benefits	350	1,037	0	10,676	2%
Old-age and survivor benefits	1,494	4,273	0	114,685	10%
Sickness/Disability benefits	518	1,901	0	29,385	3%
Education allowance	36	674	0	41,520	0%
Minimum Protection	790	1,008	0	8,821	5%
Taxes	-6,308	5,496	-64,250	8,126	-41%
Disposable equivalized income	15,516	8,055	1	153,561	100%

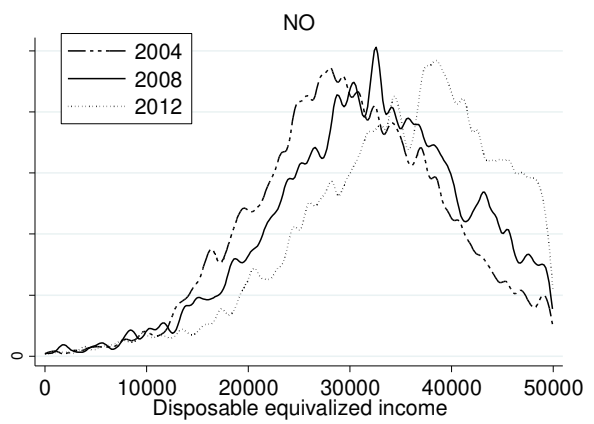
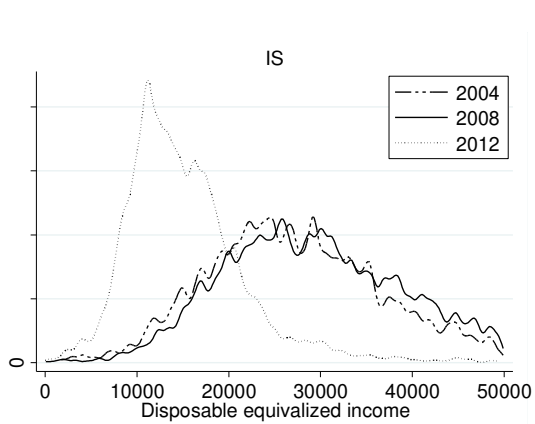
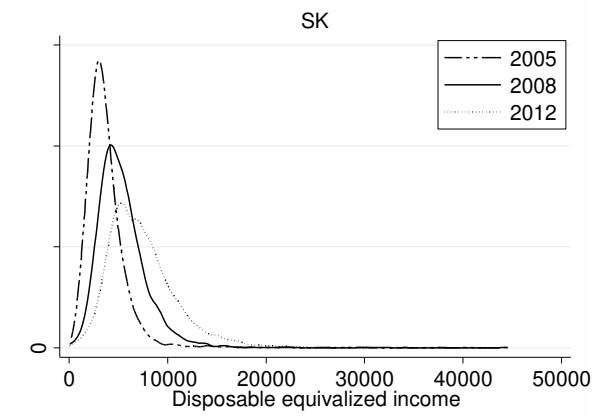
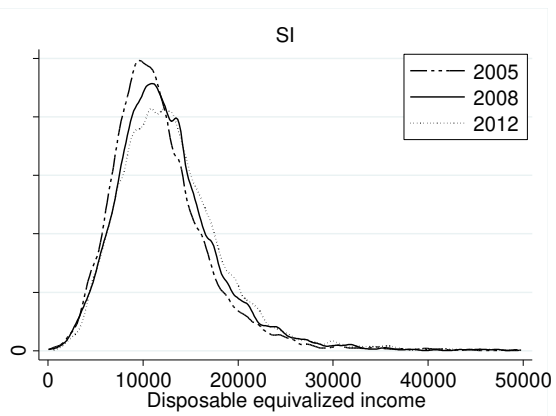
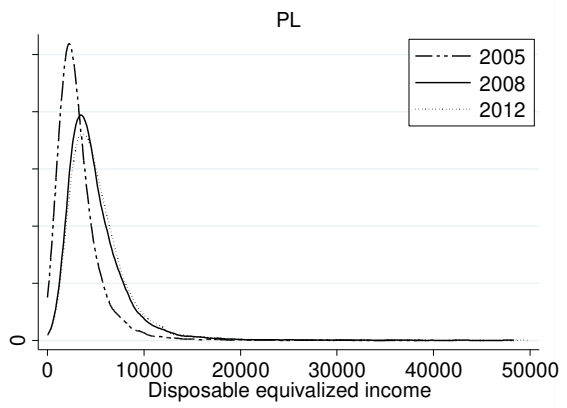
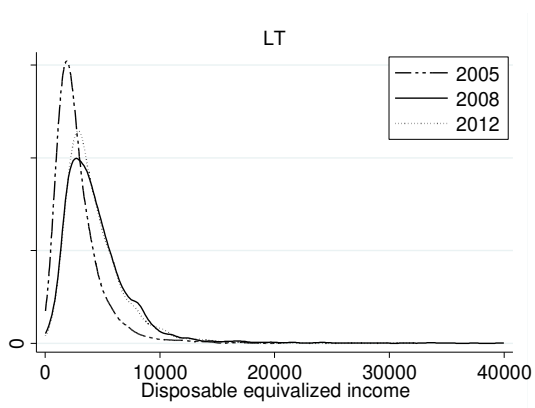
Norway - NO (# Obs: 15,515)

	Mean	Std, Dev,	Min	Max	Share DPI
Work income	45,533	35,434	-9,045	663,773	107%
Capital income	2,025	10,076	0	329,100	5%
Unemployment benefits	301	1,546	0	30,938	1%
Old-age and survivor benefits	4,706	12,023	0	94,240	11%
Sickness/Disability benefits	4,141	7,635	0	67,166	10%
Education allowance	319	832	0	9,114	1%
Minimum Protection	1,676	3,261	0	27,796	4%
Taxes	-16,011	15,076	-322,988	8,920	-38%
Disposable equivalized income	42,691	19,331	0	361,721	100%

Table A2: Kernel densities of income in 20 countries

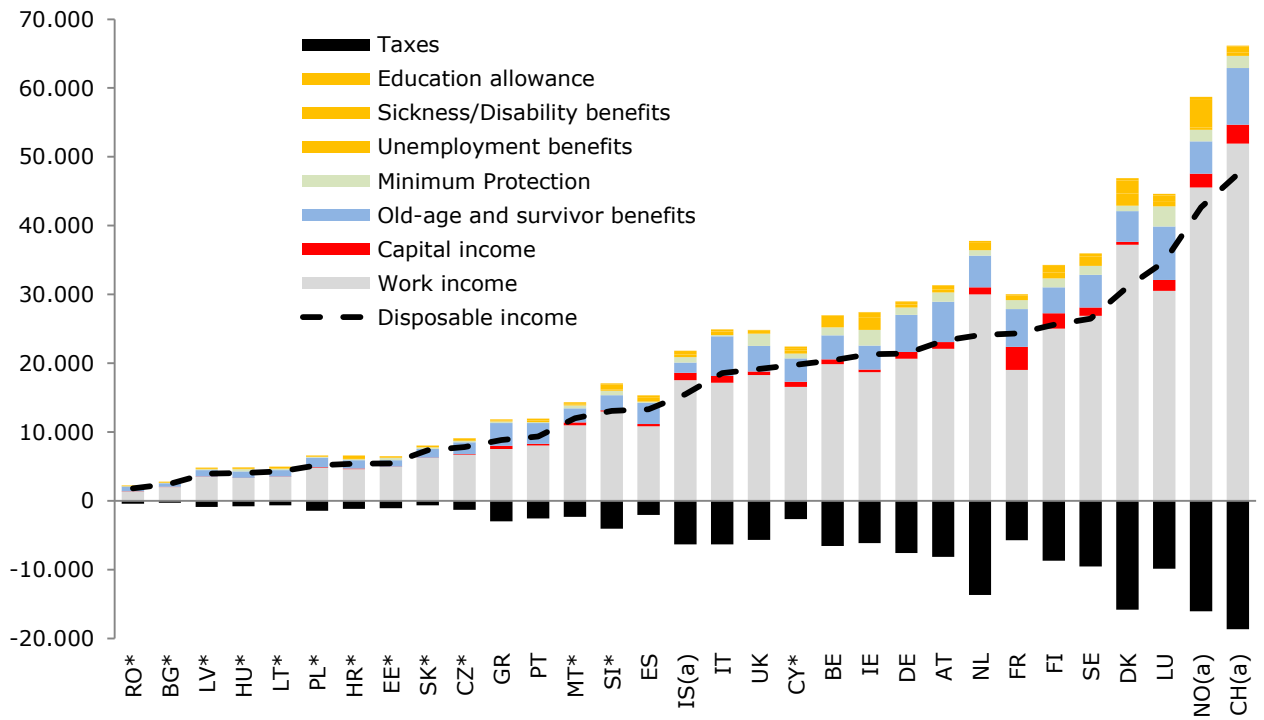






Source: own calculations EU-SILC.

Figure A1: Decomposition mean equivalized disposable income, 2012



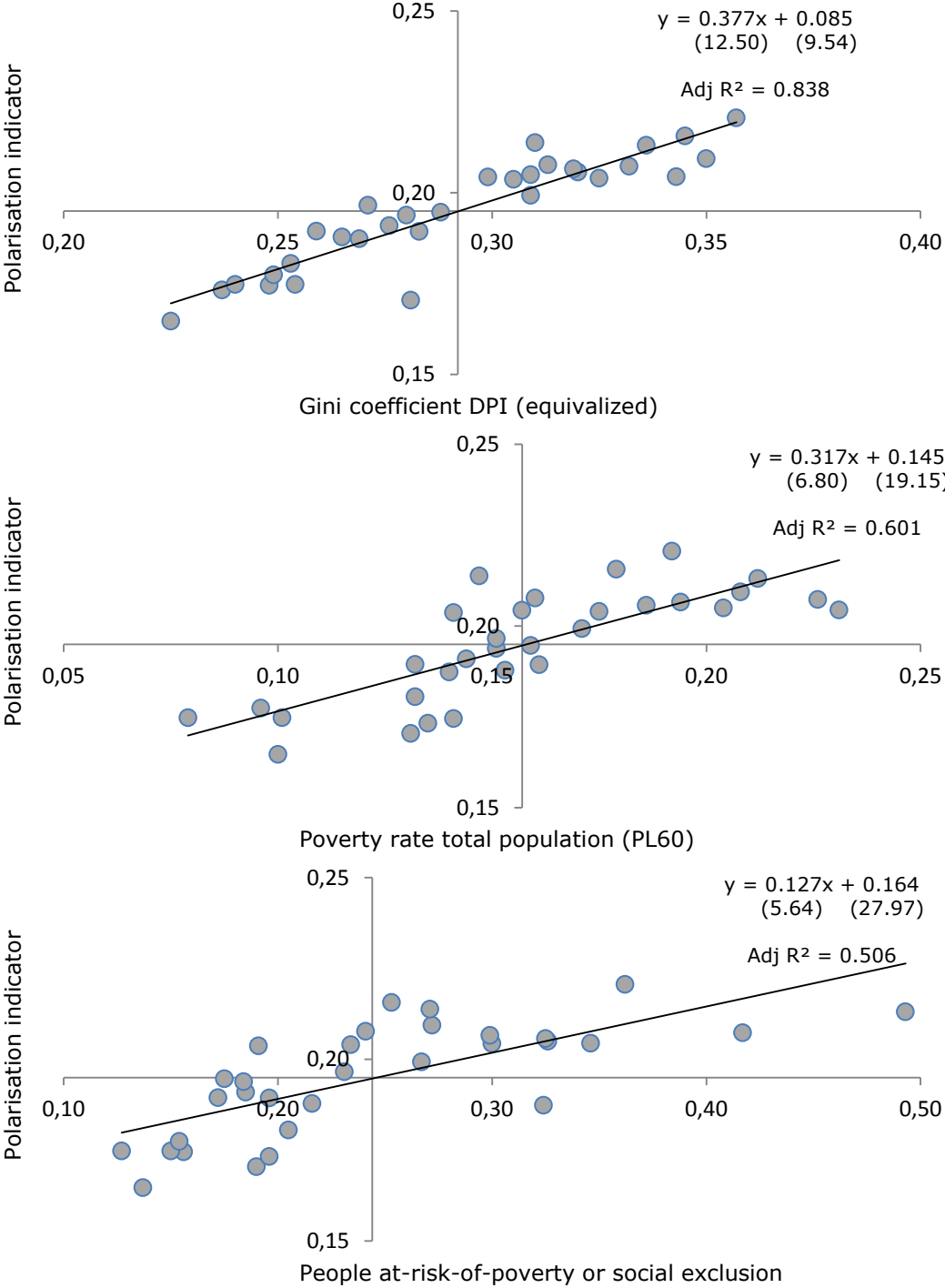
Notes: * = CEE NMS (a) = Non-EU countries

Source: own calculations EU-SILC

Appendix B: Linkage polarization estimates and other social indicators, 2012

Figure B1 shows estimates for the polarization indicator, the Gini coefficient, at-risk-of-poverty (60% of the median threshold) and the EU-agreed upon social indicator People at-risk-of-poverty or social exclusion for the countries covered by this study for 2012 (31 countries).

Figure B1: Correlation Polarization index, Gini coefficient DPI (equalized), Poverty rate total population (PL60), and People at-risk-of-poverty or social exclusion, 2012



Note: simple OLS regression; t-values between brackets

Table B1 shows estimates for the polarization indicator from EU-SILC. The table provides a broad-brush summary of the direction of movement in the indicator in the two sub-periods.

Table B1: Polarization indicator 2004, 2008 and 2012

Country	Available in EU-SILC	Polarization indicator			Change over time			
		2004	2008	2012	2004-2008	2008-2012	2004-2012	
<i>West-EU15</i>								
AT	Austria	2004-2012	0.183	0.188	0.191	2.9%	1.6%	4.3%
BE	Belgium	2004-2012	0.188	0.194	0.188	3.1%	-3.0%	0.0%
DE	Germany	2005-2012	0.191	0.193	0.189	1.4%	-2.1%	-0.8%
DK	Denmark	2004-2012	0.166	0.191	0.170	15.3%	-10.7%	2.9%
ES	Spain	2006-2012	0.207	0.202	0.209	-2.4%	3.6%	1.1%
FI	Finland	2004-2012	0.187	0.189	0.189	1.0%	0.3%	1.3%
FR	France	2004-2012	.	0.204	0.204	.	-0.4%	.
GR	Greece	2004-2012	.	0.212	0.204	.	-3.7%	.
IE	Ireland	2004-2012	0.216	0.215	0.204	-0.5%	-4.9%	-5.7%
IT	Italy	2004-2012	.	0.200	0.207	.	3.1%	.
LU	Luxembourg	2004-2012	0.189	0.212	0.194	11.9%	-8.4%	2.5%
NL	Netherlands	2005-2012	0.172	0.181	0.175	5.5%	-3.4%	1.8%
PT	Portugal	2004-2012	.	0.228	0.216	.	-5.3%	.
SE	Sweden	2004-2012	0.164	0.169	0.174	3.0%	3.4%	6.1%
UK	United Kingdom	2005-2012	0.223	0.217	0.208	-2.8%	-4.2%	-7.3%
<i>CEE NMS-13</i>								
BG	Bulgaria	2007-2012	.	0.226	0.213	.	-5.6%	.
CY	Cyprus	2005-2012	0.199	0.200	0.214	0.7%	6.8%	7.0%
CZ	Czech Republic	2005-2012	0.186	0.178	0.177	-4.2%	-0.4%	-4.8%
EE	Estonia	2004-2012	0.220	0.200	0.204	-9.1%	2.1%	-7.8%
HR	Croatia	2011-2012	.	.	0.205	.	.	.
HU	Hungary	2005-2012	0.188	0.182	0.187	-3.0%	2.7%	-0.3%
LT	Lithuania	2005-2012	0.219	0.214	0.206	-2.5%	-3.8%	-6.5%
LV	Latvia	2005-2012	.	0.239	0.221	.	-7.6%	.
MT	Malta	2008-2012	.	0.199	0.197	.	-1.3%	.
PL	Poland	2005-2012	0.217	0.203	0.199	-6.7%	-1.8%	-9.1%
RO	Romania	2007-2012	.	0.220	0.207	.	-5.8%	.
SI	Slovenia	2005-2012	0.172	0.171	0.173	-0.4%	1.1%	0.6%
SK	Slovakia	2005-2012	0.186	0.177	0.180	-4.6%	1.9%	-2.8%
<i>Other</i>								
CH	Switzerland	2008-2012	.	0.205	0.195	.	-5.1%	.
IS	Iceland	2004-2012	0.177	0.191	0.175	7.8%	-8.4%	-1.2%
NO	Norway	2004-2012	0.188	0.173	0.165	-7.9%	-5.0%	-14.3%

Note: no data for ES (2004-2005), FR (2004-2006), GR(2004-2006), IT (2004-2006), PT(2004-2006), BG (2004-2006), HR(2006-2010), LV (2005-2006), MT(2004-2007), RO(2004-2006), and CH (2004-2007).

Source: own calculations EU-SILC

Appendix C: Social indicator estimates over time

Table C1 shows estimates for the polarization indicator, the Gini coefficient, at-risk-of-poverty (60% of the median threshold) and the EU-agreed upon social indicator People at-risk-of-poverty or social exclusion for the countries covered by this study for the period 2004-2012 (20 countries). Table C1 provides a summary of the direction of movement in the four indicators over time. Figure 4 (main text) show correlation between social indicators over time.

Table C1: Polarization index, Gini coefficient DPI (equivalized), Poverty rate total population (PL60), and People at-risk-of-poverty or social exclusion, 2004-2012 for selected countries

	Available in EU-SILC	<i>Polarization indicator</i>				<i>Gini coefficient DPI (equivalized)</i>			
		Level around 2004	Level around 2012	Change 2004-2012	Rank change	Level around 2004	Level around 2012	Change 2004-2012	Rank change
Austria	2004-2012	0.183	0.191	4.5%	(18)	0.258	0.276	7.0%	(16)
Belgium	2004-2012	0.188	0.188	0.0%	(12)	0.261	0.265	1.5%	(13)
Cyprus	2005-2012	0.199	0.214	7.5%	(20)	0.287	0.310	8.0%	(18)
Czech Republic	2005-2012	0.186	0.177	-4.6%	(7)	0.260	0.249	-4.2%	(9)
Denmark	2004-2012	0.166	0.170	2.9%	(17)	0.239	0.281	17.6%	(20)
Estonia	2004-2012	0.220	0.204	-7.2%	(3)	0.374	0.325	-13.1%	(2)
Finland	2004-2012	0.187	0.189	1.3%	(14)	0.255	0.259	1.6%	(14)
Germany	2005-2012	0.191	0.189	-0.8%	(10)	0.261	0.283	8.4%	(19)
Hungary	2005-2012	0.188	0.187	-0.3%	(11)	0.276	0.269	-2.5%	(12)
Iceland	2004-2012	0.177	0.175	-1.2%	(9)	0.241	0.225	-6.6%	(6)
Ireland	2004-2012	0.216	0.204	-5.3%	(6)	0.315	0.299	-5.1%	(8)
Lithuania	2005-2012	0.219	0.206	-6.1%	(5)	0.363	0.320	-11.8%	(3)
Luxembourg	2004-2012	0.189	0.194	2.5%	(16)	0.265	0.280	5.7%	(15)
Netherlands	2005-2012	0.172	0.175	1.8%	(15)	0.269	0.254	-5.6%	(7)
Norway	2004-2012	0.188	0.165	-12.5%	(1)	0.252	0.225	-10.7%	(4)
Poland	2005-2012	0.217	0.199	-8.3%	(2)	0.356	0.309	-13.2%	(1)
Slovakia	2005-2012	0.186	0.180	-2.8%	(8)	0.262	0.253	-3.4%	(11)
Slovenia	2005-2012	0.172	0.173	0.6%	(13)	0.262	0.253	-3.4%	(11)
Sweden	2004-2012	0.164	0.174	6.5%	(19)	0.230	0.248	7.8%	(17)
United Kingdom	2005-2012	0.223	0.208	-6.8%	(4)	0.346	0.313	-9.5%	(5)
<i>Mean-20</i>		<i>0.191</i>	<i>0.188</i>	<i>-1.7%</i>		<i>0.282</i>	<i>0.275</i>	<i>-2.4%</i>	
<i>Coefficient of variation</i>		<i>0.094</i>	<i>0.074</i>	<i>-22%</i>		<i>0.152</i>	<i>0.107</i>	<i>-30%</i>	

	Available in EU-SILC	<i>Poverty rate total population (PL 60)</i>				<i>People at-risk-of-poverty or social exclusion</i>			
		Level around 2004	Level around 2012	Change 2004-2012	Rank change	Level around 2004	Level around 2012	Change 2004-2012	Rank change
Austria	2004-2012	0.130	0.144	10.8%	(15)	0.179	0.185	3.4%	(14)
Belgium	2004-2012	0.143	0.153	7.0%	(13)	0.216	0.216	0.0%	(12)
Cyprus	2005-2012	0.161	0.147	-8.7%	(7)	0.253	0.271	7.1%	(17)
Czech Republic	2005-2012	0.104	0.096	-7.7%	(8)	0.196	0.154	-21.4%	(3)
Denmark	2004-2012	0.109	0.131	20.2%	(18)	0.165	0.189	14.5%	(19)
Estonia	2004-2012	0.202	0.175	-13.4%	(5)	0.263	0.234	-11.0%	(6)
Finland	2004-2012	0.110	0.132	20.0%	(17)	0.172	0.172	0.0%	(12)
Germany	2005-2012	0.122	0.161	32.0%	(20)	0.184	0.196	6.5%	(16)
Hungary	2005-2012	0.135	0.140	3.7%	(12)	0.321	0.324	0.9%	(13)
Iceland	2004-2012	0.100	0.079	-21.0%	(2)	0.137	0.127	-7.3%	(9)
Ireland	2004-2012	0.209	0.157	-24.9%	(1)	0.248	0.300	21.0%	(20)
Lithuania	2005-2012	0.205	0.186	-9.3%	(6)	0.410	0.325	-20.7%	(4)
Luxembourg	2004-2012	0.127	0.151	18.9%	(16)	0.161	0.184	14.3%	(18)
Netherlands	2005-2012	0.107	0.101	-5.6%	(10)	0.167	0.150	-10.2%	(7)
Norway	2004-2012	0.108	0.100	-7.4%	(9)	0.158	0.137	-13.3%	(5)
Poland	2005-2012	0.205	0.171	-16.6%	(3)	0.453	0.267	-41.1%	(1)
Slovakia	2005-2012	0.133	0.132	-0.8%	(11)	0.320	0.205	-35.9%	(2)
Slovenia	2005-2012	0.122	0.135	10.7%	(14)	0.185	0.196	5.9%	(15)
Sweden	2004-2012	0.113	0.141	24.8%	(19)	0.169	0.156	-7.7%	(8)
United Kingdom	2005-2012	0.190	0.160	-15.8%	(4)	0.248	0.241	-2.8%	(10)
<i>Mean-20</i>		<i>0.142</i>	<i>0.140</i>	<i>1.5%</i>		<i>0.230</i>	<i>0.211</i>	<i>-8.2%</i>	
<i>Coefficient of variation</i>		<i>0.266</i>	<i>0.195</i>	<i>-27%</i>		<i>0.367</i>	<i>0.276</i>	<i>-25%</i>	

Source: own calculations EU-SILC

Appendix D: Sensitivity analysis polarization measure DER for a range of values for α

We computed polarization measure DER for a range of values of α across countries for 2012. Low values for α produce values of DER close to values of Gini (with high Pearson correlation), while $\alpha = 1$ leads to high disparity between Gini and the DER indices (with lower Pearson correlation).

Country	DER ($\alpha=0$)	DER ($\alpha=0.5$)	DER ($\alpha = 1$)	Gini coefficient	Poverty (PL60)	Social exclusion	Mean DPI
NO(a)	0.218	0.165	0.150	0.225	0.100	0.137	42.691
DK	0.227	0.170	0.154	0.281	0.131	0.190	31.073
SI*	0.236	0.173	0.147	0.237	0.135	0.196	13.066
SE	0.240	0.174	0.148	0.248	0.141	0.156	26.477
NL	0.235	0.175	0.159	0.254	0.101	0.150	24.126
IS(a)	0.237	0.175	0.155	0.240	0.079	0.127	15.516
CZ*	0.243	0.177	0.158	0.249	0.096	0.154	7.841
SK*	0.252	0.180	0.150	0.253	0.132	0.205	7.382
HU*	0.268	0.187	0.156	0.269	0.140	0.324	4.052
BE	0.267	0.188	0.154	0.265	0.153	0.216	20.445
DE	0.275	0.189	0.155	0.283	0.161	0.196	21.423
FI	0.274	0.189	0.161	0.259	0.132	0.172	25.620
AT	0.284	0.191	0.155	0.276	0.144	0.185	23.266
LU	0.277	0.194	0.162	0.280	0.151	0.184	34.774
CH(a)	0.289	0.195	0.157	0.288	0.159	0.175	47.514
MT*	0.284	0.197	0.162	0.271	0.151	0.231	12.019
PL*	0.301	0.199	0.157	0.309	0.171	0.267	5.175
FR	0.307	0.204	0.174	0.305	0.141	0.191	24.349
EE*	0.310	0.204	0.159	0.325	0.175	0.234	5.458
IE	0.308	0.204	0.167	0.299	0.157	0.300	21.315
GR	0.318	0.204	0.156	0.343	0.231	0.346	8.854
HR*	0.315	0.205	0.152	0.309	0.204	0.326	5.403
LT*	0.313	0.206	0.162	0.320	0.186	0.325	4.280
IT	0.325	0.207	0.161	0.319	0.194	0.299	18.592
RO*	0.324	0.207	0.153	0.332	0.226	0.417	1.814
UK	0.317	0.208	0.171	0.313	0.160	0.241	19.185
ES	0.331	0.209	0.156	0.350	0.208	0.272	13.311
BG*	0.338	0.213	0.161	0.336	0.212	0.493	2.468
CY*	0.326	0.214	0.175	0.310	0.147	0.271	19.775
PT	0.342	0.216	0.170	0.345	0.179	0.253	9.383
LV*	0.313	0.221	0.169	0.357	0.192	0.362	3.951
<i>Mean-31</i>	<i>0.287</i>	<i>0.195</i>	<i>0.159</i>	<i>0.292</i>	<i>0.158</i>	<i>0.245</i>	

Notes: * = CEE NMS (a)= Non-EU

Pearson Correlation	DER ($\alpha=0$)	DER ($\alpha=0.5$)	DER ($\alpha = 1$)	Gini coefficient	Poverty (PL60)	Social exclusion	Mean DPI
DER ($\alpha=0$)	1						
DER ($\alpha=0.5$)	0.974**	1					
DER ($\alpha = 1$)	0.582**	0.671**	1				
Gini coefficient	0.914**	0.915**	0.504**	1			
Poverty (PL60)	0.825**	0.778**	0.128	0.863**	1		
Social exclusion	0.730**	0.717**	0.208	0.745**	0.823**	1	
Mean disposable income (DPI)	-0.433*	-0.436*	-0.045	-0.454*	-0.458**	-0.647**	1

** Correlation is significant at the 0.01 level (2-tailed); * significant at the 0.05 level (2-tailed)

Appendix E: Detailed decomposition change polarization indicator 2004-2012

In the main text the polarization indicator of equivalized disposable income was decomposed into three main income components; here these partial effects of each income source will be further decomposed into a growth effect and redistributive effect, following similar studies on poverty and income inequality (Jain & Tendulkar, 1990, Kakwani & Subbarao, 1990, Datt & Ravallion, 1992, and Zhang & Wan 2006). The growth effect shows changes in polarization led by the changes in the average income component. The redistribution effect represents polarization changes due to resource reallocation. We follow Wang & Wan (2014). Their extension permits examination of how polarization will change if only the mean source income μ_x changes or if only the source income dispersion changes. Let L_x denote Lorenz curve of income x , t indexes time period, these two effects can be disentangled, as shown below:

$$\begin{aligned}\Delta p(x) &= p(x_{t+1}) - p(x_t) \\ &= p(\mu_{x_{t+1}}, L_{x_{t+1}}) - p(\mu_{x_t}, L_{x_t}) \\ &= \frac{1}{2}p(\mu_{x_{t+1}}, L_{x_{t+1}}) + \frac{1}{2}p(\mu_{x_{t+1}}, L_{x_{t+1}}) - \frac{1}{2}p(\mu_{x_t}, L_{x_t}) - \frac{1}{2}p(\mu_{x_t}, L_{x_t}) \\ &+ \frac{1}{2}p(\mu_{x_{t+1}}, L_{x_t}) - \frac{1}{2}p(\mu_{x_{t+1}}, L_{x_t}) + \frac{1}{2}p(\mu_{x_t}, L_{x_{t+1}}) - \frac{1}{2}p(\mu_{x_t}, L_{x_{t+1}}) \\ &= \frac{1}{2}\{[p(\mu_{x_{t+1}}, L_{x_t}) - p(\mu_{x_t}, L_{x_t})] + [p(\mu_{x_{t+1}}, L_{x_{t+1}}) - p(\mu_{x_t}, L_{x_{t+1}})]\} \\ &+ \frac{1}{2}\{[p(\mu_{x_{t+1}}, L_{x_{t+1}}) - p(\mu_{x_{t+1}}, L_{x_t})] + [p(\mu_{x_t}, L_{x_{t+1}}) - p(\mu_{x_t}, L_{x_t})]\}\end{aligned}$$

$$\text{Growth effect} = \frac{1}{2}\{[p(\mu_{x_{t+1}}, L_{x_t}) - p(\mu_{x_t}, L_{x_t})] + [p(\mu_{x_{t+1}}, L_{x_{t+1}}) - p(\mu_{x_t}, L_{x_{t+1}})]\}$$

$$\text{Redistribution effect} = \frac{1}{2}\{[p(\mu_{x_{t+1}}, L_{x_{t+1}}) - p(\mu_{x_{t+1}}, L_{x_t})] + [p(\mu_{x_t}, L_{x_{t+1}}) - p(\mu_{x_t}, L_{x_t})]\}$$

To estimate both effects, two counterfactual income distributions have to be simulated: (1) the income distributions of x with only its mean changed and (2) the changed distribution. The former can be expressed as $Y_x(\mu_{x_{t+1}}, L_{x_t}) = Y_x\left(\mu_{x_t} * \frac{\mu_{x_{t+1}}}{\mu_{x_t}}, L_{x_t}\right)$, from which the polarization index of $p(\mu_{x_{t+1}}, L_{x_t})$ can be estimated. The difference between $p(\mu_{x_{t+1}}, L_{x_t})$ and $p(\mu_{x_t}, L_{x_t})$ is the growth effect. Similarly, the difference between $p(\mu_{x_{t+1}}, L_{x_{t+1}})$ and $p(\mu_{x_{t+1}}, L_{x_t})$ is defined as the redistribution effect. Further, letting the starting point be $t + 1$ rather than t permits one to obtain $Y_x(\mu_{x_t}, L_{x_{t+1}}) = Y_x\left(\mu_{x_{t+1}} * \frac{\mu_{x_t}}{\mu_{x_{t+1}}}, L_{x_{t+1}}\right)$. These two partial effects are summed to estimate the total change of the polarization indicator over time.

Table E1 shows the changes of income polarization in 20 countries from 2004/5 to 2012, further splitting the countries into groups (West-EU15, CEE NMS-13 and other European countries). Countries are ranked in order of their change in polarization 2004-2012 from largest to smallest. Twelve countries have seen a non-positive change of polarization, although the magnitude is

mostly rather small due to the short period under study. Some countries show lower (higher) polarization compared to other countries.

Table E1 decompose total change into a growth and redistributive effects by country. For our 20-country-average polarization decreased in the period 2004-2012. The growth effect did not have any effect on polarization on average, while the redistributive effect appears to be polarization-reducing. However, cross-country variation is rather large.

Our analyses may be seen as an assessment how changes of the generosity of tax-benefit systems over the period 2004-2012 have had an impact on income polarization. The polarizing-reducing redistributive effect across our 20-country-average is mainly the result of the tax-benefit systems in European countries. These systems were more effective in offsetting income polarization in 2012 than in the mid-2000's in all countries, with Sweden, Cyprus and Hungary as exceptions. So, social policy changes made by most European countries in the period 2004-2012 did have an anti-poverty and equalizing effect, even if other factors as market incomes were pushing in the other direction and the overall results were disappointing (e.g. in the case of poverty reduction).

Table E1 presents rather stable income polarization over the decade in most West-EU15 countries, and somewhat lower polarization in CEE NMS countries. We do not find that tax-benefit policies had become less effective before or after the Great Recession. Among the total population in European countries, both market income polarization (labor and capital) and redistribution from social benefits and taxes rose, on average. As a result, the tax-benefit systems were more effective in offsetting income polarization in 2012 than in the mid-2000's. Detailed decomposition results for the sub-periods 2004-2008 and 2008-2012 are presented in tables E2 and E3.

Table E1: Detailed decomposition change polarization indicator 2004-2012

Country	Available in EU-SILC	Polarization indicator					Decomposition of change polarization indicator 2004-2012					
		Around 2004	Around 2012	Change 2004-2012			Partial effect: Market income		Partial effect: Social benefits		Partial effect: Taxes	
				Total change	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects
<i>West EU-15</i>												
Sweden	2004-2012	0.164	0.174	0.011	0.000	0.010	0.006	0.000	-0.005	0.008	-0.002	0.003
Austria	2005-2012	0.186	0.191	0.005	0.000	0.006	0.003	0.004	-0.002	0.000	-0.002	0.001
Denmark	2004-2012	0.166	0.170	0.005	0.001	0.003	0.004	0.003	-0.002	0.001	-0.001	-0.001
Luxembourg	2004-2012	0.189	0.194	0.005	0.000	0.005	0.004	0.002	-0.002	0.002	-0.002	0.002
Netherlands	2005-2012	0.172	0.175	0.003	0.000	0.004	0.006	-0.002	-0.003	0.002	-0.003	0.004
Finland	2004-2012	0.187	0.189	0.002	0.000	0.002	0.004	0.002	-0.003	0.001	-0.001	0.000
Belgium	2004-2012	0.188	0.188	0.000	0.000	0.000	0.000	0.002	-0.001	0.000	0.001	-0.002
Germany	2005-2012	0.191	0.189	-0.001	0.000	-0.002	0.003	-0.001	-0.002	-0.001	-0.001	0.000
Ireland	2004-2012	0.216	0.204	-0.012	-0.002	-0.009	0.008	-0.002	-0.007	-0.004	-0.003	-0.003
United Kingdom	2005-2012	0.223	0.208	-0.015	0.001	-0.016	-0.020	0.012	0.012	-0.014	0.009	-0.014
<i>Mean West EU15</i>		<i>0.188</i>	<i>0.188</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.002</i>	<i>0.002</i>	<i>-0.001</i>	<i>-0.001</i>	<i>0.000</i>	<i>-0.001</i>
<i>CEE NMS-13</i>												
Cyprus	2005-2012	0.199	0.214	0.015	0.000	0.015	0.005	0.006	-0.003	0.006	-0.003	0.002
Slovenia	2005-2012	0.172	0.173	0.001	0.000	0.001	0.004	0.000	-0.002	0.001	-0.002	0.001
Hungary	2005-2012	0.188	0.187	-0.001	0.000	0.000	-0.011	0.004	0.006	-0.003	0.005	-0.001
Czech Republic	2006-2012	0.182	0.177	-0.004	0.000	-0.004	0.015	-0.009	-0.011	0.005	-0.004	0.000
Lithuania	2005-2012	0.219	0.206	-0.013	0.001	-0.015	0.014	-0.011	-0.010	-0.001	-0.003	-0.003
Slovakia	2006-2012	0.196	0.180	-0.015	-0.003	-0.013	0.007	-0.012	-0.013	-0.002	0.003	0.002
Estonia	2004-2012	0.220	0.204	-0.016	0.000	-0.016	0.013	-0.014	-0.012	0.001	-0.001	-0.003
Poland	2005-2012	0.217	0.199	-0.018	0.000	-0.018	0.013	-0.018	-0.011	0.002	-0.003	-0.002
<i>Mean CEE NMS</i>		<i>0.199</i>	<i>0.193</i>	<i>-0.006</i>	<i>0.000</i>	<i>-0.006</i>	<i>0.007</i>	<i>-0.007</i>	<i>-0.007</i>	<i>0.001</i>	<i>-0.001</i>	<i>0.000</i>
<i>Other</i>												
Iceland	2004-2012	0.177	0.175	-0.002	0.001	-0.003	-0.010	0.012	0.009	-0.006	0.001	-0.008
Norway	2004-2012	0.188	0.165	-0.024	-0.001	-0.023	0.011	-0.017	-0.008	-0.002	-0.004	-0.003
<i>Mean European Countries (20)</i>		<i>0.192</i>	<i>0.188</i>	<i>-0.004</i>	<i>0.000</i>	<i>-0.004</i>	<i>0.004</i>	<i>-0.002</i>	<i>-0.003</i>	<i>0.000</i>	<i>-0.001</i>	<i>-0.001</i>

Table E2: Detailed decomposition change polarization indicator 2004-2008

Country	Available in EU-SILC	Polarization indicator					Decomposition of change polarization indicator 2004-2008					
		Around 2004	Around 2008	Change 2004-2008			Partial effect: Market income		Partial effect: Social benefits		Partial effect:	
				Total change	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects
<i>West EU-15</i>												
United Kingdom	2005-2008	0.223	0.217	-0.006	0.000	-0.006	-0.007	0.000	0.004	-0.003	0.003	-0.003
Ireland	2004-2008	0.216	0.215	-0.001	0.000	-0.001	0.008	0.000	-0.007	0.000	-0.002	-0.001
Finland	2004-2008	0.187	0.189	0.002	0.000	0.002	0.001	0.000	-0.001	0.001	0.000	0.001
Austria	2005-2008	0.186	0.188	0.002	0.000	0.002	0.002	0.001	-0.001	0.000	-0.001	0.002
Germany	2005-2008	0.191	0.193	0.003	0.000	0.003	0.002	0.002	-0.002	0.000	-0.001	0.001
Sweden	2004-2008	0.164	0.169	0.005	0.000	0.005	0.000	-0.001	0.000	0.004	-0.001	0.002
Belgium	2004-2008	0.188	0.194	0.006	0.000	0.006	0.001	0.002	-0.001	0.002	0.000	0.002
Netherlands	2005-2008	0.172	0.181	0.009	0.000	0.009	0.005	0.000	-0.002	0.005	-0.003	0.004
Luxembourg	2004-2008	0.189	0.212	0.022	0.000	0.022	0.000	0.007	0.001	0.009	0.000	0.006
Denmark	2004-2008	0.166	0.191	0.025	0.001	0.024	0.005	0.009	-0.002	0.008	-0.002	0.008
<i>Mean West EU15</i>		<i>0.188</i>	<i>0.195</i>	<i>0.007</i>	<i>0.000</i>	<i>0.007</i>	<i>0.002</i>	<i>0.002</i>	<i>-0.001</i>	<i>0.002</i>	<i>-0.001</i>	<i>0.002</i>
<i>CEE NMS-13</i>												
Estonia	2004-2008	0.220	0.200	-0.020	-0.001	-0.020	0.013	-0.018	-0.012	0.000	-0.002	-0.001
Slovakia	2006-2008	0.196	0.177	-0.019	0.000	-0.018	0.009	-0.015	-0.006	-0.002	-0.003	-0.002
Poland	2005-2008	0.217	0.203	-0.015	0.000	-0.014	0.014	-0.016	-0.011	0.003	-0.003	-0.001
Hungary	2005-2008	0.188	0.182	-0.006	0.000	-0.006	0.005	-0.005	-0.003	-0.001	-0.002	0.000
Lithuania	2005-2008	0.219	0.214	-0.005	0.000	-0.005	0.020	-0.013	-0.015	0.005	-0.006	0.002
Czech Republic	2006-2008	0.182	0.178	-0.004	0.000	-0.004	0.010	-0.007	-0.007	0.003	-0.003	0.000
Slovenia	2005-2008	0.172	0.171	-0.001	0.000	-0.001	0.001	-0.002	-0.001	0.001	-0.001	0.000
Cyprus	2005-2008	0.199	0.200	0.001	0.000	0.001	0.003	-0.001	-0.002	0.001	-0.001	0.000
<i>Mean CEE NMS</i>		<i>0.199</i>	<i>0.191</i>	<i>-0.008</i>	<i>0.000</i>	<i>-0.008</i>	<i>0.010</i>	<i>-0.010</i>	<i>-0.007</i>	<i>0.001</i>	<i>-0.003</i>	<i>0.000</i>
<i>Other</i>												
Norway	2004-2008	0.188	0.173	-0.015	0.000	-0.015	0.006	-0.011	-0.004	-0.002	-0.002	-0.003
Iceland	2004-2008	0.177	0.191	0.014	0.000	0.014	0.003	0.004	-0.001	0.005	-0.001	0.004
<i>Mean European Countries (20)</i>		<i>0.192</i>	<i>0.193</i>	<i>0.001</i>	<i>0.000</i>	<i>0.001</i>	<i>0.005</i>	<i>-0.003</i>	<i>-0.004</i>	<i>0.002</i>	<i>-0.002</i>	<i>0.001</i>

Table E3: Detailed decomposition change polarization indicator 2008-2012

Country	Available in EU-SILC	Polarization indicator					Decomposition of change polarization indicator 2008-2012					
		Around 2008	Around 2012	Change 2008-2012			Partial effect: Market income		Partial effect: Social benefits		Partial effect: Taxes	
				Total change	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects	Growth effects	Redistributive effects
<i>West EU-15</i>												
Denmark	2008-2012	0.191	0.170	-0.020	0.000	-0.021	-0.003	-0.003	0.004	-0.005	0.000	-0.012
Luxembourg	2008-2012	0.212	0.194	-0.018	0.000	-0.018	0.002	-0.005	-0.001	-0.006	-0.001	-0.006
Ireland	2008-2012	0.215	0.204	-0.011	-0.004	-0.007	-0.002	-0.002	-0.001	-0.005	-0.001	0.000
United Kingdom	2008-2012	0.217	0.208	-0.009	0.000	-0.009	-0.012	0.010	0.007	-0.010	0.005	-0.010
Netherlands	2008-2012	0.181	0.175	-0.006	0.000	-0.006	0.002	-0.001	-0.001	-0.003	-0.001	-0.001
Belgium	2008-2012	0.194	0.188	-0.006	0.000	-0.006	-0.001	0.000	0.000	-0.003	0.001	-0.004
Germany	2008-2012	0.193	0.189	-0.004	0.000	-0.004	0.001	-0.003	-0.001	-0.001	0.000	-0.001
Finland	2008-2012	0.189	0.189	0.001	0.000	0.000	0.003	0.001	-0.002	0.000	-0.001	-0.001
Austria	2008-2012	0.188	0.191	0.003	0.000	0.003	0.001	0.002	-0.001	0.001	-0.001	0.000
Sweden	2008-2012	0.169	0.174	0.006	0.000	0.005	0.006	0.000	-0.004	0.004	-0.001	0.002
<i>Mean West EU15</i>		<i>0.195</i>	<i>0.188</i>	<i>-0.006</i>	<i>0.000</i>	<i>-0.006</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>-0.003</i>	<i>0.000</i>	<i>-0.003</i>
<i>CEE NMS-13</i>												
Lithuania	2008-2012	0.214	0.206	-0.008	0.000	-0.008	-0.005	0.003	0.003	-0.008	0.002	-0.004
Poland	2008-2012	0.203	0.199	-0.004	0.000	-0.003	0.000	-0.002	0.000	0.000	0.000	-0.001
Czech Republic	2008-2012	0.178	0.177	-0.001	0.000	0.000	0.007	-0.003	-0.006	0.003	-0.001	0.000
Slovenia	2008-2012	0.171	0.173	0.002	0.000	0.002	0.003	0.002	-0.001	0.000	-0.001	0.000
Slovakia	2008-2012	0.177	0.180	0.003	0.001	0.002	0.000	-0.001	-0.005	-0.001	0.005	0.004
Estonia	2008-2012	0.200	0.204	0.004	0.001	0.003	0.003	0.005	-0.001	0.001	-0.001	-0.002
Hungary	2008-2012	0.182	0.187	0.005	0.001	0.004	-0.014	0.008	0.007	-0.003	0.007	-0.001
Cyprus	2008-2012	0.200	0.214	0.014	0.000	0.014	0.003	0.008	-0.001	0.004	-0.001	0.002
<i>Mean CEE NMS</i>		<i>0.191</i>	<i>0.193</i>	<i>0.002</i>	<i>0.000</i>	<i>0.002</i>	<i>0.000</i>	<i>0.002</i>	<i>-0.001</i>	<i>0.000</i>	<i>0.001</i>	<i>0.000</i>
<i>Other</i>												
Iceland	2008-2012	0.191	0.175	-0.016	0.001	-0.017	-0.002	0.006	0.010	-0.010	-0.007	-0.013
Norway	2008-2012	0.173	0.165	-0.009	0.000	-0.008	0.008	-0.007	-0.004	0.000	-0.003	-0.001
<i>Mean European Countries (20)</i>		<i>0.192</i>	<i>0.188</i>	<i>-0.004</i>	<i>0.000</i>	<i>-0.004</i>	<i>0.000</i>	<i>0.001</i>	<i>0.000</i>	<i>-0.002</i>	<i>0.000</i>	<i>-0.002</i>

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