

Income inequality: Trends and Measures

Key Points

- UK income inequality increased by 32% between 1960 and 2005. During the same period, it increased by 23% in the USA, and in Sweden decreased by 12%.
- In the 1960s Sweden and the UK had similar levels of income inequality. By 2005 the gap between the two had increased by 28%.
- Since the 1980s income inequality in the United States and the UK has increased substantially and has returned to levels not seen since the 1920s.
- The growth in inequality in the last 30 years has been driven by the top 1% of wage incomes.
- Inequality measures drawn from standard household surveys underestimate income inequality by as much as 10 percentage points, due to the under-representation of the top 1% of incomes.
- There is scope for governments to tackle inequality. Large income inequalities are not inevitable; Sweden owes its high levels of equality to policies introduced since the 50s.

Introduction

Income inequality has shaped society as we know it today (Wilkinson & Pickett, 2010). The changes in inequality which we have collectively experienced in the last 50 years are not well known among either policy-makers or the public. This digest will briefly explain some of the most frequently used measures of income inequality, and show how it has evolved in the recent past.

Measuring inequality

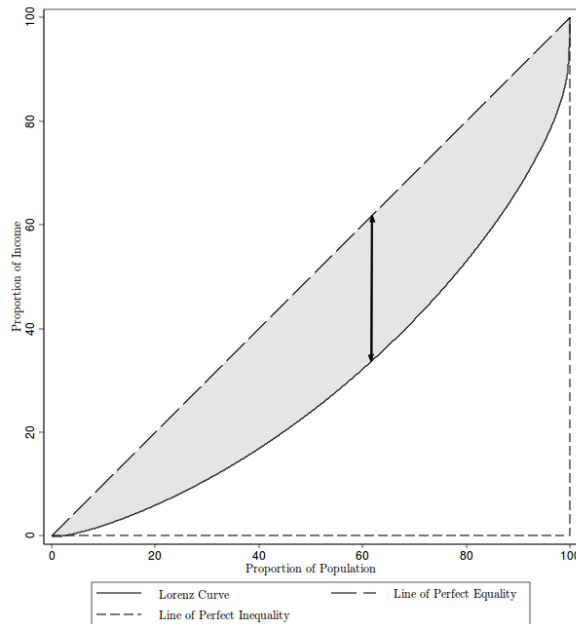
One way to measure income inequality is as a simple ratio. For example, we can take the income of the 90th percentile (i.e. the income above which the top 10% of incomes lie) and divide it by that of the 10th percentile. This gives a ratio of the top 10% to the bottom 10%. We refer to this as the 90/10 ratio. This measure is unaffected by changes at the very top and

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bottom of the income distribution (Burkhauser et al., 2009), but does not tell us about what happens amongst the remaining 80% of individuals in the middle.

A common way of measuring inequality is the Gini coefficient which is based on the Lorenz curve. Figure 1 is a Lorenz curve that shows how income is distributed across the UK in 2009². Along the horizontal axis we plot the proportion of the population, arranged in order of their incomes from poorest to richest. The scale runs from 0 to 100% of the people in the UK. Along the vertical axis we have the proportion of income in the society, this too runs from 0 to 100%. The 45 degree line shows what ‘perfect’ equality looks like, along this line every person has the same income (i.e. 10% of the population hold 10% of the income, and so on). The line of ‘perfect’ inequality shows us the extreme situation where the richest individual holds 100% of the income in a society. The more a Lorenz curve sags below the line of perfect equality, the higher the level of inequality in a society. So for instance, the Lorenz curve for the UK shows that the poorest 40% of the population get only 16% of total incomes, or that the poorest 80% got about 53% of total income, implying that the remaining 47% of income goes to the richest 20% of the population in the UK.

Figure 1: Lorenz curve for UK, 2009

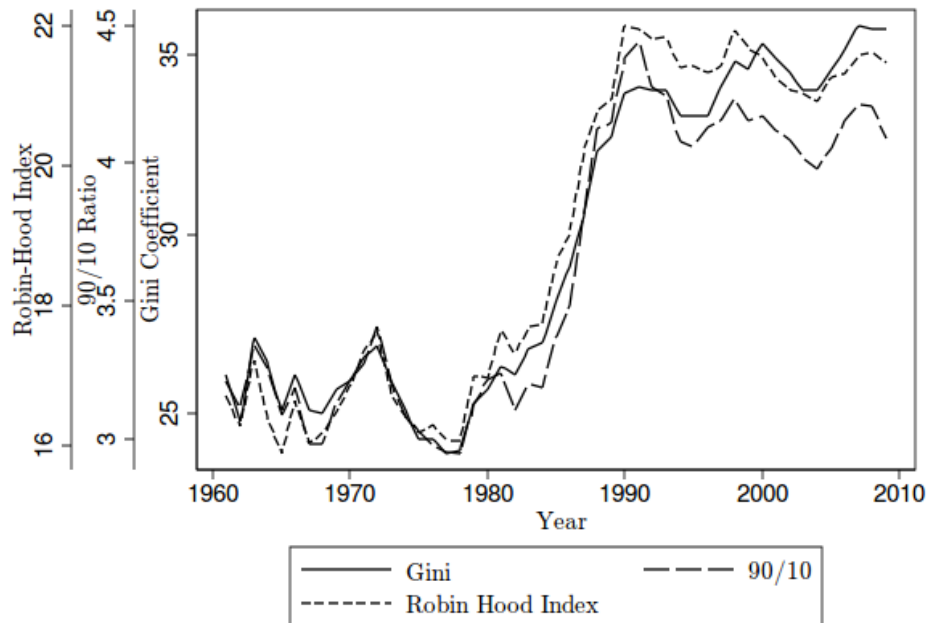


²It was calculated for modified-OECD equivalised adult income net of taxes and benefits before housing costs, using the Understanding Society survey.

The Gini coefficient is calculated by dividing the shaded area in [figure 1](#) by the total area under the diagonal line of perfect equality³. It varies from 0 (‘perfect’ equality) to 1 (complete inequality, where one individual holds 100% of the income).

The final measure we shall explore here is the Robin Hood index. It is the share of income that would need to be redistributed from individuals above the mean income to those below it in order to achieve ‘perfect’ equality ([Kennedy et al., 1996](#)). The Robin Hood index is the maximum vertical distance between the Lorenz curve and the line of ‘perfect’ equality, it is shown by the vertical line in [figure 1](#).

Figure 2: Different measures, same trend. Income inequality in the UK



Drawn from Joyce et al (2010) IFS commentary C116. Online Data Appendix, Robin Hood index derived from Joyce.

[Figure 2](#) shows the trends in inequality in the UK⁴. To show similarities and differences in the picture of trends in inequality which these measures produce, the scales have been adjusted such that they overlap. Irrespective of measure, the same general trend in income inequality can be seen. So, is it necessary to have different measures if they all show roughly the same trend? Focusing on the period 1992–2009 illustrates that the 90/10 ratio shows a different pattern, as it only measures the top and bottom of the income

³It is multiplied by 100 to express it as a percentage

⁴The 90/10 ratio and Gini coefficients were calculated by [Joyce et al. \(2010\)](#), whilst the Robin Hood index was derived from their data. The data is a series which measures income for a modified-OECD adult after taxes and benefits before housing costs.

distribution. As we shall see later in this digest, it is also hindered by the under-representation of top incomes. The difference in trends between the measures is particularly apparent after 1990 when all three measures deviate. Nonetheless, for the period 1979–1990 it is clear that there was a dramatic increase of 34%–40% in income inequality. This period accounts for the majority of the overall increase in income inequality since 1960. Despite there being some periods of decreasing inequality, such as 1994–1996 and 2000–2005, in general income inequality has also increased over the last two decades.

Measuring income

There are numerous challenges to making international comparisons of income inequality. Of these, one of the most important issues is the definition and measurement of income used (Atkinson & Brandolini, 2001). This is often referred to as the ‘income concept’. Income can, for example be defined at a household or individual level. Choosing one over the other will give different income measures and therefore different levels of income inequality. Household income may be adjusted for household size by using various ‘equivalence’ scales⁵, or figures may be left unadjusted. Definitions for individual income may mean wage income alone, or may also include state benefits and income from financial holdings. Taxation is another thing to be considered in the income concept, as different taxation systems may be more redistributive than others, thus affecting trends in income inequality. Differences in the income concept may lead to incomparable inequality measures. Other comparability issues involve differences in survey methodology over time and across countries. The data we use in the remainder of this digest overcomes these issues and comes from Solt (2009).

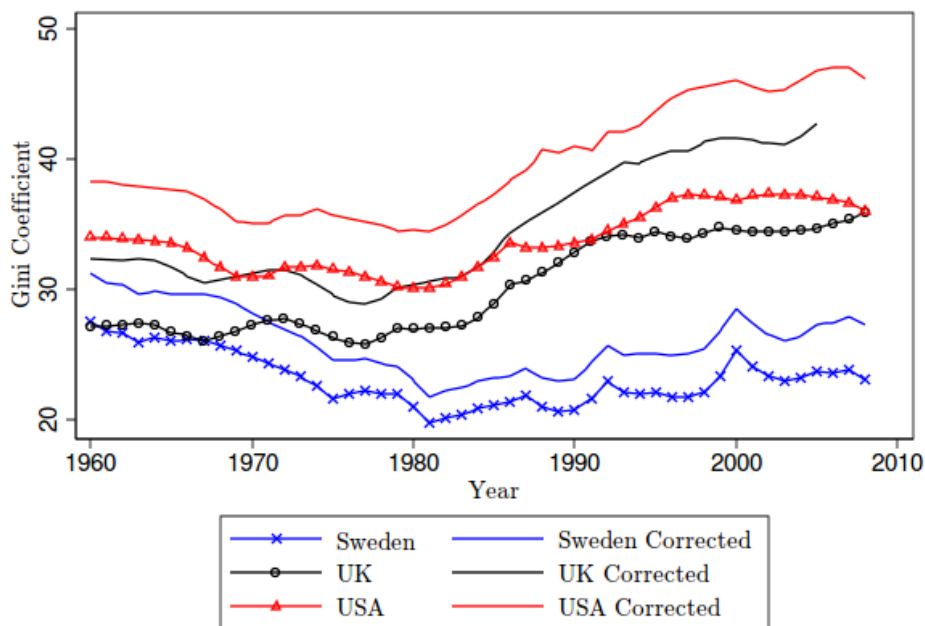
Trends in income inequality

The lines with markers in figure 3 show the changing levels of inequality in Sweden, the United States and the UK since 1960. Each country has a distinctive trajectory. In 1960 the UK and Sweden had similar Gini coefficients at roughly 27%. The United States had higher income inequality in 1960, with a Gini of about 34%. In both the UK and the United States inequality levels fluctuated around 1960 levels until the 1980s. In Sweden there was a sharp reduction in income inequality of 31% during this period. After 1980 all three countries experienced increases in inequality, with the UK rising the fastest and catching up with the United States by 2008. The levels of income inequality in the US and the UK after this marked increase

⁵For more information on equivalence scales read this brief OECD article with definitions <http://www.oecd.org/dataoecd/61/52/35411111.pdf>

are similar to those experienced in the 1920s (McCall & Percheski, 2010). The trajectories illustrate how Sweden and the UK, which were once similar, are now amongst the most and least equal of the world’s rich countries.

Figure 3: The evolution of income inequality, 1960–2008



Source: Author’s Calculations using Solt(2010) SWIIDv3 and Alvaredo et al (2011) TWTID 06.06.11

Top Incomes

Recent research has focused on the income share of the top 1% (Atkinson & Piketty, 2007, 2010). Atkinson et al. (2011) summarise this growing literature which finds that the growth in inequality in the last 30 years has been driven by top wage incomes. Given the findings of this research Atkinson (2007b) suggests that due to under-representation of top incomes in household surveys, inequality measures underreport the extent of inequality. The underreporting of top incomes in household surveys is primarily due to the practice of ‘top-coding’ which lumps together incomes above a certain threshold—such as all incomes over £100,000—for confidentiality reasons. Alvaredo (2011) proposes an adjustment which scales the Gini coefficient upwards according to the income share of the top 1%.

Using data from the world top incomes database (TWTID) (Alvaredo et al., 2011; Atkinson, 2007a; Roine & Waldenström, 2010; Piketty & Saez, 2007) and Solt (2009) we apply this adjustment to the data. The solid lines in figure 3 show the trends in income inequality for Sweden, UK, and USA

after the [Alvaredo \(2011\)](#) correction. Due to the under-representation of the top 1% of incomes, the Gini coefficient is biased downwards on average by as much as 10 percentage points. Taking into account the full extent of the income distribution it is clear that the UK and Sweden have diverged by even more than is reported by household survey data. Over the period 1960–2005 the UK experienced an increase in income inequality of 32%, for the same time period the USA had an increase of 23% and Sweden had a decrease of 12%. The role of the top one percent of incomes is notable for the USA in particular, where the rate of increase in income inequality is understated from the mid-1980s. To a lesser extent, this is also seen in the UK from the early 1990s.

It is worth noting that as [Roine & Waldenström \(2010\)](#) point out, the high levels of equality in Sweden are primarily due to high rates of marginal tax introduced after the Second World War, and subsequently increased in the 70s, coupled with “solidarity wage policies”. This demonstrates that great inequality is not inevitable, concerted policy efforts can be used to decrease it.

Global inequality

There are three main ways of thinking about world income inequality: (i) *international inequality* compares mean average incomes between nations; (ii) *population weighted international inequality* takes into account each country’s population size (i.e. populous China getting richer has a particularly strong effect on the global income distribution); (iii) lastly *world inequality* compares people, irrespective of their country, and so takes into account the extremes of earnings around the world ([Milanovic, 2005](#)).

There is uncertainty about data accuracy ([Anand & Segal, 2008](#)). One example is that household surveys may not capture the full spectrum of income, as the rich disproportionately do not respond to income surveys and the very poor are often not adequately sampled ([Anand & Segal, 2008](#)). Further, comparisons of international inequality can be affected by the exchange rates used ([Freeman, 2009](#)).

Despite different approaches to measurement and uncertainty about data accuracy, it looks as if there has been considerable increase in world inequality. In the 1960s the income of the top 20% of people was 30 times more than the income of the bottom 20%; by the early 2000s the ratio had increased to 80 ([Gordon, 2004](#)).

Conclusion

The ways to measure inequality quite often show similar trends, however, there are some differences because they measure different parts of the income

distribution. Despite slight differences shown in trends, inequality measures tend to be tightly correlated.

Income inequality in Britain has increased drastically since the 1980s. When correcting for top incomes, inequality may be up to 10 percentage points more than suggested by household surveys. The data suggests that these changes in income inequality have been driven by the increase of top wage incomes. Income inequality has also increased at a global level.

References

- Alvaredo, F. (2011). A note on the relationship between top income shares and the Gini coefficient. *Economics Letters*, 110(3), 274 – 277.
- Alvaredo, F., Atkinson, A. B., Piketty, T., & Saez, E. (2011). The World Top Incomes Database. Data, Paris School of Economics, <http://g-mond.parisschoolofeconomics.eu/topincomes>.
- Anand, S. & Segal, P. (2008). What do We Know about Global Income Inequality? *Journal of Economic Literature*, 46(1), 57–94.
- Atkinson, A. B. (2007a). The Distribution of Top Incomes in the United Kingdom 1908–2000. In A. B. Atkinson & T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, volume 1 chapter 4, (pp. 82–140). Oxford: Oxford University Press.
- Atkinson, A. B. (2007b). Measuring Top Incomes: Methodological Issues. In A. B. Atkinson & T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, volume 1 chapter 2, (pp. 18–42). Oxford: Oxford University Press.
- Atkinson, A. B. & Brandolini, A. (2001). Promise and pitfalls in the use of “secondary” data-sets: Income inequality in oecd countries a case study. *Journal of Economic Literature*, 39(3), 771–799.
- Atkinson, A. B. & Piketty, T. (Eds.). (2007). *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English-Speaking Countries*, volume 1. Oxford: Oxford University Press.
- Atkinson, A. B. & Piketty, T. (Eds.). (2010). *Top Incomes over the Twentieth Century: A Global Perspective*, volume 2. Oxford: Oxford University Press.
- Atkinson, A. B., Piketty, T., & Saez, E. (2011). Top incomes in the long run of history. *Journal of Economic Literature*, 49(1), 3–71.
- Burkhauser, R. V., Feng, S., & Jenkins, S. P. (2009). Using the p90/p10 index to measure u.s. inequality trends with current population survey data: A view from inside the census bureau vaults. *Review of Income and Wealth*, 55(1), 166–185.
- Freeman, A. (2009). The poverty of statistics and the statistics of poverty. *Third World Quarterly*, 30(9), 1427–1448.
- Gordon, D. (2004). Eradicating Poverty in the 21st Century: When will Social Justice be done? Transcript of Lecture.
- Joyce, R., Muriel, A., Phillips, D., & Sibieta, L. (2010). Poverty and Inequality in the UK: 2010. Commentary C116, Institute of Fiscal Studies, Online Data Appendix.
- Kennedy, B. P., Kawachi, I., & Prothrow-Stith, D. (1996). Income distribution and mortality: cross sectional ecological study of the Robin Hood index in the United States. *BMJ*, 312(7037), 1004–1007.

- McCall, L. & Percheski, C. (2010). Income inequality: New trends and research directions. *Annual Review of Sociology*, 36(1), 329–347.
- Milanovic, B. (2005). *Worlds apart: Measuring International and Global Inequality*. Princeton, MA: Princeton University Press.
- Piketty, T. & Saez, E. (2007). Income and Wage Inequality in the United States, 1913–2002. In A. B. Atkinson & T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, volume 1 chapter 5, (pp. 141–225). Oxford: Oxford University Press.
- Roine, J. & Waldenström, D. (2010). Top Incomes in Sweden over the Twentieth Century. In A. B. Atkinson & T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Global Perspective*, volume 2 chapter 7, (pp. 229–370). Oxford: Oxford University Press.
- Solt, F. (2009). Standardizing the world income inequality database. *Social Science Quarterly*, 90(2), 231–242. SWIID Version 3.0, July 2010.
- Wilkinson, R. G. & Pickett, K. E. (2010). *The Spirit Level: Why equality is better for everyone*. London: Penguin.