

# Rising Inequality in OECD Countries: How Does the Middle Class Fare?

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# **Rising Inequality and Living Standards in OECD Countries: How Does the Middle Fare?**

## **1. Introduction**

Concern about increasing income inequality in rich countries has become a common theme among commentators, politicians and international organisations, often focusing on the share going to the very top and linked to the implications for the living standards of those in the middle or lower parts of the distribution. Increasing inequality in a context of rising real incomes for ordinary working families would still be of concern to those focused on fairness or broader societal impacts, but would not resonate to the same extent as where the “middle” is seen to be “squeezed” in terms of living standards. The hollowing out of the occupational structure and polarisation of the wage distribution (Autor and Doorn, 2013, Goos and Manning, 2007, Goos, Manning and Salomons, 2009), polarisation in the broader income distribution (Foster and Wolfson, 2010) and ‘secular stagnation’ linked to inequality (Summers, 2014) are all seen as threats to prosperity for ordinary working families. As a consequence, the joint impact of inequality and growth on living standards for the middle and lower parts of the distribution has become an important research topic (Kakwani and Son, 2008, Dollar, Kleinberg and Kraay, 2015), and the need for “inclusive growth” has become a rallying-cry and a central focus for the OECD (de Mello and Dutz, 2012, OECD, 2015) among others.

This paper uses data from the key comparative distributional data sources available for the rich countries over a substantial period of time to examine how inequality and living standards have co-evolved from around 1980 through the Great Recession. Drawing on data from the Luxembourg Income Study, the OECD Income Distribution Database and the World Top Income Database, it investigates the extent to which increasing inequality has been associated with “middle class squeeze”, in the sense of stagnating real incomes for the middle and lower parts of the distribution, across 30 rich countries. The experience of the USA over the past 30 years has played a major role in influencing research and commentary on inequality and living standards, so establishing the extent to which that is distinctive versus representative is

particularly important. The findings have major implications not only for the empirical relationships involved but also for how national progress is best captured, including the relationship between indicators drawn from the national accounts versus household surveys which has recently begun to receive in-depth consideration (Atkinson, 2013a, b, Fesseau, Wolff and Mattonetti, 2013).

The paper is structured along the following lines. We begin with a discussion on inequality and the squeezed middle, aimed at teasing out how “the middle” might be captured and the channels by which inequality might impact on it. Section 3 describes the data on which we rely, covering most of the countries of the OECD. In section 4 we look at how real incomes evolved over time for these countries, at the median and lower down the distribution. We then document trends in income inequality in Section 5, as measured by the Gini index and the  $P_{90}/P_{10}$  and at the very top of the income distribution. In Section 6 we examine whether the evolution of living standards in real terms appears to be associated with changes in inequality. Section 7 presents the key findings and priorities for further analysis.

## **2. Inequality and the “squeezed middle”**

While the notion that the middle has been squeezed as a result of increasing inequality is widespread, it is open to a variety of interpretations, depending on what one sees as “the middle” and what constitutes being “squeezed”. Economists investigating the squeezed middle have usually focused on those in the middle of the income distribution (Gornick and Jäntti, 2013), rather than those in the middle class in sociological terms, although a good deal of the popular and political discussion refers to the “middle class” in the latter sense, who would generally be higher up the income distribution. Being “squeezed” may be taken to refer in the first instance to losing out in terms of shares in total income, but that is certainly not the whole story: little or no real income growth over time, having to rely on running up debt to finance consumption, greater insecurity and vulnerability in income due to greater risks of unemployment and volatility in earnings all feature strongly in the debate. Taking a more medium-term perspective, one can also include concerns about the ability of middle-class families to maintain their position and lifestyle and

pass it on to their children, not only due to pressures on real incomes but also on financing their children's education and helping them become home-owners.

Why would increasing income inequality give rise to such a "squeeze"? Seen in terms of shares there is of course a direct channel: if the very top receives an ever-increasing share of total income, then there must be a compensating decline in the share going elsewhere. The focus on "the middle" – broadly conceived – losing out may then reflect a perception that those towards the bottom, who may rely substantially on social transfers, are being protected. Whatever the reality, this perception may feed into the notion that it is "ordinary working families" who lose out most, and fuel political concern about "making work pay" and supporting those who are "striving". The impact of the economic crisis, while demonstrating the critical role that transfers play in cushioning the effects of such a major shock on household incomes, may well have accentuated such concerns where taxes on those in work increased in the face of fiscal deficits.

Rather than relating purely or even primarily to income shares, though, concerns about the impact of increasing inequality on "the middle" also reflect the belief that it contributes to stagnation in their real incomes, undermining the capacity to generate prosperity, security and opportunity for "ordinary working families". The channels through which it has been suggested that increasing inequality may have such effects are complex and varied, and include:

- fuelling household debt and the toxic pre-crisis combination of reckless lending, real estate bubbles and financial innovation;
- hindering recovery through its impact on aggregate demand since the wealthy have a relatively low marginal propensity to consume;
- contributing to a continuation of similar cycles of boom and bust via the need to continually expand credit in the absence of wages growth;
- undermining investment in new or replacement capital stock and thus limiting the growth in the economy's productive capacity;
- constraining the ability of middle and lower income households to invest in education and skills, leading to a workforce that is less-well educated and adaptable in the face of globalisation and technological change;

- reinforcing barriers to socio-economic mobility from one generation to the next, reducing opportunity and lowering growth as some fail to reach their full productive potential;
- entrenching the power of existing elites to protect their economic interests including rent-seeking, increasing barriers to entry and stifling innovation and ‘creative destruction’;
- exacerbating pressures for short-term responses to stagnating living standards such as greater protectionism in trade and further restriction of immigration;
- undermining the political and legal institutions and social trust that are now recognised as key to growth.

Such potentially important channels have featured in Stiglitz’s highly influential contributions (2012, 2015), in recent studies by the IMF and the OECD (see for example Ostry *et al*, 2014, Cingano, 2014, OECD, 2015), as well as financial sector commentary such as Morgan Stanley (2015) and Standard and Poor’s (2014).

Rather than tease out whether or which specific channels have operated or been central, our aim in this paper is to describe and assess overall trends and patterns in real incomes and income inequality over time across OECD countries and probe whether they appear to be related. We now describe the data to be employed for this purpose

### **3. The Data**

#### ***3.1 Underlying micro datasets***

Our analysis of the evolution of incomes and their distribution is based primarily on the two sources which provide data on income in a standardised way across countries and time that have featured prominently in seminal studies on inequality and poverty, namely, the Luxembourg Income Study (LIS) database (used for instance in Atkinson, Smeeding and Rainwater, 1995; Gornick and Jannti, 2011), and the OECD Income Distribution and Poverty database (*e.g.*, OECD, 2008; 2011; 2015). We briefly describe these datasets here; in each case detailed information is provided on the relevant websites, and the LIS and OECD datasets have also been the subject of recent in-depth reviews by Ravallion (2015) and Gasparini and Tornarolli (2015) respectively.

The LIS database allows the microdata to be accessed (remotely to safeguard confidentiality), so that inequality and poverty measures and income levels at different points in the distribution can be derived directly and consistently from the underlying data at the individual and household level. The OECD database, on the other hand, comprises a substantial set of such variables collected using a standardised questionnaire sent to member countries and filled out by them from national surveys.<sup>1</sup> LIS has assembled data for most of the countries it covers in ‘waves’ for occasional years around 1975, 1980, 1985 and so on, at approximately 5-year intervals, whilst the OECD database, has sought to include annual data for more recent years. LIS allows one to go back as far as around 1980 for rather more countries than the OECD database, but OECD has information on New Zealand, Portugal, and more than one year of information for Japan.

As the LIS and OECD databases complement each other, the EEG dataset contains figures derived from both sources. For presentational purposes the paper will concentrate on figures from LIS, noting where the OECD database would lead to markedly different conclusions for a particular country. Here we start our analysis around 1980 where possible, not further back since neither source has many observations before that, and concentrate most of our attention on 27 countries for which LIS data are available from at least 1990.<sup>2</sup> We concentrate on OECD countries only and among them do not include middle-income Chile and Mexico.

### ***3.2 Measuring living standards***

Our central measure for living standards is equivalised disposable household income. The concept of disposable household income employed in the LIS and OECD databases is in principle the same, as are the components in terms of earnings, self-employment, capital income, and taxes and transfers, though there may be subtle differences in operationalization across countries or over

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<sup>1</sup> The material on the OECD website also includes a valuable quality review, see OECD (2012).

<sup>2</sup> We have dropped a small number of observations in LIS where breaks in series have given rise to substantial changes in definitions or coverage, based on information provided about the underlying data sources and patterns in the data, namely Austria 1987 and 1995, Germany 1981, 1983, Netherlands 1983, 1987, 1990 and Switzerland 1982, 1992. We also do not use Israel 1979 or Poland 1986 because comparable PPP information (see below) is not available.

time.<sup>3</sup> In using household income as a measure of living standards for households at different income levels, we divide income by the square root of household size in making this adjustment to take differences in household size and composition into account.

To capture trends in real incomes over time for the middle versus other parts of the distribution, a number of approaches can be adopted and have featured in debates about the “squeezed middle”. One is to focus on income levels for specific deciles or quintiles of the distribution, in which case the proportion in each group remains constant over time. Here one can track how incomes at cut-off points between deciles or quintiles have evolved, such as the median which separates the fifth from the sixth decile. Another possibility would be to use average income within a decile or quintile, an approach for instance followed by Dollar *et al.* (2015). The EEG dataset contains both decile cut-offs and averages. The numbers do not deviate much – for the LIS data set the correlation in levels and growth rates for the median, or the cut-off point between the 5<sup>th</sup> and 6<sup>th</sup> decile, and the average of the 5<sup>th</sup> or 6<sup>th</sup> decile, is above 0.99. Since the cut-offs contain the median income, and as cut-offs as opposed to averages are not affected by top and bottom coding, we use these.

An alternative way of measuring the “squeezed middle” is to define a share of the population falling between certain income lines. Alderson *et al.* (2005) and Atkinson and Brandolini (2013) for instance show that the relative size of the middle-income group, defined as the share of people with an income between 75 and 150 per cent of the median wage, has decreased over time (see also Foster and Wolfson, 2010). Yet, this indicator does not convey information about the level of incomes and hence the living standards of people as such, but about the distribution of the population around certain income demarcation lines.

To use income levels to capture (absolute) living standards, we need to correct for differences in price levels over time and in purchasing power across

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<sup>3</sup> In using data from LIS we set negative disposable household incomes to zero but retain all households with zero disposable income, rather than dropping negatives or zero incomes as is sometimes the practice, and we do not apply top and bottom coding. Top and bottom coding would only affect the calculation of the inequality scalars, not the cut-off points. For the OECD database, it is not always clear whether top and bottom coding has been applied or how negative incomes have been treated, as noted in the OECD’s quality review report on the database.



countries. We use the consumer price index (CPI) to deflate household income. Unfortunately we do not have standardised CPI information at different deciles of the distribution for our full sample of countries (see for an application to the UK Flower and Wales, 2014). Thus, we have to assume that price changes affect the purchasing power of households across the distribution in a comparable way – an assumption implicitly made as well by examining Gini coefficients without corrections for this. To convert all income to a common currency, in our case 2010 US dollars, we apply purchasing power parities (PPP) for actual individual consumption to household incomes, sourced from OECD National Accounts.

### ***3.3 Measuring income inequality***

The EEG dataset contains income inequality measures both from LIS and OECD. For this paper we focus on two measures, namely the Gini coefficient, the most widely used summary inequality measure, and on  $P_{90}/P_{10}$ , which is the ratio of the income cut-off dividing the ninth from the top decile to the cut-off dividing the bottom from the second decile. The  $P_{90}/P_{10}$  is a useful complement to the Gini by capturing the evolution in the tails of the distribution, since the Gini index is particularly sensitive to changes in the middle of the income distribution. Moreover, we can construct it using our decile cut-offs to guarantee consistency across measures. In this paper we multiply the Gini by 100 for presentation purposes.

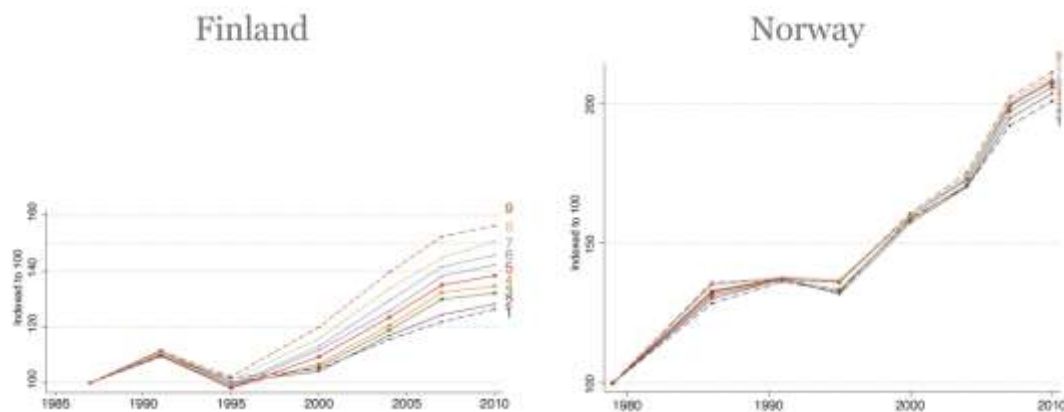
The household surveys on which both the LIS and OECD databases rely have difficulty capturing what is happening at the very top of the income distribution, so for that purposes we also draw on the World Top Income Database which brings together estimates for a range of countries of the share of total household income going to the top 1 per cent. These are based on analysis of data on incomes going to the top derived from the administration of income taxes, together with national accounts data on the total income going to households. The database itself is described in detail on the website (<http://topincomes.parisschoolofeconomics.eu>), and the trends in top incomes over the last century or more have been analysed in depth in Atkinson and Piketty (2007, 2010), Atkinson, Piketty and Saez (2011), Alvaredo *et al.* (2013), as well as underpinning the much-commented-on recent book by Piketty (2015).

Data are only available for some OECD countries, and importantly refer to the share of the top in gross rather than disposable income – that is, before income tax and social insurance contributions are deducted.<sup>4</sup> Nonetheless, they serve as a valuable complement to the data on the distribution as a whole from the LIS and OECD databases.<sup>5</sup>

#### 4. The evolution of living standards

There is significant variation in the levels and evolution of living standards across countries and periods. First we focus on the growth rates of living standards at different deciles within countries. We illustrate this by comparing Norway with very strong and inclusive growth, marked by bundled decile trends, to Finland, where growth was more modest across the distribution and has been divergent across the distribution since 1995. For the bottom decile in Norway real income doubled over the full (slightly longer) period, whilst in Finland growth was much more modest and more uneven, ranging from 56 per cent for the top decile to 26 per cent for the bottom.

**Figure 1: Finland's fanning out compared to inclusive Norway**



What can we conclude more generally about the evolution of living standards across the distribution? Averaging across our sample where we calculate the average annual growth rate between LIS waves, we can see that

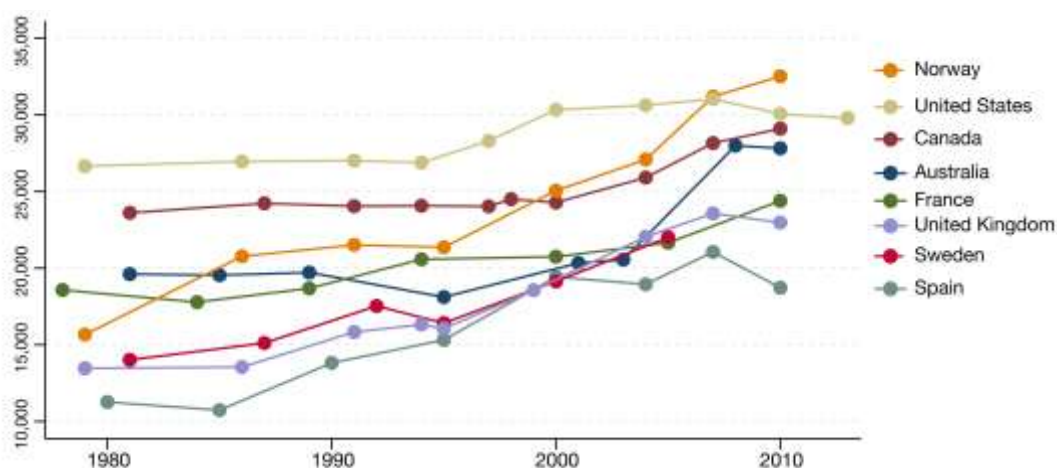
<sup>4</sup> Estimates on a post-tax basis have been produced in separate studies for a few countries, but for comparative purposes one must rely on the gross income figures for the present.

<sup>5</sup> To maximise coverage, we use 2009 information for Italy, Finland, and Ireland for 2010; 2008 information for Germany for 2010; and 1981 data for Spain 1980.

inequality went up: the bottom decile saw an average annual increase of 1.2 per cent, a number that monotonically increases to 1.5 per cent for the median, and 1.7 for the top decile. The growth rates across deciles are quite strongly correlated – for the median the correlation is higher than 0.94 for all deciles apart from the bottom (0.89) and top (0.88). The third decile, which we will use as another indicator for the middle, correlates more strongly with the bottom decile (0.93). Not surprisingly given large income differences between countries, the correlations across deciles are higher in levels (all higher than 0.92 for the median).

Given our interest in the middle of the income distribution, we continue by showing the evolution in living standards levels for the median and the third decile across countries. Figure 2 graphs the evolution of the median over time for the countries where we have data going back as far as about 1980 from LIS. This shows that growth in Norway was spectacular in international comparison, while at the other extreme the USA saw only a very modest increase, with the result that Norway's median had risen above the US figure by the end of the period. In between those extremes, Spain, Sweden and the UK saw median income rise by about two-thirds, though with a sharp decline in Spain towards the end of the period, while Canada and France saw much more modest growth and Australia saw limited growth up to the early 2000s but then a very substantial pick-up.

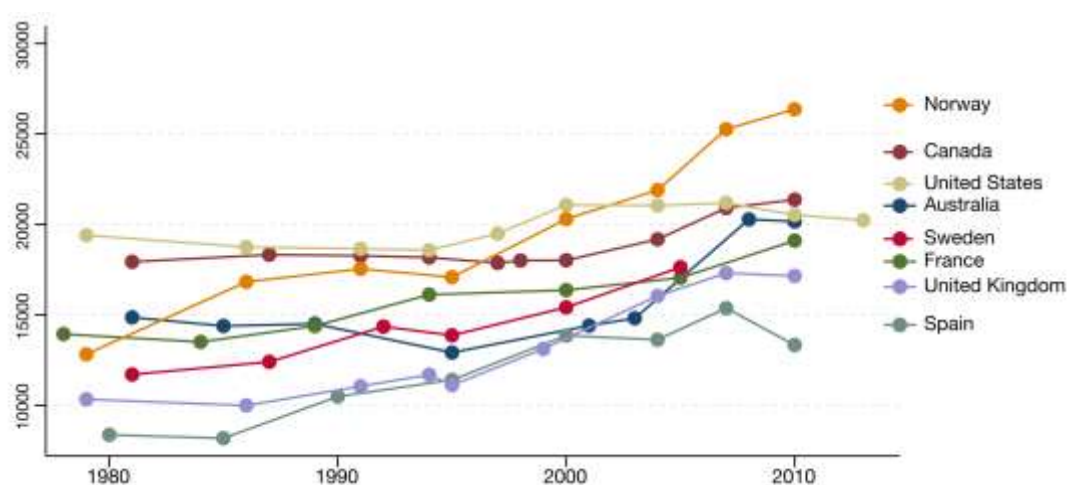
**Figure 2: Evolution of median living standards across countries from around 1980**



For the countries where our earliest observation in LIS is about 1985, there is similar variation. Ireland and Luxembourg saw median income doubling over the 25 years, Italy and Denmark had aggregate rises of about 20 per cent, with Finland doing considerably better but Germany doing worse. The four countries for which our first observation in LIS is for about 1990, all experiencing the upheaval of the post-communist transition, also display striking differences. Hungary had a sharp initial decline in median income and a subsequent recovery sufficient only to bring the median back to about where it was in 1990 in purchasing power terms. Poland also saw a sharp initial decline, but the subsequent growth, notably from the mid-2000s, was strong enough to produce a substantial increase over the whole period.

As well as the median, in thinking about the “squeezed middle” we may also be particularly interested in the evolution of real incomes among those who are above conventional poverty thresholds but clearly in the lower part of the distribution. For this purpose we look at the change over time in the  $P_{30}$  or the third decile. In Figure 3 we show the trends for the sample for which we have information from about 1980 onwards. While these are generally similar to the evolution of the median, they are not identical (especially over particular sub-periods) and it will be important to separately examine both.

**Figure 3: Evolution of living standards for the  $P_{30}$  across countries from around 1980**



While these are the patterns of real income growth seen from the LIS data, as was the case for inequality the OECD database does not always tell the same story when it comes to changes in median income. We therefore categorise countries in terms of the average annual growth rate in median income over the longest period covered in the LIS data, and note where the OECD database provides a similar picture versus a rather different one. We employ a set of (necessarily somewhat arbitrary) cut-offs, leading to the groupings shown in Table 1.

**Table 1: Annual average growth in median income by country over the longest period**

Average growth per year	Country
<i>Very strong growth</i> (2% or more)	Belgium <sup>(-)</sup> , Czech Rep, Estonia, Greece (?), Ireland, Luxembourg, Norway, Slovak Republic, Slovenia
<i>Strong growth</i> (1.6% < 2%)	Israel <sup>(+)</sup> , Poland, Spain, Sweden, UK
<i>Some growth</i> (1%-1.5%)	Australia, Finland, Netherlands
<i>Modest growth</i> (0.5% < 1%)	Austria, Canada, Denmark, France, Germany, Italy, [New Zealand]
<i>Little or no growth</i> (< 0.5%)	Hungary, Iceland, USA, [Japan]

Note: OECD data would suggest the countries marked with (+) or (-) would move up or down a category – see text

Deriving average growth rates in the median from the OECD database, about half the countries covered in both would be in the same category as shown in Table 1. The OECD database also provides trend data for Japan and New Zealand, on which basis they can be allocated to the bottom and second category respectively. There are then marginal difference for France and the UK which would just suffice to relocate them across the category boundaries, although the time-period covered in the LIS is longer and it might be preferred for that reason; taking the period covered by the OECD data into account would mean Belgium would move down a category while Israel would move up. For Ireland,

Poland and Spain the OECD data shows much lower growth but covers only from 2004 onwards and includes 2011 and thus more of the impact of the Crisis. For Luxembourg, the average growth rate in the OECD database is lower than in LIS despite covering much the same period but it remains a good performer. Greece is more problematic: the OECD data covers from 1986 whereas LIS is from 1995, but the average growth rate in the OECD data is very much lower (even when the same end-year is used), which clearly requires further investigation.

As well as the striking variation across countries in overall income growth over the whole period the available data allow us to cover for each, for most countries this also varied substantially from one sub-period to another, as is obvious from Figures 2 and 3. These countries also varied greatly in their situation at the beginning of the observation period and in the environment in which they operated over the period. Some countries had already achieved high levels of income by the 1980s, while others started from low levels and were catching up.

Focusing on the increase in median income in real terms versus percentage growth rates will affect our perspective on how well or badly specific countries have done to an extent, but it is striking that the USA's performance remains particularly poor by either standard. Countries also faced major differences in the environment in which they operated, most obviously in the case of the transition countries of eastern and central Europe, some countries benefitted in particular periods from oil or mineral resources, while Germany had to cope with the incorporation of its lower-income East. Nonetheless, it is clearly of interest to set the observed trends in real incomes against what happened in terms of income inequality and economic growth, as we seek to do in the next sections.

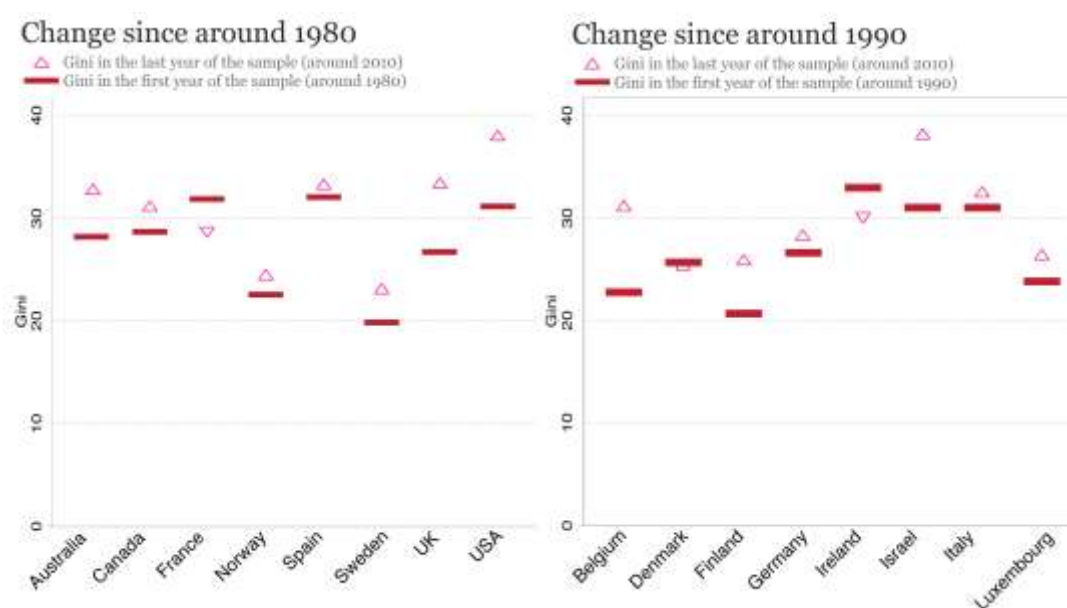
## **5. Trends in income inequality and economic growth**

### ***5.1 Generic measures of income inequality***

In order to assess trends in overall income inequality across OECD countries, we look first in Figure 4 at what happened to the Gini coefficient over time for the countries for which we have data in LIS beginning in about 1980 (left hand side) or 1990 (right hand side). The figure shows both the initial level

of the Gini – in the first year for which we have data – and the level in the latest observation in LIS. We see that there have been substantial increases in the Gini for many countries, but that inequality has risen a good deal more in some countries than in others, and has not risen significantly, or indeed has fallen, in a number of others. So while inequality has increased in a clear majority, there is no uniform trend: country experiences vary widely.

**Figure 4: Long-term trends in the Gini coefficient**



It may be helpful to categorise countries into necessarily somewhat arbitrary or impressionistic groupings by the change in the Gini coefficient shown in LIS, both to see whether other sources show a similar picture and then as a point of reference when we come to consider how trends in real incomes relate to those in inequality. This would provide the picture presented in Table 2 for countries for which there is LIS data going back at least to the 1990s. There are another three countries for which there is data over time in LIS but only for a shorter period, namely Estonia for 2000 to 2010, Iceland for 2004-2010, and Switzerland for 2000-2004; in all of these the Gini coefficient fell over the period covered.

**Table 2: Trend in the Gini index by country over the longest period**

Change in Gini	Country
<i>Pronounced increase</i> (4 points or more)	Australia, Belgium <sup>(-)</sup> , Czech Rep. <sup>(-)</sup> , Finland, Israel, Poland, Slovak Rep., Sweden, UK, USA, [New Zealand]
<i>Substantial increase</i> (2 < 4 points)	Canada, Germany <sup>(+)</sup> , Italy, Luxembourg, Norway, Slovenia, [Japan]
<i>Some increase</i> (1 < 2 points)	Spain
<i>No change</i> (<1 > -1 points)	Denmark <sup>(++)</sup> , Hungary <sup>(+)</sup> , Netherland <sup>(+)</sup>
<i>Fall</i> (1 point or more)	Austria <sup>(+)</sup> , France <sup>(++)</sup> , Greece, Ireland,
Note	OECD data would suggest the countries marked with (+) or (-) move up/down one or (++) two categories - see text below.

It is also important to assess, though, whether alternative data sources suggest the same broad groupings of countries in terms of overall change in the extent of inequality. The OECD data first allow us to add two countries for which trend data is not available from LIS, namely Japan and New Zealand; both are seen to have experienced marked increases in the Gini coefficient, on which basis Japan would be allocated to the “substantial increase” category in Table 2 and New Zealand to the “pronounced increase” category, as shown by their inclusion in brackets in the Table. (The OECD database also includes Portugal, unlike LIS, but only for 2004-11 over which period the Gini declined sharply.) Then, comparing the two databases for the countries included in both reveals a rather different pattern of change in the Gini coefficient over time for quite a few countries; sometimes but not always this reflects (perhaps among other things) the fact that a different period is being covered. So it is worth teasing out the implications for the picture presented in Table 2.

We can first distinguish countries where different periods are covered in the two sources and this may explain the different trends observed. Belgium is among the countries where LIS data shows a very marked increase in the Gini,



but OECD data show a decline; however, the former covers 1985-2000 whereas the latter relate to 2004-2010. Similarly, Austria shows a declining Gini above whereas OECD data show some increase, but again the former covers 1994-2004 whereas the latter relates to 2004-2011. For the Netherlands, LIS shows inequality declining marginally from 1993, but OECD data going back to the late 1970s suggests some increase over that longer period. For Poland, LIS data show a pronounced increase over the period from 1992, whereas OECD data covering only from 2004 show a very substantial reduction; for the Slovak Republic and Slovenia LIS also shows increasing inequality from the 1990s, whereas OECD shows a marginal decline from 2004. For Sweden, the increase from the early 1980s is even larger in the OECD data than in LIS, but the latter only cover up to 2005 whereas OECD extends to 2011. For the UK, OECD data show a rather more modest increase than LIS, but only cover from 1985 rather than 1980.

As Toth (2014) emphasises, inequality may often rise (or fall) in discrete “episodes” rather than consistently over a lengthy period, most dramatically in the case of the countries experiencing transition from state socialism in the 1990s but also to a significant degree in other OECD countries. This becomes clear when one moves from examination of the change in inequality over the entire period covered by LIS (or OECD) data to focus on sub-periods from one wave to the next, of (approximately) 5 years in length. For most countries, there is very substantial variation across these sub-periods in movements in the Gini; to give just a few examples, inequality grew rapidly in the UK in the 1980s but was stable from about 1995 and also increased much more rapidly in the USA before that date than after it, while Sweden saw some periods when inequality rose very rapidly and others where it fell. This means that the categorisation of countries in terms of changes in inequality will very much depend on the particular period examined, and what period happens to be covered by the available data may play an important role. Looking back at Table 2, then, taking both LIS and OECD data into account to cover the longest period possible might lead us to allocate Austria to the “no change” rather than “fall” group, Belgium to the “substantial increase” rather than “pronounced increase” grouping, and the Netherlands to the “some increase” rather than “no change” grouping (so they have been marked with an (+) in Table 2 to reflect this). (For Poland, Slovak

Republic, Slovenia, Sweden and the UK, the two datasets overlap but LIS covers the longer period and the categorisation in Table 2 is not affected).

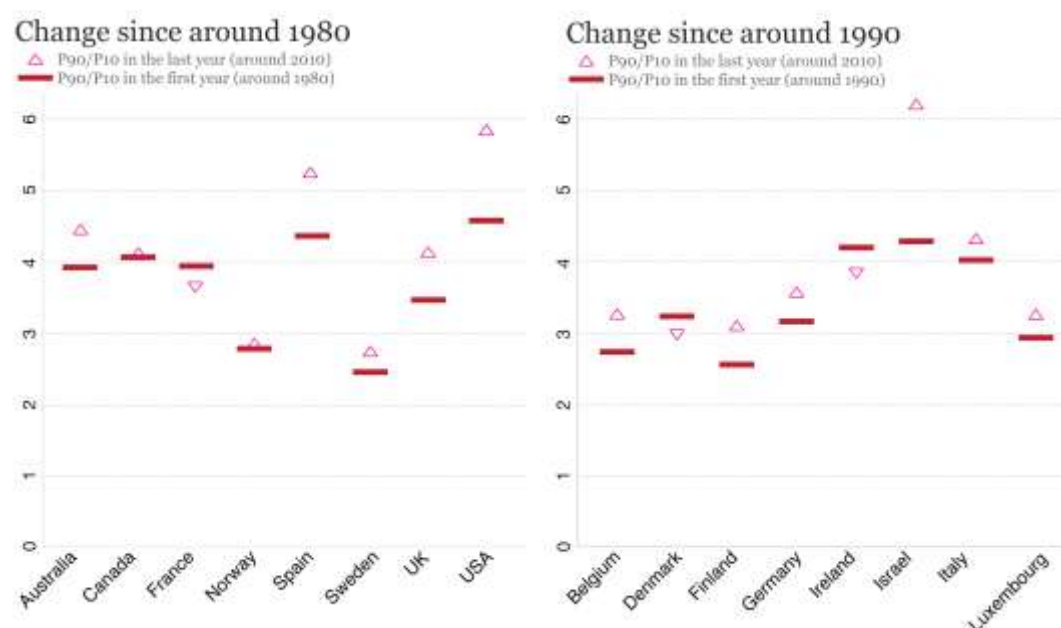
More problematically, though, there are a number of countries for which the OECD data cover the same period as LIS but show a different picture. For the Czech Republic LIS has a much greater increase in the Gini than the OECD database, whereas for Germany the OECD has a much more pronounced increase, and for Hungary the increase in OECD is also greater. The differences would in each case be enough to move them up (Germany, Hungary) or down (Czech Republic) a category in Table 2 (as signified by the (+) and (-) with which they have been marked).

The two sources diverge even more for two countries where once again the same period is covered in both. For Denmark the Gini declines marginally in LIS whereas the OECD database shows a considerable increase, and for France LIS shows inequality declining substantially whereas the OECD suggests a some increase (signified by their being marked by a (++) in Table 2).

The factors underlying these divergences between the two datasets require and merit in-depth investigation. For present purposes the central message is that available data sources capture changes in income inequality imperfectly, so the ranking of countries in terms of those trends has to be regarded as an approximation subject to error, with a particular question mark over the countries where the divergence is greatest.

Given the divergence between LIS and OECD, it becomes worthwhile to use an additional inequality indicator from LIS to further tease out the robustness of the trends. The P90/P10 is also by construction sensitive to the tails rather than the middle of the income distribution. The corresponding initial and final levels for the alternative summary inequality measure, P90/P10, derived from LIS data are shown in Figure 5. Here the picture is similar to the Gini, in terms of the broad categorisation into countries seeing a pronounced increase at one extreme versus some decline at the other. In Canada and Norway we no longer find an increase in inequality with the P90/P10, and we find a slight decrease of inequality in Belgium. For other countries, in particular for Spain and Israel, inequality went up more according to the P90/P10 than the Gini index.

**Figure 5: Long-term trends in the P90/P10 ratio**



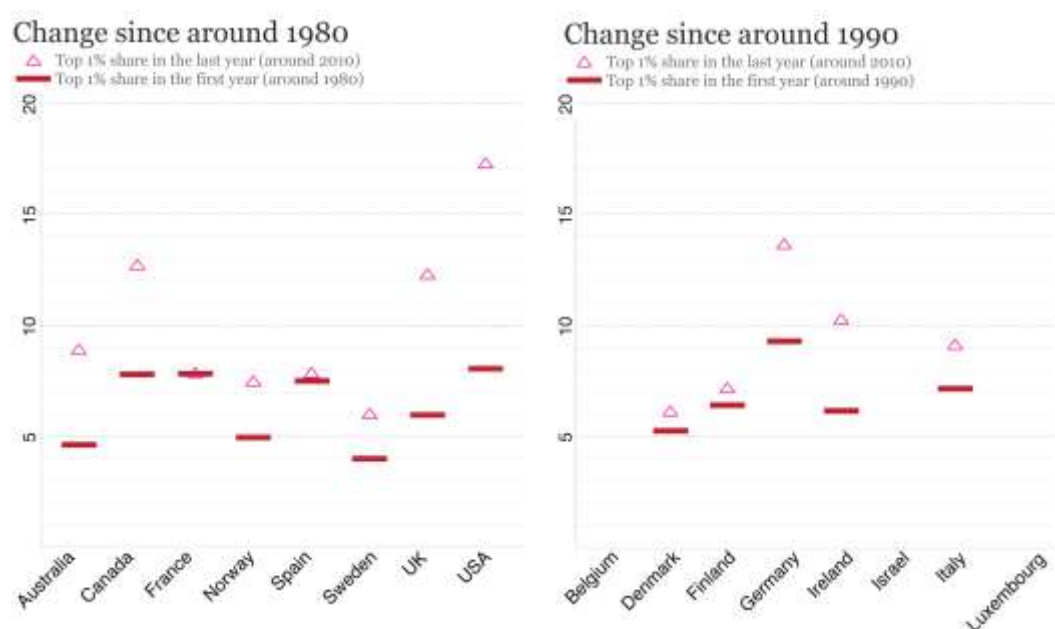
## 5.2 Top incomes

We now look into trends at the very top of the income distribution. As already noted, the underlying data are derived from different statistical sources than the overall inequality measures, which comes with important differences. First, the income shares relate to gross rather than disposable income, that is, before income tax and social insurance contributions are deducted. They are also based on a different income recipient unit, of necessity employing the tax unit (either the individual or married couple) defined in the income tax code of the country in question, whereas overall inequality indicators (and our analysis of trends in real incomes to follow) take the household to be the income sharing unit; the top income shares are also not adjusted using equivalence scales. Data are not available for Austria, Belgium, Czech Republic, Estonia, Greece, Hungary, Iceland, Israel, Luxembourg, Poland, Slovak Republic, and Slovenia.

Figure 6 shows the share of total (gross) income going to the top 1% in the sub-set of the OECD countries we are studying for which these are available, around 1980 and 2010. We see that the share going to the top has generally gone up over this period, but by a great deal more in some countries than in others.

Atkinson and Piketty (2007) highlighted the fact that the English-speaking countries saw much larger increases than the continental European countries for which estimates were available. Indeed, Australia, Canada, Ireland, the UK and the USA all saw this share increasing by 5 percentage points or more, and were the only OECD countries to do so (though New Zealand is the exception, with only a modest increase). Italy, Norway and Portugal saw a lower but still substantial increase of 3 percentage points or more, while the share of the top 1% did not increase by that much in Finland, France, Germany, Japan, Netherlands, New Zealand, Spain, Sweden and Switzerland.

**Figure 6: Long-term trends in top income shares**



How well does this align with the changes in overall inequality by country as presented in Table 2? Most of the English-speaking countries where top income shares rose particularly rapidly (namely Australia, Canada, the UK and the USA) also saw overall inequality rise markedly, but Ireland is a striking exception, where the share of the top 1 per cent increased sharply but overall inequality actually declined. The opposite contrast can be seen in the case of Finland, Germany, Japan, New Zealand and Sweden, where top income shares did not rise sharply but overall inequality did. Italy and Norway saw substantial increases in both top income shares and overall inequality. France saw little increase in

either, while the Netherlands and Spain saw little increase in top income share and some increase in overall inequality. So there is some consistency in terms of trends between the two indicators of inequality, but also some divergence. Changes occurring at the top may be missed to a varying extent across countries in measuring overall inequality, or offset by changes elsewhere in the distribution in some cases and not in others, and the differences in income concept and recipient unit may also be important. For current purposes, each indicator may then have some valuable information to convey.

To summarise, while some increase in overall income inequality has been the most common experience among the OECD countries we are examining over the past two or three decades, there has been wide variation in the extent and timing of that increase and some countries have seen little or none. Available estimates of changes in inequality are subject to error and different sources and indicators do not always tell the same story.

### ***5.3 Economic growth***

Growth in aggregate economic output in terms of value added to goods and services, or equivalently, total income available to the population, is central to the scope for living standards to rise for households. Economic growth is measured through the national accounts, whereas household income is generally captured through surveys (and increasingly administrative data), and the differences between the two in both conceptual and measurement terms are increasingly being seen as important. Not all economic growth reaches the household sector in national accounts terms, but the household sector aggregate in the national accounts may also not be fully reflected in the incomes of households as captured in surveys. This relates firstly to who is included: in some countries the national accounts combine households with non-profit institutions serving households, which includes charities, churches, and sport clubs (Atkinson *et al.*, 2015), while household income survey data generally excludes non-private households, such as people living in boarding schools, prisons, hospitals, or retirement homes. Some of the divergence also relates to what is included: rent imputed to approximate the value of services provided by owner-occupied housing, for example, is part of the national accounts aggregate

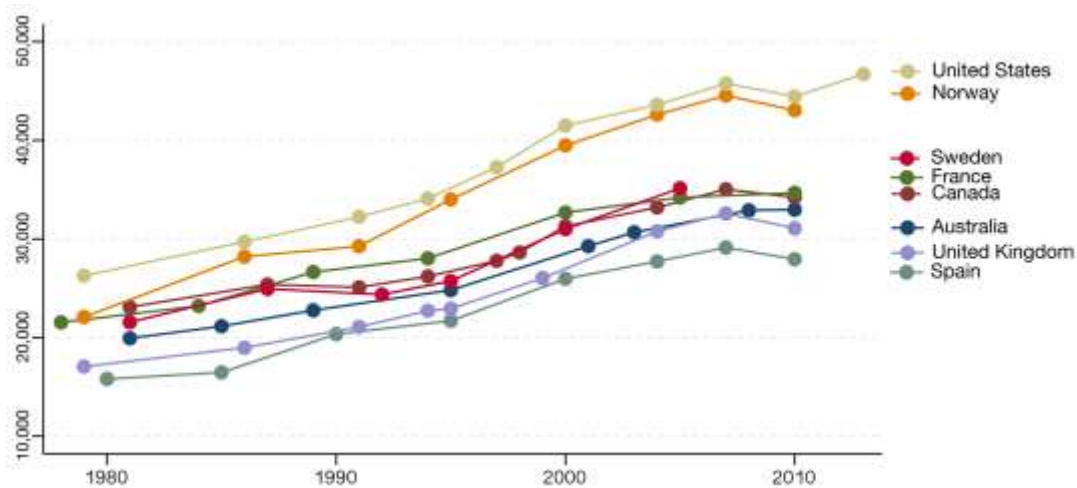
but may not be included in income estimates from household income surveys. Employer contributions to pensions and health insurance may not be immediately or fully captured in surveys, and in-kind benefits or collective goods provided by the government, taken into account in the broadest income measure in the national accounts, do not feature in standard survey-based household income measures (Jenkins *et al.*, 2012). Finally, the extent to which the various components of income are reliably captured will differ between household income surveys and national accounts, with income from capital for instance known to be underreported in household income surveys (Tormalehto, 2011).

While it will be important in future work to arrive at a more suitable aggregate income measure from the national accounts that is closer to the disposable income available to households, for this exploratory analysis we employ the conventional measure of gross national income (GNI) per capita. GNI is GDP excluding primary incomes payable to non-resident units, but including primary incomes receivable from non-resident units. This is more aligned to the sample coverage of household income surveys, as these also might cover individuals living in a certain country whilst gaining income in another. We use GNI information from the OECD National Accounts, expressed in per capita terms using OECD Population Data, and we correct the figures for differences in price levels over time by applying the GDP deflator and PPP for actual individual consumption, so that GNI per capita is as our living standards expressed in 2010 US dollars.<sup>6</sup>

### **Figure 7: Trends in GNI per Capita in Real Terms**

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<sup>6</sup> For US 2013 GNI per capita is not available. We use the trend in GDP per capita from 2012-2013 to extrapolate it.



## 6. Comparing the evolution of living standards to inequality and overall economic growth

Thus far we have seen significant variation across countries in the evolution of living standards and in measures of inequality. In this section we bring these together, to see how the evolution of inequality, economic growth and ordinary living standards are aligned.

### 6.1 Associations between inequality and living standards

As there are clear persistent differences in living standards and inequality between countries, we compare trends over time across our set of variables. We calculate the average annual percentage growth rates for our measures of living standards and annual average differences for the inequality scalars, so that the latter are expressed in absolute Gini or P90/P10 point differences or percentage point changes in the top income shares.

We start by looking into the longest time frame differences for our set of variables in Table 3. We sort the countries by their percentage growth of the median, first for the set of countries for which we have top income information, then for the countries without. We do not find for the long period that countries where median growth was the strongest, inequality measured across the distribution or at the top generally went down.

**Table 3: Evolution of living standards and inequality over the longest period**

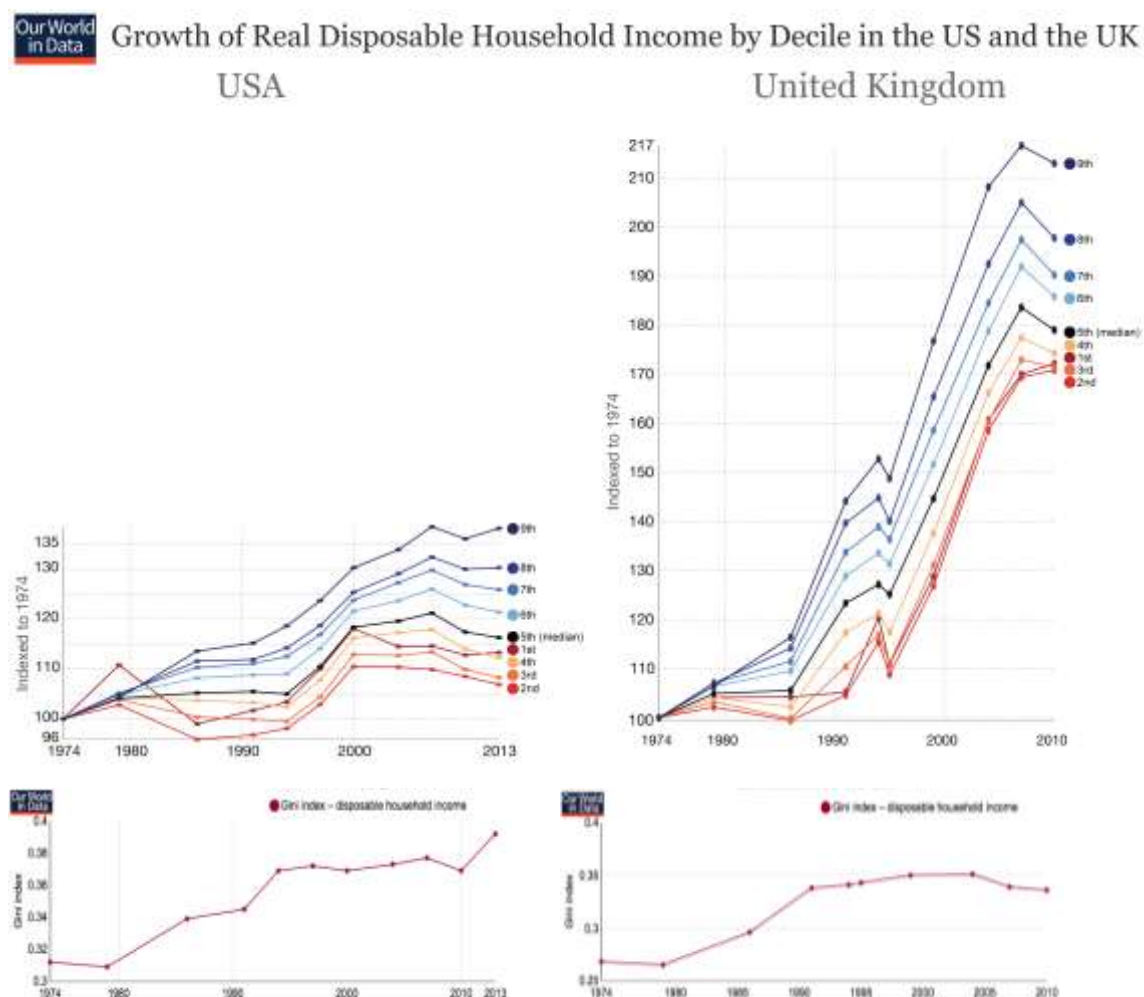
Country	Years	Average annual % growth 5 <sup>th</sup>	Average annual % growth 3 <sup>rd</sup>	Gini difference	P90/P10 difference	Top 1% percentage point
Ireland	1987-2010	3.188	3.320	-0.146	-0.020	0.190
Norway	1979-2010	2.383	2.354	0.081	0.005	0.091
Sweden	1981-2005	1.897	1.724	0.167	0.015	0.096
United Kingdom	1979-2010	1.738	1.650	0.239	0.024	0.214
Spain	1980-2010	1.707	1.565	0.063	0.032	0.021
Finland	1987-2010	1.421	1.218	0.246	0.026	0.047
Netherlands	1993-2010	1.340	1.450	-0.026	-0.009	0.071
Australia	1981-2010	1.212	1.058	0.179	0.020	0.157
Denmark	1987-2010	0.862	0.902	-0.012	-0.015	0.051
France	1978-2010	0.854	0.991	-0.084	-0.012	0.010
Italy	1986-2010	0.829	0.756	0.089	0.015	0.094
Canada	1981-2010	0.723	0.607	0.111	0.004	0.178
Switzerland	2000-2004	0.582	0.485	-0.442	-0.015	-0.195
Germany	1984-2010	0.547	0.433	0.088	0.018	0.178
United States	1979-2013	0.327	0.123	0.210	0.040	0.280
Estonia	2000-2010	6.148	6.222	-0.384	-0.055	
Czech Republic	1992-2010	2.843	2.562	0.281	0.038	
Luxembourg	1985-2010	2.809	2.681	0.123	0.015	
Slovak Republic	1992-2010	2.232	1.840	0.420	0.056	
Greece	1995-2010	2.000	2.168	-0.117	-0.073	
Slovenia	1997-2010	1.957	1.824	0.179	0.034	
Belgium	1985-2000	1.955	1.724	0.599	0.039	
Israel	1986-2010	1.595	0.956	0.320	0.082	
Poland	1992-2010	1.551	1.308	0.287	0.041	
Austria	1994-2004	0.923	0.931	-0.133	-0.025	
Iceland	2004-2010	-0.184	-0.378	-0.186	-0.016	
Hungary	1991-2012	-0.232	-0.392	0.019	0.014	

Another way to bring out the fact that a rise in inequality does not necessarily entail that the bottom income is losing out is to compare the experiences of the UK with those in the US, see Figure 8. For these liberal countries between 1979 and 2010 the Gini increased by a comparable amount (7.4 points in the UK and 7.1 in the US), and both saw a rapid increase in the top 1 per cent income share (6.6 percentage point in the UK versus 9.5 in the US).<sup>7</sup> Yet, the bottom decile gained significantly more income in the UK than even the top in the distribution of the US.

<sup>7</sup> In fact, also economic growth measured by real GNI per capita growth as we will discuss later was quite comparable (78 versus 69 per cent from 1979 to 2010).



**Figure 8: Growth of real disposable household income by decile in the US and the UK**



Having looked at long-term trends, we now use all the observations in our sample. Growth in living standards for the median is negatively correlated with the Gini measure and the P90/P10 (between -0.25 and -0.28). It has a low positive correlation with growth in top income shares (0.12). The P30 correlates slightly higher with the generic inequality measures (-0.36 to -0.39). Not surprisingly, the Gini and P90/P10 are highly correlated (0.83), whereas the generic measures of inequality are essentially uncorrelated with the top 1 per cent income share (0.02 – 0.21).

Is the evolution in the median statistically associated with the movement in inequality indicators? We conduct a simple OLS regression with clustered standard errors, where we still use the growth rates of all of our variables as

displayed in Table 4.<sup>8</sup> As we have fewer observations for the top 1 per cent income variable, we check whether the results for the Gini and P90/P10 differ depending on if we were to use the full sample (columns 1 and 3) or the sample for which we have information on the top income shares (columns 2 and 4). The results do not differ across these samples. The regression results imply a negative association between generic measures of inequality and the median, implying that growth in inequality goes hand-in-hand with lower growth in the median. The top income share is not significant. The adjusted R<sup>2</sup> is low, which corresponds to our previous finding of weak associations between inequality and living standards.

**Table 4: OLS regressions with median income as the dependent variable**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\Delta$ Gini	-1.184*	-0.700**				-0.831**	
	(0.074)	(0.027)				(0.027)	
$\Delta$ P90/P10			-7.915**	-3.658**			-3.709**
			(0.020)	(0.030)			(0.019)
$\Delta$ Top 1%					0.813	1.134	0.836
					(0.457)	(0.297)	(0.449)
Constant	1.637***	1.341***	1.647***	1.337***	1.179***	1.213***	1.235***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	153	99	153	99	99	99	99
Adjusted R <sup>2</sup>	0.059	0.025	0.070	0.019	0.004	0.041	0.024

Note Dependent variable: average annual percentage growth rate of median equivalised disposable household income. OLS with clustered standard errors. Columns 1 and 3 are based on the full sample; 2 and 4 on the sample for which we have top income information available.

From the economic growth literature (e.g., Barro, 2000; Voitchovsky, 2005) we know that there is convergence; poorer countries tend to catch up and grow faster. To account for this, we add the level of the p50 at the beginning of the period as a right hand side variable, but this variable is not significant itself and does not change the other results. One could also argue that the level of inequality rather than the growth rate might matter. If we generate an error correction model, where we include the lagged level of the dependent variable and the respective inequality indicator, then the results do not change as well, nor are the lagged levels significant.

<sup>8</sup> As the number of 5-year time periods we have available is so limited, applying estimation approaches such as System-GMM is problematic.

In Table 5 we use the growth rate of the  $P_{30}$  instead of the median. We find comparable results, though the coefficients and the explained variance are slightly higher. Also for the  $p_{30}$ , adding the lagged level on the right-hand side or lagged levels of the independent variables does not affect the results, and they are all essentially insignificant.

**Table 5: OLS regressions with growth in the P30 as the dependent variable**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\Delta$ Gini	-1.725** (0.012)	-1.243*** (0.002)				-1.390*** (0.003)	
$\Delta$ P90/P10			-11.805*** (0.002)	-7.486*** (0.001)			-7.534*** (0.001)
$\Delta$ Top 1%					0.733 (0.505)	1.270 (0.234)	0.779 (0.482)
Constant	1.575*** (0.000)	1.322*** (0.000)	1.595*** (0.000)	1.329*** (0.000)	1.120*** (0.000)	1.179*** (0.000)	1.234*** (0.000)
N	153	99	153	99	99	99	99
Adjusted R <sup>2</sup>	0.121	0.087	0.150	0.096	-0.000	0.107	0.098

Note Dependent variable: average annual percentage growth rate of equivalised disposable household income of the 3<sup>rd</sup> decile cut-off. OLS with clustered standard errors. Columns 1 and 3 are based on the full sample; 2 and 4 on the sample for which we have top income information available.

## 6.2 Bringing in economic growth

So far we have ignored the elephant in the room: economic growth – where we should keep in mind the issues raised earlier regarding differences between national accounts and household income survey data. How does average annual percentage growth in GNI per capita correlate with growth in living standards? Quite strongly – for both the  $p_{30}$  and the median this correlation is around 0.6. There is virtually no relationship between growth in GNI per capita and the evolution of overall inequality, though interestingly, economic growth is positively associated (0.52) with the trend in top 1 per cent income shares.

If we add growth in GNI per capita to our regression model as shown in Table 6, the model fit increases substantially. Economic growth is positively associated with median income growth in all model specifications. This coefficient gives us the elasticity of real income of the median with respect to economic growth (or a measure of mean income) (Dollar and Kraay, 2001; Dollar

*et al.*, 2013). We still find that generic inequality is negatively associated with median income growth, but with the inclusion of economic growth, also the evolution in top 1 per cent income shares becomes negative and significant.

**Table 6: OLS regressions with growth in median as the dependent variable, accounting for growth in GNI per capita**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% growth GNI per capita	0.714*** (0.000)	0.684*** (0.000)	0.708*** (0.000)	0.676*** (0.000)	0.690*** (0.000)	0.671*** (0.000)	0.838*** (0.000)	0.812*** (0.000)	0.822*** (0.000)
$\Delta$ Gini			-1.121* (0.053)	-0.603*** (0.006)				-0.404** (0.031)	
$\Delta$ P90/P10					-6.298** (0.040)	-2.376*** (0.006)			-1.981** (0.048)
$\Delta$ Top 1%							-1.793** (0.020)	-1.557** (0.037)	-1.731** (0.030)
Constant	0.069 (0.788)	0.056 (0.812)	0.213 (0.415)	0.124 (0.575)	0.237 (0.364)	0.116 (0.596)	0.000 (0.998)	0.053 (0.754)	0.053 (0.747)
N	153	99	153	99	153	99	99	99	99
Adjusted R2	0.367	0.351	0.422	0.371	0.412	0.357	0.395	0.400	0.398

Note Dependent variable: average annual percentage growth rate of median equivalised disposable household income. OLS with clustered standard errors. Columns 1, 3, and 5 are based on the full sample; 2, 4, and 6 on the sample for which we have top income information available.

As before, an error correction model specification, with the lagged dependent variable but also the independent variables as lagged levels included, does not improve fit nor affects our results before. For the p30 we find very comparable findings as shown in Table 7.

**Table 7: OLS regressions with growth in the P30 as the dependent variable, accounting for growth in GNI per capita**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Delta$ GNIC	0.740*** (0.000)	0.726*** (0.000)	0.730*** (0.000)	0.711*** (0.000)	0.700*** (0.000)	0.693*** (0.000)	0.906*** (0.000)	0.845*** (0.000)	0.860*** (0.000)
$\Delta$ Gini			-1.660*** (0.005)	-1.141*** (0.000)				-0.946*** (0.000)	
$\Delta$ P90/P10					-10.164***	-6.161***			-5.726***

					(0.004)	(0.000)			(0.000)
Δ Top 1%							-2.083***	-1.531**	-1.904**
							(0.003)	(0.012)	(0.014)
Constant	-0.107	-0.088	0.106	0.041	0.164	0.069	-0.152	-0.028	-0.001
	(0.681)	(0.718)	(0.679)	(0.844)	(0.512)	(0.749)	(0.442)	(0.865)	(0.993)
N	153	99	153	99	153	99	99	99	99
Adjusted R2	0.362	0.349	0.477	0.425	0.474	0.414	0.402	0.449	0.459
Note	Dependent variable: average annual percentage growth rate of equivalised disposable household income of the 3 <sup>rd</sup> decile cut-off. OLS with clustered standard errors. Columns 1, 3, and 5 are based on the full sample; 2, 4, and 6 on the sample for which we have top income information available.								

In all previous regressions we implicitly assume that the median and the p30 are independent of each other. Moreover, we only use more or less arbitrarily these two cut-off points. One way of addressing these concerns is to conduct a simple SURE regression for all odd deciles as dependent variables, with the full set of independent variables included. Doing this shows first of all that economic growth is significant and positive for all decile cut-offs. The coefficient varies between 0.66 (bottom decile) and 0.85 (p30), though additional tests show that the difference in coefficient between these two cut-off points is not statistically significant. However, we do find that for all included deciles apart from the 3<sup>rd</sup> decile the coefficient for GNI per capita is lower than 1 at the 10 per cent significance level or lower. This implies that incomes at the very bottom, the middle, but also the top do not fully co-vary with economic growth.

## 7. Discussion and conclusion

The implications of rising income inequality for ordinary living standards have become a central concern as rich countries strive for inclusive growth. We have shown, by analysis of the most satisfactory comparative data, that OECD countries have had widely varying experiences with respect to the evolution of living standards across the distribution over the last two or three decades. The extent of growth in real incomes in the middle and lower parts of the distribution has been very much stronger in some countries than others, and while aggregate economic growth has been key, trends in inequality also help to explain the trend in living standards for the middle. Economic growth transmits – though not to the full extent, at least not contemporaneously – to growth in living standards for the middle, whilst trends in inequality and top income shares co-vary negatively

with living standards for the middle. Much of the variation in the degree to which economic growth feeds through to rising living standards for middle and lower income households is however unexplained, and this needs to be the priority for research, including exploring the transmission from growth as measured in the national accounts to overall household income as captured in surveys.

The patterns described also mean that focusing entirely on measures of average economic growth, on overall income inequality or the share going to the top, or even these in combination will not reliably capture or reflect the evolution of living standards. If living standards at and below the middle of the distribution are a central concern for policy, direct measures of the way real incomes are developing in the middle, lower half and bottom of the income distribution need to be front and centre as key performance indicators for our economies and societies.

## References

- Alderson, A., Beckfield, J., Nielsen, F. (2005) Exactly how has income inequality changed? *International Journal of Comparative Sociology* 46: 405-423
- Alvaredo, F., Atkinson, A.B, Piketty, T. and Saez, E. (2013), *Journal of Economic Perspectives*, 27: 3-20.
- Atkinson, A.B. (2013a), Putting People First and Macro-economic Policy, European Commission, *Economic Papers* 481 (part II), April 2013, 39-64.
- Atkinson, A.B. (2013b) Beyond GDP: A Post-crisis Agenda for Measuring Government Performance, in O Cramme, P Diamond and M McTernan (eds.), *Progressive Politics after the Crash*, I B Tauris, 209-217.
- Atkinson, A., Brandolini, B. (2013) On the identification of the “middle class”. In Gornick, J., Jäntti, M. (eds) *Income Inequality: Economic Disparities and the Middle Class in Affluent Countries*. Stanford Stanford University Press
- Atkinson, A.B. and Piketty, T. eds. (2007) *Top Incomes over the Twentieth Century*, Oxford University Press: Oxford.
- Atkinson, A.B. and Piketty, T. eds. (2010), *Top Incomes: A Global Perspective*, Oxford University Press: Oxford.

- Atkinson, A.B., Piketty, T. and Saez, E. (2011), Top Incomes in the Long Run of History”, *Journal of Economic Literature*, 49: 3-71.
- Autor, D. and Dorn, D. (2013), The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market, *American Economic Review*, 103(5): 1553–1597.
- Barro, R. (2000) Inequality and growth in a panel of countries. *Journal of Economic Growth* 5: 5-32.
- Center for American Progress (2014) *The Middle-Class Squeeze: A Picture of Stagnant Incomes, Rising Costs, and What We Can Do to Strengthen America’s Middle Class*, Center for American Progress, Washington DC.
- Cingano, F. (2014), “Trends in Income Inequality and its Impact on Economic Growth”, *OECD Social, Employment and Migration Working Papers*, No. 163, OECD: Paris.
- De Mello, L. and Dutz, M. eds. (2012) *Promoting Inclusive Growth: Challenges and Policies*, Paris: OECD.
- Dollar, D., Kraay, A. (2001) Growth is good for the poor, *World Bank Policy Research Working Paper*
- Dollar, D., Kleineberg, T., Kraay, (2015) Growth and welfare, *Economic Policy*: 335-377
- Fesseau, M., F. Wolff and M. L. Mattonetti (2013), A Cross-country Comparison of Household Income, Consumption and Wealth between Micro Sources and National Accounts Aggregates, *OECD Statistics Working Papers*, No. 2013/03, OECD Publishing, Paris.
- Foster, J., Wolfson, M. (2010) Polarization and the decline of the middle class: Canada and the US. *Journal of Economic Inequality* 8: 247-273
- Flower, T., Wales, P. (2014) Variation in the inflation experience of UK households: 2003-2014, Office for National Statistics 15<sup>th</sup> December 2015
- Gasparini, L. and Tornaoli, L. (2015) A review of the OECD Income Distribution Database, *Journal of Economic Inequality*, online first DOI 10.1007/s10888-015-9299-x
- Goldthorpe, J.H. and McKnight, A. (2006) The Economic Basis of Social Class, in *Mobility and Inequality: Frontiers of Research from Sociology and Economics*,

- edited by S. Morgan, D. B. Grusky, and G. S. Fields. Stanford, CA: Stanford University Press.
- Goos, M. and Manning, A. (2007). Lousy and lovely jobs. The rising polarization of work in Britain. *The Review of Economics and Statistics*, 89(1), 118-133.
- Goos, M, Manning, A. and Salomons, A. (2009) Job polarization in Europe. *American Economic Review: Papers and Proceedings*, 99(2), 58-63.
- Kakwani, N. and Son, H. (2008) Poverty Equivalent Growth Rate. *Review of Income and Wealth*, 54 (4), 643-655.
- Morgan Stanley (2015) The Economic Costs of Inequality, January, <http://www.morganstanley.com/ideas/the-economic-cost-of-inequality/>
- OECD (2008) *Growing Unequal*, OECD: Paris.
- OECD (2011) *Divided We Stand: Why Inequality Keeps Rising*, OECD: Paris.
- OECD (2015) *In It Together: Why Less Inequality Benefits All*, OECD: Paris.
- Ostry, J.D., Berg, A., and Tsangarides, C. (2014) *Redistribution, Inequality, and Growth*, IMF Staff Discussion Note, SDN/14/02, IMF: Washington DC.
- Piketty (2015). *Capital in the 21<sup>st</sup>. Century*, Harvard University Press: Cambridge Mass.
- Ravallion, M. (2015) The Luxembourg Income Study, *Journal of Economic Inequality*, DOI 10.1007/s10888-015-9298-y
- Standard and Poor's (2014). How Increasing Income Inequality Is Dampening U.S. Economic Growth, And Possible Ways To Change The Tide, 5/08/2014. [https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1351366&SctArtId=255732&from=CM&ns1\\_code=LIME&sourceObjectId=8741033&sourceRevId=1&fee\\_ind=N&exp\\_date=20240804-19:41:13](https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1351366&SctArtId=255732&from=CM&ns1_code=LIME&sourceObjectId=8741033&sourceRevId=1&fee_ind=N&exp_date=20240804-19:41:13)
- Stiglitz, J. (2012) *The Price of Inequality*, W.W. Norton: New York .
- Stiglitz, J. (2015), *The Great Divide: Unequal Societies and What We Can Do About Them*, W.W. Norton: New York.
- Summers, L.H. (2014) U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound, *Business Economics*, 49 (2), 65-73.
- Tormalehto, V. (2011) LIS and national accounts comparison, *LIS Technical Working Paper Series no. 2*
- Voitchovsky, S. (2005) Does the profile of income inequality matter for economic growth? *Journal of Economic Growth*, 10, 273–296.



