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ABSTRACT[1]

In this paper we study trends at the lower tail of the EU-wide distribution of disposable household income. In contrast to most studies, we take a pan-European perspective and compare income levels across countries, after accounting for average price differences. More in particular, we make use of EU-SILC 2008 – 2014 to study trends and levels in the EU-wide low income proportion and the EU-wide low income gap. From the analysis emerges a highly dynamic picture which points to both convergence and, especially since 2010, divergence. Living standards in the new EU Member States, most notably Poland, Slovakia, and Bulgaria, have considerably improved in comparison with the EU-wide median, while living standards in Greece, and to a lesser extent Spain and Italy have clearly lost ground. These trends mark an important change in the composition of the bottom of the pan-European income distribution, with an increasing weight of the 'old' EU Member States at the bottom end, most notably the crisis-hit Southern European countries. Worryingly, we also observe that no country succeeded in substantially reducing the EU-wide low-income proportion while also substantially reducing the at-risk-of-poverty rate. This emphasises the need of a dual perspective on solidarity, a national and a pan-European, and underscores the importance of reflecting further on the need of mutual insurance and true solidarity across borders.

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1 Introduction

Income poverty and income inequality are complex phenomena. In Europe, they are most often studied from a national perspective. Indicators of relative inequality such as the Gini coefficient are predominantly used to study inequality within EU countries, while the at-risk-of-poverty indicator compares incomes with 60 per cent of the national median income. As a result, important pan-European dynamics in household incomes remain largely invisible. However, both a national and a pan-European perspective are required for understanding poverty and inequality and the complex challenge of solidarity in the European Union. By assessing household incomes with a common European standard, it is possible to gain more insight into the improvement or deterioration of the standard of living of the poorest people in the EU compared to the rest of the EU's population. This helps to shed an alternative light on progress towards the goal of greater social cohesion in the EU (e.g. Brandolini, 2007; Fahey, 2007), complementing the predominant analyses. In addition, it facilitates a better understanding of trends in the disparities of living standards between EU Member States, which poses an important challenge for European solidarity and social policy initiatives (cf. Goedemé & Van Lancker, 2009; Levy, Matsaganis, & Sutherland, 2013; Vandenbroucke, Cantillon, Van Mechelen, Goedemé, & Van Lancker, 2013). Therefore, in this paper we study recent trends in low-income dynamics from a pan-European perspective, complementing other studies that are mostly based on the at-risk-of-poverty indicator.

Several authors have shed light on poverty and inequality from a pan-European perspective by directly comparing the living standard of EU citizens. Some have looked at pan-European poverty and inequality excluding the post-2004 EU Member States (e.g. Anthony B. Atkinson, 1996; Beblo & Knaus, 2001; Berthoud, 2004; de Vos & Zaidi, 1998; Eurostat, 1990; Kangas & Ritakallio, 2007), or including at least some post-2004 EU Member States (e.g. Boix, 2004; Bönke & Schröder, 2015; Brandolini, 2007; Fahey, 2007; Förster, 2005; Lelkes, Medgyesi, Tóth, & Ward, 2009; Whelan & Maître, 2010). However, few authors have looked into changes over time, and if they have done so, they have mainly focused on the EU as a whole, or on trends characterizing clusters of countries (e.g. Goedemé & Collado, 2016).

Previous studies have highlighted the following trends. First, developments and policies at the EU level impact upon the distribution of income, both within and between Member States (e.g. Heidenreich, 2016). Second, the distribution of those with a relatively low income is very different from a pan-European perspective compared to a national perspective. With the (national) at-risk-of-poverty indicator those at-risk-of poverty tend to live predominantly in the 'old' EU Member States. In contrast, when a pan-European benchmark is used, about forty per cent of

those with a low income tend to live in the Member States that have joined the EU since 2004, in spite of their relatively low population share. Third, dynamics in national at-risk-of-poverty rates can be very different from pan-European dynamics in living standards: the low-income proportion with a pan-European threshold has tended to decrease during the past decade, while it increased in several periods if national thresholds are used. Fourth, over the past decade, substantial changes in the pan-European income distribution have taken place, mainly as a result of strong reductions in the number of households with an income below 40 per cent of the EU-wide median in the Member States that joined the EU in 2004 (Goedemé & Collado, 2016; Goedemé, Collado, & Meeusen, 2014).

In contrast to previous contributions, in this paper we disaggregate trends in pan-European low-income dynamics and track country-specific patterns in the EU. We focus on trends since the onset of the financial and economic crisis. For doing so, we make use of two indicators: the EU-wide low-income proportion (LIP) and the EU-wide low-income gap ratio (LIG). Both indicators compare household incomes to a threshold that is defined as a percentage of the EU-wide median income, controlling for average price differences across countries. With the LIP we look at the percentage of the population with an income below the threshold, while with the LIG we look at the size of the gap between household incomes and the common threshold. We focus on four questions: (1) How have the EU-wide LIP and LIG evolved in individual EU Member States? (2) How has the composition of the bottom of the pan-European distribution of incomes changed since the onset of the crisis? (3) Which countries have contributed most to (changes in) the EU-wide LIP and LIG? (4) How do these changes compare with trends in the at-risk-of-poverty rate? For the analysis we use EU-SILC 2008-2014 data. We consider all EU Member States except for Croatia, as it has acceded to the EU during the period under consideration.

The paper is structured as follows. First, we set the scene and motivate our choice of indicators with reference to what we consider to be the original inspiration of the European project, that is, the simultaneous pursuit of upward convergence across the Member States and social cohesion within the Member States. In the second section, we briefly explain our most important methodological choices, and present the data that we use. In the third section, we present the empirical findings and discuss consecutively the four questions highlighted before. Thereafter, we conclude.

2 Two perspectives on cohesion

The data presented in this paper illustrate two different perspectives on 'cohesion' in the EU. On the one hand, there is a well-known national perspective on cohesion, in which the expression 'cohesion' is associated with social inclusion as we traditionally understand it. On the other hand, there is a pan-European perspective, in which 'cohesion' is associated with the aspiration of upward convergence in prosperity across the Member States of the EU. Indeed, 'cohesion policy' is a well-known dimension of EU policies. 'Economic and social cohesion' – as defined in the 1986 Single European Act – is about 'reducing disparities between the various regions and the backwardness of the least-favoured regions'. The EU's most recent treaty, the Lisbon Treaty, adds another facet to cohesion, referring to 'economic, social and territorial cohesion'.

The overarching indicator used to assess social inclusion at the national level is the at-risk-of-poverty rate (AROP) with a threshold set at 60% of national median income, i.e. the percentage of individuals living with an income below 60% of the national median. Admittedly, AROP is but one indicator amongst many. Nevertheless, we believe there are strong arguments to use this relative at-risk-of-poverty measure as a central and overarching measure in order to gauge, at the national level, social inclusion, and thus 'social cohesion' as we wish to understand it here (for the original argument, see Anthony Barnes Atkinson, Cantillon, Marlier, and Nolan (2002); for a more recent affirmation of the same view, see Cantillon (2014)).

In this paper we apply a (technically) similar indicator at the pan-European level (the percentage of individuals living with an income below 60% or 40% of the European median), but we do not argue that, applying it with a 60% threshold, yields an indicator of 'relative poverty' at the pan-European level. We do not elaborate upon the complex and multifaceted discussion on the meaning and measurement of 'poverty' in today's integrated Europe (see, for instance, Berthoud, 2012; Fahey, 2007; Goedemé & Rottiers, 2011; Whelan & Maître, 2009a, 2009b); for this reason, we use the more neutral expressions 'LIP' and 'LIG' in this paper for the pan-European measure. However, we think LIP and LIG are useful indicators for assessing what we consider to be the historical point and purpose of the European project in the socio-economic domain: upward convergence in prosperity across the Union. This is not to say that LIP/LIG are the only indicators one should study to gauge upward convergence across the Member States of the Union; yet, the proportion of residents in a Member State that lives with an income that is considerably below the European median, provides a measure of the extent to which upward convergence in economic prosperity is a reality for a sufficiently large share of the population in that Member State. In our view, this provides a useful complement to the predominant analyses that

focus on trends in GDP per capita. In addition, the technical similarity of the national and the pan-European measure, both using 60% (or 40%) of the respective median income as a cut-off, sheds an interesting light on what we consider to be the fundamental aspiration of the founding fathers of the European project.

The European integration project has been described as a 'convergence machine' (Gill & Raiser, 2012). Convergence was not just a result, it was also a pre-condition for continuing European integration: the 'output legitimacy' of integration was based on the simultaneous pursuit of economic progress, on the one hand, and of social progress and cohesion, on the other hand, both within countries (through the gradual development of welfare states) and between countries (through upward convergence across the Union). The founding fathers of the European project who prepared the Treaty of Rome optimistically assumed that growing cohesion both *between* and *within* countries could be reached by supranational economic cooperation, together with some specific instruments for raising the standard of living across the member states (which were later brought together in the EU's cohesion policy). Economic integration was to be organised at the EU level, and would boost economic growth and create upward convergence; domestic social policies were to redistribute the fruits of economic progress, while remaining a national prerogative.

With hindsight (and in a slightly benign interpretation), one may say that the founding fathers of the European project created two perspectives on social cohesion: a pan-European perspective and a national perspective. For sure, apart from redistributive aspects of the common agricultural policy, and a limited degree of cross-country redistribution in favour of less-developed regions through structural funds, in the context of the specific 'cohesion policy', their approach was not redistributive across borders. Nor was it about the mutual insurance of risks across borders. In other words, they did not envisage the organisation of solidarity as we normally understand it within welfare states, which implies mixtures of redistribution and insurance.

Historically, the founding fathers' approach predominantly implied fair access to opportunities: trade and investment opportunities for countries joining the EU and personal opportunities for all their citizens wanting or needing to be mobile. Stretching the notion of 'inclusion', one might also say that, in pursuing cohesion, it was motivated by a (relatively vague) notion of inclusion on a pan-European scale. It is this notion of inclusion on a pan-European scale that we explore further in this paper, from an empirical perspective. Until the mid-2000s, this policy was considered to be, by and large, successful, and the founding fathers seemed vindicated in their optimistic belief. Since then, the model clearly broke down and the EU stopped being a 'convergence machine'.

Overall, new Member States recorded impressive economic growth after their accession to the EU, but the Eurozone crisis triggered a process of divergence between the Eurozone members (e.g. European Commission, 2014). Within the Member States, the overall position of pensioners has improved, but, among the non-elderly population, two mutually reinforcing processes of polarisation are leading to more inequality at the bottom end of the income distribution in a significant number of Member States. First, more people are living in work-poor households, i.e. households with a weak attachment to the labour market; second, these households are experiencing higher poverty risks. The latter trend already started before the crisis (Cantillon & Vandenbroucke, 2014; Vandenbroucke & Rinaldi, 2015). In this paper, we focus on the dynamics of pan-European social cohesion since the crisis.

3 Data and measurement

In order to assess pan-European dynamics in living standards, we make use of the European Union Statistics on Income and Living Conditions (EU-SILC), which provide harmonized individual and household level information for income as well as additional social indicators. EU-SILC is meant to be a representative sample of persons living in private households. We consider all countries that were an EU Member State between 2008 and 2014[2]. With the exception of Ireland and the United Kingdom, income data refer to the year before the survey year, while other information (e.g. on household composition) refers to the survey year. Nevertheless, the years reported in the figures below refer to the year of the survey, rather than to the income reference year. Although EU-SILC data are available annually from 2005, the analysis focuses on the period between 2008 and 2014[3] in order to limit the number of countries with a break in the time series for income[4].

Although EU-SILC is to an important extent harmonized, large differences remain with regard to the source of income data (e.g. survey vs. register

[2] At the time of writing the Brexit referendum took place. Given that our period of analysis covers the pre-Brexit period, we include the United Kingdom in the analysis.

[3] We make use of EU-SILC 2007 UDB version 6 (UK), EU-SILC 2008 UDB version 7, EU-SILC 2009 UDB version 7, EU-SILC 2010 UDB version 6, EU-SILC 2011 UDB version 5, EU-SILC 2012 UDB version 3, EU-SILC 2013 UDB version 2, and EU-SILC 2014 UDB version 1. In order to improve consistency in income reference periods, data for the UK are merged with the subsequent survey year (e.g. 2007 UK data are merged with 2008 data for the other countries).

[4] Four countries have a break in time series in 2008: Spain, France, Austria and Cyprus. Other breaks in series have appeared after this date: for the 2011 wave in Denmark, the 2012 wave in the UK and the 2014 wave in Estonia. We have not attempted to apply any correction for these breaks in series. The equivalent disposable household income in the UDB has been multiplied by correction factors in order to ensure perfect alignment of estimated national median incomes with Eurostat estimates.

data), data collection modes, weighting schemes and imputation procedures. At the same time, EU-SILC constitutes the best available source for comparative studies on income and living conditions in the EU[5]. Given that EU-SILC data are based on complex sample designs, standard errors calculated under the assumption of simple random sampling are strongly downwardly biased. For this reason, as recommended by Goedemé (2013), the analysis considers reconstructed sample design variables[6] that make optimal use of the sample design information in the data (see also Zardo Trindade & Goedemé, 2016). However, as it is not possible to calculate the covariance over different EU-SILC waves, standard errors of changes over time can be expected to be over-estimated. As has been noted by several authors, the fact that the low-income threshold is estimated as a share of median income, which itself is an estimate on the basis of the data, may have a non-negligible effect on the sampling variance (Berger & Skinner, 2003; Preston, 1995). We take this into account by making use of the DASP module developed for STATA (Araar & Duclos, 2007). For technical reasons, this effect is not taken into account when decomposing the LIP and LIG. Changes over time are considered statistically significant at the 95 per cent confidence level.

In order to calculate the LIP and LIG, we start from equivalent disposable household income[7]. Equivalent disposable household income equals the sum of all after-transfer incomes of all household members, net of taxes and social contributions, adjusted for differences in needs between households by making use of the modified-OECD equivalence scale[8]. Given that we are interested in comparing cross-national differences in real income, differences in currencies and price levels across the selected countries are taken into account. Therefore, we first convert incomes expressed in national currencies into purchasing power standards (PPS) by using purchasing power parities (PPPs) for final household consumption, calculated by Eurostat (cf. European Commission & Eurostat, 2012). Even though PPPs are faced with some limitations (e.g. Deaton, 2002; Milanovic, 2005), they are the best tool available for making incomes cross- nationally comparable. Given that income in PPS is not comparable across time, we express incomes in PPS as a percentage of the year-specific EU-wide median income in PPS. This allows us to focus on how

[5] For more information on EU-SILC, we refer to Marlier, Atkinson, Cantillon, and Nolan (2007), Iacovou, Kaminska, and Levy (2012) and Decancq, Goedemé, Van den Bosch, and Vanhille (2014).

[6] The sample design variables that we use can be downloaded from https://timgoedeme.com/eu-silc-standard-errors/.

[7] Incomes are bottom coded at 1 per cent of the country-year specific average equivalent disposable household income and top-coded at 10 times non-equivalised disposable household income (the so-called 'LIS procedure'). See Van Kerm (2007) for a discussion of the treatment of extreme income values in EU-SILC.

[8] The modified OECD equivalence scale attaches a weight of 1 to the first adult, 0.5 to all other household members aged 14 and older and 0.3 to all household members aged less than 14 years.

income levels in individual countries change in comparison with the EU-wide median. Second, the reference consumption bundle that is used for calculating the PPPs may be more representative for some countries than for others, which may lead to biased estimates of real income levels and trends in the EU-wide low income proportion. Furthermore, PPPs are not necessarily constructed on the basis of a basket of goods and services that reflects consumption patterns of low-income groups and neglect within- country differences in price levels (e.g. Deaton, 2002; Milanovic, 2005). From this point forward, we simply refer to 'income' to denote equivalent disposable household income in PPS.

In this paper we study pan-European low-income dynamics by calculating two related measures. The EU-wide low-income proportion (LIP) is equal to the percentage of the population with an income below a percentage of the pan-European median income. The EU-wide low-income gap ratio (LIG) equals the gap between the low-income threshold and the income of the poor expressed as a percentage of the low-income threshold and averaged over the total population. Both measures are part of the Foster-Greer Thorbecke (FGT) index (Foster, Greer, & Thorbecke, 1984). A more elaborate discussion of the various aspects of the FGT index and the measurement of income poverty in the EU can be found in Decancq et al. (2014).

4 Results

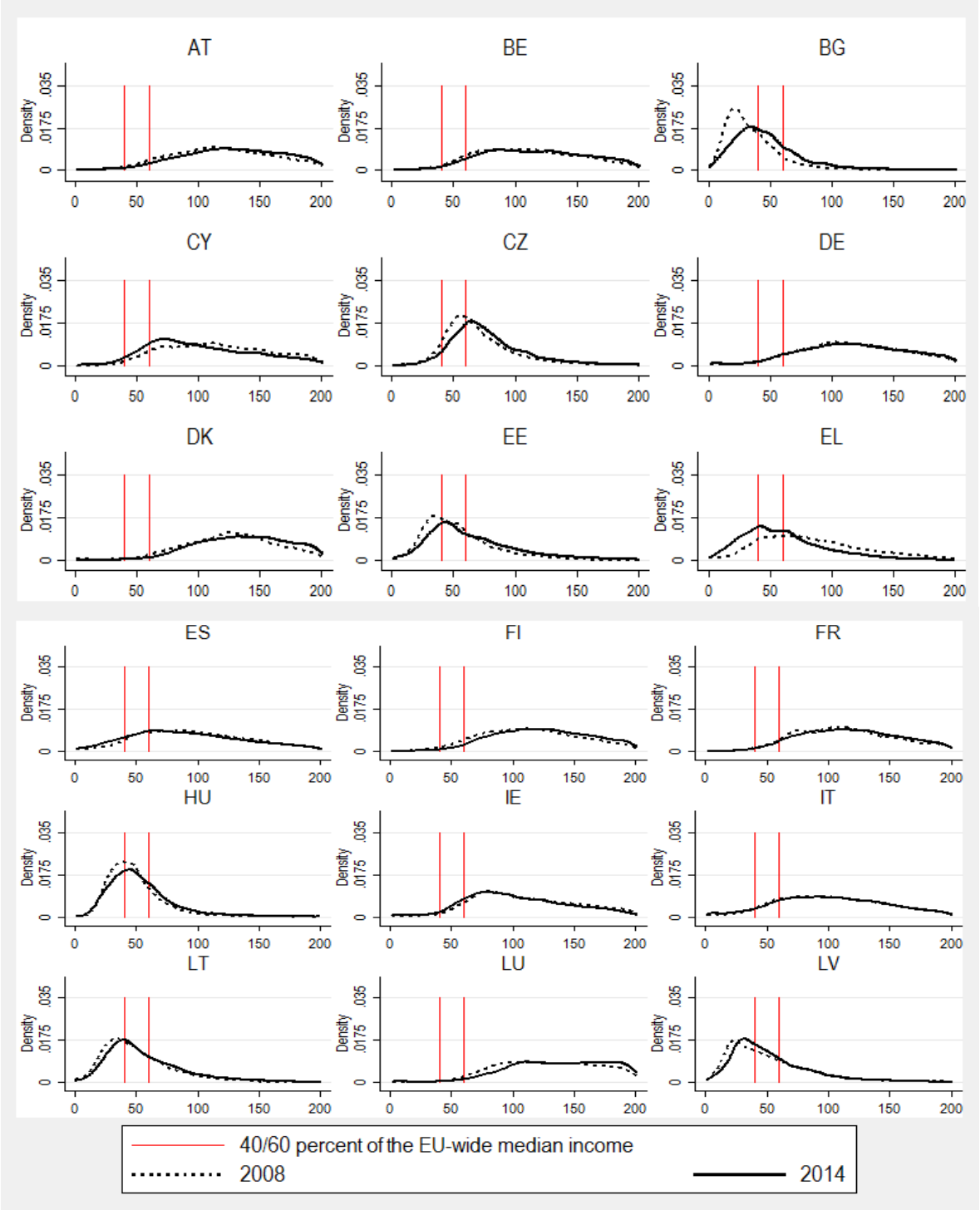
So far, low income dynamics from a pan-European perspective have mainly been studied at the aggregate level, for groups of countries. In order to shed more light on low-income dynamics in the EU, we highlight consecutively (1) trends in levels at the aggregate level and in individual Member States, (2) changes in the composition of the EU-wide LIP and LIG; (3) the contribution of individual countries to (changes in) the EU-wide LIP and LIG; and (4) the correlation between changes in the EU-wide LIP and LIG and the at-risk-of-poverty indicator.

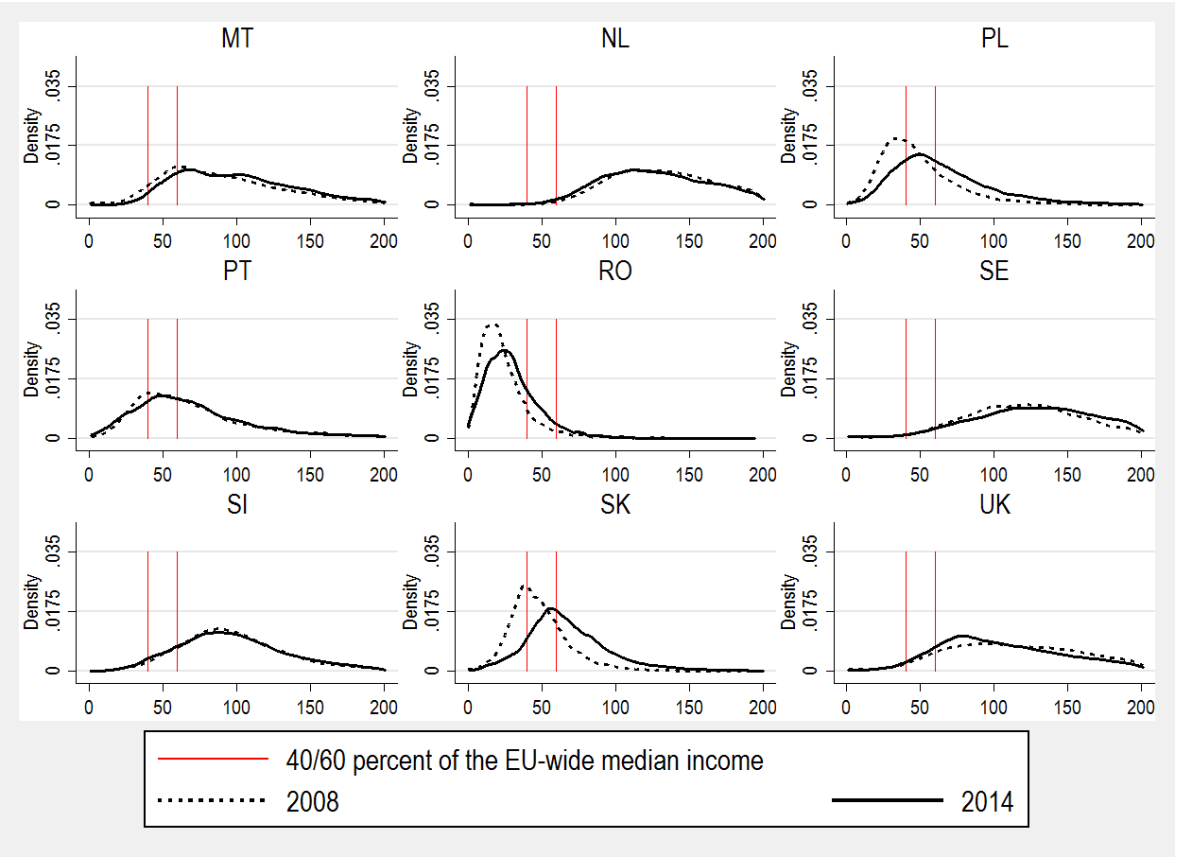
4.1 Pan-European low-income dynamics at a glance

In order to better grasp the changes in the pan-European income distribution, it is useful to first consider the changes in the wider distribution of incomes in each EU Member State. In Figure 1 we depict kernel density curves of each national income distribution, expressing incomes as a percentage of the year-specific EU-wide median income (while taking price differences into account). We do so for EU-SILC 2008 and 2014.

From the graphs, it is clear that quite some re-ranking has taken place throughout the pan-European income distribution. In comparison with the EU-wide median income, the richer EU Member States Austria, Belgium, Denmark, Finland, Sweden as well as Malta have experienced growing incomes across most of the distribution and throughout the period under consideration. However, given their relatively high income levels, except for Malta, these changes have happened mainly above 60 per cent of the EU-wide median income. In contrast, the Netherlands, Ireland, the United Kingdom, and especially Greece, Italy, Spain and Cyprus have clearly seen their income distributions fall in comparison with the pan-European median income. Changes in the income distribution in the Central and Eastern European Member States have immediate effects for the EU-wide LIP, given their relatively low level of incomes. Over the period under consideration, Poland, the Czech Republic and Romania have seen their income levels grow across the distribution, as well as Bulgaria, Hungary, Lithuania and Slovakia (even though with a decrease in some years). In Slovenia, decreases have been somewhat more predominant, depending also on the part of the income distribution under consideration.

Figure 1. Kernel density curves of national income distributions relative to the year-specific EU-wide median income (EU27), EU-SILC 2008-2014





Notes: Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

Even though kernel density curves are helpful for having a quick glance at the changes that have taken place, they do not allow for a very precise interpretation of what has happened at the bottom of the income distribution. A more direct estimation of the LIP and LIG are more helpful in that regard. Given the considerable changes in the pan-European distribution of incomes, we can expect relatively strong movements in the EU-wide LIP at the Member State level, but it is unclear how trends have been at the aggregate level. In previous work, we found that the total EU-wide LIP fell between EU-SILC 2005 and EU-SILC 2009, but changed much less in the following two years (Goedemé et al., 2013, Goedemé and Collado, 2016).

Also between EU-SILC 2010 and 2014, year-to-year changes were very modest, and mostly not statistically significant (at the 95% confidence level). Overall, between EU-SILC 2008 and EU-SILC 2014, at 40 per cent of the EU-wide median income, the LIP dropped from 13.1 to 11.3 per cent, while at 60 per cent of the EU-wide median it dropped from 24.6 to 22.9 per cent. Over three quarters of this drop was realised before EU-SILC 2011. At the same time, with the threshold set at 40 per cent of the EU-wide median income, the LIG dropped from 5.1 per cent in EU-SILC 2008 to 4.4 per cent in EU-SILC 2010, after which it remained at about the same level. A similar pattern can be observed when the threshold is set at 60 per cent of the EU-wide median income. The stagnation (LIG)

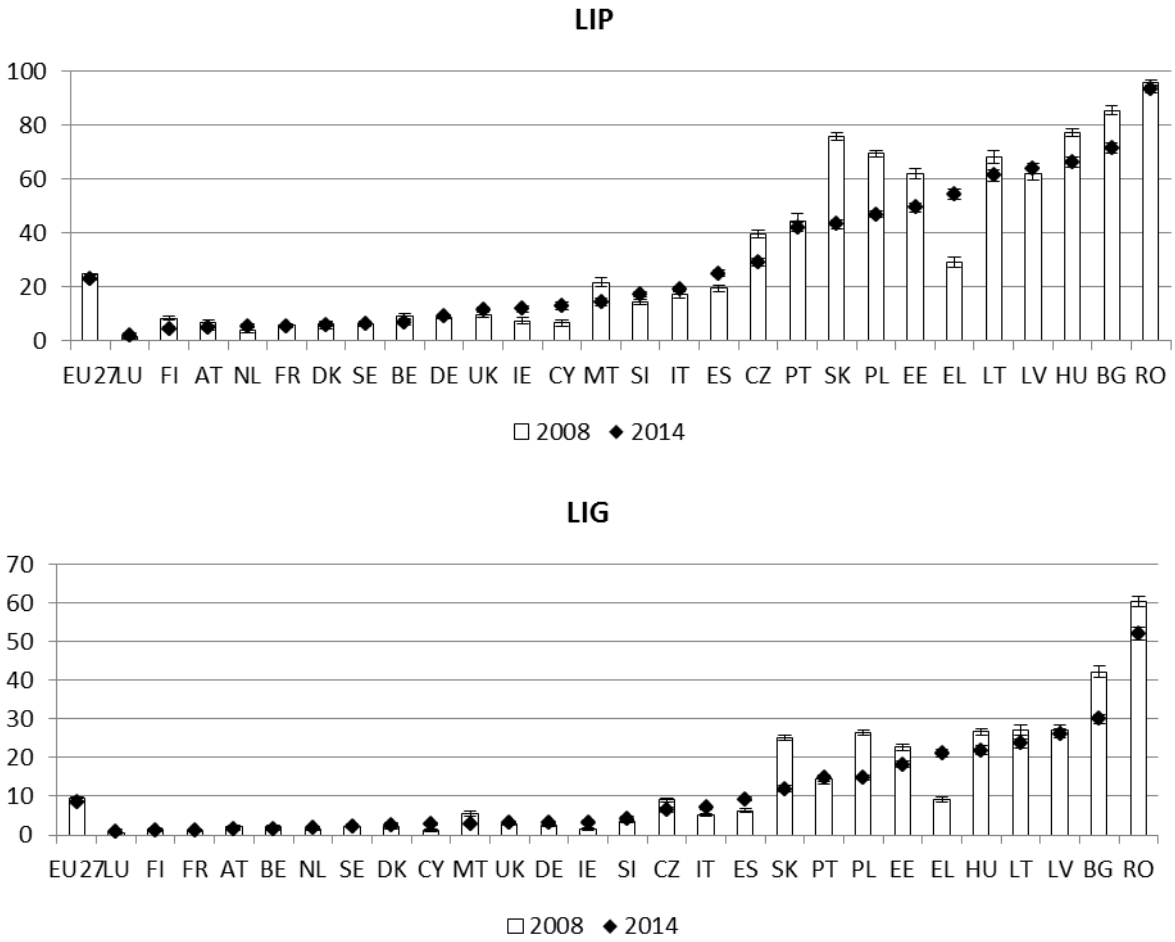
and modest changes (LIP) since EU-SILC 2010 are rather surprising, given that the crisis and the policy responses that followed continued to impact upon national income distributions and absolute changes in living standards, also after 2010 (e.g. Matsaganis & Leventi, 2014). This apparent stagnation at the EU level contrasts sharply with the strong changes that can be observed in a number of EU Member States.

Figure 2 shows recent changes in the EU-wide LIP and LIG in more detail. First, it is clear that the variation between EU Member States in the level of the LIP and LIG is enormous. With the threshold set at 60 per cent of the EU-wide median income, the LIP in Luxembourg, Finland and Austria was below 5 per cent in EU-SILC 2014. In contrast, in Greece, Lithuania, Latvia, Hungary, and Bulgaria it was over 50 per cent, and even over 90 per cent in Romania, by far the poorest country in the EU. A similar variation can be found when looking at the LIG, even though there is some re-ranking of countries, and relative differences between Luxembourg and Romania are much larger. Second, changes in the LIP and LIG also vary strongly across countries. Over the entire period Slovakia (-33 p.p.) and Poland (-22 p.p.) display the strongest decreases in the LIP with a 60 per cent threshold, while the LIP increased most strongly in Greece (+25 p.p.). Substantial decreases have also taken place in other new Member States, notably Bulgaria, Estonia[9], Hungary and the Czech Republic (all -10 p.p. or more), whereas more modest increases (between 4 and 7 p.p.) have taken place in Cyprus, Spain and Ireland. Remarkably, Romania does not figure in the list of countries with strong decreases. This is somewhat different if we consider the LIG, indicating that changes may have had a stronger impact on the LIP if the threshold would be set lower. This is not surprising, if we consider the overall level of the income distribution in Romania, as depicted in Figure 1. Third, it is worth pointing out that also the timing of changes in the LIG and LIP varies substantially across countries.

In some, the biggest changes were concentrated between EU-SILC 2008 and 2010, notably in Slovakia, in others the next two years witnessed the biggest change, notably in Greece and Hungary, whereas the strongest increase in the EU-wide LIP was observed between EU-SILC 2012 and 2014 in Cyprus. Other countries display more varied patterns, including Bulgaria, Latvia and Lithuania.

[9] Some caution is required for the Estonian estimate, given a break in series in EU-SILC 2014.

Figure 2. The EU-wide low-income proportion (LIP) and low-income gap ratio (LIG) (EU27), with the threshold set at 60 per cent of the year-specific EU-wide median income, EU-SILC 2008-2014



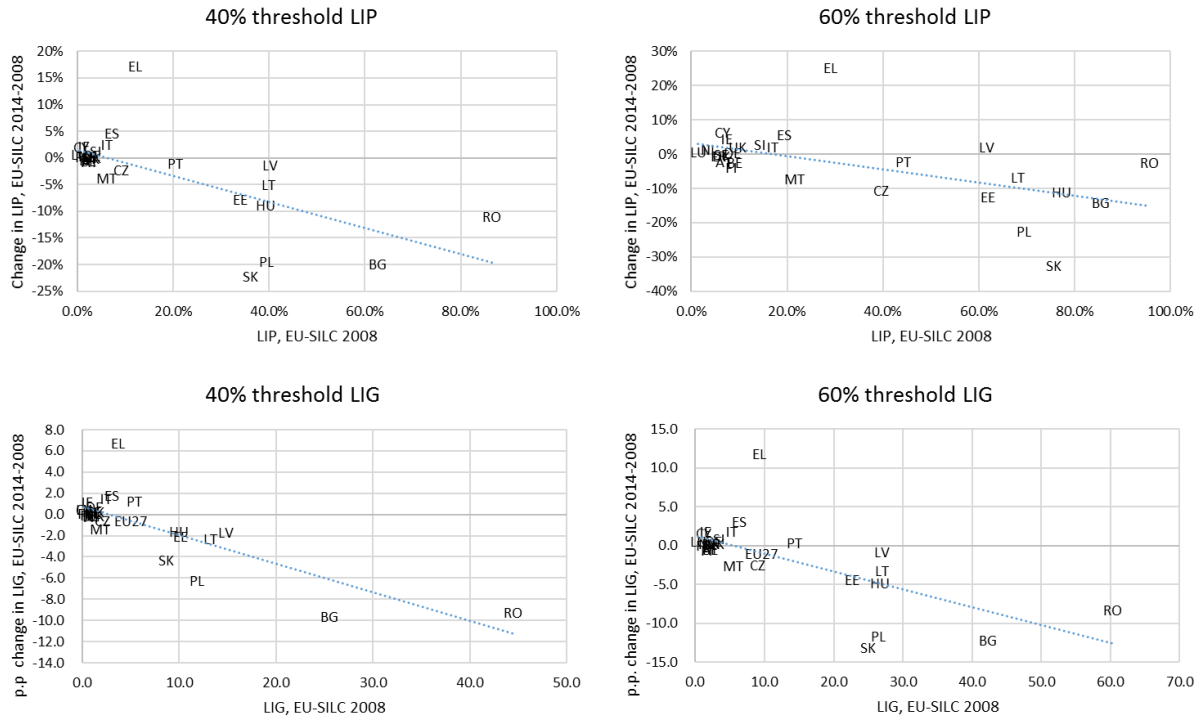
Notes: 95% confidence intervals. Countries ranked by EU-SILC 2014 values. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

Given the relatively strong decreases in most new EU Member States one may wonder whether stronger changes have taken place lower down the pan-European income distribution such that we can observe convergence in the level of LIP and LIG across countries over the period of observation. Figure 3 compares the level of the LIP and LIG in EU-SILC 2008 with the percentage point change between EU-SILC 2008 and 2014. From this graph we can observe some convergence in the LIP and LIG, at both the 40 per cent and the 60 per cent threshold[10], while convergence is stronger

[10] In line with Sala-i-Martin (1996), we linearly regress the annual growth rate of the LIP between 2008 and 2014 on the level of the LIP at the beginning of the period. The coefficient for absolute beta-convergence is estimated using an ordinary least square regression model across the EU27

the more we focus on the bottom of the distribution (i.e. by looking at the gap rather than the LIP or by taking a lower threshold).

Figure 3. Percentage point change in the EU-wide low income proportion and the EU-wide low income gap ratio



Notes: The dotted line is a linear regression line. Please note that the x and y-axis are not on a similar scale for each graph. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

The graph also highlights the diverging pattern of the Baltic countries, Hungary, Poland and Slovakia with regard to the LIP with a 40 per cent of median income threshold and the LIG with a 60 per cent of median income threshold. In EU-SILC 2008, all six countries had a LIP of about 40 per cent and a LIG of about 26 per cent (with somewhat lower figures for Estonia). Six years later, Slovakia and Poland had seen far stronger reductions in the LIP as compared to the other four countries. Finally, countries such as the Czech Republic, Estonia, Malta, Poland and Slovakia succeeded in reducing the number of people with an income between 40 and 60 per cent of the EU-wide median income, while at the same time

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countries. For the LIP, it ranges from -0.16, for a 40 per cent threshold, to -0.065, for a 60 per cent threshold. For LIG, it ranges from -0.27, for a 40 per cent threshold, to -0.23, for a 60 per cent threshold. Since the coefficients are negative, we can say that there is absolute convergence in the EU-wide LIP and LIG across countries.

lifting incomes above the 40 per cent threshold, whereas this was not the case for Romania and Bulgaria. In these countries, the number of households lifted above the 60 per cent threshold was far more limited than those lifted above the 40 per cent threshold.

4.2 The changing composition of the EU-wide low income population

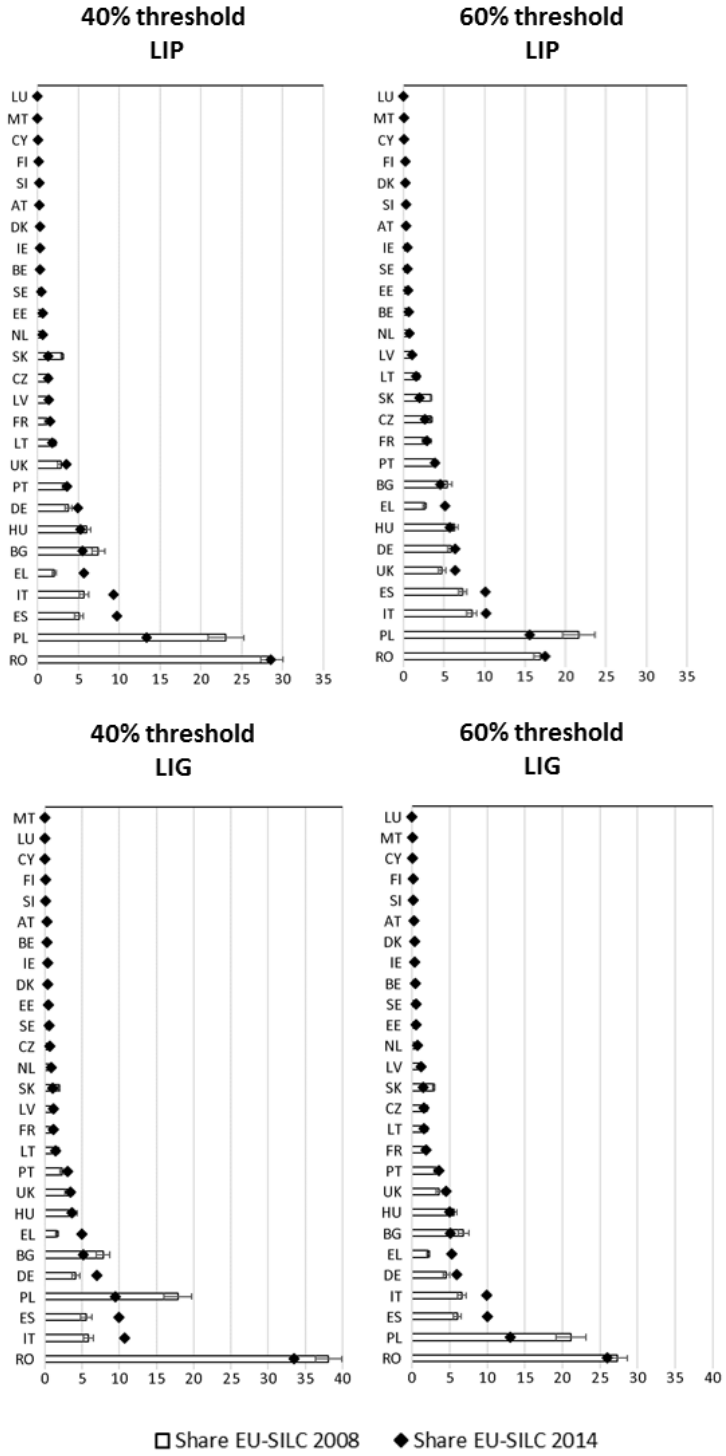
As was observed in the previous section, the EU-wide low income proportion has changed considerably in Eastern Europe and Greece. This suggests that the composition of the population with an income below the pan-European threshold has changed in important respects. Figure 4 captures the considerable changes in the composition of the pan-European low-income population between EU-SILC 2008 and 2014 in more detail. In EU-SILC 2008, the composition of those with an income below the low-income threshold and the composition of the LIG was heavily dominated by only two countries: Romania and Poland. Furthermore, the more we focus on the bottom of the distribution, the stronger this concentration was. With the threshold set at 60 per cent of the EU-wide median income, in EU-SILC 2008 nearly 40 per cent of those with an income below the threshold lived either in Romania or Poland. With the threshold set at 40 per cent of the EU-wide median income, the two countries accounted for about 56 per cent of the LIG[11]. In EU-SILC 2014, the composition of the LIP and the LIG has changed substantially, while also becoming less concentrated.

These changes have been strongest if we focus on the LIG with the threshold set at 40 per cent of the EU-wide income. Whereas Poland initially accounted for about 18 per cent of the total LIG, by EU-SILC 2014 its share was halved. In contrast, Italy, Spain, Greece and also Germany accounted for a substantially increased share of the LIG. As a result, the share of the EU15 in the LIG with the threshold set at 40 per cent of the EU-wide median income, had increased from 26 per cent in 2008 to 43 per cent in EU-SILC 2014. Still, one third of the LIG was on the account of Romania. In many countries, as a consequence of these changes, the country share in the LIG has tended to become somewhat closer in line with each country's population share. Nonetheless, strong deviations still exist: Romania, Bulgaria, Hungary, the Baltic countries and now also

[11] Please note that given price differences across countries, as well as differences in population composition, the numbers in Figure 4 do not exactly tell how financial resources in EUR should be distributed across Europe in order to reduce the LIG to zero. For a given LIG measured by equivalent income in purchasing power standards, *ceteris paribus* more resources in EUR are required if households are smaller, or if price levels are higher. In other words, the graphs underestimate the resources that would need to flow to the richer EU Member States in order to reduce the LIG to zero.

Greece are strongly overrepresented in the EU-wide low-income population and LIG.

Figure 4. The share of EU Member States in those with an income below the EU-wide low-income threshold and the low-income gap ratio, EU-SILC 2008-2014



Notes: 95% confidence intervals take account of the sample design (Goedemé, 2013), but assume an exogenous low-income threshold. Countries ranked by EU-SILC 2014 values. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

4.3 The contribution of individual countries to the overall trend

Even though the EU-wide LIP has changed most in countries such as Slovakia, Poland, Bulgaria and Greece, this does not necessarily imply that trends in these countries can explain overall trends in the total LIP, given – except for Poland – their relatively small populations. The composition of the pan-European low income population also shows that bigger countries such as Italy, Spain and Germany contribute substantially to the EU-wide low-income gap. It is possible to quantify with some more precision the contribution of each country to the overall change in the EU-wide LIP, at least in a mechanical way (that is, not in a causal framework). For doing so, we follow an accounting approach as spelled out by Corluy and Vandenbroucke (2012)[12,13].

Overall, between EU-SILC 2008 and 2014, the EU-wide LIP decreased from 24.6 to 22.9 per cent, with threshold set at 60 per cent of the EU-wide median income. In the same period, the LIG declined from 5.1 to 4.5 per cent, with the threshold set at 40 per cent of the EU-wide median income. As mentioned earlier, most of this decline was realised in the first years of observation. The subsequent stability was not so much the result of inertia in the relative income levels of individual countries, but rather the result of compensatory trends across EU Member States.

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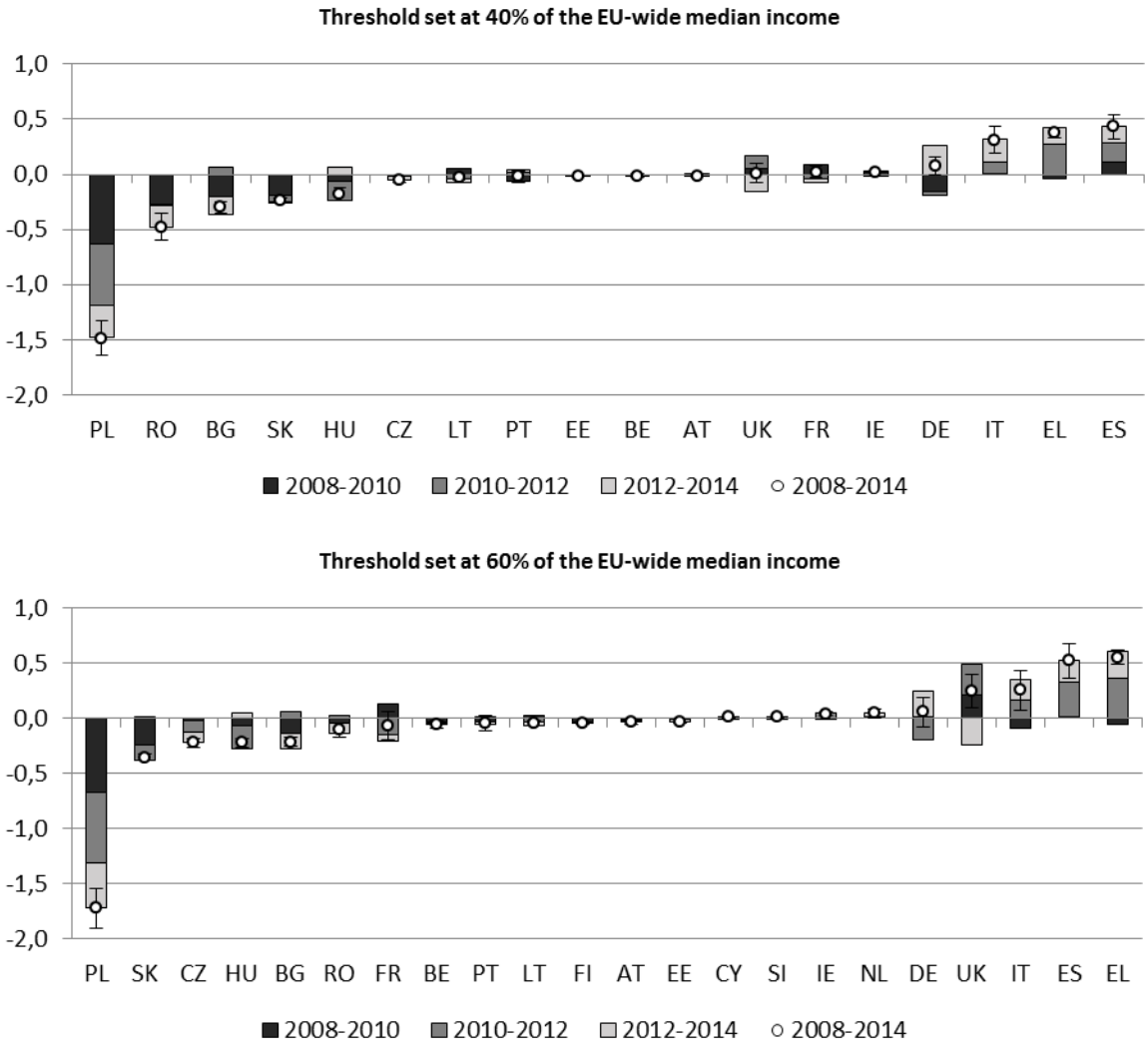
[12] The total change in the low income proportion (ΔLIP) as decomposed as follows:

$$\Delta LIP = \overline{Share_{country\ x}} * \Delta LIP_{country\ x} + \overline{Share_{EU27-country\ x}} * \Delta LIP_{EU27-country\ x} + \left(\overline{LIP_{EU27-country\ x}} - \overline{LIP_{country\ x}}\right) * \Delta Share_{country\ x}$$

The first component consists of the average share of the country under consideration in the total population, multiplied by the difference in the low income proportion in that country. The component reflects the direct effect of a change in the low income proportion in the country under consideration. The second component does exactly the same for the change in the low-income proportion in the remaining countries. Finally, the third factor estimates the impact of the change in the share of the country under consideration in the total population. Given that the effect of changes in population shares is rather small and mostly not statistically significant (at the 95 per cent confidence level), we only consider the effect of the change in the LIP / LIG in each individual Member State.

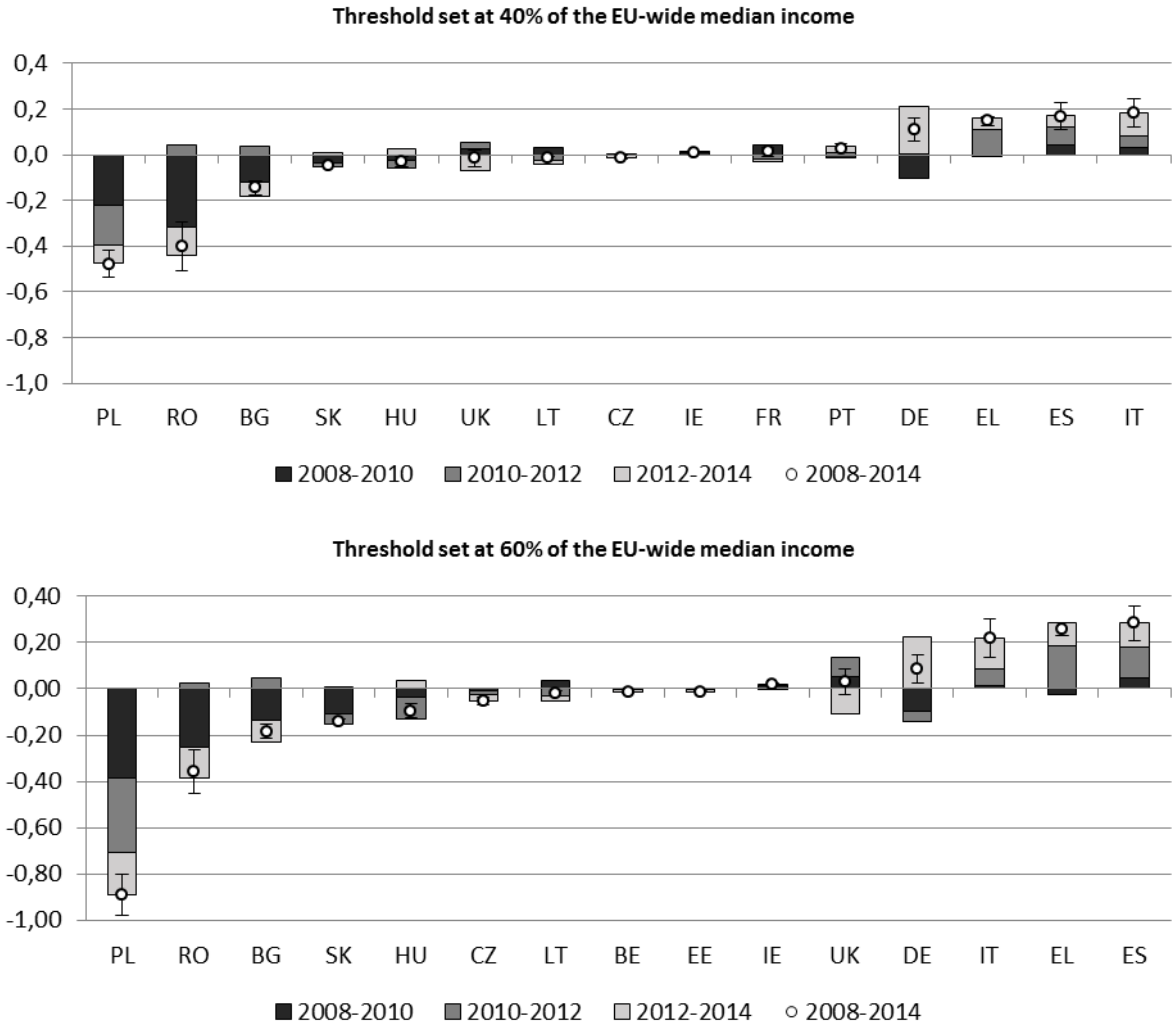
[13] Although the decomposition is useful for our purposes, at least two caveats should be borne in mind. First, the decomposition assumes that the income threshold is given and ignores the effect that each country may have on the total low-income proportion via its effect on the EU-wide median income, either by differential income growth, or by changing its share in the total population. Second, the decomposition is a mere accounting approach and is no attempt to construct a realistic counterfactual. A more detailed discussion of the limits of this decomposition can be found in Corluy and Vandenbroucke (2012).

Figure 5. The contribution of the change in the EU-wide low-income proportion in each Member State to the total change in the EU-wide low income proportion, (EU27), EU-SILC 2008-2014



Notes: Countries sorted by total contribution to the change in the LIP. Countries are included in the graphs only if they have a contribution rate of ≥0.01 for changes in the period 2008-2014. 95% confidence intervals take account of the sample design (Goedemé, 2013), but assume an exogenous low-income threshold. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

Figure 6. The contribution of the change in the EU-wide low-income gap ratio in each Member State to the total change in the EU-wide low-income gap ratio, (EU27), EU-SILC 2008-2014



Notes: Countries sorted by total contribution to the change in the LIG. Countries are included in the graphs only if they have a contribution rate of ≥0.01 for changes in the period 2008-2014. 95% confidence intervals take account of the sample design (Goedemé, 2013), but assume an exogenous low-income threshold. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

Figures 5 and 6 depict the contribution of each Member State to the overall trend in more detail, while neglecting the small contribution of the change in population shares. Remarkably, but not entirely unexpectedly, almost half of the Member States have had nearly no impact on the overall change (or lack thereof) in the total EU-wide LIP or LIG. Furthermore, changes in Poland have been of utmost importance as a factor for reducing the total EU-wide LIP and LIG. Nonetheless, also other Member States contributed a substantial share to keeping the LIP low, or reducing it, most notably Romania and Bulgaria (especially if one focuses on the LIG or a threshold at 40 per cent of the EU-wide median income).

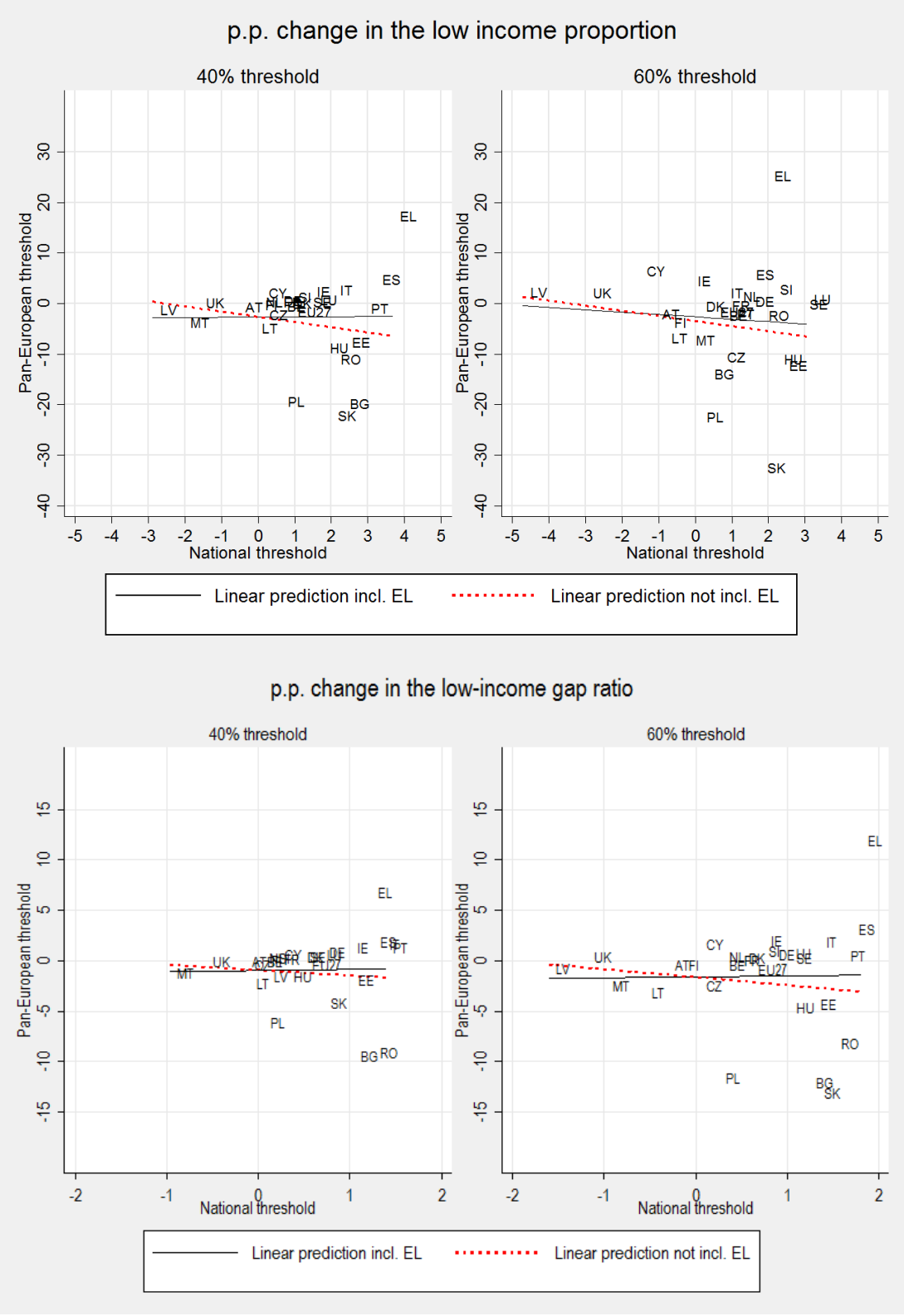
At the other side, upward pushes contributing to an increase in the LIP came primarily, and more evenly, from three crisis-hit countries: Spain, Greece and Italy. Remarkably, at times also Germany and the United Kingdom had an important impact on the total change, even though – especially in Germany – changes in the EU-wide LIP have been rather modest.

4.4 Contrasting a pan-European with a national perspective

In the introduction, we argued that for understanding poverty and inequality in the EU, both a national and a pan-European perspective are indispensable. In the specific context of EU enlargement, it is interesting to verify whether or not countries that see a growing proportion of their population obtaining incomes above 40 per cent or 60 per cent of the EU-wide median, are typically countries in which the at-risk-of-poverty indicator (which uses a national threshold) improves or not. In other words, the question is whether or not we see the simultaneous achievement of (a) catching-up processes in terms of economic prosperity for a middle-group of people, whose position shifts over the EU-wide 60 per cent threshold, and (b) improvements in the internal income distribution (from the perspective of the bottom end of the national distribution of incomes).

From Figure 7 it can be observed that there are hardly any countries that achieve such a combination. Latvia, Lithuania and Malta have combined a decrease in the LIP and LIG with a national and EU-wide threshold in some instances, but not at all levels of the low-income threshold, and with rather modest decreases in the EU-wide LIP. Notably, none of the new Member states that have witnessed the strongest decreases in the EU-wide LIP and LIG, have combined this with a substantial drop in the LIP and LIG with a national threshold. Potentially, this signals a kind of 'trade-off'. However, when looking at all EU Member States, we do not observe a strong negative correlation between trends in the LIP and LIG with a national threshold and the LIP and LIG with an EU-wide threshold. Presumably, the reason why there is no negative correlation over the whole set of countries (in this brief window of observation) is linked to the Eurozone crisis: this produced the simultaneous increase of the LIP from an EU perspective and more 'national poverty' in countries like Italy, Spain and Greece.

Figure 7. The change in the low-income proportion between EU-SILC 2008 and 2014. A comparison of the trend with a pan-European and a national threshold



Notes: Please note that the x and y-axis are not on a similar scale for each graph. Breaks in series in Denmark (2011), United Kingdom (2012) and Estonia (2014).
Source: EU-SILC UDB 2008-2014, own calculations (see methodological section for details).

5 Conclusion

In the past there have been calls for studying the pan-European distribution of incomes. With only a few exceptions, pan-European low-income dynamics have received relatively little attention. In this paper we explored pan-European low-income dynamics, complementing the picture depicted in other studies, which mainly draw on the (national) at-risk-of-poverty indicator. What emerges from trends observed between EU-SILC 2008 and 2014 is a highly dynamic picture. Even though the window of observation is short, important changes have taken place. Since EU-SILC 2010 these changes have been rather limited at the aggregate level, mainly because continuing changes in individual Member States tended to cancel each other out.

More in particular, a pan-European perspective underscores the relative improvements in living standards in the new EU Member States, most notably Poland, Slovakia, and Bulgaria, as well as the deterioration of living standards in Greece, and to a lesser extent Spain and Italy. Also, it shows that the non-negligible improvements in Romania are only visible if one focuses really on the very bottom of the pan-European distribution of incomes, given Romania's overall very low living standards. These trends mark an important change in the composition of the bottom of the pan-European income distribution, with an increasing weight of the 'old' EU Member States at the bottom end, most notably the crisis-hit Southern European countries. Worryingly, we also observed that no country succeeded in substantially reducing the EU-wide low-income proportion while also substantially reducing the at-risk-of-poverty rate. In other words, upward convergence stopped to be the general rule, and in the Eurozone there was a sharp divergence. Moreover, insofar as there was still convergence for a number of countries, it was often not combined with increased domestic social cohesion.

The story behind the data – the collapse of the traditional European 'convergence machine' – is a mixture of design failures in the architecture of the Eurozone, the impact of the increasing heterogeneity of the enlarged EU, and longer-term domestic trends that generate more poverty within a significant number of Member States, notably within the working age population. Whatever the solutions that are proposed to a variety of problems besetting the monetary union (e.g. a banking union; a fiscal capacity at the Eurozone level, possibly associated with a re-insurance of national unemployment insurance schemes or a genuine EU unemployment insurance scheme), these solutions always entail the *ex ante* organization of solidarity mechanisms. In short, a polity that initially emerged as an 'opportunity structure', motivated by the aspiration of growing cohesion, is in need of mutual insurance and true solidarity across borders. Simultaneously, supporting convergence across the enlarged EU presupposes a much more active social and 'human capital' dimension in

the EU's policies than the founding fathers deemed necessary (Vandenbroucke and Rinaldi, 2015).

Thus, a dual perspective on solidarity, national and pan-European, is the logical consequence of developments that started more than 60 years ago. In fact, one might consider such a dual perspective on solidarity to be the defining normative feature of 'the European Social Model': the European Social Model is not simply a summary description of a set of co-existing national social models; it also describes the way these national welfare states interact with each other – or are supposed to interact with each other – in Europe. Hence, we need a conceptual and empirical apparatus to describe the income dimension of this interaction in an integrated way; we believe that the methodology and data presented in this paper provide a promising perspective to that end.

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