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by Andrea Brandolini and Alfonso Rosolia

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THE DISTRIBUTION OF WELL-BEING AMONG EUROPEANS

by Andrea Brandolini* and Alfonso Rosolia*

Abstract

We analyse the evolution of EU citizens' living standards, considering the EU as a single country. Average living standards have improved considerably as the European integration process has unfolded. EU28 income inequality has steadily declined, mostly as a result of the macroeconomic convergence of new EU-accession countries. EU15 income inequality fell steadily until the mid-1980s, but picked up again during the economic turmoil following the Great Recession, largely reflecting the divergence between periphery and core countries in the euro area. Using a common EU standard reveals more progress in terms of poverty reduction. It also shows that the patterns of income convergence across member states differ across categories of residents, thus calling for a more careful consideration of the personal and national dimensions of EU policies.

Keywords: European Union, Euro Area, European integration, income inequality, welfare analysis. JEL Codes: D31, D63, E01, I32.

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1. Introduction [‡]

European countries are engaged in a process of economic and political integration which has no parallel at the global level. It has taken place by steps over the last sixty years, moving from the original six countries that signed the Treaty of Rome on 25 March 1957 and formed the European Economic Community in 1958 to the 28 countries comprising the European Union (EU) in 2018, before the withdrawal of the United Kingdom (UK). The common currency, the euro, was introduced in 1999 and is currently used by 19 countries. Integration has undeniably gone hand in hand with the continent's economic development, though establishing causal links is arduous. But how has the well-being of European citizens changed during such a long process?

In this paper we address this question by taking personal income as a proxy of well-being. Well-being is multifaceted and can be hardly reduced to income alone, but there is little doubt that it fundamentally depends on people's income – “a crucial means to a number of important ends” (Anand and Sen 2000: 100). Thus, investigating the evolution of the distribution of income among Europeans would go some way toward assessing the social progress of the EU. This approach is rarely taken, however. Aside from data limitations, one important reason lies in the design of the integration process.

Creating a fairer and inclusive society is the declared aim of integration, but the political priority at the European level has always been the establishment of a common market. This has constantly been seen as the primary route to enhance economic growth and hence people's well-being, while devolving the attainment of social objectives to

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redistributive policies and welfare measures decided at the national level, though subject to limitations due to EU membership. This approach has led to decouple the assessment of macroeconomic convergence and territorial cohesion, focusing on countries or regions, from the evaluation of social exclusion and inequality, concerned with people living in nations taken in isolation.

Accordingly, Eurostat calculates the EU-wide statistics for poverty and inequality as “the population-weighted arithmetic average of individual national figures” (Eurostat 2017). This practice amounts to overlook differences in income levels among countries, either in the setting of poverty thresholds or in the calculation of overall inequality. As Atkinson warned as early as 1989, whenever the at-risk-of-poverty threshold is set as a proportion of the national median, “the impact of growth on poverty in the Community [depends] solely on what happens within each country”, whereas it would be affected “by the relative growth rates of different member countries” (1995: 71) if the threshold was proportionate to the overall EU-wide median.¹ Likewise, taking an inequality index that is exactly decomposable by population subgroups, Eurostat practice simply means ignoring the between-country component of European inequality. This exact decomposition does not hold for the two inequality measures standardly released by Eurostat, the income quintile ratio and the Gini index,² but even with these indices the level of EU inequality measured as average of national levels clearly does not depend on how much, say, the average Dutch is richer than the average Slovakian: only within-country income gaps matter.

In this paper we adopt a different perspective: we study the distribution of living standards among European citizens by measuring income distribution in the EU as if it was a single country rather than taking it to be the average of national values. One straightforward implication is that measured inequality does not depend on where a person lives within the

¹ Differently from statistics based on household incomes, two European indicators use common standards across the EU: the *severe material deprivation* indicator counts persons who experience at least 4 out of 9 deprivation items due to lack of resources; the *low work intensity* indicator counts children and adults living in households where adults work a small proportion of their annual work potential. Together with the *at risk-of-poverty rate*, both indicators concur to define the headline indicator of the Europe 2020 strategy “People at risk of poverty or social exclusion”. The notion of material deprivation was introduced to mitigate the shortcomings from using purely national standards in poverty measurement (e.g. Guio 2005, Goedemé and Rottiers 2011).

² The income quintile ratio is the ratio of total income received by the richest 20 per cent to that received by the poorest 20 per cent of a country’s population; the Gini index is the mean absolute difference of all pairs of incomes divided by the overall mean and varies, for non-negative values, between 0 (perfect equality) and 1 (maximum inequality). Two common additively decomposable inequality measures are the mean logarithmic deviation and the Theil index; both belong to the broader class of the generalised entropy indices.

EU, whereas it does by using an average of individual national figures (Brandolini and Carta 2016). At a more conceptual level, it means that the well-being of European citizens is assessed by reference to the whole of European citizens rather than to the people living in their same country, consistently with the fact that they share a single market and can move freely within the EU.³ This different approach to inequality measurement may appear purely technical but it has, in fact, a deep political meaning which is discussed in the conclusions.

The remaining of the paper is organised as follows. We start Section 2 by summarising the main dates of European integration. So far we have loosely used the term EU, but in the empirical analysis we need to be precise about the supranational aggregate to which we refer to. Throughout, we indicate by EU the European Union (Community before 1993) in general, according to its varying historical composition, by EU15 the group of 15 countries that formed the EU in 1995-2003, and by EU28 the group of 28 countries that form the EU since July 2013 (but before the withdrawal of the UK). Similarly, EA stands for the Euro Area in its historical composition, EA12 for the group of 12 member states participating in the monetary union in the early 2000s, and EA19 for the group of 19 countries which currently share the common currency. We then use national accounts to describe the European economic development since the Second World War, taking the United States (US) as a reference. These data show the considerable improvement of the average living standards in the EU, both in terms of goods and services produced and in lower time spent at work. On average, differences among people living in different countries also diminished. This long-run process slowed down with the sovereign debt crisis and the associated divergence between the “core” and the “periphery” of the EA.

While national accounts provide valuable evidence on the evolution of average living standards as the integration process has deepened, they are silent on how unequal the distribution of living standards has been among Europeans. We move to this question in Section 3. We first compare the distributions of real incomes in EU countries (except Croatia) in 2005 and 2015, using microdata from the EU Statistics on Income and Living Conditions

³ This is an explicitly normative choice which does not require that Europeans actually take the whole EU as a reference to assess their living standards. Some authors have seen the “Europeanisation of reference groups” as a justification for adopting the EU-wide approach to the measurement of poverty and inequality, based on the finding that in the upper middle classes of new accession countries people were and felt poorer than those belonging to the lower middle classes in most advanced European countries (Fahey, Whelan and Maître 2005, Delhey and Kohler 2006, Fahey 2007). As Fahey (2007: 45) writes, “in the EU as a whole those who *are* disadvantaged on uniform EU-wide measures also tend to *feel* disadvantaged in proportion”. The issue is controversial (Heidenreich and Wunder 2008, Whelan and Maître 2009a,b, Nolan and Whelan 2011). Following a distinction suggested by Goedemé and Rottiers (2011), our choice is closer to the notion of “publicly oriented” reference groups than to the concept of “privately oriented” reference groups which is used in the psychological literature on the assessment of personal outcomes.

(EU-SILC), and show that income disparities are considerable. We then turn to long-run changes and find evidence of some U-shaped pattern in most of the 12 countries considered, though the shape of the U greatly varies. Our brief review of the literature suggests that the reversal of the post-war downward trends has been driven by a combination of general economic forces, such as globalisation and technical change, and national policy choices. Despite their national specificities, these choices shared common objectives, such as making labour markets more flexible and reducing the redistributive role of government. Irrespective of the drivers, the substantial dispersion of personal incomes and its changes over time must be taken into account in investigating the well-being of Europeans.

We examine the EU-wide income distribution and its evolution in Section 4. The evidence for old decades is fragile but it seems to confirm some narrowing of income distribution until the mid-1980s, consistently with the macroeconomic evidence and with national patterns. With the more reliable data available for recent years, between 2005 and 2015 inequality shows a descending trend in the EU28 but a rising one in the EU15 and the EA. Expressing incomes at nominal market exchange rates raises estimates of inequality relative to adjusting incomes for international differences in price levels, but has little effects on trends. Around 2015 incomes appear to be more unevenly distributed in the US than in the EU, and especially so in the EA. This outcome stems from the greater income redistribution achieved by European welfare states. We delve into inequality developments in the EU during the last decade in Section 5, where we analyse the consequences of the Great Recession in 2008-09 and the sovereign debt crisis in 2011-12 for the geographic clustering of income inequality in the EU and for specific socio-demographic categories.

In Section 6 we draw the main analytical conclusions and place our EU-wide analysis of inequality into the broader context of the social dimension of European integration. We discuss technical measurement aspects in Appendix 1 and review estimates of the EU-wide distribution in Appendix 2.

2. An aggregate view of post-war developments

The process of European integration started in 1957 when Belgium, France, Italy, Luxembourg, the Netherlands and West Germany signed the Treaty of Rome. The Treaty created the European Economic Community that came into force on 1st January 1958. Denmark, Ireland, and the UK joined in 1973, Greece followed in 1981, and Portugal and Spain in 1986. The Eastern German Länder became part of the European Community as a

consequence of the country's reunification in October 1990.⁴ In 1993 the Maastricht Treaty established the European Union, which was joined by Austria, Finland, and Sweden in 1995. The enlargement in 2004 brought ten new member states in the Union: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. Bulgaria and Romania joined in 2007, and Croatia in 2013. On 1st January 1999 eleven countries irrevocably fixed the exchange rates of their currencies and adopted the euro: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Eight countries joined in the following years: Greece (2001), Slovenia (2007), Cyprus (2008), Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014) and Lithuania (2015).

The different stages of the integration process are evident in the stepwise increase in the EU population and employment (Figure 1; the vertical lines indicate the changes in EU membership). By virtue of this gradual accession of new countries, between 1958 and 2015 the population sharing the EU membership tripled from 170 to 514 million persons, although the population living in the whole of the 28 countries currently comprising the EU (EU28) only rose by around 30 per cent. The number of people in employment follows broadly similar long-run tendencies. The impact of the Great Recession is evident in the sharp drop in employment in 2009, followed by return to pre-crisis levels only in 2013 in the US and two years later in Europe. European employment fell considerably also during the early 1990s, a period characterised by extensive restructuring in transition economies, by the German reunification, and by the currency crisis that forced Italy and the UK to leave the European Exchange Rate Mechanism in September 1992. The employment-to-population ratios show wide fluctuations, though not as large as in the US. In Europe, the trend was downward until the mid-1980s. The higher ratios characterising planned economies decreased during the transition to a market economy, and aligned with those observed in the EU15 by mid-1990s. In subsequent years employment ratios went up till the Great Recession. In 2015, 45 per cent of all persons were employed in the EU vis-à-vis 47 per cent in the US. Note that these ratios refer to the whole population rather than the working-age persons: hence, they reflect also changes in the demographic structure (e.g. ageing). While employment ratios are not too different from their values in the 1950s, despite wide fluctuations, the average annual hours of

⁴ In the remaining, West Germany and East Germany refer to the Federal Republic of Germany and the Democratic Republic of Germany before reunification, and the Western and Eastern Länder afterwards.

work per employed steadily fell. Since the 1950s they have declined by over a fourth in the EU15, against around a tenth in the US, as a result of both a shortening of working times and a spreading of part time occupations. The considerable fall in the proportion of lifetime spent at work since the Second World War indicates a rise in leisure time and an improvement in the well-being of a typical European.

Mean gross domestic product (GDP) per capita grew until the Great Recession and then flattened out, both in the EU15 and the EU28 (Figure 2, top panels). (Throughout, all statistics from national accounts are population-weighted values.) From 1958 to 2008, it increased 3.5 times in the EU15 against 3 times in the US. However, the European convergence stopped in the early 1980s: the gap vis-à-vis the US widened from 17 per cent in 1982 to 27 in 2015. For the EU28, GDP per capita in 2015 fell short of the US level by 33 per cent. These statistics also provide us with a first rough indication of the dispersion of economic well-being among Europeans. This is obtained by looking at cross-country convergence, as measured by the Gini index of real GDP per capita (Figure 2, bottom panel; results would not change by considering the coefficient of variation). From 1958 income disparities fell considerably within the EU15, but in the second half of 2000s returned to widen. In the EU28, cross-national income gaps sharply rose around the collapse of communist regimes but then significantly narrowed, thanks largely to the catching-up of Eastern European economies. The lessening of disparities since the early 1990s for the EU28 appears to match by intensity that for the EU15 in the two decades following the Second World War.⁵ As summarised in the European Commission's *Employment and Social Development in Europe 2016*, "all in all, while the gradual catching-up process appeared consistent with previous decades for the Member States that joined the EU since 2004, since the mid-2000s and the crisis in 2008-09, convergence patterns in the Euro area have come to a halt. The divergence largely reflected the adverse impact of the crisis on Southern and Eastern EA Member States" (Bontout et al. 2016: 74).

⁵ These national accounts data are estimated by The Conference Board, which regularly updates calculations originally made by Maddison (2001). While there is virtually no difference for the US, the story partly changes for the EU according to the Penn World Table (Figure A1 in Appendix 1). The EU15 mean GDP per capita grew much more substantially, by 4.5 times between 1958 and 2008; there is no income stagnation in the aftermath of the Great Recession. The gap relative to the US was initially much larger, almost 60 per cent in the early 1950s, but has kept narrowing, down to 23 per cent in 2014; the corresponding value for the EU28 is 29 per cent. As to income disparities, their decline in the EU15 during the 1950s and 1960s is more pronounced, while the rise after mid-2000s is slightly less intense. The different methodology used to adjust for variations in price levels, across countries and over time, is an important factor behind discrepancies between the two sources.

The long-run improvement in average living standards as approximated by aggregate output per capita is substantial, as is the reduction in their dispersion across the EU. Though population-weighted, cross-national differences in real GDP per capita are however a very rough measure of inequality in Europe: first, they are based on GDP rather than households' incomes and, second, they ignore within-country inequality. We start with the former and examine the latter in the next section.

GDP measures the size of the economy in terms of the value of goods and services internally produced, and is only an imperfect proxy of the revenues available to (resident) households to sustain their living standards. It does not account for the net flow of incomes earned and paid abroad and it includes the resources used by governments to supply in-kind services and collective goods as well as the profits (gross of capital depreciation) retained by businesses to sustain their investment plans. Resident households as a whole dispose of a spendable income which is on average less than two thirds of GDP in the EU (including small sole proprietorship enterprises and non-profit institutions serving households, NPISH); in small open economies such as Luxembourg and Ireland this proportion falls well below 40 per cent. The difference is not only in levels but also in dynamics, as shown for instance by the more limited fall of household gross disposable income (HGDI) during the Great Recession, due to the effects of automatic stabilisers and stimulus packages (Jenkins et al. 2013, Atkinson 2013). In national accounts, HGDI offers a better indicator of living standards than GDP.⁶

Comparable time series for HGDI are released by Eurostat for all EU countries from 1995 onwards, with few exceptions. Real HGDI per capita, which is adjusted for cost-of-living differences both across countries and over time as described in Appendix 1, is higher in the EU15 than the EU28, but the gap has been narrowing as a consequence of the faster growth of Eastern European economies (Figure 3). After a decade of relatively steady growth, the Great Recession hit severely the EU15, with real HGDI per capita falling by almost 5 per cent between 2008 and 2013. In the remaining EU countries as a whole, income slowed down

⁶ By including the value of social transfers in kind, "adjusted" HGDI would be an even better indicator of living standards. As these transfers are generally not covered in household surveys, we focus here on HGDI to maintain consistency with the subsequent distributive analysis. An extensive literature shows that extending the income concept to include transfers in kind for education, health care and housing (valued at market prices or actual cost) narrows the measured income distribution. For instance, Aaberge, Langørgen and Lindgren estimate that in European countries "inclusion of non-cash income reduces inequality by 15-25 per cent" and "poverty rates ... by 30-50 per cent" (2010: 339).

but kept rising. This was not sufficient to maintain the Gini index for the EU28 on a steady descending trend because cross-national household income disparities within the EU15 abruptly increased during the sovereign debt crisis of 2012-13. Figure 3 also reports data for the EA and the EA19 since the introduction of the euro in 1999. The time patterns for the EA19 resemble those for the EU15, but exhibit a larger fall in mean income and a steeper rise in the Gini index from 2007 to 2013.

The overall income growth since 1995 is lower for real HGDI per capita than for real GDP per capita both in the EU15 and the EU28. The narrowing of the distribution prior to the Great Recession appears more pronounced for HGDI than GDP, while the intensity of the subsequent rise looks about the same. In 2015 income dispersion in the EU15 is a fifth higher than in 1995 based on real GDP per capita, but a fifth lower if measured with real HGDI per capita; income convergence within the EU28 is sizeable for both measures but greater for HGDI than GDP. Thus, the fall in inequality across EU nations during the last two decades is stronger for household incomes than domestic output.

To sum up, average GDP per capita in the EU15 almost quadrupled from the beginning of the integration process, closing some of the gap vis-à-vis the US (though it still exceeded a quarter in the EU15 and was a third in the EU28 in 2015). Coupled with the large decline in time spent at work these figures suggest a sizeable improvement in the well-being of the average European. Until the Great Recession, these income gains were larger in relatively poorer countries of the EU15 and the EA19, considerably reducing cross-country inequality. Significantly, this long-term process reversed during the sovereign debt crisis, following the divergent performances of the “core” and the “periphery” of the EA. As a consequence, convergence within the EU28 temporarily stopped, before resuming driven by the catching-up of new accession countries.

3. Inequality in national income distributions

National accounts provide crucial insights on the long-run evolution of Europeans' incomes, hence indirectly of their well-being. This is especially the case if aggregate values refer to the part of national disposable income received by households, HGDI. The cross-national variation of HGDI per capita is a first proxy of European income inequality, but a very imperfect one. It measures average income gaps *between countries*, but it ignores how unequally incomes are distributed among a country's inhabitants. Accounting for income

distributions *within countries* is essential to estimate the EU-wide distribution at a point in time and to ascertain its temporal pattern.

Figure 4 offers a snapshot of the national income distributions in all EU countries excluding Croatia in 2005 and 2015. To ensure the comparability of living standards, household incomes are adjusted for differences in household composition, by means of a standard equivalence scale, and for differences in cost of living across countries, by using proper price indices, as explained in Appendix 1. The box plots in Figure 4 show, for each country, the median value (the horizontal mark), the distance between the 25th and the 75th percentiles (the thick vertical bar) and the 5th and 95th percentiles (the two extremes of the thin vertical bar) of the distribution of real equivalised incomes among persons. Countries are arranged in ascending order of median real equivalised income. This ranking follows a known pattern, with Eastern European countries preceding Southern European countries, and then the remaining EU countries rather close to each other except for Luxembourg which is clearly leading. This pattern is broadly similar in 2005 and 2015, but there are some notable changes, which are the legacy of the Great Recession and the following sovereign debt crisis: Greece moves down several positions, just above Romania, Bulgaria and Hungary, whereas Germany goes up towards the top.

Income differences are sizeable not only between countries, as we know from national accounts data, but also within countries. In 2015 the Romanian median is only 17 per cent of the Luxembourger median, and this figure falls to 9 per cent if the comparison is made at the 5th percentile. For three quarters of Eastern Europeans household incomes are below or at most comparable to the incomes of the poorest quarter of those living in Central and Nordic countries. As this exercise assesses living standards within the EU as a whole, the comparison in Figure 4 necessarily refers to absolute differences. In international comparisons of inequality, the real income gaps among countries are typically removed by expressing income levels as percentages of national medians. In such a case, income differences within Eastern European countries would not look so small compared to those within the other EU countries. In 2015 the 5th percentiles in Bulgaria and Romania are 21-22 per cent of the national medians and just 8-9 per cent of the 95th percentiles. These two countries exhibit the largest values of relative inequality, ahead of Southern and Baltic States, taking the ratio between the 95th and the 5th percentiles, but a similar ranking would emerge looking at the Gini index.

The EU-wide measures of inequality that we discuss in the following sections account for disparities both within and between countries. How much of the overall inequality is explained by each component? Using exactly decomposable indices, they can be neatly set

apart as they add up to the total. The within-country component is the weighted sum of the inequalities within each country, while the between-country component is the inequality that would result if each person had an income equal to his or her country's mean income, with weights depending on the index. Estimates based on two of such decomposable indices, the mean logarithmic deviation and the Theil index, show that the within-country inequalities accounts for a proportion of total inequality which is around 90 per cent in the EA and the EU15, and around 75 per cent in the more heterogeneous EU after eastern enlargements (Beblo and Knaus 2001; Brandolini 2008; Hoffmeister 2009; Bönke and Schröder 2014; Papatheodorou and Pavlopoulos 2014; Filauro 2018; Filauro and Parolin 2018).

Clearly, the assessment of the evolution of well-being among Europeans cannot ignore how national income distributions have varied over time. In Figure 5 we illustrate the long-run inequality patterns in 12 EU countries as measured by the Gini index for disposable income and the share in taxable income of the top 1 per cent of adult individuals.⁷ The patterns tracked by the two types of series are far from being perfectly coincident, which is not surprising given that they measure inequality differently and refer to dissimilar income concept. Overall, however, the evidence gathered in Figure 5 consistently suggests that income distribution narrowed until around the 1980s. This is the case for all EU15 countries shown in Figure 5. Several factors contributed to reduce income inequality during the post-war Golden Age: on the one hand, strong and prolonged economic growth was accompanied by high levels of employment, rapidly rising wages and decreasing earnings dispersion, and in general a shift from capital to labour; on the other hand, expanding welfare states and progressive taxation boosted the redistributive role of governments. The increase in government transfers, in particular the development of old-age pension systems, was effective in narrowing the distribution of disposable income (e.g. Gustafsson and Palmer 1997, Muffels and Nelissen 1997, Uusitalo 1989, for Sweden, the Netherlands and Finland, respectively). While all eight EU15 countries share these developments to some extent, the relative importance of each factor differs across countries and sub-periods. As regards the earnings

⁷ In Figure 5, the Gini indices from national studies are generally not comparable across countries but are internally consistent, except for few statistical breaks (either ignored or adjusted for the absolute difference between old and new series in overlapping years). These figures are shown alongside the Gini indices from the Income Distribution Database (IDD) of the Organisation for Economic Co-operation and Development (OECD), which are in principle cross-nationally comparable. The data for the top 1 per cent income share are drawn from the World Inequality Database (WID). They are not comparable across countries, e.g. due to different definitions of taxable income and tax unit, and suffer from discontinuities (not shown), e.g. due to changes in national tax laws. See notes to Figure 5 for details on sources and data characteristics.

distribution, for instance, Atkinson (2008: 51) remarks that “the late 1960s and 1970s were a period of earnings compression in a number of countries (Finland, France, Italy, Sweden, and the United Kingdom)”, but then observes that the top decile had been rising from 1950 to the mid-1960s in France and the UK, although not in West Germany. According to Piketty (2003: 1016), in France “wage dispersion significantly widened between 1950 and 1967-68, and the sharp increases in the minimum wage implemented in the summer of 1968 and during the 1970s led to a significant decline in wage inequality until 1982-83, when the newly elected socialist government decided to freeze the minimum wage (wage dispersion has increased somewhat since then)”.

The downward movement of income inequality after the Second World War came to a halt during the 1980s. The turning point showed up first in the UK roughly at the same time as in the US, in coincidence with the electoral victories of Margaret Thatcher and Ronald Reagan. Earning disparities widened considerably and went along with a shift away from employment towards both unemployment and self-employment (Jenkins 1995, 1996); the impact on the distribution of household disposable incomes was amplified by government policies aimed at reducing social spending and taxes on top incomes (Johnson and Webb 1993; Atkinson 2003). Inequality rose sharply in the UK until the 1990s and then flattened out; the reforms of income support and tax credits implemented by the Labour government played an important role in offsetting an otherwise ascending trend between the late 1990s and the mid-2000s (Bargain 2012, Belfield et al. 2017).

In West Germany, disposable income inequality during the 1980s and 1990s either rose moderately, or remained substantially stable, depending on the source of data; government redistribution played an important role in mitigating market income inequality (Biewen 2000, Bach, Corneo and Steiner 2009, Fuchs-Schündeln, Krueger and Sommer 2010, Corneo, Zmerli and Pollak 2014). Income distribution widened considerably during the first half of the 2000s, driven by developments in the labour market and changes in the tax system (Biewen and Juhasz 2012, Bach, Corneo and Steiner 2013). Since 2005 inequality has remained stable, even during the Great Recession, largely as a result of the expansion of employment opportunities (Grabka, Goebel and Schupp 2012, Biewen, Ungerer and Löffler 2017). In France, income inequality begun to rise at the end of the 1990s: Frémeaux and Piketty (2014) suggest that it was partly due to the lack of progressivity of the overall tax system, a feature that was reinforced during the 2000s. In the Netherlands, the Gini index recorded a leap in the late 1980s but otherwise did not show any persistent upward tendency. The evidence from the top income series does not modify this conclusion, once we take into

account that the upsurge in 2001 reflects a break in the series and the blip in 2007 is due to a temporary tax relief on dividends (Salverda 2017). Salverda et al. (2014) notices that tax-and-benefit reforms aimed at activating citizens to work (by restricting eligibility and shortening duration of benefits, lowering top tax rates, and introducing working tax credits) reduced the redistributive effects of social policy, but might have sustained work participation and hence labour incomes.

In Italy, income inequality, as measured by the Gini index, rose sharply during the currency crisis of the early 1990s but much less during the double-dip recession from 2008 to 2013, despite a similar growth in (absolute) poverty ratios (Brandolini, Gambacorta and Rosolia 2018). The widening of income distribution in the latter crisis offset the narrowing in the previous decade, and was fairly contained in the face of the severity of the recession. The figures for the top income share also indicate a rise of inequality since the mid-1980s, but there are perceptible differences from the series for the Gini index in some sub-periods (e.g. second half of the 1980s). In Spain, the Gini index decreased after the return to democracy and then hardly changed during the long economic expansion prior to the Great Recession, save for temporary rises in economic downturns. This Spanish diversity, relative to the patterns observed in other advanced countries, disappeared with the Great Recession and the sovereign debt crisis, when the Gini index sharply increased (Pijoan-Mas and Sánchez-Marcos 2010, Ada Ferrer-i-Carbonell, Ramos and Oviedo 2014, Ayala Cañon 2016). The top 1 per cent income share has moved differently from the Gini index, largely because of the inclusion of capital gains that primarily account both for its dynamics and the 1987, 2000 and 2005 spikes (Alvaredo and Saez 2009).

After the UK, Finland and Sweden are the two EU15 countries in Figure 5 that exhibit the steeper increases in inequality since the 1980s, although starting from very low levels. In both countries important drivers of inequality were the introduction of a dual income tax system in the early 1990s, which created strong incentives to shift earnings towards capital income and contributed to the rise of the top income shares, and the downsizing of social protection, which hit especially people at the bottom of the distribution (Blomgren et al. 2014, Jäntti et al. 2010, for Finland; Eriksson and Pettersson 2000, Roine and Waldenström 2008, Fritzell et al. 2014, for Sweden). In some years tax reforms also pushed investors to realise capital gains on equities, causing the spikes shown in the series.

As to Eastern Europe, a narrowing of income distribution in the 1960s and 1970s characterises Czechoslovakia and Hungary (Atkinson and Micklewright 1992),⁸ while a sharp rise of inequality following the end of communist regimes is clearly visible in both countries and Poland. The available data show a flat trend during the 2000s in the Czech Republic and Slovakia, where taxation and transfers significantly mitigated market income inequalities (Kahanec et al. 2014), a stability followed by a fall after 2004 in Hungary (Fábián et al. 2014), and a modest growth in Poland since early 1990s (Letki, Brzeziński and Jancewicz 2014). In East Germany, the Gini index also increased after the reunification (Biewen 2000), but by less than in the other three Eastern European countries; its movements match fairly close those in West Germany.

We draw three conclusions from this overview of national trends in a selected group of EU countries. First, some U-shaped pattern is perceptible in virtually all countries, but timing, magnitude and persistence of inequality movements differ. As Atkinson observed, “... it is misleading to talk of ‘trends’ when describing the postwar evolution of the income distribution. ... It may be better for a number of countries to think in terms of ‘episodes’ when inequality fell or increased” (1997: 303). While common forces may have affected all European economies, countries’ circumstances and policy choices led to distinct national patterns. Second, the causes of the reversal of post-war inequality downward trends seem to lie in labour markets becoming more “flexible”, in taxation reforms favouring high taxpayers, in the rolling back of welfare states. These tendencies are typically seen as the inescapable response to exogenous forces such as globalisation and technological progress, but they also reflect radical changes in economic theory, policy-making and social norms, which pre-date the establishment of the EU in 1993 and the adoption of a common currency in 1999. The findings of Beckfield (2006, 2009) and Bertola (2010) that the deepening of European integration has been associated with a rise of within-country income inequality must be seen against this background. European integration may have facilitated the adoption of increasingly homogeneous policies, but it is reasonable to expect that countries would have gone roughly in the same directions irrespective of integration. The similarity between the patterns observed in Figure 5 for Sweden and Finland, two Nordic countries that differ for

⁸ As regards data availability and quality during the communist regime, Atkinson and Micklewright (1992: 74) note that “in the case of the earnings distribution, not only is information available for Czechoslovakia, Hungary and Poland, but the similarities in the sources we use with the corresponding survey in Britain ... are more striking than differences”. More generally, they observe that income data in these three countries have significant deficiencies, but all in all do not compare too unfavourably with corresponding British data.

their participation in the monetary union, seems to back up this conjecture. Third, independently from the explanation of national experiences, Figure 5 confirms that income inequality has changed considerably within countries during the last half a century. This needs to be taken into account in the estimation of the EU-wide distribution over time.

4. Estimates of the EU-wide income distribution

Estimating the EU-wide distribution is a demanding exercise. Apart from important methodological choices (e.g. the adjustment for differences in cost of living across countries, the alignment of survey data to national accounts), it crucially depends on the availability of information on national income distributions. Ideally, one needs a database with cross-nationally comparable person- or household-level income data for all EU countries, such as EU-SILC in recent years. This permits applying consistently the same measurement assumptions to all income observations. Lacking microdata, the main alternative is to use summary statistics on national distributions. Borrowing approaches typically employed to estimate global inequality, a “synthetic” EU-wide income distribution can be constructed by stacking the income means of all population quantile groups, ranked by income, comprising each national distribution, or by estimating national parametric distributions from available summary statistics. The gains from going back in time using existing tabulated data are counterbalanced by the impossibility of amending inconsistencies in underlying national distributions (e.g. due to differences in equivalence scales) and the understatement of measured inequality if income differences within quantile groups are ignored.⁹ Due to data availability, direct estimates based on comparable microdata can only cover a relatively recent period, since the 1990s for the EU15 and the next decade for the EU28; synthetic estimates may extend over a longer period, but are less accurate. In Figure 6, we report a selection of estimates of the Gini index for the EU15 (top panel) and the EU28 (bottom panel) as a whole, and for the US as reference. In Appendix 2 we survey available estimates, their sources and the underlying methodological assumptions.

⁹ On methodological problems arising in studies of income distribution in supranational entities, see Brandolini (2007) for the EU and Milanovic (2005), Anand and Segal (2008, 2015) and Atkinson (2017) for the world.

For the EU15, the synthetic estimates by Morrisson and Murtin (2004), Darvas (2016) and Vercelli (2018) align distributive information to national accounts but differ in method and source of real GDP series; those by Bonesmo Fredriksen (2012) do not make any adjustment to national accounts and cover only 10 countries. The calculations by Vercelli suggest a steady decline of the Gini index between the late 1950s and the 1980s; the series shows ups and downs thereafter, but in 2014 it is back to the values of the mid-1980s. Vercelli (2018: 7) observes that “there is statistical evidence of structural break ... in 1984” and concludes that the reduction in the Gini index occurred “almost entirely” between 1958 and 1984. Also Morrisson and Murtin estimate a fall between 1970 and 1980, though on much lower levels. For the period 1980-1995 they observe a stasis rather than Vercelli’s small decline. Also Darvas calculates a substantial stability from 1988 to the mid-2000s, followed by an increase till 2015. For a subgroup of ten EU15 countries, Bonesmo Fredriksen finds a rise of the Gini index between 1985 and 1995, and a further increase afterwards. Moving to direct estimates on microdata, Beckfield (2009) calculates a fall between 1980 and 2000 (gathering national data from different years around these two indicated years) and Troitiño Cobas (2007) finds a steady decline during the 1990s (considering only 11 countries for 1993-96), similarly to Vercelli. For the second half of the 1990s, however, Benczúr, Cseres-Gergely and Harasztosi (2017) observe little change, despite using the same microdata as Troitiño Cobas. From 2005 onwards the estimates by Benczúr, Cseres-Gergely and Harasztosi (2017) and our own indicate a coherent pattern, leaving aside marginal differences in levels: inequality unequivocally increases.

Figures for the EU28 as a whole are available only for the most recent period. The synthetic estimates by Darvas (2016) suggest a sharp rise from 1988 to the early 1990s, a steady decline until the Great Recession, and little change thereafter. Our own estimates on the EU-SILC microdata and those by Bönke and Schröder (2014), not shown, Benczúr, Cseres-Gergely and Harasztosi (2017), Filauro (2018) and Filauro and Parolin (2018) consistently point to a reduction of inequality from 2005 to 2009 followed by stability until 2015, contrary to what has been observed for the EU15. These findings square with the aggregate evidence discussed earlier, hinting at the importance of macroeconomic developments in driving inequality changes.

The estimates discussed so far are based on incomes expressed at Purchasing Power Parities (PPPs). PPPs provide the relative values, in national currencies, of a fixed bundle of goods and services, and allow us to account for the fact that price structures differ across countries. This is not the case if we instead convert incomes to a common unit of account (e.g.

the euro) by using fixed-euro parities for the EA countries and market exchange rates for non-EA countries. This latter choice tends to understate real incomes in relatively poorer European states, since for instance labour-intensive non-tradable services are typically cheaper than in richer countries. On the other hand, it corresponds to the standard way of measuring inequality within a country, which usually ignores internal differences in the cost of living. See Appendix 1 for technical details.

The choice of the conversion rate matters. Brandolini (2007) and Bonesmo and Fredriksen (2012) calculate that the estimated Gini index is higher when incomes are expressed in euro than in PPS by 3 to 5 percentage points in the EU28 but less than 2 in EU15, where cross-national differences in price levels are more contained. The importance of these methodological differences is further illustrated in Figure 7 for the EU15 and the EU28 (top panels) and the EA12 and the EA19 (bottom panels). In each panel, the series labelled PPS refers to incomes adjusted for differences in price levels across countries using the PPP indices for Household Final Consumption Expenditure (HFCE), while the series labelled Euro refers to incomes in euro converted by using the fixed-euro parities for EA countries and the average annual market exchange rates for non-EA countries. The series labelled PWM is the population-weighted mean of national values, which corresponds to the EU/EA figures regularly released by Eurostat. The last series is the Gini index in the US, as estimated by Andrews, Palesch and Thomas (2015) replicating as closely as possible Eurostat methodology on data from the Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC) of the US Census Bureau. This series refers to incomes unadjusted for price level differences across the US states.

There is little change in inequality between 2005 and 2015 according to population-weighted averages, but this result is biased by the neglect of between-country inequality. Once the latter is considered, inequality is increasing in the EA19, as well as in the EA12 and the EU15, and decreasing in the EU28. The more pronounced widening of the income distribution is measured for the EA12, where the Gini index rose by about 2.5 percentage points between 2005 and 2015. As found in earlier studies, the Gini index is higher when incomes are converted to euro at nominal exchange rates, by more than 1 percentage point in the EA19 and about 4 points in the EU28. The trend looks the same for the EA19 but is somewhat different for the EU28, with inequality for incomes in euro going up, rather than down, after 2009. Focusing on the PPS series, in 2015 the Gini index was equal to 34.9 per cent in the EU28 and 32.5 per cent in the EA19, which are values located in the upper part of the range of national values estimated across all EU countries (from 24 to 38 per cent).

As shown in Figures 6 and 7, inequality is consistently higher in the US than in the EU28 when using PPP indices. As incomes are not adjusted for differences in price levels across the US states, one might also consider the Euro series rather than the PPS series: this comparison is apparently more coherent, but ignores that territorial price variation is much larger in the EU than the US. In this case, the US and the EU28 would show similar levels of income inequality in 2015, about 39 per cent. Regardless of the measure, income distribution in the EA19 (as well as EA12 and EU15) is considerably less unequal than in the US; abstracting from year-to-year fluctuations, its widening since 2005 parallels that observed in the US. The lower level in the inequality of disposable incomes is achieved in the EU also thanks to far more redistributive tax-and-benefit systems in EU member states than in the US (e.g. Brandolini and Smeeding 2009). Filauro and Parolin (2018) estimate that inequality in the EU28 is slightly higher than in the US for market incomes (i.e. before taxes and transfers), while it is lower for disposable incomes (in both cases, incomes are adjusted for internal price differences). They remark that this reflects “the relative strength of European welfare states: in 2014, European tax and transfer systems reduced the level of income inequality by 36 percent (from 0.54 to 0.35), while the post-fisc inequality fell relative to pre-fisc inequality by 29 percent (from 0.53 to 0.38) in the US” (Filauro and Parolin 2018: 8). While European welfare states tend to be more redistributive than the US one, they are however different from each other, inducing Caselli et al. (2016: 187) to observe that: “Country-level redistribution means that the geographic clustering of disposable incomes is even greater than the geographic clustering of market incomes. In other words, country-level redistributive policies reduce inequality, but give rise to a more heterogeneous Union”.

To sum up, the evidence for old decades is fragile but it seems to confirm some narrowing of the EU15 income distribution until the mid-1980s. This is coherent with the downward trends observed for both between-country inequality (convergence in real GDP per capita) and within-country inequality (descending national patterns), although such a neat decomposition is not appropriate for the Gini index. With the more reliable data available for recent years, between 2005 and 2015 inequality exhibits an overall descending trend in the EU28 but a rising one in the EU15 and the EA. These recent tendencies are little affected by expressing incomes at nominal market rates rather than at purchasing power parities. The inequality of disposable incomes in the EU and, especially, the EA falls below the levels observed in the US, thanks to the operation of the European tax-and-benefit systems.

5. A look inside EU inequality developments in the last decade

As seen, between 2005 and 2015 the distribution of equivalised incomes became less unequal in the EU28 but more unequal in the EU15. By considering changes in the bottom and top deciles, Benczúr, Cseres-Gergely and Harasztosi (2017: 5-6) observe that this EU15 development “... comes from the lower and only to little or no extent from the upper part of the distribution. Again, this process was driven mostly by changes for the Mediterranean, so powerful that it could induce a decrease and subsequently an increase in the overall EU15 inequality, despite the relatively small share of this country group”. This confirms the importance of what Caselli et al. (2016: 172) call “geographic clustering” of income levels, or “the fact that the relatively rich households and the relatively poor ones are geographically segregated”. Accordingly, we investigate the dynamics of income distribution in the EU by taking a rather accepted, if arbitrary, clustering of countries: we split the 12 oldest EA members into CORE (Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands) and PERIphery (Greece, Ireland, Italy, Portugal, Spain); we include in EUNEA the three EU15 non-EA countries (Denmark, Sweden, the UK) and in NEU15 the remaining 12 new accession countries (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia), which comprise seven EA members and five non-EA countries (Croatia is not included).

Figure 8 displays the Growth Incidence Curves (GICs) for each country cluster. The GICs show the percentage cumulated growth rates between 2005 and 2015 for every percentile of the distribution of real equivalised disposable household incomes. Note that incomes are “real” in a double sense: they have the same purchasing power in all EU countries, as they are converted by means of PPP indices, and in both years, as they are adjusted for the average inflation in the EU28 (see Appendix 1 for details). The observed reduction in the EU28 inequality reflected the much stronger growth of the bottom fourth of the distribution with respect to the other three fourths. In turn, this stemmed mostly from the major improvements recorded in new accession countries (NEU15), where income growth was much stronger than in other EU countries along the whole distribution. In the other groups, developments in equivalised disposable incomes were more contained and homogeneous along the distribution, though qualitatively different: in the PERI countries, income fell throughout the distribution, but very strongly at the bottom; income also declined

in the EUNEA countries, except for some rise at the bottom;¹⁰ on the contrary, in the CORE countries growth was positive at all income levels and increasing by moving toward the top. Figure 8 provides a clear representation of how the recent divergence between core and periphery EU15 economies affected their income distributions: the income gap enlarged particularly at the bottom of the respective distributions, but widened also at the top. The resulting changes in the overall EU distribution are shown in Figure 9, where we exploit the fact that the EU-wide density of equivalised income can be expressed as the weighted sum of country-group specific densities, with weights equal to population shares. The massive shift of the NEU15 population towards the middle of the EU-wide distribution and the raising share of the PERI population in its lower tail are evident by comparing 2005 and 2015.

To examine these changes in greater detail, we adopt an income-based definition of social class and divide the EU population into a low income class (individuals with equivalised disposable income below 60 per cent of the EU median value), a lower middle class (60 to 120 per cent), an upper middle class (120 to 300 per cent), and a high income class (above 3 times the EU median value). In line with our EU-wide perspective, we implement this classification using for all countries the same income thresholds, as calculated on the EU28 distribution of equivalised disposable income (Table 1, panel A). In 2005, 122 million persons, or 25 per cent of EU population, were at risk of poverty, that is had an equivalised disposable income below 60 per cent of the EU-wide median value. About 63 per cent of them were from new accession countries, where they accounted for three quarters of that country-group population; another 20 per cent was from periphery countries, and only 10 per cent from core countries. In 2015, the number of persons at risk of poverty fell to 112 million individuals, or 23 per cent of the EU population: only 48 per cent was from new accession countries, while 31 per cent was from periphery countries. Over the period, the incidence of low income in NEU15 countries fell from 75 to 54 per cent, while that in periphery countries increased from 19 to 26 per cent. At the upper end of the income ladder, the high income class accounts for less than 3 per cent of the EU population. The share in this class of people residents in core countries went up from 41 to 62 per cent, whereas that of persons living in periphery countries decreased from 29 to 21 per cent. Finally, the different

¹⁰ This negative pattern is dominated by results for the UK, whereas the profiles for Denmark and Sweden are very positive. See Figure A2 in Appendix 1. This evidence for the UK may be affected by a statistical break in the EU-SILC series; other sources, such as national accounts and the estimates by the Institute for Fiscal Studies used in Figure 5, do not indicate any decrease in British household incomes.

income dynamics between new accession countries and periphery countries emerges in the composition of the (lower and upper) middle classes: while the share in these classes of NEU15 residents increased from 14 to 24 per cent, that of PERI residents decreased from 57 to 51 per cent.

The picture would be dramatically different by using national thresholds, thus neglecting mean income differences between countries (Table 1, panel B). The at-risk-of-poverty rate would be significantly lower, around 17 per cent of the EU population in either year. In 2005 core and periphery countries would account for 29 and 31 per cent of the EU low income individuals, respectively, against 24 per cent for new accession countries. In 2015 the corresponding shares would fall to 21 per cent for new accession countries but it would raise to 32 per cent for both core and periphery countries. This is a neat example of Atkinson’s observation cited in the introduction: using the EU-wide threshold, the at-risk-of-poverty rate clearly improves as a consequence of taking into account “the relative growth rates of different member countries”.

The EU-wide perspective has implications not only for the “size” of income-defined social classes and for their developments over time, but also, and perhaps more importantly, for the identities of poor and rich people beyond their residence country. For example, with EU-wide threshold, in 2005 above 27 per cent of European children (aged 0-17 years) lived in low income households against 24 per cent based on national income thresholds. By 2015 progress in the reduction of child poverty turns out to be stronger on the basis of the EU-wide threshold (down to 25 per cent) than on the basis of national thresholds (stable at 24 per cent).

Focusing on the EU as a whole helps underscoring important fault-lines. While similar population categories achieve comparable levels of well-being across countries, others fare very differently. This can be seen by comparing the relative equivalised income positions of selected socio-demographic categories and their changes relative to the overall EU between 2005 and 2015. Socio-demographic categories are identified from educational achievement, age, employment status, and country-group of residence, where all characteristics refer to the household’s head. Figure 10 plots the changes in the ratios of the group-specific-deciles to the overall median against their initial values in 2005, for each group (i.e. a socio-demographic category in a country group).¹¹ Points in the north-east quadrant indicate that the group-

¹¹ Let m_t be the overall median real equivalised income at time t , and q_t^{dc} the d -th decile of the distribution of real equivalised income *within* socio-demographic group c at time t . The ratios $p_t^{dc} = (q_t^{dc}/m_t)$ indicate the position of group c ’s distribution relative to the overall distribution, as summarised by its median value, and $\Delta^{dc} = (p_t^{dc} - p_s^{dc})$

specific deciles were above the overall median to start with and, over the period, moved farther away from the overall median. On the contrary, points in the south-west quadrant indicate that the group-deciles were below the overall median at the beginning of the period and fell further below it over time; points in the two other quadrants indicate a convergence towards the median during the period. Visually, an upward (downward) sloping curve means that the group-specific distribution became more (less) unequal over time, whereas a flat one suggests that the relative positions did not change; the position of the curve in the space informs instead on the position of the group relative to the overall median. For each group-specific curve, the marker in Figure 10 singles out the 2005 group-specific median.

With the exceptions of the low educated and the retired, the broad patterns are rather similar across groups. In periphery and in non-EA EU15 countries the position of these groups relative to the overall EU distribution has worsened, more so for higher initial income levels; in core and new accession countries, instead, they have generally climbed the distribution while, at the same time, recording an increase in within-group inequality. Only among the low educated, residents in core countries have just maintained their relative positions. These patterns are broadly absent in the group of retirees' households, whose incomes are plausibly more insulated from cyclical macroeconomic developments. While in PERI and EUNEA countries retirees' households have virtually kept their positions, in NEU15 countries they have significantly improved their relative conditions, as other groups; a significant upgrade has been also achieved by rich retirees' households in CORE countries. This evidence confirms the divergent patterns within the EA, with income gaps among specific groups, which in some cases were already sizeable in 2005, becoming more marked during the following decade.

To sum up, the evidence in this section shows that casting national income distributions into a wider EU perspective leads to different assessments of the current situation and of the progress made with respect to social targets such as the at-risk-of-poverty rate. It also highlights how the patterns of income convergence across member states are not

says by how much this *relative* position changed between time s and t . For example, consider people living in households whose head has high education (i.e. at least a high school degree, *HS*). In 2005, the overall EU median real equivalised income was 13,548 euros; the 5th decile of the income distribution for these educated heads in CORE countries was about 17,240 euros, 27.2 per cent higher than the overall median, hence $p_{2005}^{5,HS,CORE}=(17,240/13,548)=1.272$. In 2015 the overall median rose to 14,681 euros, and the 5th decile of high educated heads in CORE countries rose to 20,127 euros, yielding $p_{2015}^{5,HS,CORE}=(20,127/14,681)=1.371$. As a result, $\Delta^{5,HS,CORE}=1.371-1.272=0.099$, which indicates a rise of 10 percentage points in the ratio $p_t^{5,HS,CORE}$.

the same for all categories of residents; incomes of some population groups, typically young and active persons in the labour market, have fared much more differently both within and across countries than those of other groups (elderly and retired). It therefore suggests that there is room for a better integration of regional and social policies that takes jointly into account the personal and the national dimension.

6. Conclusions

Sixty-two years have passed since the European project started with the signature of the Treaty of Rome. Twenty-six years since the establishment of the EU sanctioned the free movement of goods, services, people and money among all member countries. Twenty years since the euro became the common currency. Yet, the European project is facing hard times. The divergent economic performance of Northern and Southern economies following the sovereign debt crisis of 2011, the strengthening of populist and anti-European parties, the political disagreement on how to cope with the refugee crisis, the British withdrawal from the Union after the referendum held in 2016 are unambiguous symptoms of the increasing difficulty to push forward integration.

These difficulties should be put into a broader historical context. In this paper we have adopted an explicit European perspective to assess how the distribution of well-being has evolved among Europeans since the start of the integration process. We have measured income distribution in the EU as if it was a single country rather than taking it to be the average of national values.

Our analysis has ascertained few facts.

- Average living standards have improved considerably, in terms of both much higher income levels and lower time spent at work; while no causal link can be easily established, economic progress went along with European integration.
- Average differences among people living in different countries narrowed, at least until the mid-2000s (macroeconomic convergence).
- Within most countries, income inequality declined up to the mid-1980s, then started to increase, though timing, size and persistence of this rising tendency vary across countries.
- As a result of the macroeconomic convergence and the prevailing U-shaped profiles of national inequality, the EU15-wide income distribution narrowed until the mid-1980s; the

subsequent pattern is less clear, but the economic turmoil around 2010 pushed inequality up, mainly because of the divergence between the core and the periphery of the EA. The EU28-wide inequality has instead remained on a descending trend, driven by macroeconomic convergence of new accession countries.

- Thanks to the more redistributive European tax-and-benefit systems, around 2015 incomes are distributed far more unevenly in the US than in the EA, and also in the EU once cross-national differences in the cost of living are taken into account; aside from annual fluctuations, the increase in EU15-wide inequality in the last decade parallels that observed in the US.

In brief, the EA income inequality has tended to grow as integration has deepened and in particular since the adoption of the common currency. However, the parallel trend of inequality in the US and the similar patterns in Sweden and Finland, two countries which differ in terms of participation in the monetary union, hint that the story may be more complicated. Our brief review of the inequality literature underlines the importance of national policy choices, such as those aimed at stimulating economic growth and keeping public finances under control through, for example, more flexible labour markets and more limited government redistribution. These policies started to be implemented before the deepening of the integration process, and also in countries not necessarily involved in it, although sharing the common EU policy framework might have sustained the process.

The European perspective provides further insights. For example, based on the standard practice of setting national poverty thresholds, the number of low income Europeans is estimated to have increased from 80 to 86 million between 2005 and 2015. With a common EU-wide threshold, the measured number of low income people would turn out to be substantially higher, but would have also shown a fall from 122 to 112 million during the same period. Thus, using a common European benchmark would signal some progress in reducing the at-risk-of-poverty rate rather than the deterioration shown by standard measures. The change in perspective naturally leads to a reassessment of who belongs to certain segments of the income distribution and, in turn, to a reconsideration of the association between individual characteristics and socio-economic status such as, for example, being at risk of poverty.

All this has to do with the *analytical* insights that can be derived from adopting the European perspective. Our main contention is that the reason for taking this perspective is *foundational*, as it follows naturally from the rationale of European integration.

Deep political motivations are traditionally seen as lying at the roots of the project of European integration initiated in the aftermath of the Second World War – “the response to the trauma and demons of the two halves of the twentieth century” (Fabbrini 2015: 3). As recently stated, “A complete EMU is not an end in itself. It is a means to create a better and fairer life for all citizens, to prepare the Union for future global challenges and to enable each of its members to prosper” (Juncker 2015: 2). However, superior motivations aside, the core of the project has constantly been the much more mundane formation of a common market. Even recently, the Four Presidents’ Report (Van Rompuy 2012) and the Five Presidents’ Report (Juncker 2015) attempted to revive the integration project by outlining interventions almost exclusively in the economic sphere. Once more the economic objectives appear to prevail on the social dimension. As Sen noted more long ago, it is surprising how these instrumental objectives overshadow the underlying “... bigger objectives that involve social commitment to the well-being and basic freedoms of the involved population” (1996: 33).

In fact, the social dimension has not been missing from the European policy discourse. An EU social policy has existed for decades. It has taken diverse forms: an extensive and long-standing activity of regulation in various fields (labour law, working condition, safety at the workplace, gender equality, etc.), a limited redistribution through various community programmes (e.g. the European Social Fund, the European Globalisation Adjustment Fund), and a mutual evaluation of national policies through the open method of coordination (Daly 2006; Falkner 2010). The Lisbon European Council of 2000 declared the strategic goal of “greater social cohesion” and the commitment to taking steps “to make a decisive impact on the eradication of poverty” (Council of the European Union 2000). Ten years later, the Europe 2020 strategy has gone even further by making poverty reduction a priority, with a well-defined quantitative target to be achieved by 2020 (European Commission 2010). The income quintile ratio is among the overarching indicators used to monitor social progress. In November 2017, the EU leaders gathered at the Social Summit for fair jobs and growth in Gothenburg proclaimed the European Pillar of Social Rights expressing “principles and rights essential for fair and well-functioning labour markets and welfare systems in 21st century Europe” (European Parliament, Council of the European Union and European Commission 2017: 8).

Nevertheless, the improvement of the well-being of European citizens is seen as flowing naturally from achieving the economic targets of the single market. This view not only underlies documents such as the Five Presidents’ Report, but also informs the whole policy discourse, a good example being the primacy attributed to raising employment among

the policies to combat poverty, despite the little association observed between household jobless rates and relative income poverty ratios.¹² Once the conditions for a properly functioning single European market are laid down, the attainment of social objectives is entirely left to national policies, subject to limitations due to EU membership. Even the mutual surveillance mechanism is much softer than the one envisaged for macroeconomic imbalances. As explained by the European Commission, the Macroeconomic Imbalance Procedure “endeavours to both avoid the accumulation of unsustainable trends or vulnerabilities and ensure a proper adjustment of existing imbalances” in order to preserve *macroeconomic stability*: “The main rationale for a supra-national surveillance mandate builds on the fact that macroeconomic imbalances and economic policies in one country have relevance also for other Member States” (2016: 7-8). There is no corresponding supra-national attempt to preserve *macrosocial stability*.

It could be argued that the separation between the supra-national economic dimension and the national social dimension was the only practicable way of pushing forward European integration, given the diversity of EU Member States’ societies and institutions. On the other hand, this approach is bound to reinforce an intrinsic tension between economic integration and nation-based welfare states. As observed by Ferrera, “based as it is on the logic of economic opening, European integration is programmatically geared towards the expansion of individual option and choices, often challenging those closure conditions that sustain social solidarity [i.e. a clearly demarcated and cohesive community]. Therefore, it is no surprise that ordinary citizens remain ‘nationalist’ when asked about the latter and express a preference for keeping the EU away from this sphere” (2005: 2). Moreover, this separation is likely to indirectly back up views that the EU integration process is to be blamed for growing economic insecurity and inequalities, for instance because of the limits imposed to national governments in carrying out independent fiscal policies. These are commonly held views in the political conjuncture of the late 2010s, but they contributed to slow down the approval of the European constitution already in the early 2000s. As presciently noted by Bertola, the risk is that “economic integration may be politically unsustainable if it results in less generous inequality-preventing independent social policies but does not foster the higher productivity which deregulation promises when markets work well” (2010: 362).

¹² See de Beer (2007), Cantillon (2011), de Graaf-Zijl and Nolan (2011), Vandenbroucke and Vleminckx (2011) and Marx, Vandenbroucke and Verbist (2012).

Forgoing the hierarchical separation between economic and social dimensions and taking a supra-national view of the EU social condition could ease these tensions. This approach would better capture not only the narrative of European integration but also the spirit of Article 2 of the Treaty of Lisbon, the constitutional basis of the EU, according to which the Union “shall promote economic, social and territorial cohesion, and solidarity among Member States”. Consistently with this view, in this paper we have adopted the EU-wide approach to the measurement of inequality and poverty. It is a way to deal with the decoupling between macroeconomic convergence and inequality.¹³ It is admittedly a short step, but it signals a radical change in perspective to evaluate progress toward greater social cohesion.

¹³ In his agenda for a reformed European cohesion policy, prepared for the Commissioner for Regional Policy, Barca suggested to partially overcome this decoupling by bringing together social and territorial objectives into a “territorialised social agenda”, which is “... focused on individuals but aware that their well-being and the effectiveness of any intervention depend on the place where they live” (2009: XIII).

Appendix 1: Data sources and measurement definitions

We draw national accounts data from three sources: The Conference Board Total Economy Database™ (version November 2018), the Penn World Table (version 9.0) and the Eurostat website (Tables nama_10_gdp, nama_10_pe, nasa_10_nf_tr; January 2019). The first two sources contain GDP estimates expressed in international dollars whose real value is comparable across times and countries thanks to the use of Purchasing Power Parities (PPPs). PPPs account for differences in price structures across countries, and generally raise measured living standards in poorer countries, where labour-intensive non-tradable services are typically cheaper than in rich countries. PPP indices differ for the underlying methodology, which in turn reflects alternative ways of summarising the bilateral price comparisons between all pairs of countries. Maddison (2001) and The Conference Board apply the “EKS method” named after Eltetö, Köves and Szulc (de Vries and Erumban 2017), whereas the Penn World Table favours the “GK method” named after Geary and Khamis (Feenstra, Inklaar and Timmer 2015). These methodological differences can account for the diverse aggregate patterns revealed by the two sources (compare Figure 2 with Figure A1 in this Appendix).

The EKS method is also applied by Eurostat (2012) to provide the conversion rates from national currencies to an artificial common currency labelled Purchasing Power Standard (PPS). Incomes in PPS are normalised in such a way to have a purchasing power of 1 euro in the average of the EU (or some specific EU subgroup). Eurostat releases PPP indices for various national accounts aggregates, including GDP and Household Final Consumption Expenditure (HFCE). The PPP index for HFCE might be preferable for real incomes comparisons across persons because it measures purchasing power in terms of consumption goods and services, while GDP covers items, such as in-kind transfers for education and health care, which are generally not included in the household disposable income as measured in surveys (Smeeding and Rainwater 2004). PPP indices adjust for cross-country differences in price levels but not for their changes over time. Hence, we convert nominal household incomes to real values in two steps. First, we adjust for cross-country price level differences by dividing all nominal values in national currency by the annual PPP for HFCE for the EU28. Second, we deflate these adjusted nominal values by the annual HFCE implicit deflator (covering also NPISH) for the EU28 to express all values at the 2010 prices for the whole EU28 (as in Brandolini and Rosolia 2016). PPPs are drawn from Table prc_ppp_ind in the Eurostat website.

The distributions of real incomes in the EU countries are calculated on data from the EU-SILC public use file CROSS UDB 2005-2017, version of October 2017. This release covers all 28 member states. However, to maximise time coverage, we exclude Croatia, which joined the project only in 2010, and approximate the missing data for Bulgaria, Malta and Romania in 2005 by duplicating the wave for 2006 (after deflating all income values by the change between 2005 and 2006 in the national nominal household disposable income per capita). Hence, our EU28 aggregate actually refers to 27 countries. The income reference period is the whole calendar year preceding the interview in all countries except Ireland, where it is the 12 months immediately prior to the interview, and the UK, where it is the calendar year of the interview. While for Irish data there is no straightforward solution, for British data we depart from the Eurostat practice of reporting information from the same wave and we take the previous wave (as also Filauro 2018 and Filauro and Parolin 2018).

We focus exclusively on equivalised total disposable income (variable HX090), which accounts for age-related changes in needs and economies of scale in consumption by applying the modified OECD scale recommended by Eurostat. This scale assigns value 1 to the first adult, 0.5 to any other person aged 14 or older, and 0.3 to each child younger than 14. We attribute the equivalised household income to all persons living in the household. Household income is the sum of the incomes received by all household members less tax on income and social insurance contributions, regular taxes on wealth, and regular inter-household cash transfer paid. In detail, income includes: gross cash, near-cash and non-cash employee income; gross cash profits or losses from self-employment (including royalties); interests, dividends, profit from capital investments in unincorporated business; pension from individual private plans; social benefits (unemployment benefits, old-age benefits, survivors' benefits, sickness benefits, disability benefits, education-related allowances, family- and children-related allowances, housing allowances, and social exclusion not elsewhere classified); income from rental of a property or land (excluding imputed rents on owner-occupied dwellings); regular inter-household cash transfers received.

To convert nominal incomes to real values, we apply the same two-step procedure described above for aggregate data. First, taking into account that the variable HX090 in the EU-SILC user database is expressed in euro, we divide it by the annual Price Level Index (PLI) for HFCE instead of the PPP index. The PLIs are calculated by dividing the PPPs by the current nominal exchange rates and express the price level of each country relative to the EU28. As the PPPs, the PLIs are drawn from Table `prc_ppp`. Second, we deflate these

adjusted nominal values by the annual HFCE implicit deflator (covering also NPISH) for the EU28 to express all values at the 2010 prices for the whole EU28.

The impact of these adjustments on income levels and their changes is shown in Figure A2. Each panel reports the Growth Incidence Curves for different price adjustments for each country or group of countries. We report the cumulated growth rates of equivalised incomes between 2005 and 2015 in nominal terms (unadjusted), adjusted for the national HFCE implicit deflator (covering also NPISH), adjusted for the EU28 HFCE implicit deflator (covering also NPISH), and adjusted for both the EU28 HFCE implicit deflator (covering also NPISH) and the PLIs for HFCE for the EU28. The figures show that these alternative choices about deflators and the adjustment for differences in price levels are not innocuous, but in most instances do not substantially alter the qualitative profiles of income growth along the income distribution.

Appendix 2: Estimates of the EU-wide distribution

Atkinson (1996) was the first to estimate income inequality for the EU as a whole around 1985. He derived a synthetic EU-wide distribution by stacking the mean incomes of 40 groups (20 in some countries) of equal size from populations ranked according to equivalent disposable income, for 12 EU15 countries. He used tabulations calculated on comparable microdata from the Luxembourg Income Study (LIS) and converted incomes to the same unit of account by using the PPP index for National Disposable Income (NDI). Boix (2004) applied the same method to tabulations assembled at the World Bank to derive estimates of the Gini index around 1993 and show how subsequent steps in the EU enlargement are associated with an increase in inequality. Morrisson and Murtin (2004), Vercelli (2018) and Bonesmo Fredriksen (2012) used variants of this method to derive long time series. Morrisson and Murtin (2004) considered the nine bottom decile groups and the two top vingtile groups; they calculated figures for few selected years by drawing real GDP series from Maddison (2001) and distributive shares from a database assembled at the OECD. Vercelli (2018) focused on decile group shares and filled for missing values by interpolating fractional polynomials of third degree, obtaining an annual time series for every country; he drew real GDP from the Penn World Table and income shares from the World Income Inequality Database compiled at the United Nations University-World Institute for Development Economics Research (UNU-WIDER). Both papers accounted for within-group differences by approximating the overall income distribution with a Gaussian kernel density function for each country and year. Bonesmo Fredriksen (2012) did not impose any adjustment to national accounts, nor used kernel estimation, drawing national distributions by decile groups from the OECD IDD. Dauderstädt and Keltek (2011) extrapolated synthetic estimates of the income quintile ratio for the period 2005-08 from the mean incomes of each country's quintile groups, in turn calculated from deciles drawn from EU-SILC. Darvas (2016) applied a parametric version of the synthetic approach. He estimated national income distributions by calibrating two-parameter distributions with the observed values of the mean and Gini index. He considered both deterministic and stochastic estimates of lognormal, Pareto and Weibull distributions, for a total of nine sets of estimates which turned out to be very similar each other. He drew the Gini index from the Standardised World Income Inequality Database (SWIID) of Solt (2016) and adjusted mean values to real GDP per capita series from the World Economic Outlook database of the International Monetary Fund (IMF)

WEO). Table A1 reports the available synthetic estimates and summarises their main characteristics (only a selection of Vercelli's annual figures is included).

The alternative approach of estimating the EU-wide income distribution directly from microdata is more recent because it requires the availability of a suitable database. The collection of cross-nationally comparable microeconomic information for all EU countries started with the European Community Household Panel (ECHP), an input-harmonised annual longitudinal survey conducted by national statistical agencies from 1994 to 2001 under Eurostat co-ordination. In the early 2000s, the ECHP was replaced by the EU Statistics on Income and Living Conditions (EU-SILC), which has since collected income microdata using a decentralised output-harmonised approach. EU-SILC provides the EU reference source for comparative statistics on income distribution and social exclusion at the European level, particularly in the context of the EU monitoring of the progress towards greater social cohesion. Comparable information obtained by ex-post standardisation of existing national surveys is also contained in the long-established LIS database used by Atkinson (1996), but its coverage by country/year is too sparse for a comprehensive estimation of EU-wide statistics. Lastly, since around 2013 the Eurosystem's Household Finance and Consumption Survey (HFCS) collects output-harmonised microdata on households' assets and liabilities as well as gross incomes in EA countries.

The first estimates of the EU/EA distribution based on microdata relied on the ECHP data possibly integrated with the LIS data (Beblo and Knaus 2001; Brandolini 2007, 2008; Troitiño Cobas 2007; Rodríguez-Pose and Tselios 2009) or on the LIS data alone (Beckfield 2009; Hoffmeister 2009). The EU-SILC data are the basis for all recent studies (Heidenreich and Härpfer 2011; Bönke and Schröder 2014; Papatheodorou and Pavlopoulos 2014; Maquet 2015; Caselli et al. 2016; Benczúr, Cseres-Gergely and Harasztosi 2017; Filauro 2018; Filauro and Parolin 2018; Anderson et al. 2018; Wang et al. 2018), including our own estimates in this paper. Table A2 reports available estimates and summarises their main characteristics.

In addition to these studies, the literature has also focused on poverty (Atkinson 1995, 1998; de Vos and Zaidi 1999; Förster 2005; Fahey, Whelan, and Maître 2005; Fahey 2007; Kangas and Ritakallio 2007; Whelan and Maître 2010; Goedemé and Rottiers 2011; Goedemé and Collado 2016; Jenkins 2018; Goedemé, Trindade and Vandenbroucke 2019), earnings distributions (Behr and Pötter 2010; Brandolini, Rosolia and Torrini 2012; Eurofound 2015; Brandolini and Rosolia 2016; Perugini and Pompei 2016; Pereira and Galego 2018; Vacas-Soriano 2018) and wealth distributions (Lindner 2015).

For both the synthetic and direct approaches, it should be borne in mind that the adjustment to national accounts may be important. Grossed-up income estimates derived from sample surveys tend to differ from the corresponding aggregates from national accounts. These discrepancies are due in part to underreporting and sampling errors in surveys, and in part to conceptual differences (e.g. Atkinson and Micklewright 1983, for the UK; Brandolini 1999, for Italy; Atkinson, Guio and Marlier 2017, for EU countries). For instance, national accounts aggregates often include the disposable income of NPISH, since separate accounts are only available in some countries; they cover incomes of persons living permanently in institutions (hostels, nursing homes for the elderly, military bases, etc.), who are excluded from sample surveys; they include imputed rents on owner-occupied housing, whose amount is significant in many EU countries but is not incorporated in the survey income definition. The alignment of survey data to mean incomes from national accounts is common in the literature on global income inequality, and until recently the statistical department of the UN Economic Commission for the Latin America and the Caribbean region adjusted survey data by income category based on their shortfalls relative to sector accounts to enhance cross-national comparability (Bourguignon 2015). These adjustments allow studying within-country distributions without altering the country ranking provided by the national accounts. On the other hand, they overlook that national accounts are intrinsically different from survey data: “... the differences in coverage and definition between [National Accounts] and surveys mean that, even if everything were perfectly measured, it would be incorrect to apply inequality or distributional measures which are defined from surveys, which measure one thing, to means that are derived from the national accounts, which measure another” (Deaton 2005: 17). As shortfalls of survey totals relative to national accounts values are negatively correlated with real income levels across countries, the alignment of household-level data to aggregate statistics is likely to reduce measured EU-wide inequality.

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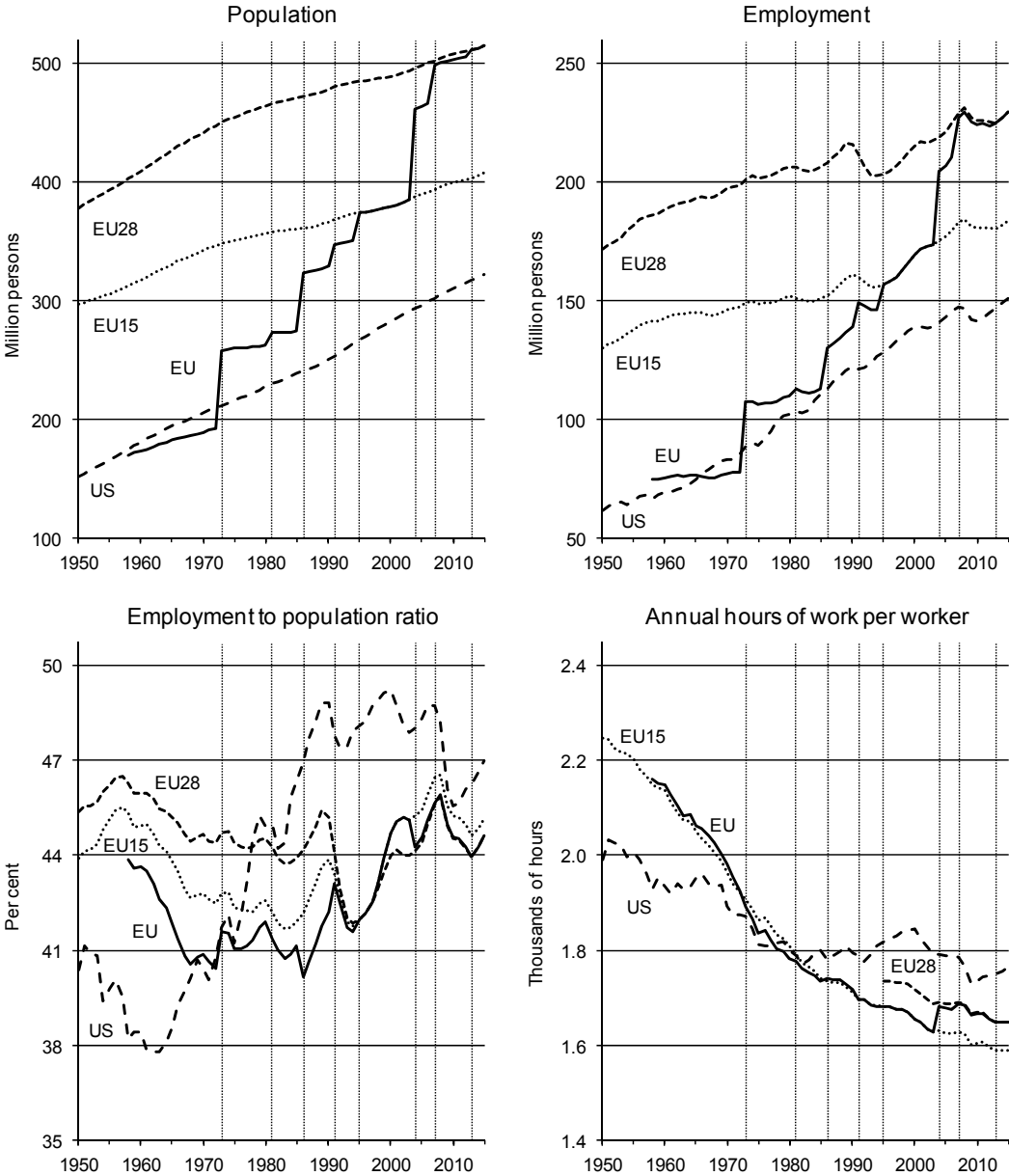
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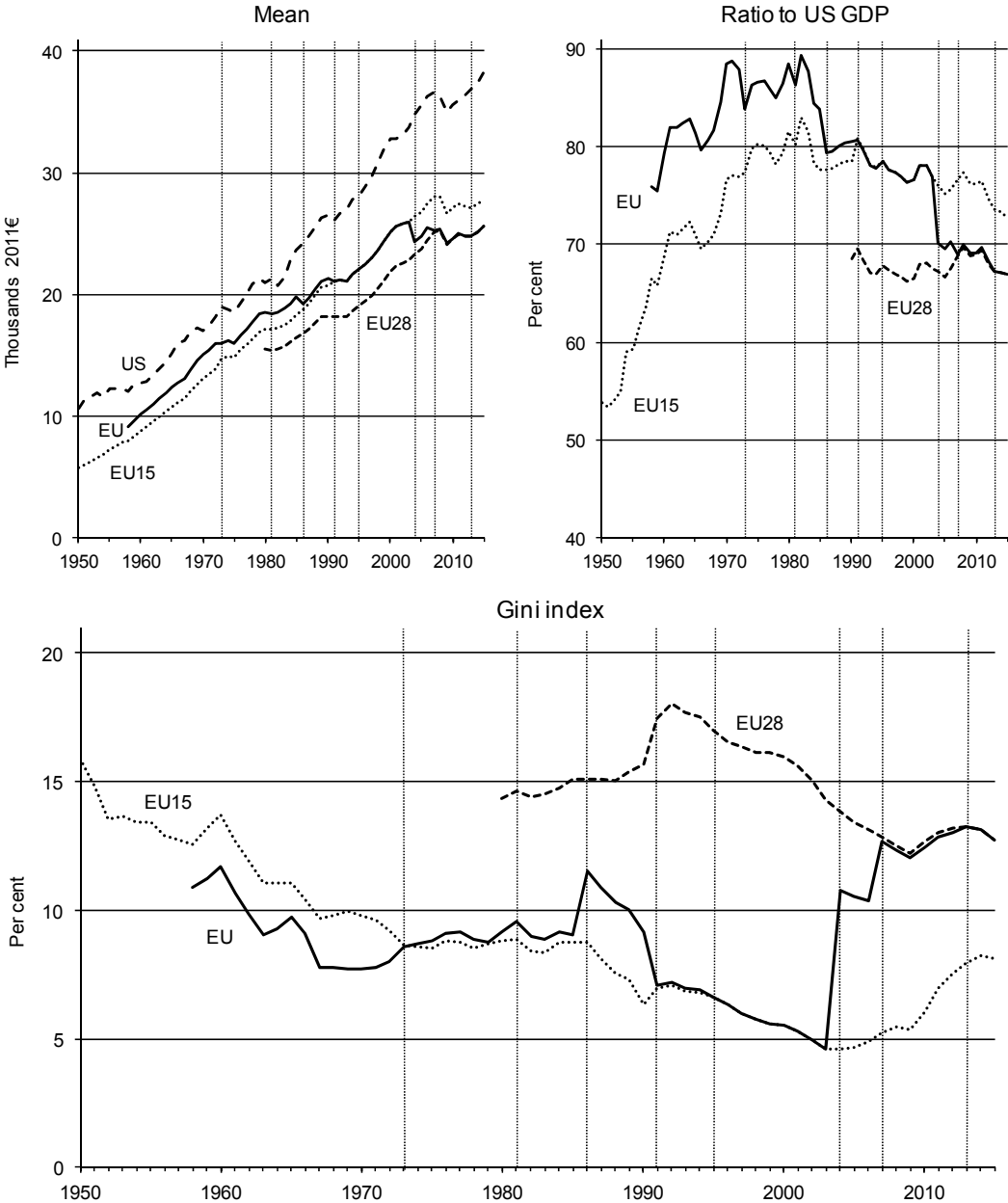
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Figure 1: Population and employment in EU, EU28, EU15 and US, 1950-2015



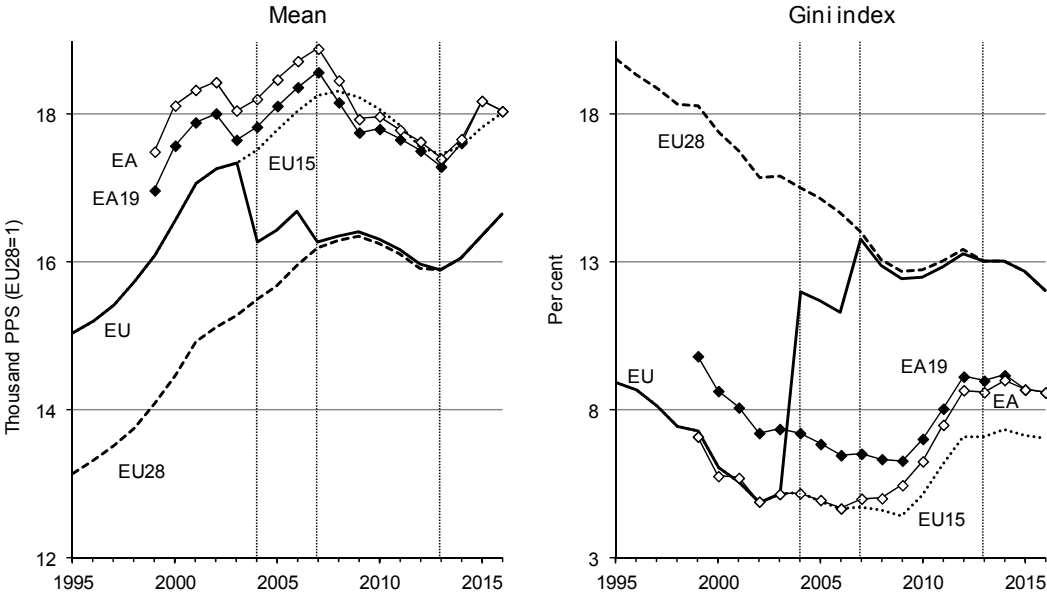
Source: authors' elaboration on data from The Conference Board Total Economy Database™. All figures are from the database (Original version) of November 2018 except for the figures for West Germany in 1958-1990 which are from the database of May 2016. EU: totals for actual EU member countries; EU15: totals for the 15 countries that formed the EU in 1995-2003; EU28: totals for the 28 countries that form the EU since July 2013. The vertical lines indicate the changes in EU membership.

Figure 2: Real GDP per capita in EU, EU28, EU15 and US, 1950-2015



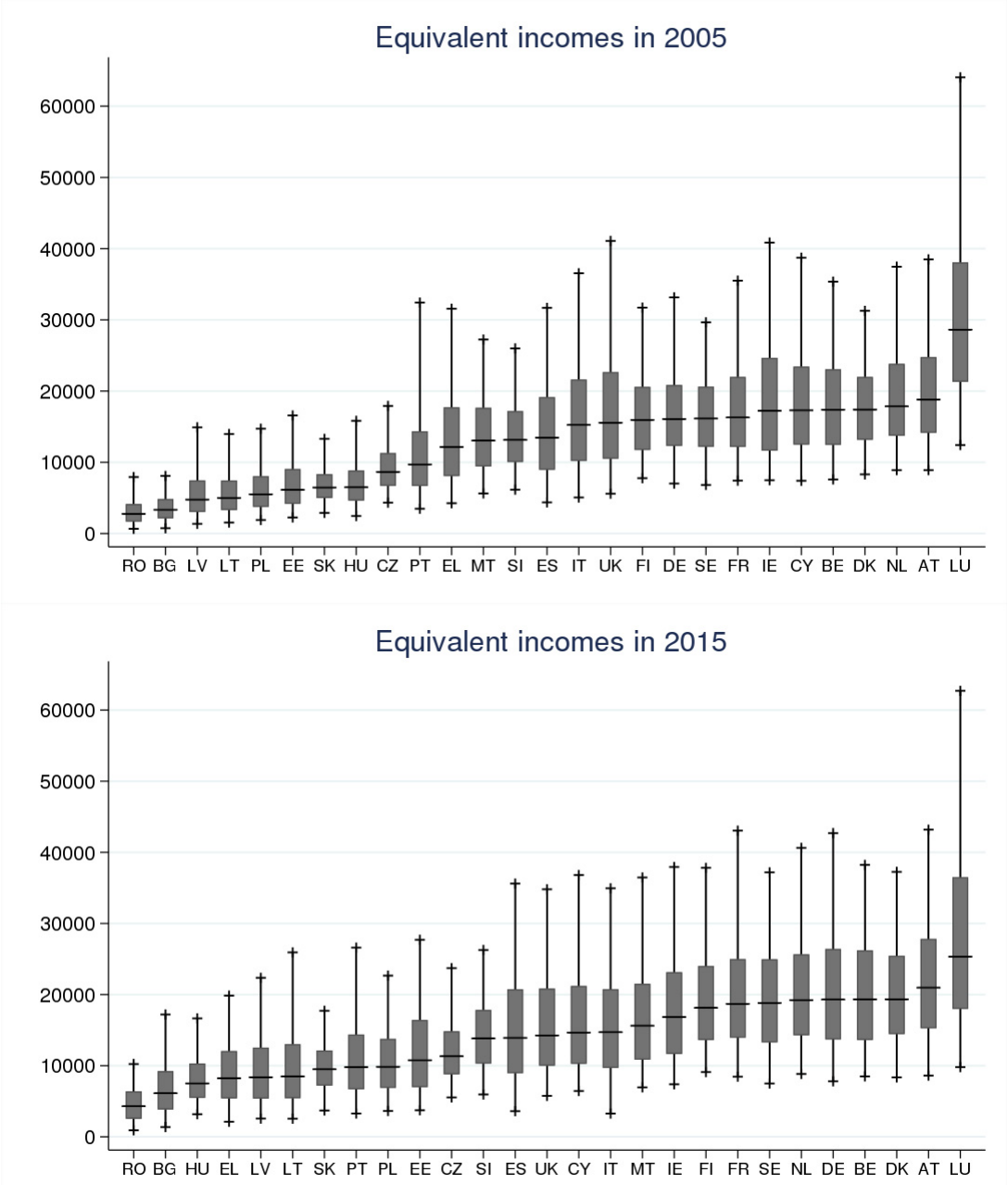
Source: authors' elaboration on data from The Conference Board Total Economy Database™ (Original version), November 2018. The figures for West Germany in 1958-1990 are obtained by rescaling the total for Germany based on separate figures for West and East Germany from The Conference Board Total Economy Database™, May 2016. Real GDP is obtained by applying the EKS method; original values in millions of 2011 US\$ at chained PPPs are converted into 2011€ by multiplying for the exchange rate in 2011 (0.719€/€). EU: totals for actual EU member countries; EU15: totals for the 15 countries that formed the EU in 1995-2003; EU28: totals for the 28 countries that form the EU since July 2013. The vertical lines indicate the changes in EU membership. All estimates are population-weighted values.

Figure 3: Real HGDI per capita in EU, EU28, EU15, EA and EA19, 1995-2016



Source: authors' elaboration on data from Eurostat, National Accounts (January 2019). Real HGDI is obtained by dividing the national series for HGDI by the PPP indices for HFCE (EU28=1) and by deflating the EU aggregates by the implicit deflator of household and NPISH final consumption expenditure (index: 2010=100); the implicit deflator for EU is that for EU15 until 2003 and that for EU28 from 2004. Figures for the household gross disposable income for Spain (1995-98), Croatia (1995-2001, 2013-16) and the whole series for Malta are estimated on the basis of figures for nominal GDP. EU: totals for actual EU member countries; EU15: totals for the 15 countries that formed the EU in 1995-2003; EU28: totals for the 28 countries that form the EU since July 2013. The vertical lines indicate the changes in EU membership. All estimates are population-weighted values.

Figure 4: Real income distributions within EU countries, 2005 and 2015



Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017).
 Equivalised disposable household incomes; modified OECD equivalence scale; nominal incomes in euro divided by the PLI for HFCE (EU28=1) and by the HFCE implicit deflator (covering also NPISH) for EU28 (index: 2010=100); distribution among individuals.

Figure 5: Gini index of disposable income and top 1 per cent share of taxable income in selected EU countries, 1950-2015

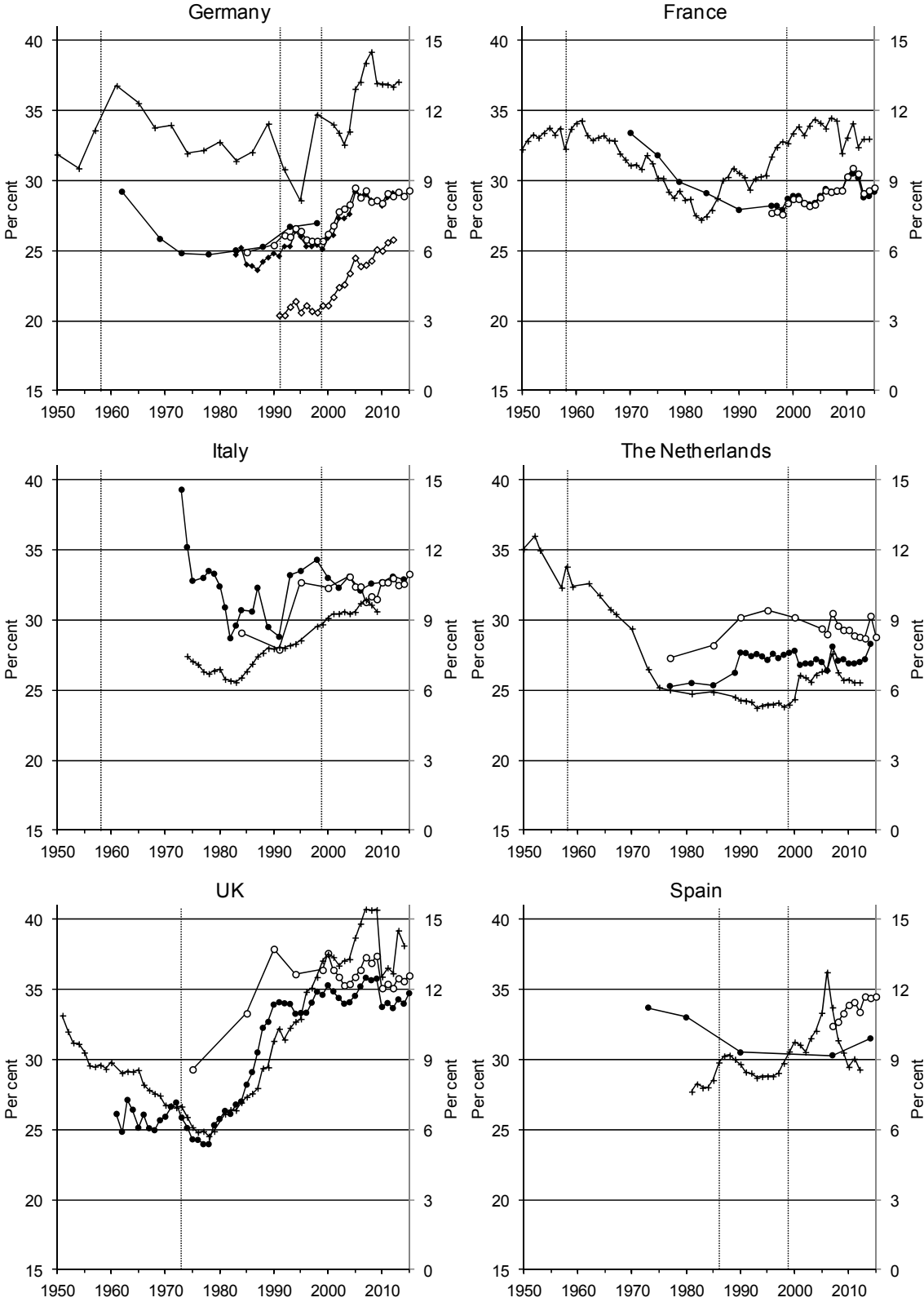


Figure 5: Gini index of disposable income and top 1 per cent share of taxable income in selected EU countries, 1950-2015 (continued)

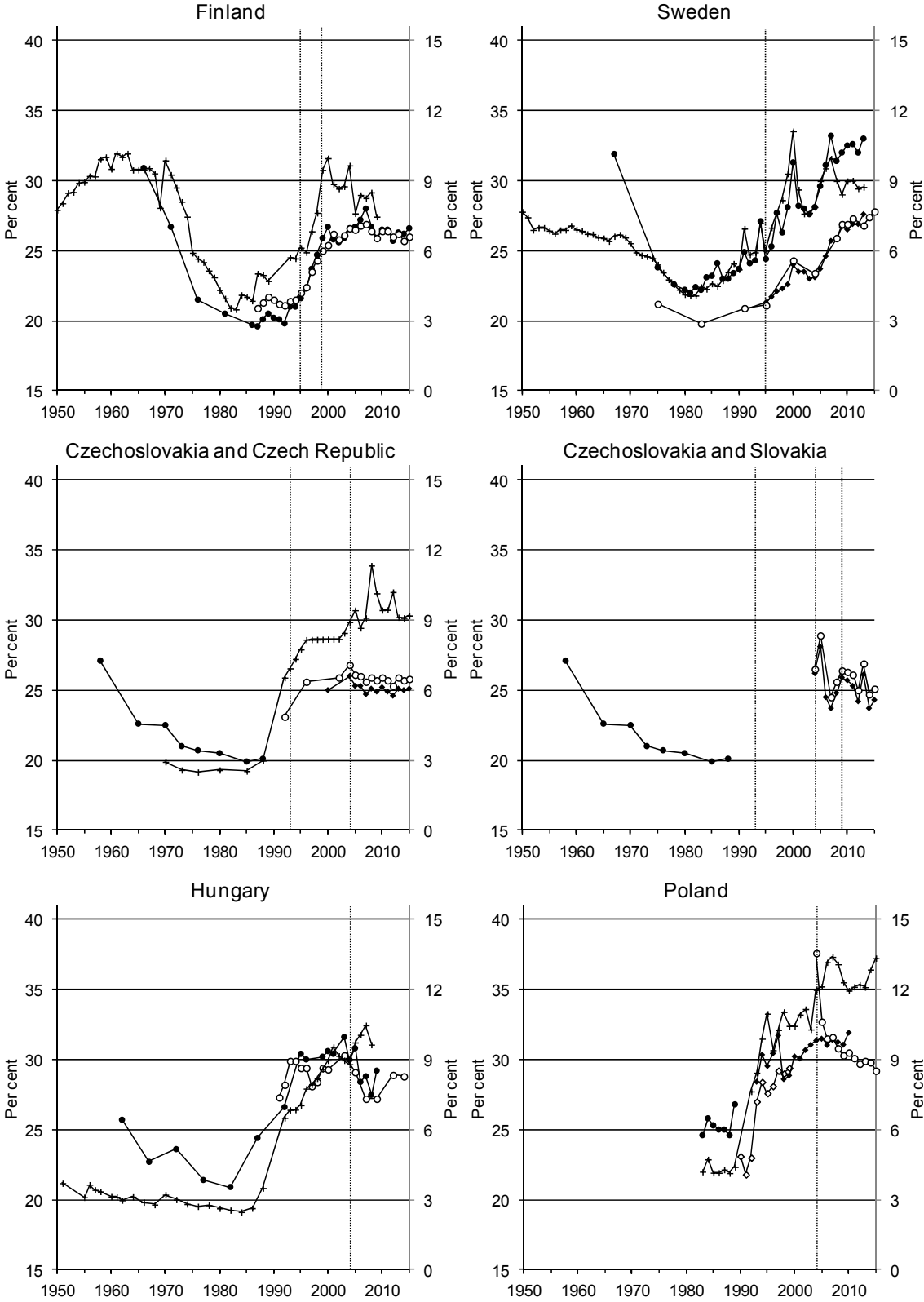
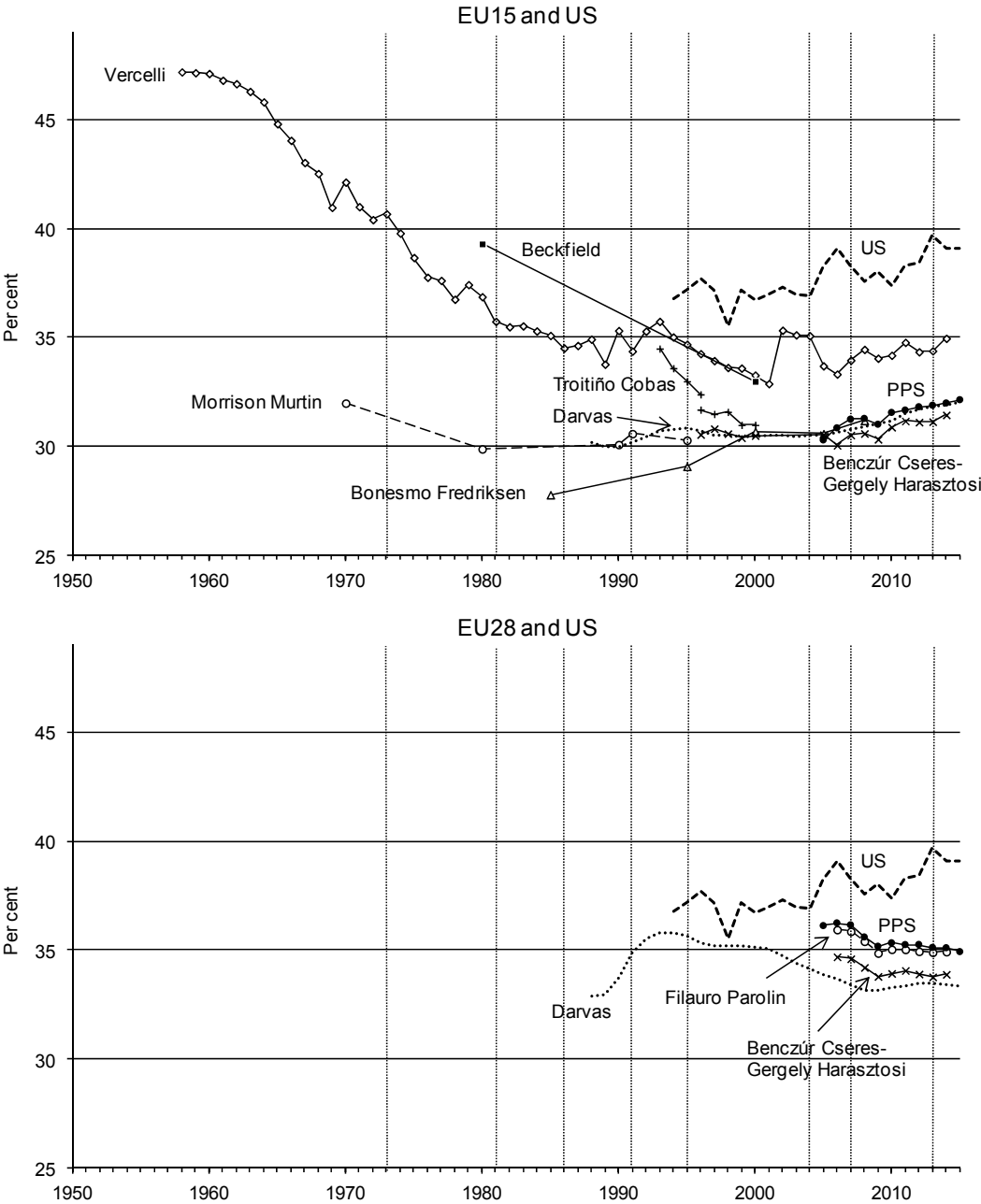


Figure 5: Gini index of disposable income and top 1 per cent share of taxable income in selected EU countries, 1950-2015 (continued)

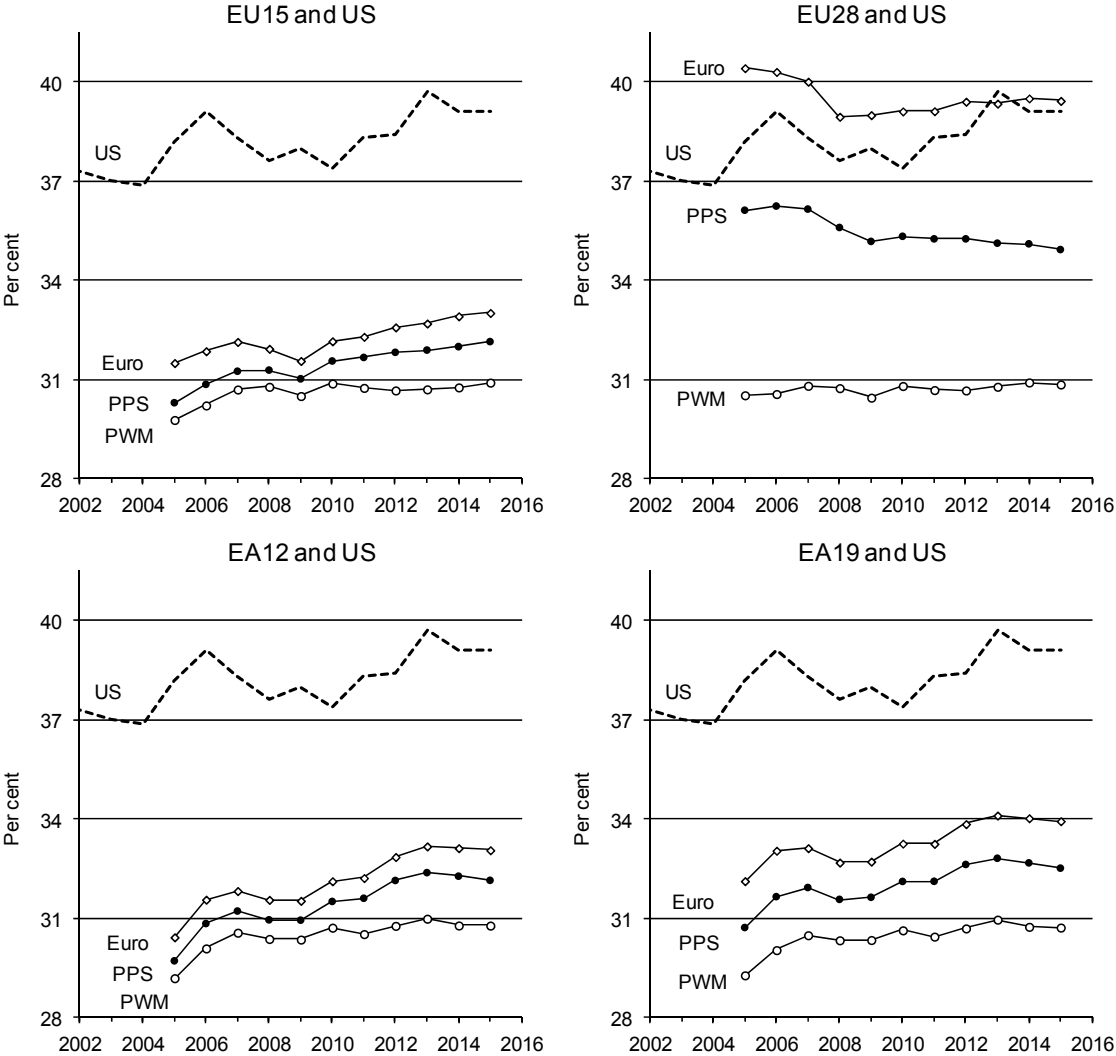
Source: Vertical lines indicate first year of participation in EU and in EA, if applicable; additional lines indicate year of reunification for Germany and year of dissolution of Czechoslovakia for Czech Republic and Slovakia. In some cases, statistical breaks have been ignored or adjusted by linking series in overlapping years. *All countries*: (○) OECD (website, as of 25 November 2018), IDD: equivalised disposable household cash income, excluding imputed rents; square root equivalence scale; distribution among individuals; (+, right-hand scale) WID (website, as of 14 January 2019): pre-tax national income; distribution among adult individuals. *West Germany*: (●) Becker (1997, table 1) for 1962-1988 and Becker et al. (2003, table 3.3) for 1983-1998; Income and Consumption Survey (EVS); equivalised disposable household income; OECD equivalence scale; distribution among individuals, only German population. (◆) SOEP Group (2015: 83-85); Socio-Economic Panel (SOEP); equivalised disposable household income, included imputed rents; modified OECD equivalence scale; distribution among individuals. *East Germany*: (◇) SOEP Group (2015: 83-85), SOEP; equivalised disposable household income, included imputed rents; modified OECD equivalence scale; distribution among individuals. *France*: (●) INSEE (website, as of 25 November 2018); Enquêtes Revenus Fiscaux for 1970-1990 and Enquêtes Revenus Fiscaux et Sociaux for 1996-2015; equivalised disposable household cash income, included imputations for undeclared property incomes; modified OECD equivalence scale; distribution among individuals, including only households with non-negative taxable income. *Italy*: (●) Brandolini (1999, table 13) for 1973-1975 and Banca d'Italia (website, as of 25 November 2018) for 1977-2014; Survey of Household Income and Wealth (SHIW); equivalised disposable household income, included imputed rents; modified OECD equivalence scale; distribution among individuals; figures for 1973-1975 estimated from grouped data. *The Netherlands*: (●) Centraal Bureau voor de Statistiek (personal communication and website, as of 25 November 2018), Income Distribution Survey (Inkomensonderzoek) for 1977, 1981, 1985 and Income Panel Survey (Inkomens Panelonderzoek) for 1989-2014; equivalised disposable household income, including imputed rents; CBS national equivalence scale; distribution among individuals. *UK*: (●) Institute for Fiscal Studies (website, as of 25 November 2018): Family Expenditure Survey for 1961-1992/93 and Family Resources Survey from 1993/94, adjusted for "very rich" households using data from HMRC's Survey of Personal Incomes; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals. *Spain*: (●) Ayala Cañón (2016: Table 1): Encuesta de Presupuestos Familiares (EPF); equivalised disposable household income; square root equivalence scale; distribution among individuals. *Finland*: (●) Tilastokeskus (website, as of 25 November 2018): Household Budget Survey for 1971, 1976, 1981 and Income Distribution Survey for 1987-2015; equivalised disposable household income, including capital gains and imputed rents; modified OECD equivalence scale; distribution among individuals. *Sweden*: (●) Gustafsson and Uusitalo (1990: Table 2) for 1967-1985 and Statistiska centralbyrån (website, as of 25 November 2018) for 1975-2013: equivalised disposable family income; national equivalence scale; distribution among individuals; (◆) Statistiska centralbyrån (website, as of 25 November 2018): Incomes and taxes survey (IoS); equivalised disposable household income, capital gains excluded; national equivalence scale; distribution among individuals. *Czechoslovakia*: (●) Atkinson and Micklewright (1992, Table CSI1): disposable household income per capita; distribution among individuals. *Czech Republic*: (●) Eurostat (website, as of 25 November 2018): EU-SILC; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals. *Slovakia*: (●) Eurostat (website, as of 25 November 2018): EU-SILC; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals. *Hungary*: (●) Atkinson and Micklewright (1992, Table HI1) for 1962-1987 and Gini Project (website, as of 25 November 2018) for 1982-2009: Hungarian Central Statistical Office Income Survey for 1962-1987, Hungarian Household Panel for 1992, 1995, 1996, TÁRKI Household Monitor for 1999-2009; disposable household income per capita; distribution among individuals. *Poland*: (●) Atkinson and Micklewright (1992, Table PI1): Household Budget Survey (HBS); disposable household income per capita; distribution among individuals; (◇) Szulc (2006: Table 2): Household Budget Survey (HBS), breaks in 1993 and 1997; equivalised disposable household income; national equivalence scale; distribution among households; (◆) Gini Project (website, as of 25 November 2018): Household Budget Survey (HBS); equivalised disposable household income; OECD equivalence scale; distribution among persons.

Figure 6: Long-run changes in the Gini index in EU15, EU28 and US, 1958-2015



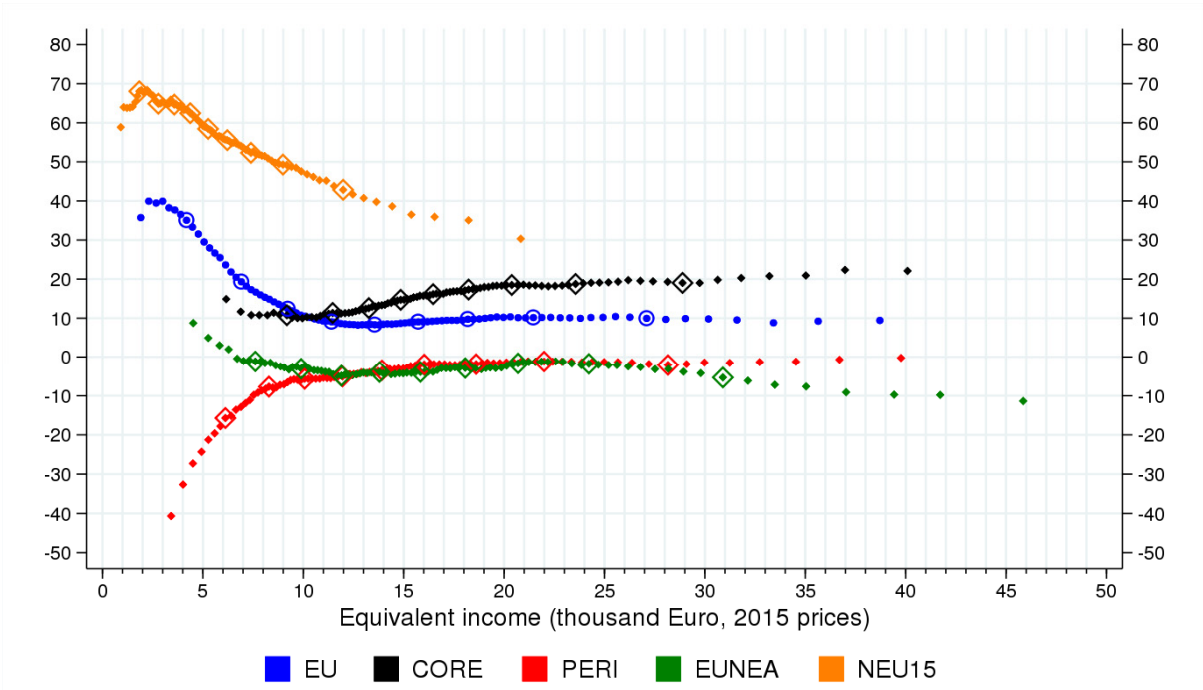
Source: *Vercelli*: Vercelli (2018): synthetic estimates on WIID data; adjusted to national accounts. *Morrison Murtin*: Morrison and Murtin (2004), synthetic estimates on World Bank data, break due to inclusion of East Germany since 1991; adjusted to national accounts. *Bonesmo Fredriksen*: Bonesmo Fredriksen (2012), synthetic estimates on OECD IDD data, excluding Austria, Belgium, Spain, Ireland, Portugal. *Darvas*: Darvas (2016), synthetic estimates on SWIID data. *Troitiño Cobas*: Troitiño Cobas (2007), direct estimates on ECHP data, excluding Austria, Finland, Luxembourg, Sweden in 1993-1996. *Beckfield*: Beckfield (2009), direct estimates on LIS data, excluding Greece and Portugal, for various years around indicated year. *Benczúr Cseres-Gergely Harasztosi*: Benczúr, Cseres-Gergely and Harasztosi (2017), direct estimates on ECHP and EU-SILC data, excluding Croatia. *Filauro Parolin*: Filauro and Parolin (2018), direct estimates on EU-SILC data, excluding Malta (2006) and Croatia (2006-08). *PPS*: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia. *US*: Andrews, Palesch and Thomas (2015 and personal communication), direct estimates on CPS-ASEC data; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals. See Tables A1 and A2 in Appendix 2 for details.

Figure 7: Gini index in EU15, EU28, EA12, EA19 and US, 2002-2015, by different definitions



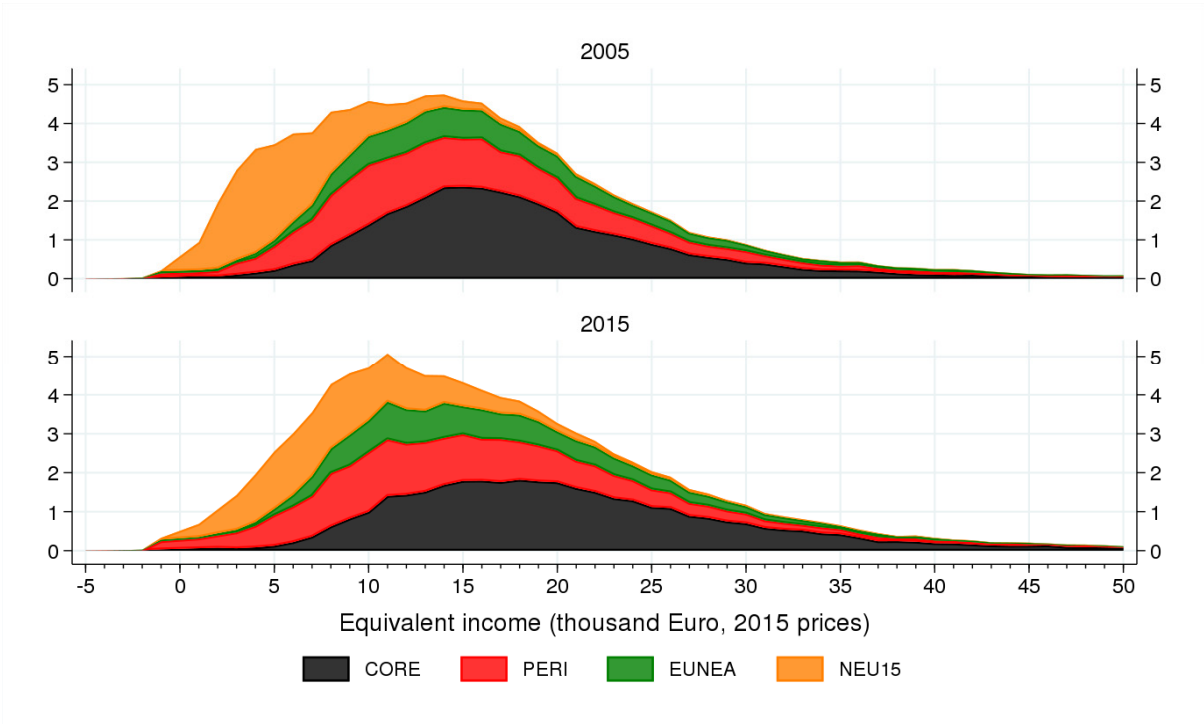
Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017) for EU15, EU28, EA12 and EA19 and from Andrews, Palesch and Thomas (2015 and personal communication) for US; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals. *Euro*: incomes converted to euros by market exchange rates; *PPS*: incomes in PPSs; *PWM*: population-weighted means of national indices.

Figure 8: Growth Incidence Curves for EU28 and selected country groups, 2005-2015



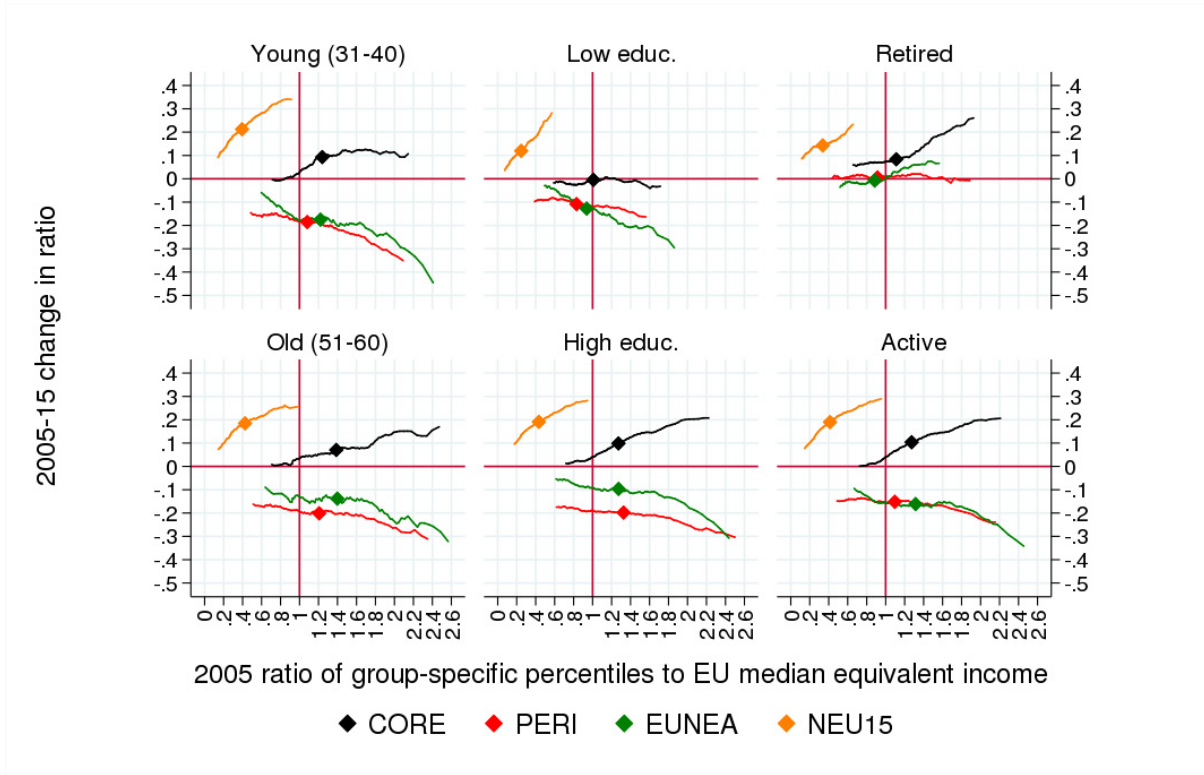
Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia. The figure displays, for each country group, the percentage cumulated growth rates between 2005 and 2015 (y-axis) for every percentile of the distribution of equivalised disposable household income among individuals against their value (in PPSs) in 2005 (x-axis); only percentiles 3 to 97 are reported; hollow markers single out deciles of the corresponding distribution in 2005. CORE: Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands; PERI: Greece, Ireland, Italy, Portugal, Spain; EUNEA: Denmark, Sweden, the UK; NEU15: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Figure 9: The composition of the EU28 equivalised income distribution, 2005 and 2015



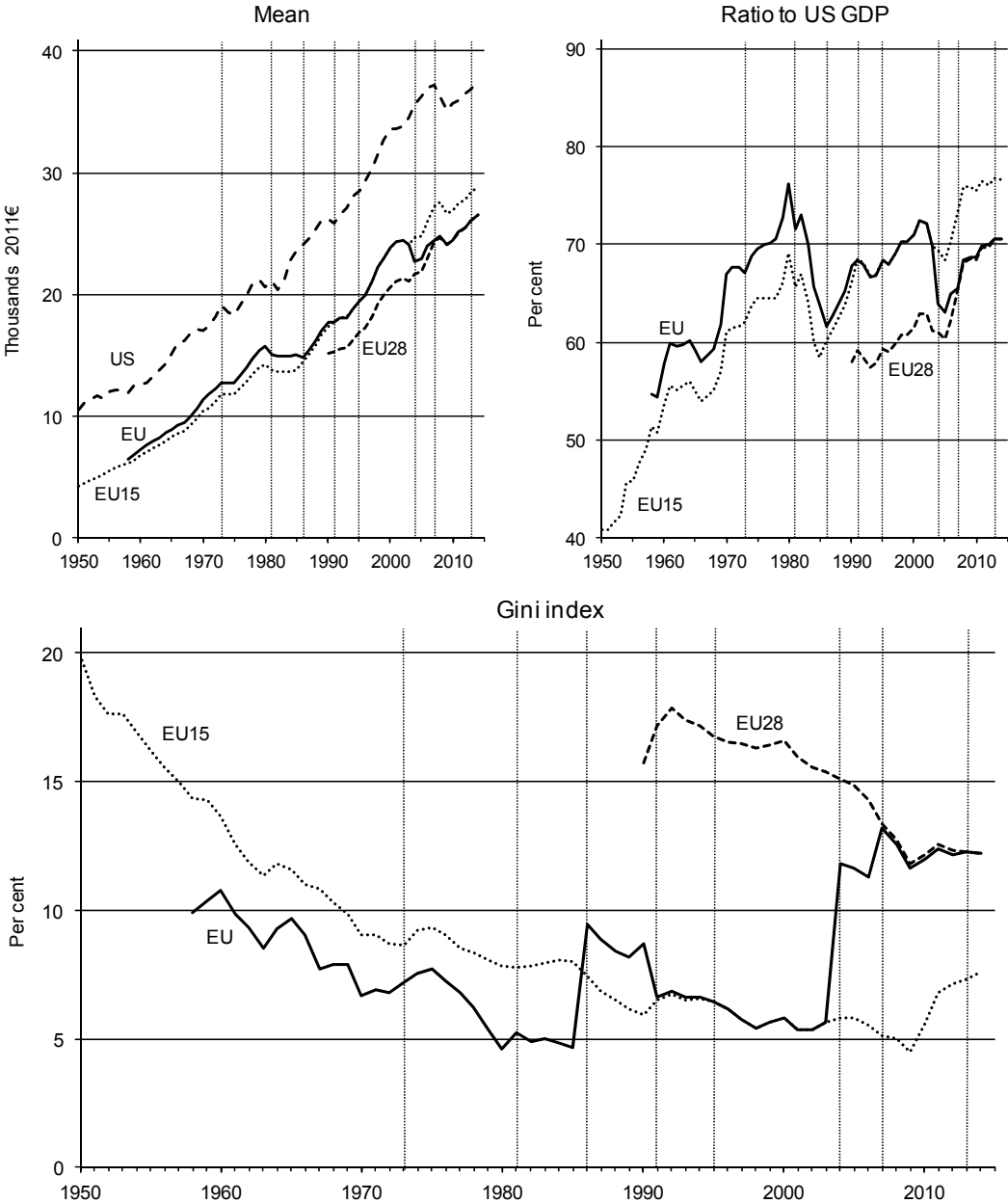
Source: authors’ elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals; incomes in PPSs. *CORE*: Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands; *PERI*: Greece, Ireland, Italy, Portugal, Spain; *EUNEA*: Denmark, Sweden, the UK; *NEU15*: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Figure 10: Relative equivalised incomes dynamics in EU28 country groups, 2005-2015



Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals; incomes in PPSs. *CORE*: Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands; *PERI*: Greece, Ireland, Italy, Portugal, Spain; *EUNEA*: Denmark, Sweden, the UK; *NEU15*: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia. Markers single out group-specific medians, where group indicates a population category in a country group.

Figure A1: Real GDP per capita in EU, EU28, EU15 and US, 1950-2015



Source: authors' elaboration on data from Penn World Table, version 9.0. The figures for West Germany in 1958-1990 are obtained by rescaling the total for Germany based on separate figures for West and East Germany from The Conference Board Total Economy Database™, May 2016. Real GDP is obtained by applying the GK method; original values in millions of 2011 US\$ at chained PPPs are converted into 2011€ by multiplying for the exchange rate in 2011 (0.719€/€). EU: totals for actual EU member countries; EU15: totals for the 15 countries that formed the EU in 1995-2003; EU28: totals for the 28 countries that form the EU since July 2013. The vertical lines indicate the changes in EU membership. All estimates are population-weighted values.

Figure A2: Growth Incidence Curves for country groups and member states, 2005-2015

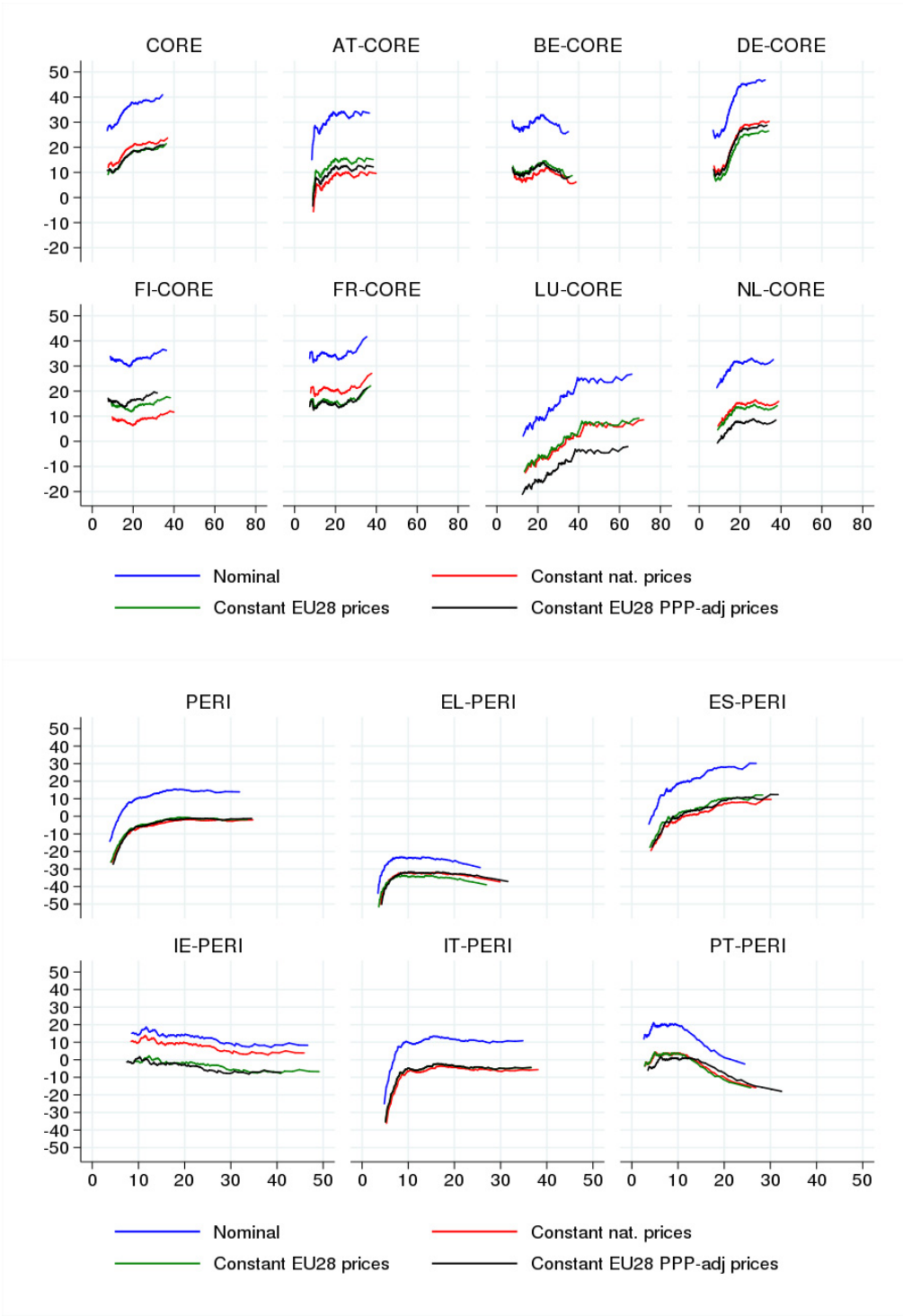
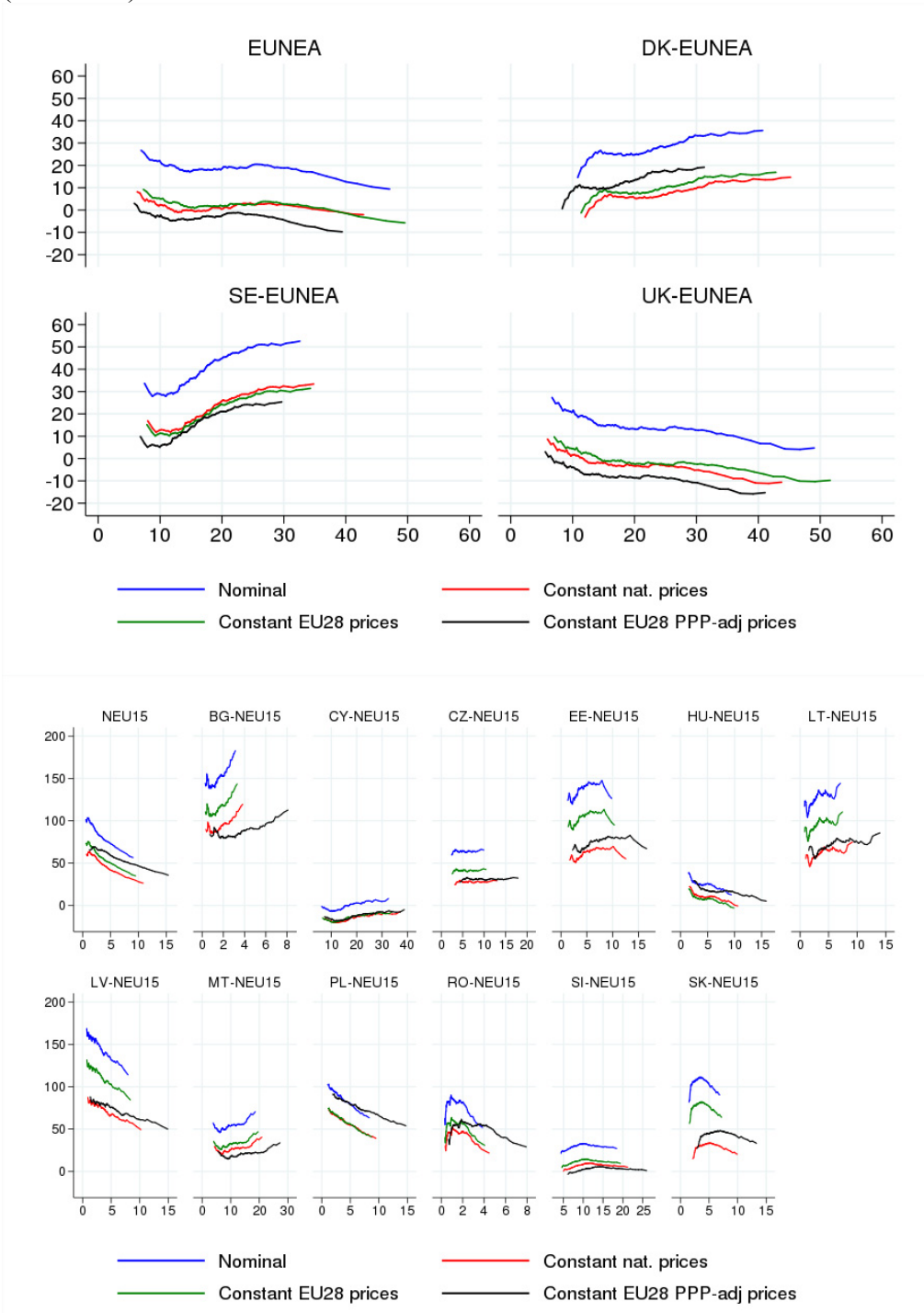


Figure A2: Growth Incidence Curves for country groups and member states, 2005-2015
(continued)



Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia. The figure displays, for each country or country group, the percentage cumulated growth rates between 2005 and 2015 (y-axis) for every percentile of the distribution of equivalised disposable household income among individuals against their value (in PPSs) in 2005 (x-axis); only percentiles 3 to 97 are reported. CORE: Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands; PERI: Greece, Ireland, Italy, Portugal, Spain; EUNEA: Denmark, Sweden, the UK; NEU15: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Table 1: Economic social classes in EU28 and selected country groups (thousands persons and percentage composition)

Country group	Low income class		Lower middle class		Upper middle class		High income class		Total	
A. Thresholds based on EU-wide median										
2005										
CORE	12,273	2.5	76,123	15.7	87,826	18.1	5,238	1.1	181,460	37.4
PERI	24,316	5.0	53,487	11.0	46,420	9.6	3,791	0.8	128,014	26.4
EUNEA	8,885	1.8	29,221	6.0	31,843	6.6	3,245	0.7	73,194	15.1
NEU15	76,732	15.8	20,797	4.3	4,069	0.8	621	0.1	102,219	21.1
EU28	122,206	25.2	179,628	37.0	170,158	35.1	12,895	2.7	484,887	100.0
2015										
CORE	11,797	2.4	68,017	13.7	98,114	19.7	8,191	1.6	186,119	37.5
PERI	34,390	6.9	54,928	11.1	40,095	8.1	2,718	0.5	132,131	26.6
EUNEA	12,657	2.5	35,212	7.1	29,678	6.0	1,854	0.4	79,401	16.0
NEU15	53,409	10.8	36,713	7.4	8,641	1.7	397	0.1	99,160	20.0
EU28	112,253	22.6	194,870	39.2	176,528	35.5	13,160	2.6	496,811	100.0
B. Thresholds based on national medians										
2005										
CORE	23,030	4.7	99,727	20.6	56,202	11.6	2,503	0.5	181,462	37.4
PERI	25,099	5.2	55,843	11.5	43,572	9.0	3,500	0.7	128,014	26.4
EUNEA	12,971	2.7	33,647	6.9	24,514	5.1	2,062	0.4	73,194	15.1
NEU15	19,079	3.9	45,721	9.4	33,701	7.0	3,717	0.8	102,218	21.1
EU28	80,179	16.5	234,938	48.5	157,989	32.6	11,782	2.4	484,888	100.0
2015										
CORE	27,613	5.6	95,277	19.2	59,866	12.0	3,364	0.7	186,120	37.5
PERI	27,752	5.6	55,180	11.1	45,841	9.2	3,358	0.7	132,131	26.6
EUNEA	12,875	2.6	37,358	7.5	27,424	5.5	1,745	0.4	79,402	16.0
NEU15	18,005	3.6	45,661	9.2	33,394	6.7	2,101	0.4	99,161	20.0
EU28	86,245	17.4	233,476	47.0	166,525	33.5	10,568	2.1	496,814	100.0

Source: authors' elaboration on data from EU-SILC CROSS UDB 2005-2017 (version of October 2017), excluding Croatia; equivalised disposable household income; modified OECD equivalence scale; distribution among individuals; incomes in PPSs. *CORE*: Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands; *PERI*: Greece, Ireland, Italy, Portugal, Spain; *EUNEA*: Denmark, Sweden, the UK; *NEU15*: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Table A1: Synthetic estimates of the Gini index in EU15 and EU28, 1960-2016

Authors	Atkinson 1996	Boix 2004	Morrisson Murtin 2004	Dauderstädt Kelttek 2011		Bonesmo Fredriksen 2012		Darvas 2016			Vercelli 2018
Income concept	disposable	not specified	disposable	disposable	disposable	disposable	disposable	disposable	market	disposable	mostly disposable
Equivalence scale	square root	per capita	square root	modified OECD	modified OECD	square root	square root	not specified	not specified	modified OECD	various
Welfare unit	individual	individual	individual	individual	individual	individual	individual	not specified	not specified	individual	mostly individual
Conversion rate	PPP (NDI)	PPP	PPP (GDP)	PPP	market exchange rate	PPP	market exchange rate	PPP	PPP	PPP	PPP (GDP)
Source of national distribution data	LIS, data for 20/40 quantile groups	database assembled by Milanovic at World Bank	database assembled at OECD, data for 9 bottom decile groups and 2 top vingtile groups	Eurostat estimates on deciles based on EU-SILC	Eurostat estimates on deciles based on EU-SILC	OECD IDD, data for decile groups	OECD IDD, data for decile groups	SWIID and Eurostat (2014-15)	SWIID and Eurostat (2014-15)	Eurostat estimates based on EU-SILC	WIID, data for decile groups
Adjustment to national accounts	none	none	real GDP per capita from Maddison (2001)	none	none	none	none	real GDP per capita from IMF WEO	real GDP per capita from IMF WEO	none	real GDP per capita from PWT
Notes	data from various years around indicated year; index estimated from decile group shares			estimates for quintile ratio	estimates for quintile ratio	data from various years around indicated year	data from various years around indicated year	based on national log-normal distributions estimated from Gini index and mean	based on national log-normal distributions estimated from Gini index and mean	based on national log-normal distributions estimated from Gini index and mean	missing observations estimated by fractional polynomials of 3rd degree
EU15	excl. AT DK EL		excl. East DE until 1990		excl. AT BE ES IE PT						
1960											0.471
1965											0.448
1970			0.320								0.421
1975											0.387
1980			0.299								0.369
1985	0.292					0.278					0.351
1988								0.302	0.463		0.349
1989								0.300	0.463		0.338
1990			0.301					0.300	0.464		0.353
1991			0.306					0.302	0.467		0.344
1992								0.304	0.473		0.353
1993		0.342						0.307	0.479		0.357
1994								0.308	0.484		0.350
1995			0.303			0.291		0.308	0.486		0.347
1996								0.307	0.485		0.343
1997								0.305	0.484		0.339
1998								0.305	0.485		0.336
1999								0.305	0.485		0.336
2000						0.307		0.305	0.487		0.333
2001								0.305	0.488		0.329
2002								0.305	0.489		0.353
2003								0.305	0.490		0.351
2004								0.305	0.492		0.351
2005						0.306		0.305	0.492		0.337
2006								0.307	0.495		0.333
2007								0.308	0.496		0.340
2008						0.312		0.309	0.499		0.345
2009								0.310	0.503		0.341
2010								0.312	0.508		0.342
2011								0.315	0.510		0.348
2012								0.317	0.512		0.343
2013								0.319	0.516		0.344
2014								0.319	0.515		0.350
2015								0.320	0.515		
2016								0.319			
EU28	excl. HR		excl. HR BG(2005-6) RO(2005-6)		excl. HR BG(2005-6) RO(2005-6)		excl. BG CY EE HR LT LV MT RO		excl. BG CY EE HR LT LV MT RO		
1988								0.329	0.472		
1989								0.330	0.474		
1990								0.338	0.480		
1991								0.349	0.490		
1992								0.356	0.499		
1993		0.399						0.358	0.505		
1994								0.358	0.509		
1995								0.356	0.511		
1996								0.353	0.509		
1997								0.352	0.508		
1998								0.352	0.509		
1999								0.352	0.510		
2000								0.351	0.511		
2001								0.350	0.512		
2002								0.347	0.511		
2003								0.344	0.510		
2004								0.341	0.510		
2005								0.339	0.509		
2006								0.337	0.509		
2007								0.334	0.508		
2008						0.328	0.354	0.332	0.508		
2009								0.331	0.511		
2010								0.333	0.515	0.353	
2011								0.334	0.515	0.354	
2012								0.335	0.517	0.351	
2013								0.335	0.519	0.352	
2014								0.334	0.518	0.352	
2015								0.333	0.517	0.352	
2016								0.330		0.348	

Source: authors' elaboration.

Table A2: Direct estimates of the Gini index in EU15, EU28 and EA, 1980-2015

Authors	Beblo Knaus 2001	Troitiño Cobas 2007	Brandolini 2007				Beckfield 2009	Hoffmeister 2009	Rodríguez-Pose and Tselios 2009	Heidenreich Härpfer 2011	Bonke Schroeder 2014	
Income concept	disposable	disposable	disposable	disposable	disposable	disposable	disposable	disposable	disposable	disposable	disposable	
Equivalence scale	modified OECD	modified OECD	modified OECD	modified OECD	modified OECD	modified OECD	modified OECD	OECD	square root	none	modified OECD	modified OECD
Welfare unit	individual	individual	individual	individual	individual	individual	individual	individual	individual	individual	individual	individual
Conversion rate	PPP	PPP	PPP	PPP (HFCE)	PPP (GDP)	PPP (GDP)	market exchange rate	PPP (GDP)	PPP (HFCE)	market exchange rate	PPP	PPP
Source of national distribution data	ECHP, LIS	ECHP	ECHP	ECHP, LIS	ECHP, LIS	ECHP, LIS	ECHP, LIS	LIS	LIS	ECHP	EU-SILC	EU-SILC
Adjustment to national accounts	none	none	none	none	none	adjusted to Household Net Disposable Income	none	none	none	none	none	none
Notes	estimates for Theil index							data from various years around indicated year; top/bottom coded incomes	estimates for mean logarithmic deviation	only individuals with positive income below 90th percentile; estimates shown only in chart	excl. zero incomes; top/bottom coded incomes	top/bottom coded incomes
EU15	excl. LU AT SE FI							excl. EL PT	excl. PT	excl. FN NL		
1980								0.393				
1993	0.345											
1994	0.336											
1995	0.330											
1996	0.324		0.317									
1997			0.315									
1998			0.316									
1999			0.310									
2000			0.310	0.296	0.294	0.291	0.313	0.330				
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
EU28				excl. BG CY HR LT LV MT RO	excl. BG CY HR LT LV MT RO	excl. BG CY HR LT LV MT RO	excl. BG CY HR LT LV MT RO	excl. BG CY CZ HR LV LT MT PT SK RO		excl. MT		excl. BE BG HR IE MT RO
2000				0.334	0.328	0.317	0.378					
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
EA												
1996												
2000				0.293	0.290	0.288	0.307					
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												

Table A2: Direct estimates of the Gini index in EU15, EU28 and EA, 1980-2015 (continued)

Authors	Papathodorou Pavlopoulos 2014	Maquet 2015	Caselli et al. 2016	market	Benczúr Cseres-Gergely Harasztosi 2017	Filauro 2018; Filauro Parolin 2018	disposable	disposable, incl. Imputed rents	market	Anderson et al. 2018	Wang et al 2018	This paper
Income concept	disposable	disposable	disposable	market	disposable	disposable	disposable, incl. Imputed rents	market	disposable	disposable	disposable	disposable
Equivalence scale	modified OECD	not specified	OECD	OECD	modified OECD	modified OECD	modified OECD	modified OECD	modified OECD	square root	modified OECD	modified OECD
Welfare unit	not specified	not specified	individual	individual	individual	individual	individual	individual	not specified	not specified	individual	individual
Conversion rate	PPP	not specified	Fixed euro conversion rates	Fixed euro conversion rates	PPP (actual individual consumption)	PPP (GDP)	PPP (GDP)	PPP (GDP)	PPP (HFCE)	PPP	PPP (HFCE)	market exchange rate
Source of national distribution data	ECHP, EU-SILC	EU-SILC	ECHP, EU-SILC	ECHP, EU-SILC	ECHP, EU-SILC	EU-SILC	EU-SILC	EU-SILC	EU-SILC	EU-SILC	EU-SILC	EU-SILC
Adjustment to national accounts	none	none	none	none	none	none	none	none	none	none	none	none
Notes	top/bottom censored distribution					UK wave realigned	UK wave realigned	UK wave realigned	estimated with mixture distribution techniques; only positive incomes	excl. non-positive income; estimates for polarisation indices	UK wave realigned; BG(2005), MT(2005), RO(2005) estimated	UK wave realigned; BG(2005), MT(2005), RO(2005) estimated
EU15												
1980												
1993												
1994												
1995												
1996	0.300				0.306							
1997					0.308							
1998					0.306							
1999					0.304							
2000					0.305							
2001												
2002												
2003												
2004												
2005					0.306						0.303	0.315
2006					0.301						0.309	0.319
2007					0.305						0.313	0.321
2008	0.294				0.306						0.313	0.319
2009					0.303						0.310	0.316
2010					0.309						0.316	0.322
2011					0.312						0.317	0.323
2012					0.311						0.318	0.326
2013					0.311						0.319	0.327
2014					0.315						0.320	0.329
2015											0.322	0.330
EU28			excl. CY HR MT LU	excl. CY HR MT LU	excl. HR	excl. MT(2006) HR(2006-8)	excl. MT(2006) HR(2006-8)	excl. MT(2006) HR(2006-8)		excl. BG ES FR GR HR IT LV MT PT RO	excl. HR	excl. HR
2000												
2004												
2005											0.361	0.404
2006					0.347	0.359	0.344	0.540			0.362	0.403
2007					0.346	0.359	0.343	0.532			0.362	0.400
2008					0.342	0.354	0.343	0.532			0.356	0.390
2009					0.338	0.349	0.338	0.536			0.352	0.390
2010					0.339	0.350	0.339	0.541			0.353	0.391
2011					0.341	0.350	0.338	0.540			0.353	0.391
2012					0.339	0.350	0.338	0.544			0.353	0.394
2013			0.38	0.44	0.338	0.349	0.337	0.543			0.351	0.394
2014					0.339	0.349	0.336	0.542			0.351	0.395
2015											0.349	0.394
EA			EA12 excl. LU	EA12 excl. LU		EA19 excl. MT (2006)	EA19 excl. MT (2006)		EA19 excl. MT		EA19 excl. HR	EA19 excl. HR
1996				0.41								
2000												
2004												
2005									0.385		0.307	0.321
2006						0.315	0.299				0.317	0.331
2007						0.318	0.305				0.319	0.331
2008				0.37		0.314	0.302		0.400		0.316	0.327
2009						0.314	0.303				0.316	0.327
2010						0.319	0.307				0.321	0.333
2011						0.319	0.306		0.404		0.321	0.333
2012						0.322	0.310				0.326	0.339
2013		0.332	0.325	0.392		0.325	0.311				0.328	0.341
2014						0.323	0.309		0.421		0.327	0.340
2015											0.325	0.339

Source: authors' elaboration.