The European Union's income inequalities

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Introduction

There have been many studies on household income inequality in recent years; however, most of these have focused on the national level. There is very little research that addresses the level of the European Union as a whole. An exclusive focus on national levels of inequality ignores the relative income levels among European countries, which differ considerably and may also have changed significantly in recent years. In addition, analysis on a national level seems insufficient for analysing the nature of governance and policy making in regard to inequality at the European level. This raises multiple questions. For example, what does inequality in the European Union look like if it is considered as a single entity in comparison to the USA? How do the American states compare to the EU's member states in terms of income inequality? Constructing a single income distribution for the EU as a whole is an important thought experiment that can serve to focus attention on the long term. Here I will present a first description aimed at providing a starting point for a better understanding of the pan-EU income distribution.

In addition, I will look beyond the distribution of net-equivalised income. Household incomes are ultimately derived from the generation of market income. However, there are important factors to consider that affect the distribution of disposable equivalised household income. These factors include the formation of households, their patterns of labour supply, policies and effectiveness of transfers, income taxation and social contributions, and (a priori methods of) equivalising incomes for household size and composition. Equivalised incomes are the subject of social policies, as exemplified by the European measure of relative poverty. Interestingly, these factors have been undergoing deep-seated change. For example, in terms of household formation, the number of single-person households has doubled. As for household labour supply, there has been the demise of the single-breadwinner model and, instead, the rise of dual earner and multiple earner households, which coincides with

an increase in female employment (and often times part-time employment).

First, I look at EU27 as a whole, and then I examine the individual countries. Next, I draw a comparison with the USA and the individual states. Then, I turn to the roles of income redistribution and the equivalisation of incomes. Finally, I consider the role of labour earnings, which is the most important market income, in terms of, first, how it contributes to household income inequality and, second, how it is increasingly affected by that inequality.

How unequal is the EU as a whole?

New literature is starting to address the level of inequality for the EU as a whole, aimed at making a comparison with the USA as an entity, and at studying European social integration. Table 1 lists the Gini coefficients of the EU-wide income distribution found in contributions offering the widest coverage in the European Union. Evidently, the first question to ask is how to make incomes comparable, as currencies differ between European countries, which is unlike the American states that all share the US dollar. Purchasing power parities (PPP) represent what households can do with their income in one country compared to another accounting for different price levels. This contrasts with exchange rates, which are more useful for understanding market forces. Plausibly, PPP conversion brings the countries' incomes closer to each other and leads to lower levels of EU-level inequality compared to exchange-rate conversion.

The study by Brandolini (2007) is the first intensive scrutiny of EU-wide income distribution, which shows the effects of the methodological choices that need to be made. He finds lower inequality for the aggregate of 21 EU countries[1] (Gini of 0.33) than for the USA (0.37) on the basis of PPP; on an exchange rate basis, however, without further adjustments, the two coefficients appear very similar. He also finds that EU-level inequality is higher than the population-weighted average of the member countries, casting doubt on Eurostat usage of such average. The other contributions find that there is a lower level of inequality in the EU also after including most of the new member states. Consistent with this finding, some contributions find a strikingly large role for inequalities within EU countries compared to those among them. Brandolini places these findings in perspective by comparing the three percentage point increase due to the

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[1] Including 6 prospective new member states: the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia.

Table 1
EU-level income equality levels found in the literature.

Author	Data type and source	Countries	Period	Conversion	Gini*
Brandolini (2007)	micro ECHP/LIS	EU21	2000	PPP	0.334
				Euro	0.378
Heidenreich & Härpfer (2011)	micro EU-SILC	EU26	2008	PPP	0.347
Bonesmo Fredriksen (2012)	meso OECD-IDPD	EU20	2008	PPP	0.328
	(decile means)			Euro	0.354
Goedemé et al. (2014)	micro EU-SILC	EU24	2005-2011	PPP	0.333
Bönke & Schröder (2015)	micro EU-SILC	EU22	2004-2011	PPP	0.311

*Notes: PPP – purchasing power parities. * Gini coefficient for net-equivalised income; year closest to 2010 for Goedemé et al. (2014) and Bönke & Schröder (2015). The Gini coefficient is a summary measure of inequality ranging from zero (maximum equality: all households treated identically) to one (maximum inequality: all in the hand of one single household). Data sources mentioned in the end of article.*

enlargement of the EU with the seven percentage points increase in UK inequality in the second half of the 1980s.

I expand the research by including other measures of inequality for EU27 (excluding Croatia) for the year 2010 (Table 2). The net-equivalised Gini coefficient at 0.303-0.305 appears well below the American level of 0.380, regardless of whether PPP or exchange rates are used. Similarly, the American S10:S1 shares ratio (between the aggregate incomes of the top and bottom deciles) exceeds the European ratio and so does its P90:P10 percentiles ratio, albeit more modestly. The American and European shares ratios are drastically higher than the percentiles ratios (between the lowest income of the top decile and the highest income of the bottom decile). This demonstrates the importance of including the full tails of the distribution in the examination of inequality. The breakdown of the percentiles ratio into its two halves shows very similar outcomes for the lower half of the distribution (P50:P10), but the disparity in the European upper half (P90:P50) is notably higher if based on exchange rates. The household incidence of poverty is much higher in the USA but the corresponding aggregate income share is approximately equal to Europe, which implies relatively lower average incomes for the American poor. This lower than expected American income share appears to rest on the much larger American top-income share, as poverty gaps vary only slightly between the EU and USA. The S10, which can be compared only for gross incomes, is at a significantly higher level in the USA. The table shows striking differences for Europe in the effects of using either PPP or exchange rates for the S10:S1 ratio, the P90:P50 ratio, the household poverty rate, and the mean poverty gap; however, the Gini coefficient, the S10 and the poor's income share seem unaffected.

How do the countries fit the EU?

Adopting the EU perspective generates a Gini coefficient for EU27 as a whole but retains the Gini coefficients of individual countries, as both PPP and exchange-rate conversions are linear transformations that leave internal country rankings unchanged. However, the change of perspective

Table 2
Aggregate household income* inequalities in the EU and USA, 2010.

	EU27		USA
	PPP	*Exchange rate*	*$*
Gini coefficient	0.303	0.305	0.380
S10:S1 ratio of income shares	13.8	22.8	15.9
S10 income share	25.9%	26.8%	
gross incomes	31.0%	32.2%	46.4%
P90:P10 ratio of decile cut-offs	5.5	8.3	6.1
P90:P50	2.1	2.1	2.2
P50:P10	2.7	3.9	2.7
Poverty			
household share	23.2%	26.9%	32.9%
income share	7.5%	7.5%	7.9%
mean poverty gap	37%	46%	37%

Note: *) Net-equivalised incomes unless otherwise mentioned. Source: Author's calculations on EU-SILC for EU, PPP from Eurostat; USA from OECD-IDPD (Gini, poverty) and WWID (Top-10%).

strongly affects the other measures of inequality at the country level.

Figure 1 shows the differences in the EU-wide and national approaches in regard to the total income of the poor and the top incomes; effects on household shares (not shown) are similar, albeit somewhat larger for the poor and smaller for the rich. Poverty is shown as the stalagmites building on the floor of the graph and the top incomes are shown as the stalactites hanging from the ceiling, while the remainder of the distribution is in the middle. The poverty share for EU27 remains the same (note that the households share decreases from 27% to 23% of all households, or from 56 million to 48 million households) and also the share for top incomes does not change. However, the situation is drastically different for the individual countries. For 14 out of 27 countries, the EU-
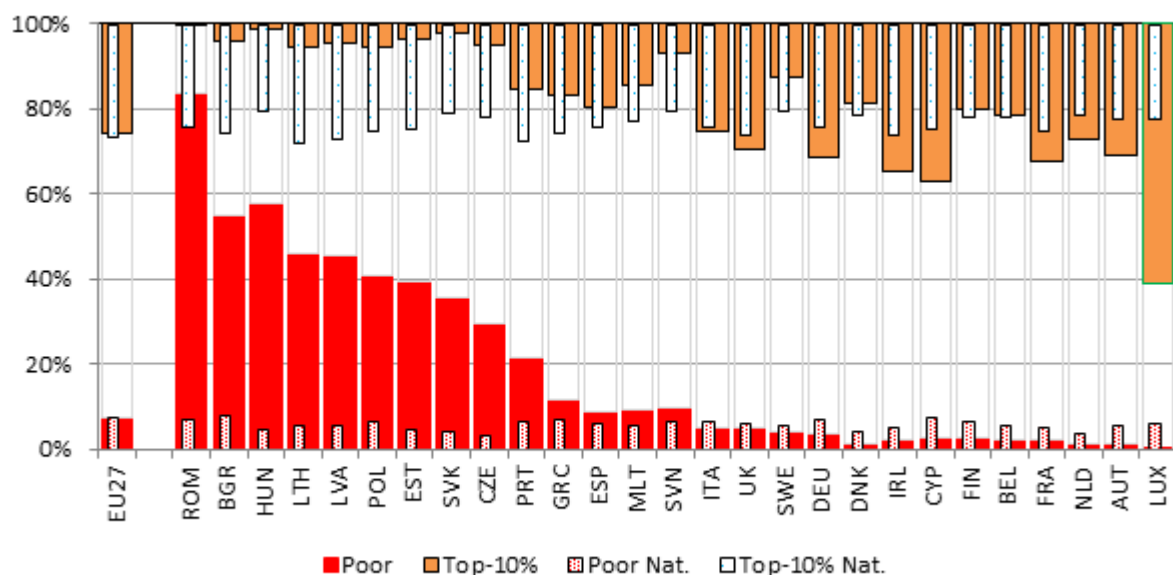
Notes: EU27 distribution after PPP conversion. Due to the small number of relevant observations in SILC, Top-10% outcomes for Bulgaria and Romania are not reliable. *) Relative poverty below 60% of median income; **) Net-equivalised incomes; ***) Conversion by PPP for household final consumption. ***) Ranked by household incidence of poverty.
Source: Author's calculations on EU-SILC, using Eurostat PPP.

Figure 1. Net-equivalised income shares of the poor* and Top-10%**: EU-wide*** versus national measurement****, 2010.

wide approach increases the incidence of poverty while it is reduced for the remaining 13 countries. Immense increases are found for the poorest countries; for example, in Romania, a massive 90% of all households are poor on the EU-wide measure, while the rate is 20% using the national approach, which is similar to many other countries. Absolute reductions for the richer countries are modest or small, but relative reductions can be quite large; for example, Luxembourg's national poverty rate of 15.5% is reduced to only 1% on the EU-wide basis[2]. The explanation for this is a strong decline in the poverty threshold when its level is determined internationally instead of nationally. For top incomes, opposite effects are found, but they are less pronounced. Only a few countries have a household share at the top that is clearly higher when looking at it from the EU perspective; Luxembourg stands out from the others with a share of more than 60%.

It is here that an EU-wide approach is most useful for the EU's long-term perspective. It is hard to imagine a general European anti-poverty policy being put in place to lift such a massive population out of poverty in the poorest countries. It is also not desirable that richer countries reduce or stop their own anti-poverty policies because they have much lower poverty rates in comparison to other European countries. At the same time, it is clear that something needs to be done to remove the incentive to migrate to richer countries e.g., discourage Romanians from migrating to other parts of

the EU. The finding supports the case for policy making with a strong long-term focus on individual countries, instead of placing all the trust into general EU-wide policies, such as the EU2020 strategy, that have no EU-wide point of departure and leave policy making to the national level.[3]

A comparison of the USA and EU

The EU-wide approach provides a better comparison to the USA because it places a spotlight on the two aggregates and their internal variations. This is shown in Figure 2 for both the Gini coefficients and the Top-10% income shares, using gross incomes and exchange rates for the EU27 since PPP is not applicable within the USA. The figure presents within-country and within-state levels relative to the aggregate levels of the EU and USA, respectively. Obviously, the American levels of inequality generally exceed Europe's level of inequality, and the European variation in absolute income levels is incomparably wider than in the USA. The relative levels show the diversity of the two entities across their regions. Both cases compare reasonably well in terms

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[2] Cf. Brandolini (2007, 20) for similar effects due to the lowering of the EU-wide median income at the poverty threshold during enlargement.

[3] Salverda (2014, 63-67) discusses the weakness of EU2020 policy making on poverty and social inclusion.
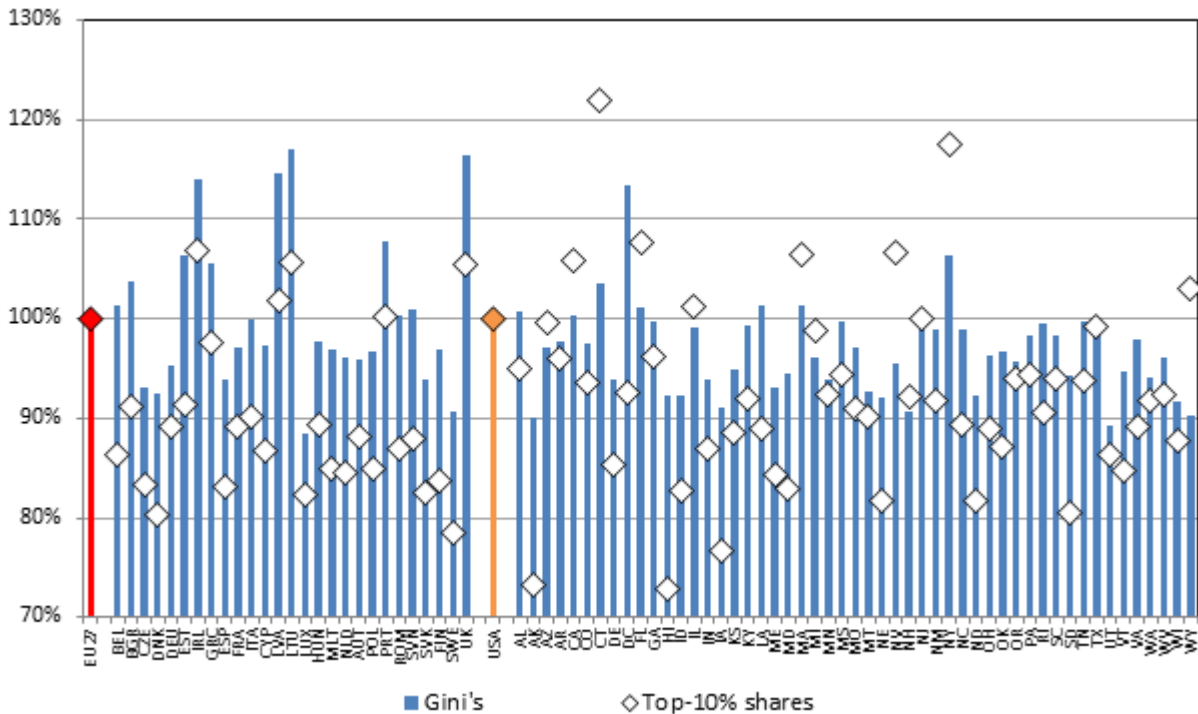
Note: American data includes capital gains. EU27 and USA are full-population ranked aggregates. Countries and states are within-ranked. Sources: Author's calculations on EU-SILC, ACS (for Gini's) and WWID (for Top-10% shares).[4]

Figure 2.   Relative Gini coefficients and Top-10% income shares (gross incomes) for the EU and USA, 2010.

of the overall range of income inequality. European top-income shares and Gini coefficients both stretch over a range of 30 percentage points around the EU27 level. The relative spread of the American top-income shares (almost 50%) is wider, but the Gini coefficients are narrower (25%). In Europe, only Ireland, Estonia and the UK have a clear (> 5%) above-average Top-10% share, which gives them 17% of the EU's top incomes in comparison to 16% of all incomes; in the USA, six states (California, Connecticut, Florida, Massachusetts, Nevada and New York) are above-average, having 35% of national Top-10% incomes versus 32% of all incomes.

In the EU there is a strong correlation across the countries between the top-income shares and the Gini coefficient (0.90), while in the USA this is considerably less (0.35) than one might in first instance expect from a more integrated economy. Poverty rates (not shown) and Top-10% shares are uncorrelated in the USA, while across European they are slightly negatively correlated (0.30), but it is important to note that the definitions of poverty differ. However, it seems plausible in principle that rich households may be more mobile geographically and cluster together more strongly than poor households, which would occur more be easily in an integrated economy such as the USA.

Some interesting conclusions may be drawn from these findings. First, the USA shows as much internal variation in inequality as Europe despite its integrated economy. Second,

the comparison gives no reason to expect that the variation within Europe will wither automatically as economic integration advances. Clearly, there is a need for policy making here. Third, conceivably, a closer European Union may create a stronger geographical concentration of top incomes. London may already be a case in point.

Redistribution and equivalisation of incomes

Net-equivalised income is the common currency of most inequality studies and certainly of EU policy making regarding poverty.[5] EU inequalities in the previous section present only the façade of incomes after taxation and equivalisation. Taking them at face value, we will miss the three forces keeping the façade upright: the initial acquisition of incomes, the subsequent redistribution and the equivalisation of income. Each provide a dynamic of its own: the market economy, redistributive policy-making, and the population's household

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[4] See Frank et al. (2015) for a methodological note on states' top incomes and their adaptation to the WWID. Compared to the WWID, based on comprehensive administrative data, the EU-SILC is a small-scale survey that likely underestimates the top-income shares.

[5] As a result, it was also the only concept of income available for all countries in EU-SILC until very recently when gross income data became available.

Table 3
Effects of redistribution and equivalisation for different measures of inequality, EU27, 2010.

	Gini	S10:S1	S10	S1	P90:P10	Poverty rate (60%) Household share	Income share	Mean gap
Gross	0.411	33.9	31.0%	0.9%	11.21	30.7%	7.4%	46%
Net	0.357	17.3	27.8%	1.6%	6.84	25.8%	7.6%	38%
Net-equivalised	0.303	13.8	25.9%	1.9%	5.49	23.2%	7.5%	37%
Redistribution	-13%	-49%	-10%	76%	-39%	-16%	3%	-16%
Equivalisation	-15%	-20%	-7%	16%	-20%	-10%	-2%	-3%
Total	-26%	-59%	-16%	105%	-51%	-25%	0%	-19%

Notes: EU-wide distribution after PPP conversion.
Source: EU-SILC (author's calculation).

formation, respectively. The size and composition of households drive the equivalisation – higher incomes that maintain larger families will be brought down and vice-versa. Overlooking the latter force, the level and evolution of inequality would seem to depend solely on policy-making. To determine their importance we need to start from the distribution of gross incomes and work our way towards the net-equivalised distribution. In this section, we consider redistribution and equivalisation, and in the next section, we will examine market incomes, with a particular focus on labour-market earnings. It is important to distinguish between the two and to do so at the right level. Evidently, equivalising incomes throughout the whole process, i.e. starting from gross-equivalised incomes (as done in the OECD's Income Distribution Database), does not allow establishing the effect of equivalisation itself. In addition, it can distort the effect of income redistribution because households are sorted differently by size between their rankings by either gross or net incomes (Salverda 2015a, 27-28). Also equivalised gross levels, such as the mean or median earnings, which are at the core of the public debate, are hard to relate to actual household observations.

Table 3 elaborates on this by indicating the same two effects for various measures of inequality for EU27 as a whole. Again, the Gini coefficient draws a considerably more modest picture of redistribution and equivalisation than the shares ratio S10:S1 that focuses on the two tails of the distribution. The Gini coefficient is reduced by 26% and the shares ratio by 59%. The split between the two also differs: for the shares ratio, the redistribution effect is much larger (49%) and far exceeds the equalisation effect. This is largely due to redistribution towards the bottom decile (cf. +76% for S1). However, the absolute effect on that bottom share is very limited, as we have seen before. It is lifted from 0.9% of all incomes to only 1.9%. A comparison with the poverty rate also indicates that the bottom decile is a pocket of deep poverty within the broader set of poor households, and that it stays that way throughout the process of redistribution and equivalisation. Interestingly, the decrease in the mean poverty gap (19%) is not much different from that of the S10 top-income share (16%).[6]

Figure 3 shows for the EU countries the reduction of the Gini coefficient for the gross-income distribution via redistribution and equivalisation towards the distribution of net-equivalised incomes. It demonstrates clearly that the effects of equivalisation are substantial. The reduction in inequality is as much the work of individual household formation as of redistributive policy-making. For EU27, the initial gross-income Gini of 0.41 is decreased by both factors equally, -0.05 each. On average the equivalisation effect exceeds the redistribution to a certain degree. The largest redistributive effect is found for Hungary (-0.10 on 0.40: -25%), and the smallest for Spain and Bulgaria (-6%). Relatively large equivalisation effects (-20 to -25%) are found for Denmark, Finland, Slovakia, Slovenia and Sweden, while the smallest (-10%) is found for Portugal and Spain. Larger effects imply a stronger correlation between the level of net income and the size of the household. Apparently, redistribution and household structures across the income distribution differ appreciably among countries. While the household formation is a relatively slow and silent force, taxation easily catches most of the attention. Peichl et al. (2012) demonstrate the importance of changing household formation for income inequality in the German case.

Importantly, Figure 3 also suggests that, in a cross-country comparison, the initial distribution of gross incomes largely drives those of net incomes and net-equivalised incomes. Redistribution and equivalisation do lower the levels of inequality, but they hardly change the mutual country differences. This suggests that the extent of the reductions is largely independent of the initial level of inequality. It underlines the importance of the initial distribution of gross incomes for the analysis as well as for policy-making.

We may expect these effects not only to differ in a cross-section but also to change over time and at a different pace for different countries. Tax rates affect the expansion of top-income shares, while the rise of single households and declining fertility change equivalisation. The growing number

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[6] Note that the comparisons between Figure 3 and Table 3 show net effects and include a re-ranking of households between the types of income. Salverda (2015a, 2016a) shows the gross flows behind the net effects and measures redistribution after re-ranking consistently for the same type of income.
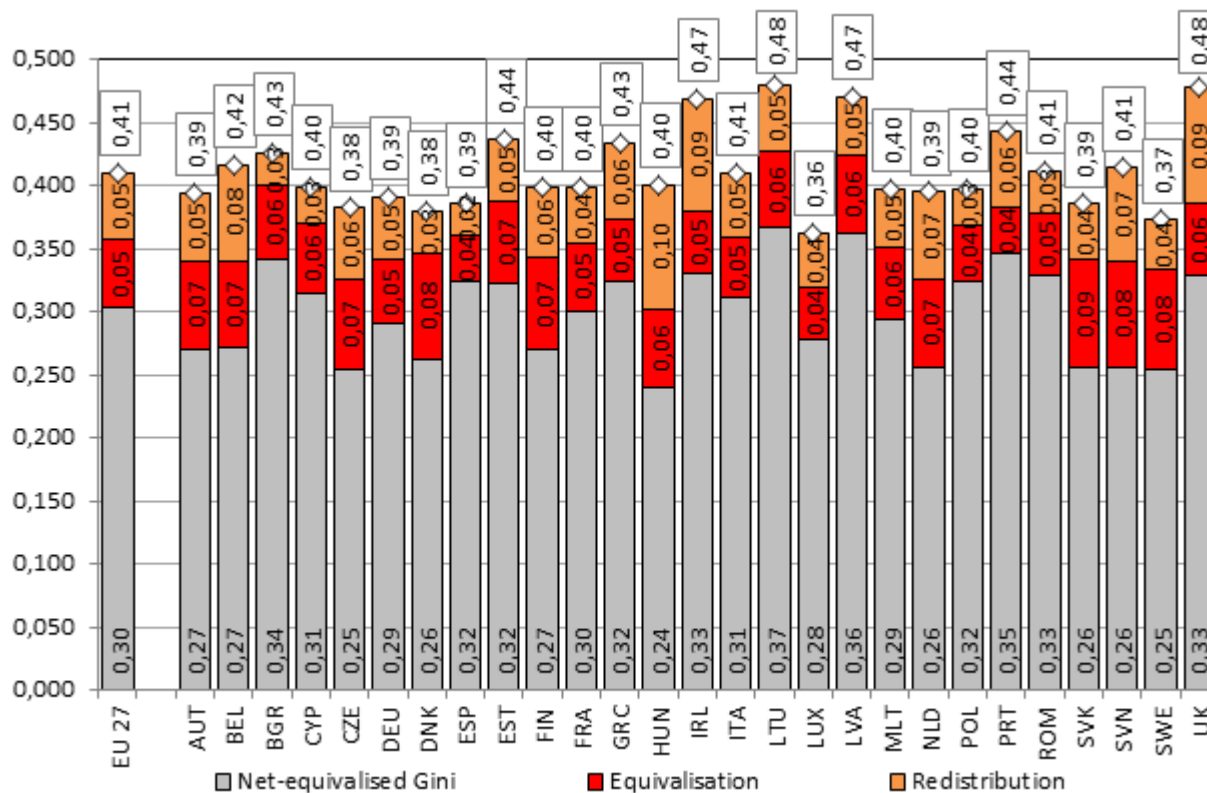
Note: EU27 distribution after PPP conversion. Source: EU-SILC (author's calculation).

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of earners in the household (see next section) may reinforce the population gradient of the income distribution if it shifts larger households to higher levels of income and confines the single-breadwinner households to the lower ranks of the distribution.

It is beyond the purpose of this study to elaborate on this issue. It seems advisable that policy-making pays equal attention to the effects of household formation. Preferably, international datasets should address this distinction and include inequality measures for non-equivalised and gross income distributions.

From earnings to household income inequality and back

Among gross incomes, which was my starting point, and for the Top-10% in particular, market incomes play the most important role. In terms of household incomes, labour earnings are a major source of market incomes and play a very important and growing role among top incomes. Figure 4 shows the role of earning-dependent households in the income of all households for the Top-10% and the poor. In terms of EU-wide PPP-converted gross incomes, their share is 70% among all incomes and 80% among top incomes,

which is in contrast to only 26% among poor households' incomes. Conversely, the share of those with Top-10% incomes among all labour households' incomes alone is 35% (not shown).

The picture shows modest international variation in the national importance of labour households, from a minimum of less than 60% of total income in Greece and Italy, to a maximum of almost 90% in Estonia and Latvia. In most cases, the incomes are skewed towards the top of the distribution; for example, in 24 countries, their presence in the Top-10% exceeds that among all households. In Estonia and Latvia the entire Top-10% consists of labour households; Bulgaria, Czech Republic, Greece and Italy are at the lower end with 70% or less and without a clear overrepresentation at the top. The presence of labour households among the poor is more varied and rather high in countries with a high incidence of poverty in general. Taking a different perspective, of all labour households in Luxembourg 47% belong to the EU-wide Top-10% of all labour households, while Belgium, the Netherlands, Austria, the UK and Ireland are all between 30% and 40%.

The WWID provides a break down by source of income that places this result in a long-term perspective, regrettably
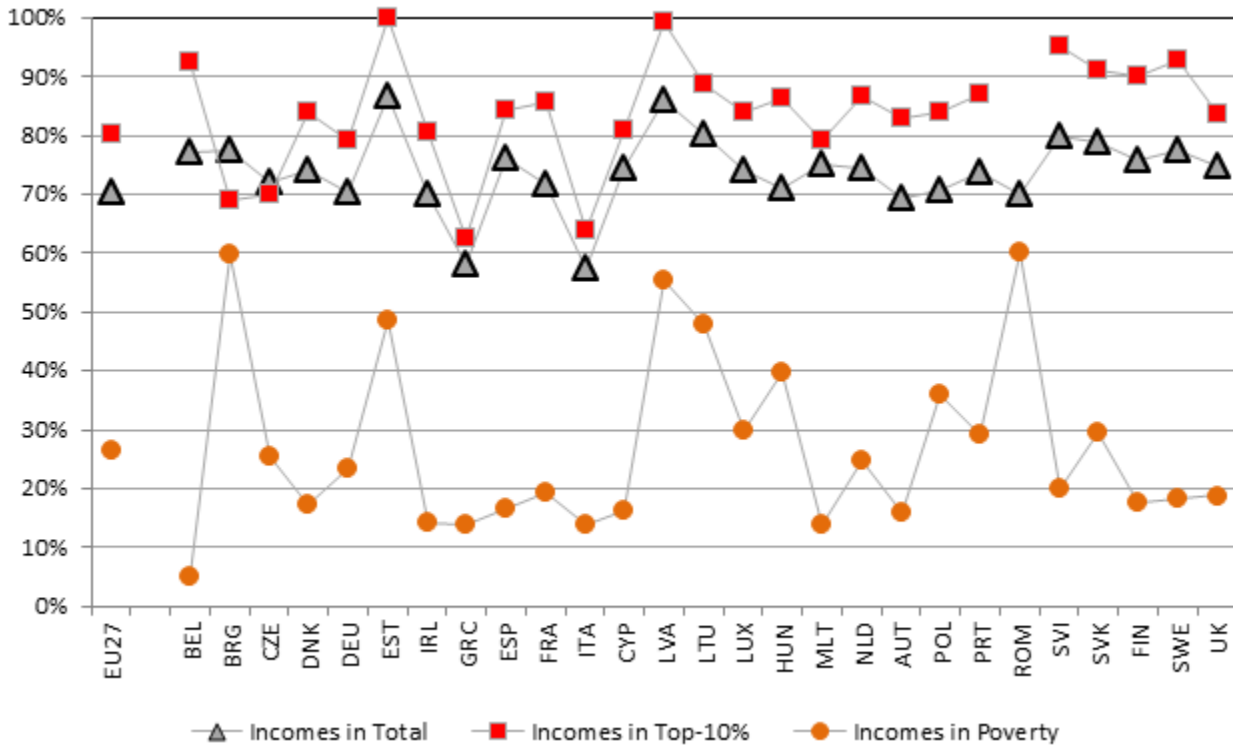
*Notes: EU27 distribution after PPP conversion. *) At least half of their income is from earnings.*
Source: EU-SILC (author's calculation).

Figure 4. Labour household* gross-income shares among all households, Top-10% and poor households, 2010.
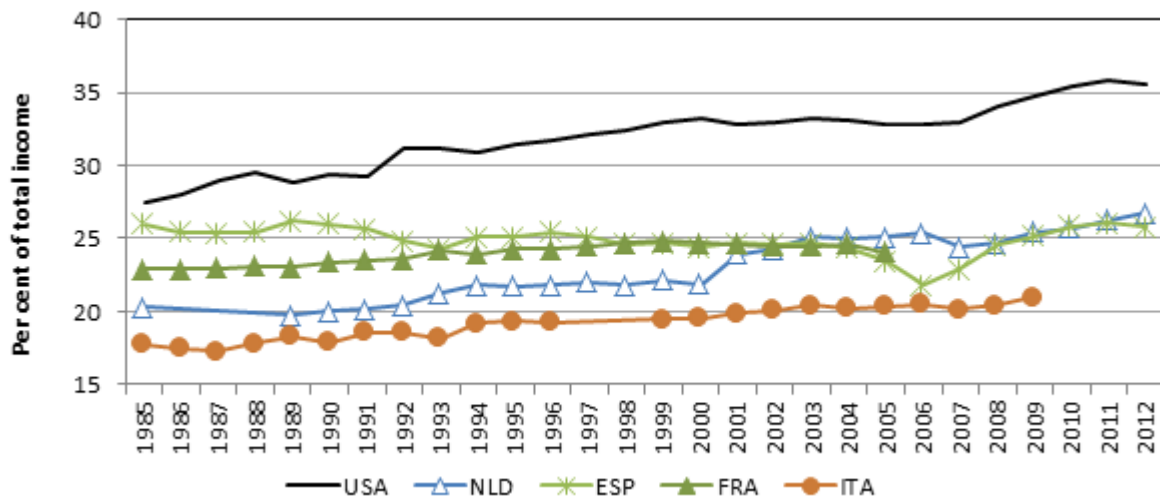
Note: This concerns fiscal units, not households. Source: WWID (author's calculation).

Figure 5. Share of earnings in Top-10%, percentage of total income, fiscal units, 1985–2012.
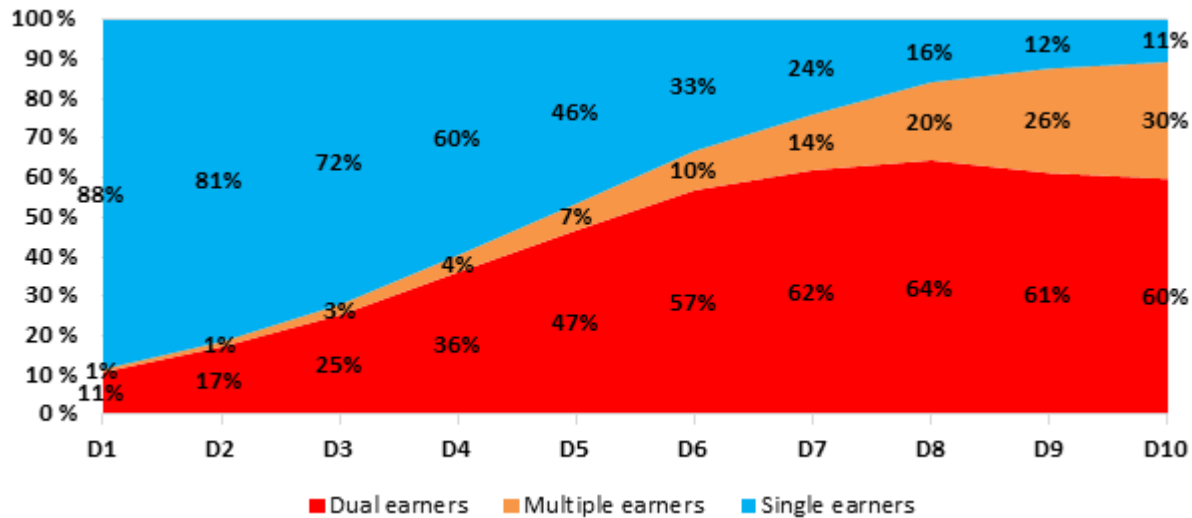
*Note: Labour households receive their main income from earnings. *) EU27 excluding Cyprus and Malta.
Source: Salverda and Haas (2014).*

Figure 6.   Within-decile distribution of labour households by number of earners, EU25*, 2010.

only for a few countries (Figure 5). Labour earnings received by the Top-10% households as a percentage of overall income have grown by 8 percentage points in the USA, 6 in the Netherlands, 3 in Italy, and 1 in France, but Spain remains unchanged. Plausibly, labour households have also shifted higher up the income distribution in other countries, but not necessarily in all countries.

It is important to realise the responsibility of the number of earners within labour households for this situation and for the overall evolution.[7] Single-earner households are a minority, and they concentrate at the bottom of the households' earnings distribution (Figure 6). By contrast, households with two or three-or-more earners have a strong presence at the top. Likely this distribution has grown more skewed against single earners in recent decades as household joblessness decreased less than personal employment increased, implying a stagnation of the household rate of employment and a growth of the number of earners in households (Corluy and Vandenbroucke 2013). Consequently, individual earners concentrate higher on the income distribution because of their household membership. Only the very high paid in the individual earnings distribution will make it to the top with their household as single earners, while on average the individual earners in the other households at the top find themselves at lower levels of the earnings distribution (Salverda and Haas, Salverda & Haas 2014, Figure 3.11).

The excess of low-paid employees over in-work poor employees (Figure 7) means that a significant share of low-wage earners must be members of dual-earner or multi-earner households that are not poor. For lack of data on hourly pay, the EU-SILC does not enable us to verify the presence of low-paid workers across the household income distribution and particularly not at the top. I circumvent this constraint with a second-best solution that focuses on the least-skilled

or 'elementary' occupations instead, which have a high likelihood of low pay. Those jobs are found even at the very top of the income distribution (Figure 8). In other words, individuals from the bottom of the earnings distribution may be members of the highest income households. Clearly, this will influence job competition in the low-paid segment as these people start from a background of sufficient income in the household. Many will seek a combination with other activities, such as household care and education, and compete on different terms than making a living out of their earnings. Substantially more than half of all low-wage employees work part-time in Austria, Belgium, Germany, Netherlands, Sweden and the UK. This is in contrast with Eastern European countries where there is little part-time employment in the first place.[8] Part-time, low-paid jobs generally provide insufficient income for maintaining a household; however, they make it easier for households to supplement additional labour supply in combination with other (household or educational) activities.

Summary

The first conclusion is that EU27 as a whole has lower level of income inequality than the USA, while the variation within the two entities seems reasonably comparable. Second, the equivalisation of incomes plays an equally important

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[7] Salverda and Atkinson (2007, Figure 10.9A) show the contribution of dual earners to Top-10% incomes for the Netherlands since 1977, when data became first available.

[8] Salverda and Haas (2014, Figure 3.10) indicate for the EU on average that of all Top-10% labour households 16% contain a part-time worker, and approximately 8% of all individual employees in these households work part-time.
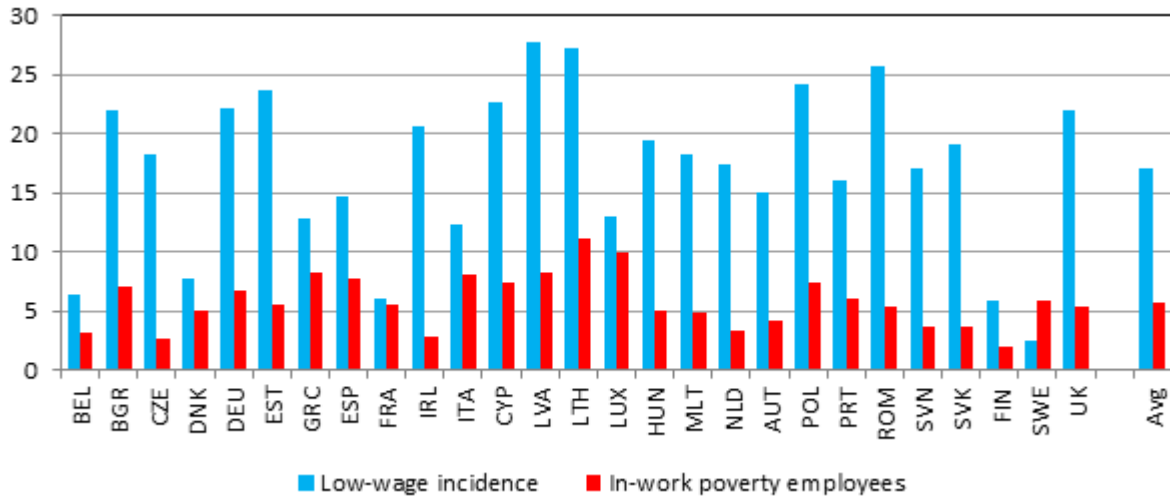
Note: Low pay is below two thirds of median gross hourly earnings; poverty is below 60% of median household income.
Source: Eurostat, SES 2010 and At-risk-of-poverty [ilc_li04]

Figure 7. Incidence (%) among employees of low pay and in-work poverty, 2010.
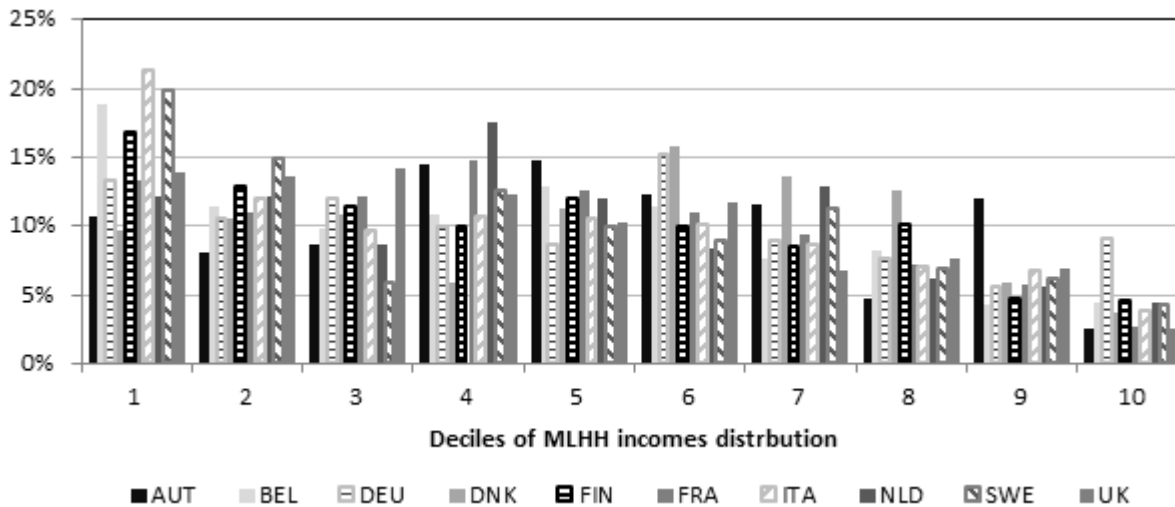
Source: Salverda 2016b, Figure 20. (SILC 2013 for year 2012, author's calculations).

Figure 8. Distribution of elementary jobs over deciles of labour households' income distribution, 2012.

role as the redistribution of incomes for reducing inequalities. This points to important effects of household formation that warrant more attention in the analysis of inequality and in policy-making. Third, the distribution of gross incomes remains the main driver of income inequality as internationally comparative levels barely change under the influence of redistribution and equivalisation. Finally, a crucial role is found for earnings from labour, which is the main type of market income. Increasingly, households with earnings shift higher on the income distribution and 'occupy' the Top-10%, largely due to the growing number of dual and multiple-earner households. In turn, high-income households supply low-paid labour and affect job competition in low-wage labour markets. It is a major issue to consider for policy-making concerning the future course of income inequality.

Acknowledgements

analytical base for integrating the study of household income inequality with that of wages and employment inequalities.

Data sources

ACS: American Community Survey
(https://www.census.gov/programs-surveys/acs/)

ECHP: European Community Household Panel
(http://ec.europa.eu/eurostat/web/microdata/european-community-household-panel)

EU-SILC: EU Statistics on Income and Living Conditions
(http://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions

LIS: Luxembourg Income Study
(http://www.lisdatacenter.org/)

OECD-IDPD: OECD Income Distribution and Poverty Database
(http://www.oecd.org/social/income-distribution-database.htm)

SES: Structure of Earnings Survey
(http://ec.europa.eu/eurostat/web/microdata/structure-of-earnings-survey)

WWID: World Wealth and Income Database
(http://www.wid.world/)

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