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DISCUSSION PAPER SERIES

IZA DP No. 14996

Getting the Measure of Inequality

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LSE and IZA

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ISSN: 2365-9793

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ABSTRACT

Getting the Measure of Inequality

I focus on one of the most-commonly-cited 'facts'; about UK income inequality – that it has changed little over the last 30 years – and reflect on how robust that description is. I look at a number of fundamental issues in inequality measurement related to inequality concepts (e.g., inequality aversion, relative versus absolute inequality, and inequality of opportunity versus outcome), definitions of 'income', the income-receiving unit, and the reference period, and related data issues. There are grounds for arguing that income inequality levels are higher, and the inequality increase over time greater, than conventional approaches indicate.

JEL Classification: D31, C81

Keywords: inequality, income inequality, top incomes, tax return data, survey data

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1. Introduction

Let us salute Pascale Bourquin and Mike Brewer (2021, 'BB' hereafter) for their thorough and comprehensive description of what has been happening to the UK income distribution over the last half century or more and the factors underlying these trends. Their chapter will be a landmark reference. Rather than trying to engage with the large number of findings BB present, I focus on one of the most-commonly-cited 'facts' about UK income inequality – that it has changed little over the last 30 years – and reflect on how robust that description is. I look at several fundamental issues in inequality measurement related to inequality concepts (e.g., inequality aversion, relative versus absolute inequality, and inequality of opportunity versus outcome), definitions of 'income', the income-receiving unit, and the reference period, and related data issues. This is what I mean by getting the measure of inequality.

2. Different degrees of inequality aversion and different trends

Headline summaries of UK inequality trends are based on Gini coefficient estimates for the distribution among individuals of equivalized household disposable income ('net income before the deduction of housing costs'), where the specific definitions are those of the Department for Work and Pensions' (2020) *Households Below Average Income* ('*HBAI*') statistics derived from the Family Resources Survey (FRS), and also used by the Institute for Fiscal Studies in their annual report on inequality and poverty (see, e.g., Bourquin et al. 2020), as well as by BB. The Office for National Statistics' *Effects of Taxes and Benefits on the Distribution of Income* ('*ETB*') and *Household Income Inequality* ('*HII*') series use the same income definitions, but estimates are derived from the Living Costs and Food Survey (LCFS): see, e.g., Office for National Statistics (2021*a*, 2021*b*).

The *HBAI* Gini coefficient series is displayed in Figure 1, together with series for three other inequality indices (discussed below), where I have expressed each of them relative to its 1962 value so trends can be compared independently of index scale. (Cf. BB's Figure 1.1.) Although the Gini grew by around 40% between the mid-1970s and the start of the 1990s (from 0.243 to 0.340), it changed little thereafter. Citing earlier versions of this Gini series, commentators such as Young (2015) stated that 'there's not much evidence that the United Kingdom became more unequal in the last parliament', and a Deputy Governor of the Bank of England said that income inequality is 'broadly unchanged' over the past quarter

century (Broadbent 2016, 2). Clearly, these conclusions follow directly from what we see in Figure 1 for the Gini, but are they the only conclusions that can be drawn about what has been happening to income inequality?

<Figure 1 near here>

Figure 1 shows that the answer is 'no'. Other inequality indices calculated from the same data lead to quite different inequality trends for the period since the start of the 1990s. The ratio of the 90th percentile to the 10th percentile ($p90/p10$) declined between 1990 and 2018 from 4.38 to 4.04. By contrast, changes in the Theil index were broadly similar to those in the Gini before 1980 but, thereafter, the rise in inequality was substantially greater in proportionate terms and the levelling off in inequality did not occur until the late 1990s. According to the Theil index, inequality was 21% greater in 2018 than in 1990; according to the Gini, only 3% greater.

The lesson is that conclusions about UK inequality trends are contingent on the inequality index used. Different inequality indices summarize (changes in) income dispersion differently, depending on where in the distribution those changes occur. By construction, the $p90/p10$ index simply ignores what is happening to top incomes. The Gini is a middle-sensitive inequality index, whereas the Theil index is more top-sensitive. Half the squared coefficient of variation (HSCV), not shown, is a top-sensitive index and it increased by around 80% between 1990 and 2018 (IFS 2020). The share of total income held by the richest 1% is, by construction, a top-sensitive measure and Figure 1 shows that it not only fell by (proportionately) more than the Gini did between the start of the 1960s and the late 1970s, but it also increased substantially more from the early 1990s onwards. In sum, normative judgements matter: the more sensitive you are to changes at the top of the distribution, the less plausible is the claim that UK income inequality has not changed for 30 years.

A counterargument is that survey-data estimates for top-sensitive inequality indices should be discounted because they generate spurious trends – that their top-sensitivity means that they are excessively sensitive to high-income outliers that appear in some years of survey data and not others. The point is not simply that standard errors are larger but that the estimates themselves are unduly sensitive to such outliers (Cowell and Victoria-Feser, 1996, 2002). This contamination problem is presumably the reason why BB exclude the top 1% (and bottom 1%) each year from the dataset used for their decomposition analysis based on the HSCV index. This exclusion leads to a substantial reduction in estimated inequality levels and inequality is relatively stable from 1990 onwards: cf. BB's Figure 1.17 with the HSCV discussion above.

Such data trimming is inappropriate in my view because it over-smooths the inequality time series, suppressing genuine cross-time variation, and inequality levels are under-estimated. (On this, see also Burkhauser et al. 2018*b*.) The most thorough analysis of the robustness of inequality indices to influential high-income outliers, by Cowell and Flachaire (2007), highlights problems arising with the HSCV measure in particular. But their recommendations are not to drop observations but, rather, to use semi-parametric estimation methods, shown to work well. Cowell and Flachaire also point out that outlier values may be genuine. Relatedly, observe in Figure 1 the greater increase in inequality according to inequality indices other than the HSCV – not only the Theil index but also the top 1% share.

Focusing on the top 1% share raises additional questions. Are the differential trends a consequence of using different definitions of 'income' and income-receiving unit or, more fundamentally, related to the data source – income tax administrative data rather than household survey?

2. Combining household survey and tax data to estimate inequality levels and trends

Answers to these questions are provided by my recent research with colleagues (Burkhauser et al. 2018*a*, 2018*b*, 2021; Jenkins 2017), exploiting the fact that the definitions used in UK income tax administrative data – the Survey of Personal Incomes ('SPI') held by Her Majesty's Revenue and Customs – can be reconstructed in the household survey data so that like can be compared with like. Our work shows that UK household surveys have become increasingly bad at capturing the income of the very richest people ('survey under-coverage') and we argue that that this is more likely due to under-reporting rather than unit non-response by the richest people. The forte of the income tax data is their much better top-income coverage – but they have poorer coverage of lower ranges than do survey data. Our research shows how to exploit the complementary strengths of survey and tax data to examine inequality levels and trends: combine income tax data about the very highest income ranges with survey data about the rest of the income range.

Our work built on pioneering work by the Department for Work and Pensions. Since the early 1990s, their *HBAI* income distribution series based on the FRS have incorporated information from SPI data using a 'SPI adjustment' which modifies the incomes of at most the top ½% of incomes. BB's data incorporate the same adjustment.

Our work showed, first, that to properly address top income under-coverage you need to adjust more, around 3% to 5% of top incomes. Second, you need to take better account of the inequality that existed within the very rich group. Third, we argued that the Department for Work and Pensions' separate adjustments to top incomes for groups defined by country (Northern Ireland versus the rest of the United Kingdom, i.e., England, Wales, and Scotland) and whether of pension age were unnecessary (these characteristics were poor markers of top income status), recommending that this stratification be dropped. Fourth, our work indicated that using SPI data from a past year (because current year data are unavailable when the Department for Work and Pensions prepare their income distribution series) introduces systematic biases, and we recommended further work on this.

We showed that UK income inequality is greater when calculated using our combined-data methods than when using the Department for Work and Pensions SPI-adjustment, and that inequality increased after the mid-1990s to a greater extent, according to the Gini, MLD, Theil, and HSCV indices. This was true whether we used a non-parametric approach to data combination (Burkhauser et al. 2018*b*) or a semi-parametric approach based on fitting generalized Pareto distributions to SPI top incomes (Jenkins 2017). The results about inequality levels are unsurprising because our approach attributes more income to the top end of the income distribution. For example, we estimate the share of total gross income held by the top 1% in 2010/11 to be 12.9% according to our 'SPI2' method but 11.6% according to the Department for Work and Pensions 'SPI' method (Burkhauser 2018*b*, Figure 6 and Appendix Table E1).

In methodological work based on the LCFS, the Office for National Statistics (2019, 2020*a*) considered the four issues that we had raised (see above). They adopted our first and second points. Our third recommendation, regarding stratification, was partly adopted (stratification by pension age was retained). Regarding the use of past-year SPI data, the Office for National Statistics also found biases and recognised these as an issue that would 'need to be closely monitored' (2020*a*, 15).

The Office for National Statistics' methodological work also extended the income distribution series to more recent years and confirmed our findings, i.e., showing that inequality levels were higher when combined survey-tax data were used and that inequality trends differ. For example, their old-basis series without any top-income adjustment shows a decline in the Gini coefficient between 2010/11 and 2015/16 whereas their new-basis series with top-income adjustments show a rise. See Figure 2. The fall in the adjusted series between 2009/10 and 2010/11 is largely explained by behavioural responses by top-income

receivers when the top marginal rate of income tax was changed (the top-income adjusted series are more sensitive to this than the unadjusted series). See Seely (2014) for further discussion of these 'forestalling' and 'reverse forestalling' issues.

<Figure 2 near here>

It may surprise some readers that the Gini estimates in the adjusted series are only about two percentage points higher than those in the unadjusted series. But remember that the Gini is a middle-sensitive index and so the effects of top-income adjustments are dampened. According to more top-sensitive indices such as Theil or HSCV, inequality increases in the early-2000s (for example) calculated from data adjusted using top-income adjustment method are markedly greater than those estimated from non-adjusted data: see Burkhauser (2018*b*, Table 3).

After further methodological work, the Office for National Statistics (2021*a*, 2021*b*) introduced top-income adjustments into their official *ETB* and *HII* series on income inequality. The additional refinements were to modify the survey weights as well to replace the very highest incomes with SPI values (as in Figure 2) in a slightly different way. Thus, there is now a reweighting step as well as the income replacement step discussed earlier, though this has relatively little (additional) effect. For further discussion of the Office for National Statistics' recent methodological work and revisions to their estimates, see Jenkins (2021).

Figure 3, from Jenkins (2021), compares the most recently available series for the Gini coefficient provided by the Department for Work and Pensions (*HBAI* series) and the Office for National Statistics (*HII* series), and covering 1977 through to 2019/20. Both series record a substantial rise in inequality during the 1980s and the smaller rise combined with fluctuations since the start of the 1990s, and both series show a distinct increase in the Gini coefficient over the last 3 to 4 years. (This was not apparent in Figure 1 as its final survey data points refer to 2017/18.) The Gini coefficient is clearly higher than a decade ago.

There are some differences between the *HBAI* and *HII* series. First, before the early-1990s, when the Family Expenditure Survey was used by both the Office for National Statistics and the Department for Work and Pensions, *HII* Ginis were almost always slightly larger than the corresponding *HBAI* Ginis. It is unclear why. Second, since the mid-1990s, the *HII* series has exhibited greater variability than the *HBAI* series because the sample size of the yearly LCFS (and its predecessors) is substantially smaller than the FRS's. Third, over the period when the *HBAI* series includes top-income adjustments, but the *HII* series does not, i.e., 1992 to 2001/02, the *HBAI* series lies above the *HII* one (in all but one year), which is

what one would expect. Fourth, after 2001/02, i.e., the years for which the Office for National Statistics has applied its top-income adjustment, the *HII* series is above the *HBAI* series in all but two years. Again, this is what one would expect. As Jenkins (2021) points out, if you make a more substantial correction for survey top-income under-coverage, your estimate of inequality increases relative to the benchmark (*HBAI*) estimate.

Discussion of top-income under-coverage in household surveys is increasing around the world, accompanied by discussion of how to address the issue when deriving inequality estimates. For a recent survey, see Lustig (2018) and, for applications to multiple countries, see Bartels and Metzing (2019) and Blanchett et al. (2019). Survey top-income under-coverage for multiple countries is documented using Luxembourg Income Study data by Yonzan et al. (2020). I hope that the Department for Work and Pensions will update its SPI adjustment method so that we return to having consistency between their *HBAI* series and the Office for National Statistics *ETB* and *HII* series. The prospects for other national and international statistical agencies introducing top-income adjustments to survey data are discussed by Jenkins (2021), who concludes that few agencies are likely to do so, partly because their priorities are elsewhere (e.g., for reasons related to Covid-19).

An alternative data combination approach would be to use the incomes in the tax data source as the 'backbone' and to use the survey data to fill in information about the bottom of the income range (Atkinson and Jenkins 2020). This is precisely the approach of former 'Blue Book' series originally produced by the predecessor to the Office for National Statistics (see Ramprakash 1975) and last updated by the Royal Commission on the Distribution of Income and Wealth (1979). It is also the approach taken by Thomas Piketty and colleagues' Distributional National Accounts project which aims to maximize the consistency between macroeconomic (national accounts) data and microeconomic (distribution) data. However, that consistency need not be the only guiding principle and using the survey as the backbone has other advantages, not least that the abundant detail collected by the survey enables derivation of income distribution definitions that accord more closely with conventional ideals (the household as the income-receiving unit; adjustment for differences in size and composition using an equivalence scale; and a disposable rather than gross income concept). Of course, for detailed inequality decomposition analyses by population subgroup and income source, as undertaken by BB, household surveys are the only feasible data source because of the lack of information about characteristics in the tax data, and analyses must be based on the survey data without top income adjustments.

3. The income-receiving unit, within-household sharing, the equivalence scale, and related issues

The top income share estimates shown in Figure 1 refer to distributions of pre-tax national income among adults. For most purposes, we would prefer the survey definition of income, i.e., disposable (net) income, on the grounds that it provides a better measure of potential command over resources. But what about the income-receiving unit? We cannot link individuals belonging to the same family or household in currently available UK income tax data on incomes, as has recently been done for the USA. (See Larrimore et al.'s (2019) innovative work using address matching to identify members of different tax units living in the same household.) However, we can use survey data to explore the consequences of varying the unit definition.

Before the *HBAI* series was introduced in 1988, the UK's income distribution statistics used the 'tax unit' as the income-receiving unit rather than the household. Until 1990 the UK's tax unit was the nuclear family (married couple or unmarried individual). Atkinson and Jenkins (2020) made a case for using this nuclear family definition to complement household-based analysis, pointing out that 'using the household assumes that income is fully shared within the household and that all household members are equally well off. It ignores within-household inequality' (2020, 257). Using a narrower income unit (nuclear family) definition incorporates some within-household inequality.

Figure 4 shows that narrowing the income-receiving unit from the household to the nuclear family increases inequality measured using the MLD by about two percentage points throughout the period 1961–1999 (the same is true for the Gini; not shown). The switch's effect on inequality trends is small, however.

<Figure 4 near here>

If we classify households according to whether they contain one family (tax unit) or multiple families (tax units), we can decompose overall household income inequality into a weighted sum of inequality within single-tax-unit households and inequality within multiple-tax-unit households (where the weights are the fractions of individuals in each household type), plus inequality between the two household types (which turns out to be near zero in this case because mean incomes for the two groups are very similar). Figure 4 shows for the 1961–1999 period that inequality among multi-family households was markedly lower than among single-family households – reflecting the assumption of equal sharing within

households – though inequality trends for the two groups are similar. However, the fraction of all individuals living in multi-family households declined substantially between 1961 and 1999, from around 40% to 25%, though remained steady at around 30% between 1975 and 1990, so overall inequality increasingly reflected inequality among single-family households.

These patterns are suggestive regarding the effects of Covid-19 on income inequality. As the pandemic has led to an increase in the proportion of young people returning to live with their parents or sharing accommodation with peers – continuing a trend that began around 2000 (Office for National Statistics 2021*c*) – the fraction of individuals in multi-family households will have risen. If one assumes equal sharing of income within households, as in official income distribution statistics, the pandemic-induced demographic change will reduce measured inequality by a small amount.

Equal sharing within households (or families) is an assumption made for practical reasons rather than a claim to reflect reality. There are a range of ways to explore alternative scenarios (Jenkins 1991*a*). One approach with demonstrated feasibility is examination of distributions of 'individual incomes' as in the unfortunately now defunct *Individual Incomes* series (Women and Equality Unit 2006) briefly resuscitated by the National Equality Panel (2011) and Karagiannaki and Platt (2015). This series provided comparisons of the income received by adult women and by adult men (with some assumptions made about accrual in the case of benefits with family-based means tests). There is a good case for reinstating this series. Although there is much data about the gender pay gap and its trend, we need to know about income, not only employment earnings for employees, to compare the living standards of all men and all women.

Estimates from economists' collective models of bargaining between marital partners provide another approach, albeit less feasible for a statistical agency to provide. Lise and Seitz (2011) provide the most fully-worked application for the UK, examining consumption inequality for two-person households (childless couples) aged 22–55 years not in self-employment. Lise and Seitz argue that, although consumption inequality between households rose between the early-1970s and the early-2000s (consistent with the conventional picture, as shown by, e.g., BB Figure 1.6 for the whole population), within-household inequality fell between the mid-1970s and mid-1980s and was stable thereafter. The net effect was that total consumption inequality (the combination of within- and between-household inequality) trended upwards from the 1980s onwards but not as much as between-household inequality.

Underpinning these results is a rise in married women's earnings, reflecting their rising labour force participation rates and a falling gender wage gap. As both these trends

have continued over the last two decades, one would expect collective models to predict within-household inequality to have continued to fall and partially offset the upward trend in between-household inequality. The picture for overall inequality is more complicated to predict, however, because the working-age childless couple households that Lise and Seitz (2011) model form only a small subset of the UK's population – just under 13% of individuals belonged to this family type in 2018/19 (Department for Work and Pensions 2020, Table 3.1db (BHC)).

It is ubiquitous to adjust observed incomes by an equivalence scale to account for the impact of differences in household size and composition on real living standards. The modified-OECD scale is the scale used in the UK's official income distribution statistics produced by the Department for Work and Pensions and the Office for National Statistics, as well as by Eurostat and the OECD, though the Social Metrics Commission (2018) has recently argued that the scale needs to be revised for UK application (stating, e.g., that it does not properly reflect the costs of children relative to adults or of children of different ages). It is well-known that there is a systematic U-shaped relationship between point-in-time inequality measured using indices such as the Gini and MLD and economies of household size (Coulter et al. 1992, Jenkins and Cowell 1994). But of particular interest in the current context is whether estimates of inequality trends are robust to the choice of equivalence scale. UK evidence about this, from Jenkins (1991*b*, Table 5), indicates that estimates of inequality change between 1976 and 1986 were robust for all standard indices and scales with an elasticity with respect to household size between 0.25 and 0.75 – which includes all commonly-used scales, including the modified-OECD one. Jenkins and Cowell (1994, Table 2) report similar results for changes in the Gini coefficient between 1987 and 1988/89. These conclusions should be re-examined using more up-to-date data.

My final observation under this heading is that the UK's official income measures take no account of differences in the costs of living across regions. This is unlike, say, the US Supplementary Poverty Measure. There are certainly such differences (Office for National Statistics 2018), but there is little UK evidence about whether these have been changing over time – which is particularly relevant for the assessment of inequality trends. Arguably the AHC measure of household, with its deduction for housing costs, goes some way towards addressing this issue, but it deserves further investigation.

4. The definition of 'income'

The definition of household net income before the deduction of housing costs ('net income BHC') that is employed by the Department for Work and Pensions and the Office for National Statistics conforms to the international standards formulated by the Canberra Group (2011) and implemented also by the statistical agencies of most rich countries, and international statistical agencies such as OECD and Eurostat. This is also the main measure used by BB to summarize inequality levels and trends.

In contrast, net income after the deduction of housing costs ('net income AHC') is now favoured for UK poverty measurement for the reasons rehearsed by Bourquin et al. (2020, Appendix A). The same reasons provide a case for summarizing inequality levels and trends using net income AHC, and the choice makes a difference. In the 1960s and 1970s, the AHC Gini was only around 1 percentage point greater than the BHC Gini but a gap between the series opened up around the beginning of the 1980s and grew over the 1990s. For the last two decades, the difference has remained at 4 to 5 percentage points – which is large if benchmarked against, say, the 10 percentage point increase in the BHC Gini that occurred during the 1980s (IFS 2020). AHC inequality is greater than BHC inequality because low-BHC income households tend to spend a larger share of their income on housing than better-off households. The advent of the gap between AHC and BHC inequality series coincided with the introduction of the Right to Buy policy in 1981 that enabled social housing tenants to buy their dwelling at discounted rates. Among those who remained social tenants, there was a marked decline over the 1980s in employment rates, and median employment earnings and (BHC) net income relative to the population as whole (Adam et al. 2015, Figure 3) before a levelling out.

Economics principles suggest that using income measures incorporating imputed rental income from owner occupation or subsidized renting would be a better approach to accounting for the costs and benefits of housing. It is certainly possible to estimate imputed rental income, as BB do for their measure of household consumption. However, we are not yet at the stage at which imputed rental income should be routinely incorporated in official statistics' income measures. There is no consensus about the practical details of how to estimate imputed rental income, and changing to income measures based on it would lead to substantially different conclusions about the positions in the distribution of different groups (notably elderly people, most likely to be owner-occupiers, asset-rich but cash-poor), a

finding with controversial policy implications. The issues are clearly spelt out by, for example, Sauli and Tömälehto (2010) and Tömälehto and Tömälehto (2017).

Income from capital gains is also not included in the BHC or AHC income measures, following the Canberra Group principles of excluding income judged to be irregular. Advani and Summers (2020), using administrative data from Capital Gains Tax records, show that inclusion of realised capital gains make a substantial difference to levels of inequality measured in terms of top income shares. For example, they estimate the top 1% share in 2018 was just under 17% if realised capital gains are included compared with around 14% if excluded (2018, Figure 6). The effect of including this source is proportionately greater the further one goes up the distribution (because the gains are disproportionately to the very rich) and, for example, the top 0.01% income share rose by more over the last decade than did the top 1% share.

As with the treatment of imputed rental income, there would be substantial issues of principle and practice involved with incorporating capital gains income into the Department for Work and Pensions' and Office for National Statistics' income statistics. These are discussed well by Corlett et al. (2020).

5. Absolute versus relative concepts of 'inequality'

By summarizing inequality using 'relative' measures – functions of incomes expressed relative to mean income (or income shares) – BB follow the near-universal practice of statistical agencies and other researchers. But this is not the only way to conceptualize and summarize interpersonal income differences. Kolm (1976) 'found many people who feel that it is an equal absolute increase in all incomes which does not augment inequality, whereas an equiproportional increase makes income distribution less equal or more unequal – and these were people of moderate views' (1976, p. 419), and he went on to develop 'absolute' inequality measures.

Put differently, real income growth of 1% may be of little consequence for someone at or below the poverty line but translate into substantial increases in income levels for people at the top of the distribution. For example, between 2010/11 and 2018/19, the UK $p10$ increased by only one pound per week, but $p90$ increased by £57 per week (IFS 2020). Do these differential increases translate in the popular mind to a greater increase in inequality than knowledge that the percentage changes in income were 1% and 5% respectively? We do

not know, and it would be interesting to research the issue further because it makes a difference.

Changing the perspective from relative inequality to absolute inequality alters the picture about UK income inequality trends markedly. Jenkins (1991*b*, 1992) provided estimates for 1971–1986. Figure 5 provides estimates for the whole period 1961–2018 for the absolute Gini, standard deviation, and $p90$–$p10$ gap. (The absolute Gini, like the standard Gini, is related to the average of absolute differences in income between all individuals but, unlike the standard Gini, the average is not divided by mean income.) The three absolute indices provide very similar pictures of inequality trends up until the mid-1980s. Although their paths diverge thereafter, all three indices show a distinct increase in inequality over the last 25 years – which is not the case for the relative Gini and $p90/p10$ ratio (Figure 1). For example, the absolute Gini increased by around one third.

<Figure 5 near here>

In sum, conceptualizing income inequality in terms of absolute differences changes substantially the perception what has been happening to trends.

6. Inequality of opportunity (and horizontal inequalities)

The focus so far has been on inequalities of outcomes measured in terms of income but, arguably, the inequalities that people think are unfair are inequalities in the *opportunities* to earn those incomes. This is the idea that differences in income deriving from factors over which we have no control ('circumstances') are unjust whereas differences due to our efforts are merited. There are now substantial theoretical and empirical literatures about the measurement of inequality of opportunity. For a recent review, see Roemer and Trannoy (2016).

In a nutshell, having classified individuals into groups ('types') according to combinations of their circumstances (parental education level, ethnic minority group, etc.), inequality of opportunity is measured by the amount of between-type inequality (an absolute measure) or the amount expressed as a proportion of total inequality (a relative measure). There is a link with the literature on horizontal inequalities because that focuses on comparisons of incomes across groups (for example, ethnic minority groups, or men and women) – as addressed in various papers for the Deaton Review. The inequality of

opportunity literature focuses on differences in group-mean incomes but defines groups in a more intersectional way.

Inequality of opportunity estimates for the UK are rare because there are few datasets containing information about mid-life incomes (to measure outcomes) as well as detailed family background variables (the principal measures of 'circumstances') and characteristics such as ethnic minority group membership. Carranza (2020) reports estimates for individuals aged 25–55 exploiting two years of EU-SILC data in which a range of background questions were asked. He finds that around 8% of net income inequality (measured using the MLD) in 2005 was accounted for by inequality of circumstances compared with around 5% in 2011 (Figure 14a). These are 'lower bound' estimates since not all relevant circumstances are measured; his upper bound estimates derived using a fixed-effects approach, are 57% and 54% respectively. Using Understanding Society data covering 2009–2017, Flatscher (2020) reports that around 10% of inequality measured using the MLD was attributable to inequality of opportunity, whether looking at inequality of employment earnings, gross income, or net income (lower bound estimates). Hufe et al. (2017, Figure 9) use data from the 1970 Birth Cohort Survey (BCS70), and report lower bound estimates for net income inequality (MLD) in 2018–12 (i.e., at around age 40) of 30%.

The substantial variation in estimates prevents firm conclusions from being drawn. It reflects the nature of the data currently available, specifically the portfolio of circumstances variables. For example, Hufe et al.'s (2017) relatively high estimate is largely due to their use of a more extensive set of circumstances variables. Given the great policy interest in (in)equality of opportunity, getting better data – particularly with more extensive sets of family background variables – and hence more reliable estimates should be a priority. Adding a small number of retrospective recall questions to the Family Resources Survey, e.g., about respondents' parents' educational qualifications and their occupations during the respondent's childhood is an obvious way to implement this, and it would need to be done for around three years in order that the calculations could use information about ethnic minority group reliably. (The retrospective intergenerational transmission modules that were included in the EU Statistics on Income and Living Conditions surveys in 2011 and 2019 are exemplars of this strategy.) Research is also needed to reconcile the large gap between lower and upper bound estimates.

7. Consumption, income, and longitudinal income variability

BB's updating of Brewer and O'Dea's (2012) comparisons of consumption and income inequality is welcome. There are additional arguments about the extent to which income and consumption can be reliably measured, especially at the very bottom of the distributions, as BB also point out.

Economists have long argued that consumption provides a better measure of household living standards than income does. In part, this represents a view that the resources consumed provide a better measure of household welfare than the potential command over resources represented by income. In addition, economists often assume that households smooth their consumption over time even if their incomes fluctuate. However, not all households can do this relatively costlessly. For example, the costs of borrowing are typically much higher for poor people than rich people. If you cannot smooth consumption easily, your current consumption possibilities are defined by your current income.

A related issue is the reference period over which income and consumption are measured – the week, month, or year. For households with volatile incomes, the ability to smooth income from one week or fortnight to the next is important. For these households, per-year measures of income and consumption simply define their problems away. It would be valuable to be able to compare the inequality of annual income to the inequality of income measured over much shorter periods. No UK data source currently provides that information.

More generally, there is little information available about how individuals' and households' incomes vary over relatively short periods of time. Household panel surveys such as the British Household Panel Survey, now Understanding Society, provide data about longitudinal income variation but not at sufficiently high frequency to address questions related to households' abilities to cope in the short-term. (Year to year income changes are documented in detail by Jenkins 2011.) What we need is an updating and expansion of the pioneering study by Hills et al. (2006) which tracked a sample of low-income people's incomes week by week over the 2002/03 year using a combination of survey and tax-credit administrative data. For a US exemplar, see Morduch and Schneider (2017).

These points also highlight that we need to know more about the adequacy of buffers against adverse economic shocks (such as the pandemic), especially for low-income households. According to Wealth and Assets Survey data for 2016–18, 'nearly a third of individuals towards the bottom of the household income distribution, and around a fifth of those in middle income households, said that they would be unable to manage a month if

their household lost its main source of income (Sturrock 2020 cited by Blundell et al. 2020). More up-to-date information from the Resolution Foundation's November 2020 Covid-19 survey reports that 'more than four-in-ten (42 per cent) adults report using at least one form of borrowing (credit cards, borrowing from family and the like) to cover everyday living costs. Most strikingly (and worryingly), this figure rises to over half (54 per cent) for those living in the lowest income families, indicating not only the pressure such households are under currently, but also that a debt problem may be brewing for the future' (Handscomb and Judge 2020, 19). There is already evidence from pre-pandemic times that 'payday loans provide shortlived liquidity gains and encourage consumers to take on additional credit. However, in the following months, payday loans cause persistent increases in defaults and cause consumers to exceed their bank overdraft limits' (Gathergood et al. 2018, 496).

Assessments of measured inequality are tempered by how much turnover there is at the very top of the distribution as well as at the bottom – is the top 1% a closed group or relatively open? Top-income under-coverage is a serious barrier to survey-based research on this topic, but administrative data are becoming available. Using newly-available UK tax record data covering from 2000–01 to 2015–16, Joyce et al. (2019, Figure 14) show that, of the individuals in the top 1% of the taxable income distribution among tax-payers, some 75% remain in the top 1% after one year, 60% after two years, and 50% after 3 years. To the authors, these statistics indicate that 'the top 1% of income tax payers are not a stable group' (2019, 2). However, the statistics are also consistent with there being negligible turnover in the membership of the top 5% (say) – which would be a situation of stability. We need more detailed information of top income mobility patterns, and for the population as a whole (not only tax payers). There are also issues such as whether capital gains could or should be included in the income measure.

Finally under this heading, I echo BB's support for the Office for National Statistics' (2020*b*) recent work examining the joint distributions of income, spending, wealth – currently based on the statistical matching of LCFS and Wealth and Assets Survey data. One of the most striking findings is the high correlation between people's positions in each distribution. For example, '[a]round 7% of households in Great Britain were in the bottom fifth of all three of the income, spending and wealth distributions in April 2016 to March 2018. This compares with just under 9% of households that were in the top fifth of all three measures' (Office for National Statistics, 2020*b*, 6). More generally, '3D' perspectives on household finances, as illustrated for the USA by Fisher et al. (2016), provide valuable background against which to assess the inequality in any single dimension.

8. Inequality of subjective well-being

My final remarks are a variant on the 'inequality of what?' theme. Nowadays much attention is given to the distribution of subjective well-being (SWB) by many official statistical agencies including the OECD and the Office for National Statistics, following the recommendations of the influential Stiglitz-Sen-Fitoussi (2009) report, *Beyond GDP*. Although the relationship between income levels and SWB levels have been extensively studied, surprisingly little attention has been given to whether SWB inequality and income inequality move together over time.

To examine this issue, I have used the only individual-level SWB data that I could find for Britain that covered multiple decades – European Values Survey data about life satisfaction (reported on a 10-point scale) at five points between 1981 and 2018. Figure 6 plots estimates of life satisfaction inequality, by year, according to eight different indices designed to be applied to ordinal data as well as the standard deviation (which is not).

Figure 6 suggests that there was hardly any change in life satisfaction inequality between 1981 and 2009 (the magnitudes of any apparent differences are small) with some indications that life satisfaction inequality was slightly lower in 2018 than in previous years. However, the confidence intervals around the estimates are large, reflecting the small-sized European Values Survey samples. What can be said is that there was no distinct increase in life satisfaction inequality between the early 1980s and the late 2010s in the way that there was for income inequality.

<Figure 6 near here>

9. Summary and conclusions

I have shown that UK income inequality levels are higher than conventionally assumed, and the conclusion that income inequality in the UK has changed little over the last 30 years is sensitive to the choice of inequality index employed or inequality conceptualization ('relative' versus 'absolute'). Using a more top-sensitive inequality index than the Gini coefficient, or an absolute index rather than relative index, you are more likely to conclude that income inequality has definitely risen over this period.

These points are the primary ones that might change the average person's views about the nature of UK income inequality and its trends. There is a range of other issues which, if we had more information about them, might affect people's views as well.

For example, how we assess any given level of inequality depends also on how much household incomes fluctuate over time and the extent to which this can be smoothed, but we have little up-to-date information about longitudinal variability at the bottom or top of the distribution, especially within-year variability. More systematic information about capital gains and who receives them would change the picture about income inequality levels and possibly trends as well. Judging the unfairness of observed inequalities of outcome would also be enhanced were we to have reliable information about inequalities of opportunities. Enhanced or new household survey data would help us address many of these issues though, for many of them, using administrative data in combination with survey data is likely to be the most productive way ahead, as my examples have illustrated. BB's chapter is a cornucopia of what we know about UK income inequality, but there remains much to learn.

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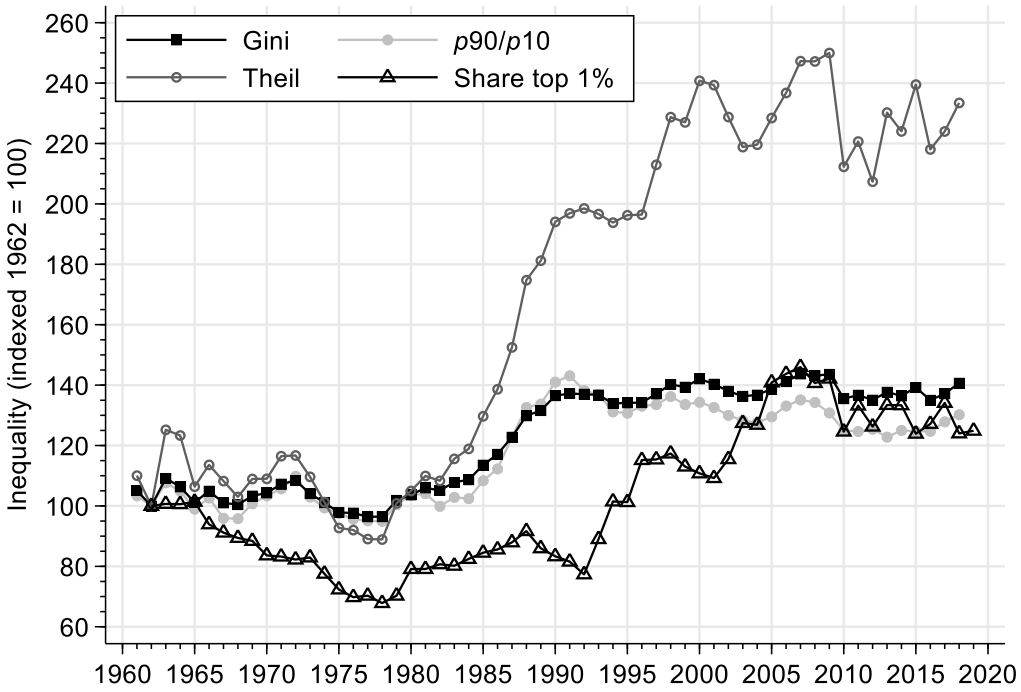
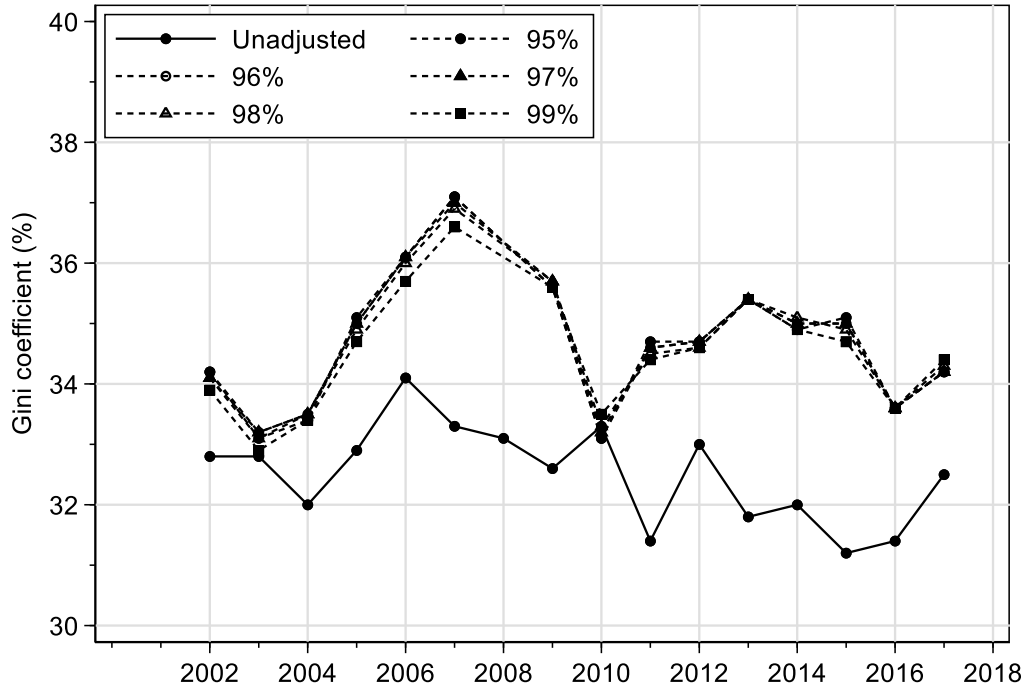
Figure 1. Trends in UK income inequality since 1961, by measure



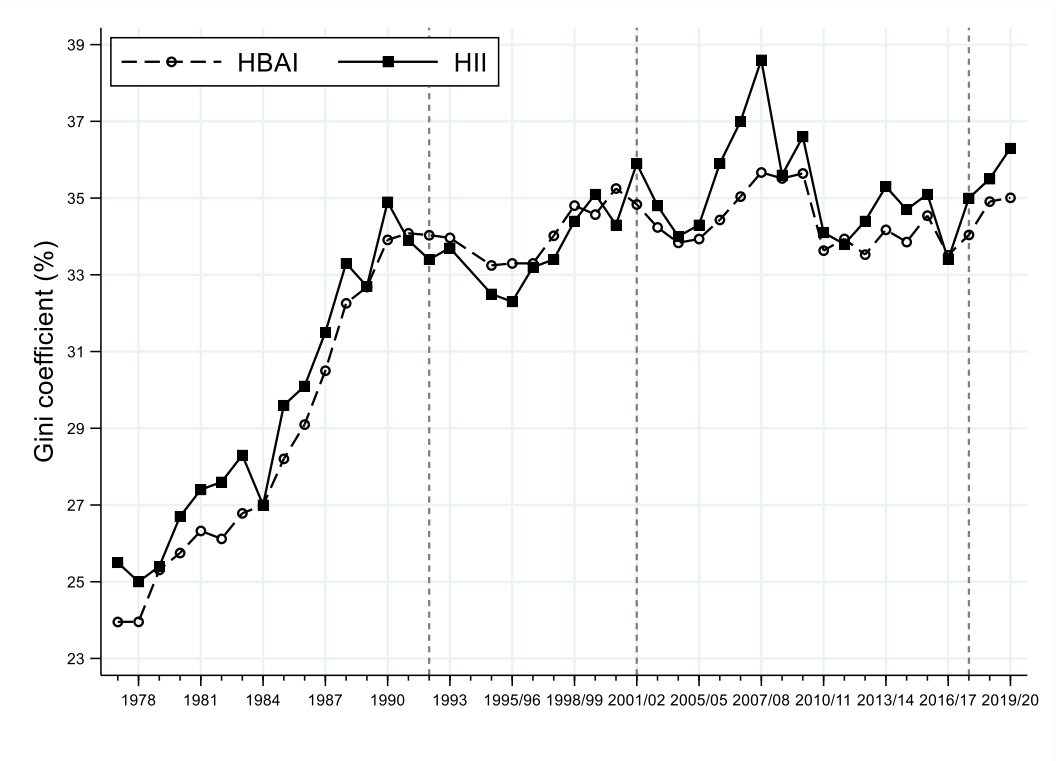
Notes. Gini, Theil, and *p*90/*p*10 measures refer to distributions among individuals of equivalized household net income before the deduction of housing costs (using the same definitions as employed by the Department for Work and Pensions' (2020) *Households Below Average Income* statistics), derived from the Family Resources Survey (source: IFS 2020). Years are fiscal years from 1994/95 ('1994') onwards. The top 1% share measure refers to the distribution of pre-tax national income among adults (equal split assumption), derived from income tax return data in the Survey of Personal Incomes (source: World Inequality Database 2021, data downloaded 23 January 2021).

Figure 2. Gini coefficient series without top-income under-coverage adjustment and with SPI-based adjustments above multiple thresholds



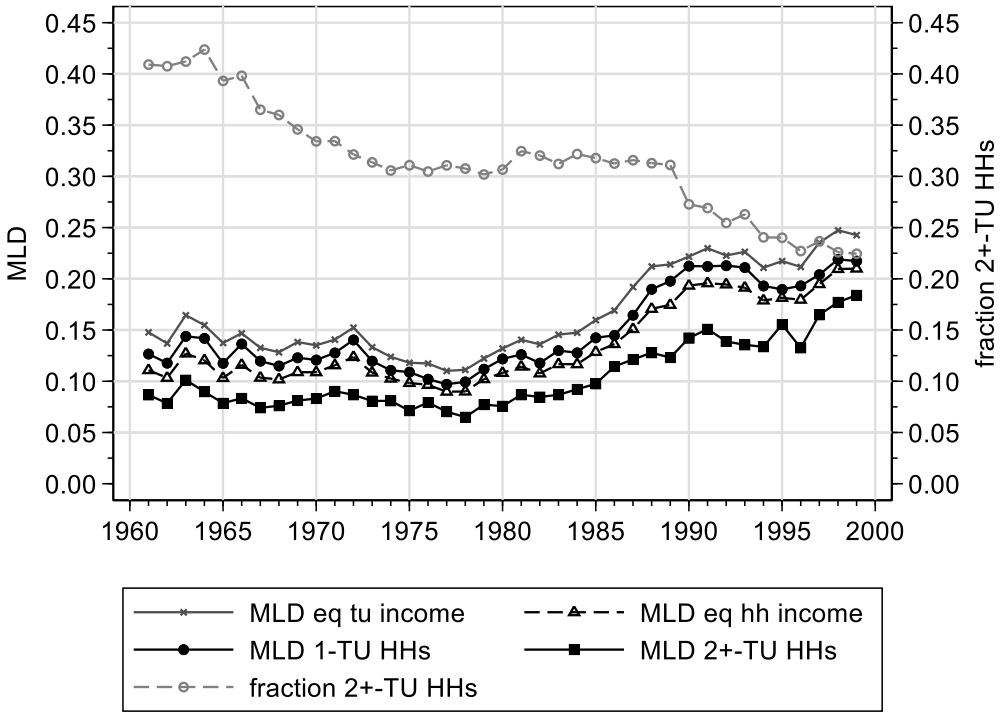
Notes. Source: Office for National Statistics (2019, Figure 3), redrawn by the author. Based on data from the Living Costs and Food Survey and the Survey of Personal Incomes (SPI). Income is equivalized net household income. Years refer to financial years (2002/03 is '2002', etc.). The solid line is the Gini estimate without any adjustment for top-income under-coverage. The dotted lines show Gini estimates calculated using SPI-based imputations for incomes above different percentile thresholds; estimates for 2008 are missing as no SPI dataset is available for that year.

Figure 3. Gini coefficient series: ONS 'HII' and DWP 'HBAI' estimates



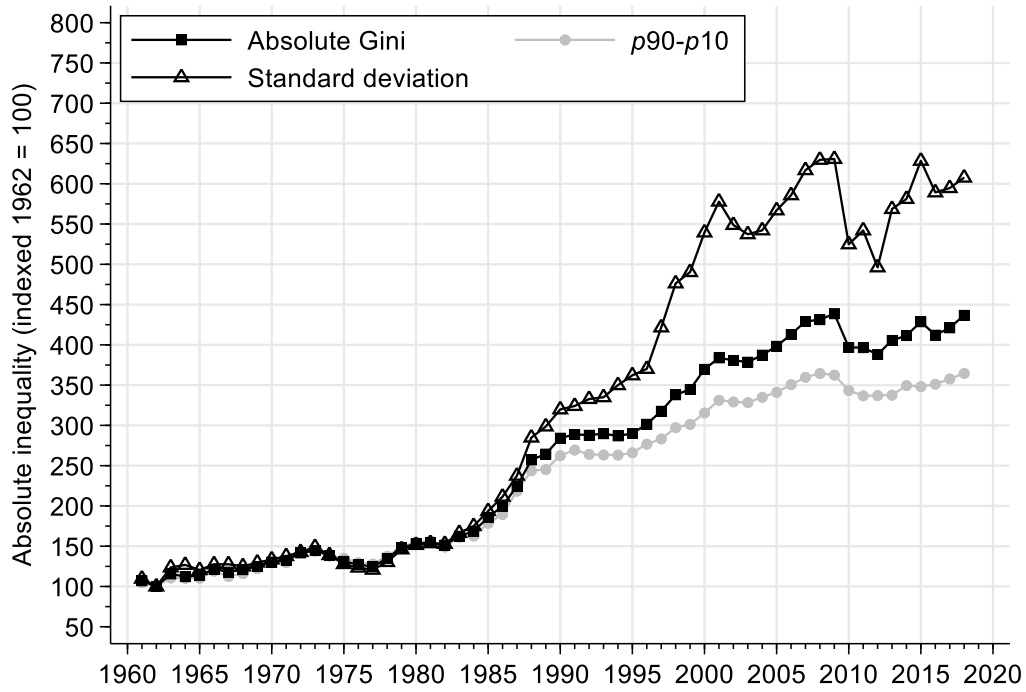
Source. Jenkins (2021, Figure 4), using data in spreadsheets accompanying Office for National Statistics (2021*a*, 2021*b*) for the *HII* series and Cribb et al. (2021) for the *HBAI* series. Notes. All distributions refer to distributions of net household income, equivalized using the modified-OECD scale. The individual is the unit of analysis, with estimates based on the full private household population. The *HBAI* estimates are the same as published by the DWP and are based on the FRS (and Family Expenditure Survey before 1994/95). Northern Ireland data included from 2002/03 onwards. The *HBAI* series uses the SPI-adjustment method from 1992 onwards. Up to 2016/17, the *HII* series is based on data from the Living Costs and Food Survey and its predecessors; the estimates for 2017/18 onwards are based on Household Finances Survey data (which extend the LCFS). The *HII* series incorporates a top-income adjustment for years 2001/02 and thereafter based on the Office for National Statistics' 'quantile' method employing a 97% threshold and 0.5% quantile band width. The vertical dashed lines indicate the survey years for which the Department for Work and Pensions and the Office for National Statistics first used their top-income adjustments and the year the Office for National Statistics switched to using Household Finances Survey data.

Figure 4. Inequality (MLD), 1961–1999: households and tax units



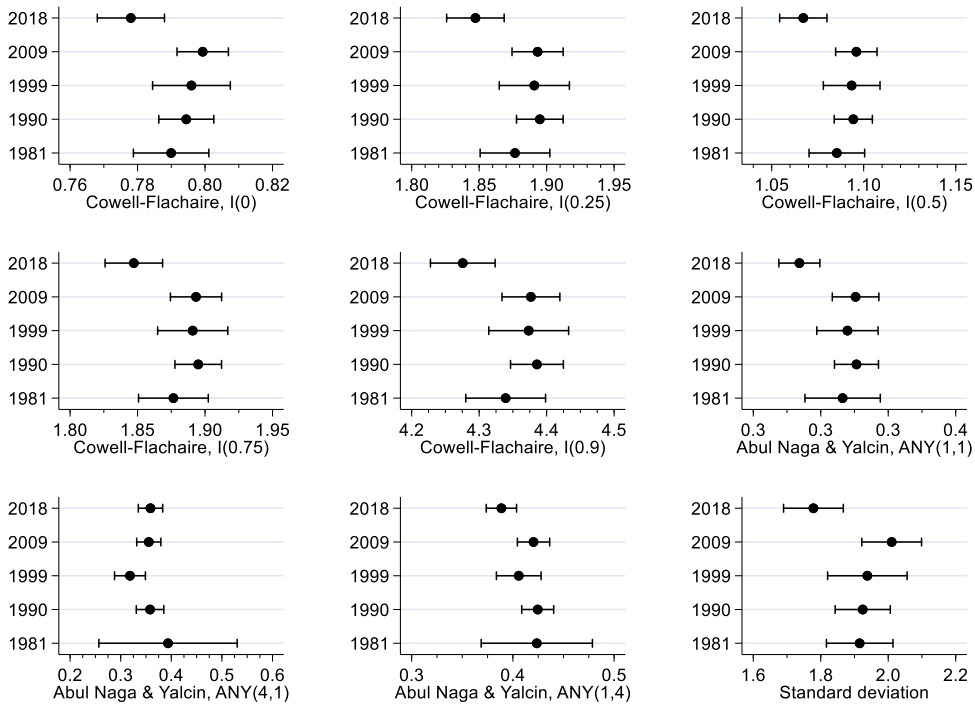
Notes. MLD is the mean logarithmic deviation inequality index calculated for distributions of equivalized net income amongst individuals. Income receiving-unit is the nuclear family ('tax unit') for the 'eq tu income' series, and the household for the other series. (Tax unit is the pre-1990 definition throughout.) 'MLD 1-TU HHs' is inequality among households containing one family; 'MLD 2+-TU HHs' is inequality among households with more than one family. 'fraction 2+-TU HHs' is the fraction of all individuals living a household with more than one family. Source: author's calculations from the dataset for 1961–1991 accompanying Goodman and Webb (1994), extended to 1999 by Allissa Goodman. Data sources are the Family Expenditure Survey before 1994 and the Family Resources Survey thereafter.

Figure 5. Trends in UK income inequality since 1961, by absolute inequality measure



Notes. The indices summarize absolute inequality in distributions among individuals of equivalized household net income before the deduction of housing costs (using the same definitions as employed by the Department for Work and Pensions' (2020) *Households Below Average Income* statistics), derived from the Family Resources Survey (source: IFS, 2020). Years are fiscal years from 1994/95 ('1994') onwards. The Absolute Gini is the standard Gini coefficient multiplied by mean income.

Figure 6. Life satisfaction inequality, GB, 1981–2018, by inequality index



Notes. Author's derivation from weighted European Values Survey data. The inequality indices are explained by Jenkins (2020). Life satisfaction is measured on a 10-point scale ranging from 1 (dissatisfied) to 10 (satisfied). Panels show estimates plus 95% confidence intervals (derived using bootstrapped standard errors with 500 replications).