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Accounting for changes in income inequality: Decomposition analyses for Great Britain, 1968-2009

Mike Brewer
Institute for Social and Economic Research
University of Essex and
Institute for Fiscal Studies

Liam Wren-Lewis
Overseas Development Institute Fellow and
ECARES, Université Libre de Bruxelles

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Non-technical summary

It is widely known that household income inequality in the UK is much higher than it was thirty years ago. However, the rise over this period has not been even. Instead, on many measures income inequality rose very quickly during the 1980s, and has changed little since 1991. This is all the more puzzling given the fact that individual wage and earnings inequality rose fairly steadily over the period, at least until 2000. These patterns are different from the US, where income inequality has continued to rise along with earnings inequality. This article investigates these recent changes in income inequality, which have remained relatively understudied compared with changes in earnings or wage inequality. We address the question "why did income inequality rise very rapidly over the period 1978 to 1991 but then remain relatively flat thereafter?"

To answer these questions, we decompose changes in income inequality into the contributions from different factors. We first decompose income inequality according to the income *sources* which have contributed to changing inequality (earnings from employment, investment income, state benefits, etc): this allows us to assess the share of changes in total inequality attributable to each income source. We then focus on decomposing inequality according to *household characteristics* which we expect to influence income (such as age, education, sex, and so on).

We find that inequality in employment and self-employment income amongst the economically active grew both before and after 1991, but, since 1991, a number of factors have mitigated the effect of this on inequality in total income. First, inequality between those with different employment statuses has fallen since 1991, primarily due to a fall in the number of unemployed people. Second, employment taxes have played a larger role since 1991 in mitigating the increase in inequality of gross employment income than they did before 1991. Third, investment income has become less unequal since 1991, largely due to the decline in its importance, which itself may be explained by a fall in nominal interest rates. Finally, a rise in the relative incomes of pensioners and households with children under five has pulled inequality down. Overall, these four factors have almost entirely offset the impact of the rise in earnings and self-employment income inequality since 1991.

Accounting for changes in income inequality: Decomposition analyses for Great Britain, 1968-2009[1]

MIKE BREWER[2] and LIAM WREN-LEWIS[3]

We analyse income inequality in Great Britain over the period 1968-2009 in order to understand why income inequality rose very rapidly over the period 1978-91 and then stopped rising. We find that earnings inequality has risen fairly steadily since 1978, but other factors that caused inequality to rise in 1978-91 have since reversed. Inequality in investment and pension income has fallen since 1991, as has inequality between those with and without employment. Furthermore, certain household types – notably the elderly and those with young children – which had relatively low incomes in 1978-91 have seen their incomes converge with others.

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[2] Institute for Social and Economic Research, University of Essex; Institute for Fiscal Studies. Correspondence to mbrewer@essex.ac.uk.

[3] Overseas Development Institute Fellow and ECARES, Université Libre de Bruxelles.

I. METHODOLOGY

It is widely known that income inequality in the UK is much higher than it was thirty years ago (Hills et al., 2010; Cribb et al. 2012). However, the rise over this period has not been even. Instead, on many measures income inequality rose very quickly during the 1980s, and has changed little since 1991. This is all the more puzzling given the fact that wage and earnings inequality rose fairly steadily over the period, at least until 2000 (Machin and van Reenen, 2007; Blundell and Etheridge, 2010;). These patterns are different from the US, where income inequality has continued to rise along with earnings inequality (Burkhauser et al., 2009; Heathcote et al., 2010).

Specifically, between the late 1960s and the present day, income inequality in Great Britain has risen from that of a relatively average developed country, with a Gini coefficient of 0.226, to one of the most unequal countries in the OECD, with a Gini coefficient over 0.305, and now stands close to its highest level since the comparable time series began (see Figure 1, which also details changes in other macroeconomic variables, including earnings inequality, GDP growth, unemployment and the percentage of adults in households were no-one is employed).

[Figure 1 here]

This article investigates these recent changes in income inequality, which have remained relatively understudied compared with changes in earnings or wage inequality. We address the question "why did income inequality rise very rapidly over the period 1978 to 1991 but then remain relatively flat thereafter?" We seek to distinguish between two broad hypotheses: was it the case that those factors which drove the rise in income inequality during 1978 to 1991 were specific to that period? Or was it that the factors behind the 1980s rise in inequality have continued, but have been offset by new factors pulling inequality downwards?

To answer these questions, we use three complementary techniques which decompose changes in income inequality into the contributions from different factors. We use three different techniques as each gives a different insight into the underlying forces driving changes in inequality. We first decompose income inequality according to the income *sources* which have contributed to changing inequality (earnings from employment,

investment income, state benefits, etc), following Shorrocks (1982): this allows us to assess the share of changes in total inequality attributable to each income source. We then focus on decomposing inequality according to *household characteristics*, using two further techniques: we use the regression-based method of Fields (2003) and Yun (2006) to decompose changes in inequality by various characteristics which we expect to influence income (such as age, education, sex, and so on), and we investigate specific characteristics further by decomposing inequality by subgroups defined by these characteristics following Shorrocks (1984). Decomposing using these methods has a number of advantages. Since the methods are relatively simple, they allow us to analyse and present the effect of a large number of sources and characteristics. Moreover, the decomposition methodologies of Fields (2003) and Shorrocks (1982, 1984) give results that are independent of the inequality measure or the order in which factors are analysed, unlike more complex simulation methods such as those used by Bourguignon et al. (2004).

An obvious inspiration for our work is Jenkins (1995), who decomposed changes in income inequality in the UK between 1971 to 1986. He found that causes of changes in inequality during this period were the result of a multiplicity of characteristics, some temporary and others part of ongoing trends.[1] Goodman and Webb (1994) looked in detail at changes in income inequality in the period 1961 to 1991 and used decompositions by family type and employment status to help explain these changes. In his presidential address to the Royal Economic Society, Atkinson (1997) provided a comprehensive survey of possible explanations for changes in the UK income distribution over the previous decades, concluding that one must look beyond changes in the earnings distribution to understand the full picture.

Subsequent studies have considered particular aspects of the changes in income inequality since the early 1990s, but these have tended to focus on a select set of explanatory factors. For example, Clark and Leicester (2004) and Adam and Browne (2010) both use simulation techniques to analyse the effect of changes in personal tax and benefit policy on income inequality. They find that the impact of reforms on inequality has varied considerably over time, with the end of the link between benefit entitlements and average earnings appreciably increasing inequality during the 1980s, and the rise in the importance of means-tested benefits reducing inequality in the later 1990s and 2000s. A number of studies have explored the role played by particular factors that affect income inequality in the UK. Fräßdorf et al. (2010) analyse the contribution of income from capital to total income inequality, in the UK,

US and Germany, showing that it is a major determinant of income inequality in all countries. A recent report by the (OECD, 2008) looks at a number of factors that may be driving household income inequality trends across OECD countries, including population structure and various income sources. A separate strand of literature has focused on the role of `top incomes' in explaining income inequality, and decomposed changes in the income of this group. Atkinson and Piketty (2007) provide a review of the evolution in many countries including the UK, and Brewer et al. (2009) analyse changes at the top of the UK income distribution between the mid 1990s and mid 2000s. A complementary approach to ours is to use longitudinal data, and Jenkins and van Kerm (2005) use the British Household Panel Study to analyse precisely how the income distribution has changed. By decomposing changes by subgroups at different points in the income distribution, they unravel the complex changes in income inequality in the 1980s, and show that the trend was likely to have been driven by changes in the wage distribution. Finally, Goodman and Oldfield (2004) and Blundell and Etheridge (2010) have documented UK trends in inequality in household expenditures (or households consumption) as well as household income, and Brewer and O'Dea (2012) have compared the different impressions one gets about the level and trends in inequality in the UK, or the extent and composition of poverty, if one uses consumption, rather than income, to proxy for a household's living standards.

Household income inequality has also been a focus of many US studies. Burkhauser et al. (2009) estimate trends in income inequality between 1975 and 2004, finding that US household income inequality rose substantially both in the 1980s and the 1990s, though the exact pattern depends on the inequality measure used. That US income inequality rose substantially is also found by Gottschalk and Danziger (2005), who analyse changes in household income inequality alongside various forms of earnings inequality. They show that changes in household income inequality have largely mirrored male wage inequality, but that this masks other trends affecting household income inequality. In particular, increases in male earnings inequality have been offset by changes in earnings of other family members, with other sources of income explaining part of the rise in household income inequality in the 1980s. Studying the relationship between wage, income and other forms of inequality, Heathcote et al. (2010) also find that household income inequality has tracked the rise in wage inequality fairly steadily in the US since 1970. Reed and Cancian (2001) decompose changes in US household income inequality between 1969 and 1999 by income source,

finding that the contribution of capital income inequality and self-employment income inequality has risen over time.

The changes in household income inequality in both the UK and the US have been accompanied (and no doubt partly caused) by sizeable changes in individual earnings inequality over the same period. While this paper does not aim to understand these changes in wage inequality, we are interested in the role of wage inequality in determining trends in income inequality. The rise in UK full-time workers' earnings inequality shown in Figure 1 has been the subject of several studies, which this article serves to complement. Machin and van Reenen (2007) provide a survey of changes in male and female wage inequality over the period. They show that wage inequality rose through the distribution in the 1980s, but that the picture since 1990 is more complex, with the difference between the median and the bottom decile remaining stable. Lemieux (2008) provides a thorough survey of the wage inequality literature, and notes that the evidence suggests that the US and the UK have shared very similar experiences. He suggests that there is broad agreement that the rise in inequality during the 1980s was driven partly by SBTC, but that questions remain as to why such large inequality rises were not observed in other countries, and why inequality growth slowed in the UK and US during the 1990s. Blundell and Etheridge (2010) link the changes in earnings inequality to changes in household income inequality in the UK and find that taxes and transfers have done much to offset losses at the lower end of the earned income distribution (other papers in the same journal issue do similar analyses for selected other countries).

Overall, the literature has made considerable progress in understanding the changes in UK income inequality, particularly concerning the changes in the 1970s and 1980s. Important work has also been carried out on several aspects of the changes in income inequality in the 1990s and 2000s, including the role of tax policy and the growing role of the very rich. But no study has set out to provide a thorough decomposition of changes in income inequality in Great Britain during the last two decades, or compare the relative importance of different factors, and this is the main contribution of this article. By considering the entire period 1968-2009, we compare the drivers of more recent changes in income inequality with those that caused the rise in inequality in the 1970s and 1980s. As well as analyzing a longer period than previous similar decompositions, we also use more frequent data and a greater range of household-level variables. The study is also novel in its combination of the three decomposition methodologies described above. As argued by Cowell and Fiorio (2011), additional insights are gained by using both an *a priori* decomposition approach (which

includes decompositions by income source and by subgroup) alongside an `explanatory models' approach (which includes regression-based methodologies). Furthermore, by decomposing income inequality changes both by income source and household characteristics, we increase the range of influences that we can detect in our analysis. An early version of this work was prepared for a major review of UK income inequality (the review's conclusions are in Hills et al., 2010; our material is in Brewer et al., 2009). Related work by us has also assessed the causes of the changes in the level of (rather than inequality in) household incomes in the UK: see Brewer and Wren-Lewis (2011).

Section 2 gives details of the methodology of each of our three decomposition techniques. In Section 3 we describe our data and explain the periods we choose for the analysis, which are based on turning points or points of inflection in the evolution of income inequality. The results of the income decompositions are then analysed in Section 4. We consider first the decomposition by income source and secondly the decompositions by characteristic. In each of these two parts, we focus first on factors influencing the large rise in inequality between 1978 and 1991. This allows us to compare our results with those of earlier studies, but also provides us with a baseline that helps us to interpret the results from the second decomposition of the factors influencing the much smaller changes in income inequality between 1991 and 2008-09. Section 5 draws together the results to answer our key questions.

II. METHODOLOGY

We use three different decomposition methodologies to analyse the changes in UK income inequality, breaking changes down by income source, by subgroup and using a multivariate regression-based approach. We use these three different decomposition methods, rather than focusing on one, because each provides us with a different insight into what drives inequality. For example, the decomposition by subgroup provides us with a measure of inequality between different groups, but it cannot tell us which of two different variables contributed the most to total inequality if the two variables are correlated. This is an advantage of the multivariate regression-based decomposition, since all the variables are included simultaneously. On the other hand, decomposing inequality by subgroups can give us a better understanding of why inequality between groups changed.

By income source

In order to decompose income inequality into the various sources of income, we use the method set out in Shorrocks (1982).[2] In this decomposition, the *component inequality weight* of source k, $s_k(Y)$, is the covariance of this income source with total income, scaled by the total variance of income, i.e.

$$s_k(Y) = \text{cov}[Y^k, Y] / \sigma^2(Y) \quad (1)$$

If we define S'_k to be the absolute contribution of source *k* in a future year, and I' to be the level of inequality in this future year, then the share that source *k* plays in the change is then given by $\frac{S'_k - S_k}{I' - I}$. This method has the advantage of being invariant to choice of inequality measure, and allows for a simple decomposition of changes. We use half the coefficient of variation squared, $I_2 = (1/n)\Sigma_i[(Y_i/\mu)^2 - 1]/2 = \sigma^2/2\mu^2$, as our measure of inequality for this decomposition, meaning that the absolute share of source *f* in total inequality is then $S_k = \frac{cov(Y^k, Y)}{2\mu^2}$. Like the Gini coefficient, this measure is defined when values of income are zero, which is clearly necessary when decomposing inequality by income source. Compared to the Gini coefficient, I_2 is relatively sensitive to inequality in the top of the income distribution.

Multivariate regression-based

We use the method set out in Fields (2003) to produce a regression-based decomposition.[3] The technique involves estimating an income generating equation of the form

$$y_i = \Sigma_{c=0}^{c=N} \beta_c X_{ci} + \grave{o}_i \quad (2)$$

where $y_i = \ln(Y_i)$, Y_i is an individual's income, $(X_{ci})_{c\in[0,N]}$ a set of observed variables that influence this variable and $\grave{o}_i$ the residual term. The coefficients β_c are estimated by OLS regression at the adult level; given the coefficients, we can calculate the estimated residual for each observation.

The decomposition technique is identical to Shorrocks' (1982) once one treats each $\beta_c X_{ci}$ and the residual like an income source in the Shorrocks sense. We can then define the relative characteristic inequality weight as

$$s_c(y) = \text{cov}[\beta_{ct} X_c, y] / \sigma^2(y) \quad (3)$$

In practice, the right hand side of our equation (2) consists of sets of dummies representing the different subgroups that we consider. We therefore add the shares of the dummies together to form the total share explained by that variable.[4] The decomposition will also calculate the share given by the residual terms. In practice, this residual term is generally large, reflecting the substantial heterogeneity resulting from unobservable factors. Using the shares calculated in equation (3), for any suitable inequality measure we can then express the contribution of the c^{th} characteristic in the change in inequality between time *t* and *t'* as

$$s'_c I' - s_c I \quad (4)$$

Yun (2006) uses the Fields (2003) method but goes further by restricting attention to a single measure of inequality (the variance of logs of incomes).[5] He constructs an auxiliary distribution of income, where $y_i^* = \Sigma_c \beta'_c X_{ci} + e_i$, i.e. the distribution of income if the coefficients changed but not the individual characteristics or residuals. He then shows that

$$I' - I = \Sigma_{c=1}^{c=N} (s'_c I' - s_c^* I^*) + \Sigma_{c=1}^{c=N} (s_c^* I^* - s_c I) \quad (5)$$

where the first set of terms are known as "price effects" and the second known as "quantity effects". The price effect is the part of an inequality change explained by a change in the influence of a particular characteristic on income – for example, a rise in the education price effect is due to education becoming a more important determinant of an individual's income. The quantity effect is due to a change in the distribution of a characteristic amongst the population – for example, a rise in the education quantity effect might be due to education becoming less equally distributed amongst the population. This allows a distinction between the effect of a characteristic becoming more unequally distributed, and the effect of it becoming a greater determinant of income.

By subgroup

Another way of decomposing inequality is to partition the population into non-overlapping subgroups. By using inequality measures that are part of the generalized entropy family, it is then possible to express total inequality as the sum of the inequalities within each group and the inequality that exists between the groups, or :

$$I_{Total} = I_{Between} + I_{Within}$$

Here $I_{Between}$ stands for between group inequality, which is the inequality that would arise were each person to receive the mean income of the subgroup to which s/he belonged, and I_{Within} stands for within group inequality, which is the weighted sum of inequality within each group, with the weights depending (in general) on the income share and population shares of each group.

Given this decomposition of inequality in several periods, we can similarly decompose changes in total inequality into three components: (i) a change in the relative income of the subgroups, which changes the inequality between subgroups; (ii) a change in the inequality within some or all of the subgroups; (iii) a change in the population shares within the different groups.[6]

We use methods from Mookherjee and Shorrocks (1982) and Jenkins (1995), taking advantage of the additive decomposability of the mean log deviation (MLD), where $I_0 = (1/n)\Sigma_i \ln(\mu / Y_i)$.[7] This can then be decomposed into between and within components, i.e.

$$I_0 = \Sigma_g v_g I_{0g} + \Sigma_g v_g \ln(1/\lambda_g) \tag{6}$$

where $\lambda_g = \mu_g / \mu$ and $v_g = n_g / n$, with μ_g the mean income of subgroup g and n_g its size (μ and n are the mean and size of the whole population).[8] The first set of terms in equation (6) represents the part of total inequality that is made up of inequality within the subgroups, and the second set inequality resulting from differences in the mean income of subgroups. Since the MLD is the index for which subgroup–indices are population share weighted, Mookherjee and Shorrocks (1982) show that changes can be decomposed as:

$$\Delta I_0 \approx \Sigma_g \bar{v}_g \Delta I_{0g} + \Sigma_g \bar{I}_{0g} \Delta v_g + \Delta_g [\bar{\lambda}_g - \overline{ln(\lambda_g)}] \Delta v_g + \Sigma_g (\bar{\theta}_g - \bar{v}_g) \Delta \ln(\mu_g) \tag{7}$$

where a bar over a variable indicates an average of base and current period values. The choice of weights in this average is arbitrary and is somewhat equivalent to the path-dependence problems faced by simulation methods (see, for example, Bourguignon et al., 2004). Changes are thus decomposed into, from left to right in equation (7), `pure' changes in inequality within groups, changes due to changing numbers in the different groups, and changes due to shifting relative incomes between groups. We can see from equation (7) that the population share subgroup effect is composed of two separate terms – the first of these is

the effect through the fact that different populations have different levels of inequality within themselves, and the second due to the relative income between populations (i.e. within and between effect). For simplicity, we will refer to the second and third effects as "subgroup population share effects" in our decompositions.[9]

We use the bootstrap to assess the statistical significance of our findings. This is done by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples.[10] Confidence intervals for the changes in total inequality or the contribution of a particular source/characteristic are then calculated by considering the distribution of these 500 results. 95% confidence intervals are reported in Appendix C.

III. DATA

We base our analysis on the Households Below Average Income (HBAI) data series, used by the UK Department for Work and Pensions to provide annual snapshots of Britain's income distribution. Data for Northern Ireland were included in the HBAI series from 2002-03 onwards, but we exclude this to avoid introducing a discontinuity. The HBAI series is in turn derived from two large cross-sectional household surveys: the Family Expenditure Survey (FES) for the years between 1968 and 1993, and the Family Resources Survey (FRS) for the years between 1994-95 and 2008-09. The FES provides a representative sample of around 7,000 households per year, and the introduction of the FRS provides a substantially larger sample size of around 24,000 households per year. Our data covers all the years from 1968 to 2008-09.[11]

We use HBAI's measure of 'weekly net disposable equivalent household income', in which incomes are summed across all individuals living in the same household. Incomes are measured net of taxes and benefits – that is, after all direct taxes (income tax, National Insurance contributions and council tax), and all state benefits and tax credits have been taken into account. Incomes are then adjusted ('equivalised') to take into account the size and composition of households, using the modified OECD equivalence scale.[12] Our initial income sample (before trimming, see below) includes all individuals in the HBAI sample that live in Great Britain.[13]

As Section II makes clear, we use several different measures of inequality in our analysis, because different decomposition techniques require inequality measures with different properties. Several of these inequality measures are highly sensitive to changes in incomes at the very top and bottom of the distribution, which is unfortunate, because those are also the parts of the income distribution which household surveys are likely to measure with the most error. To mitigate the risk that fluctuating, but mismeasured, incomes in the extremes of the distribution are driving our results, we trim by removing the top and bottom 1% of the income distribution. In doing so, we do not wish to downplay the importance of the tails of the distribution to overall inequality. Nor, however, do we wish our results to be driven entirely by changes in the worst-measured parts of the income distribution. Our decision to trim only the top and bottom 1% of the distribution represents a trade-off between these two concerns. We use the trimmed income distribution in all decompositions contained in this paper.

Even if we did not trim the data in this way, however, the 'true' level of inequality at the top and bottom of the distribution cannot be accurately measured. First, the income distribution in the HBAI data is left-censored at the bottom, as households with negative income are assigned a value of zero. Second, at the top of the distribution the HBAI series replaces the incomes of a large fraction of the top 1% with a 'replacement value' derived from income tax data (the Survey of Personal Incomes [SPI]).[14] By trimming the top and bottom 1%, we remove all individuals living in households with zero income, and all individuals living in high income households subject to the SPI adjustment.[15]

We use the underlying FES/FRS to provide us with data on individual earnings. We also have measures of the tax paid on employment income, but only at the household level. We also use data from the FRS to estimate the amount of benefit income that is received in the form of tax credits from 2000–01 onwards, which we treat (differently from the official HBAI series) as an income source in its own right. Benefit income is then treated separately according to the type of household that receives the income – in particular we identify households which are headed by a pensioner, and households which include children. Since different benefits are targeted at different types of household, this allows us to approximate which kind of benefits are driving our results. For example, though we cannot distinguish directly between income received from public pensions and other benefits, we can infer that pensions are likely to be responsible for any change observed amongst benefits received by pensioners.

Choosing time periods for comparisons

Decomposing a *change* in inequality involves choosing two years to compare (e.g. "change in inequality from 1968 to 1969", or "change in inequality from 1970 to 1980"). As Jenkins (1995) emphasises, the conclusions a researcher draws about inequality trends can be driven in part by the years they choose to compare. We have carried out our decompositions for all adjacent years in the period 1968 to 2008-09, but it is useful when presenting results to focus on specific sub-periods (annual changes in the decompositions can be found in Appendix B). One option would be to report results over five year intervals (e.g. between 1980 and 1985, etc.), but this approach has its drawbacks: for some time periods (e.g. between 1970 and 1975) inequality rose and then fell, so that our decompositions would analyse only very small changes in inequality, purely as a result of the years chosen for comparison.

Since income inequality is our primary focus, a more natural approach is to choose time periods based on the behaviour of income inequality. Specifically, we define time periods such that the boundaries roughly correspond to turning points or points of inflection in the time series of income inequality in Britain.

Figure 2 shows five measures of income inequality over this period (the Gini coefficient, Mean Log Deviation [MLD], the variance of logs I_2 and 90/10 ratio). In order to aid comparison, each measure has been scaled so that the minimum value over the period is 0 and the maximum value is 1. Vertical lines show the years designated as 'turning points'.

[Figure 2 here]

Though the inequality measures do not all 'turn' in exactly the same years (with I_2 in particular reaching slightly different peaks and troughs to the other measures), they nonetheless follow very similar trends:

Period 1: All measures rise between 1968 and 1972

Period 2: All measures fall between 1972 and 1978

Period 3: All measures are higher in 1984 than in 1978, but some measures (Gini and I_2) rise consistently and others (90/10 and MLD) fall slightly in 1981, before rising again

Period 4: Very rapid growth from 1984 to 1988

Period 5: Slightly slower (but still substantial) growth from 1988 to 1991

Period 6: All measures show a slight fall in inequality between 1991 and 1995-96[16]

Period 7: All measures show a rise in inequality between 1995-96 and 2000-01

Period 8: All measures fall somewhat from 2000-01 to 2004-05

Period 9: All measures have ticked upwards from 2004-05 to 2008-09

This choice of periods is robust to sampling error in that, of the periods, the 95% confidence interval of the change in inequality calculated through bootstrapping does not include zero (results available on request). Figure 1 shows that these changes in inequality are not strongly correlated with growth in GDP per capita or unemployment: the latter two fluctuated wildly during the 1980s when income (and earnings) inequality was increasing (correlation coefficients are 0.01 and 0.08 respectively). But there is an apparent link between the turning points in income inequality and the business cycle, with the turning points of income inequality in 1981 and 1991 coinciding with recessions, and those of 1995 and 2000 close to highs in the growth rate. However, the link is not a straightforward one: the recession in 1991 preceded a fall in income inequality, but the recession of 1981 preceded a substantial rise in inequality. Similarly, the growth highs of 1988 and 1994 preceded rises in income inequality but the mini-boom of 2000 was followed by a fall in inequality. Overall, there appears to be no obvious link from the figure in terms of the relationship between any of the other macroeconomic variables and income inequality.

IV. RESULTS

This section presents our main results. As described in Section 2, we have used the bootstrap to construct confidence intervals for the main quantities of interest. These are given in full in Appendix C, and, in the tables below, results are put in italics when zero lies within the confidence interval.

Decomposition by income source

We begin by decomposing changes in household income inequality into the contribution of the different sources of household income. Figure 3 below displays income inequality (as measured by 1000 x I_2, where I_2 is half the squared coefficient of variation) decomposed by the various income sources. The sources that contribute positively are stacked upon one another, and those that contribute negatively to inequality (such as income from benefits) are shown as lines below the axis.

[Figure 3 here]

Tables 1 and 2 then presents the decomposition in more detail. Table 1 presents the share of each income source in average income, and the share of each income source in total income inequality. The first panel of Table 2 shows the number of households which receive a non-zero amount of income from each source, and the second panel of Table 2 shows changes in the absolute contribution of each income source to income inequality in each of our periods.

We first consider those income sources that contributed sizably to the rise in income inequality between 1978 and 1991, and then we compare this to the changes since 1991. In our discussion of the results, we use the term `relative contribution to inequality' to describe a source's share in total income inequality, and `absolute contribution to inequality' to mean the share multiplied by the level of total income inequality. When inequality rises, it is therefore possible for an income source to increase its absolute contribution to total inequality while its relative contribution falls.

1978 to 1991

Employment income was the largest contributing source behind the rise in total income inequality between 1978 and 1991 (from Figure 3, and the second panel of Table 1). Overall, the absolute contribution of net employment income from both men and women accounts for 66% of the total rise in income inequality from 1978 to 1991. This is consistent with the large rise in earnings inequality over the period that we discussed in Section 2. Moreover, it also captures an increase in inequality between those with and without employment income and the increase in the number of households not receiving income from male employment, which rose from 22% to 39% over the period (see the first panel of Table 2). The exact breakdown of this change is explored in the next section when we decompose inequality by employment status.

Three other income sources also played a substantial role in the rise in income inequality (as can be seen from the second panel of Table 2): self-employment income, investment income and income from pensions. Together they explain 38% of the total 1978 to 1991 rise. Consistent with Jenkins (1995), we find these non-employment income sources exerted a particularly strong force on income inequality in the 1984 to 1988 period.

Table 1 tells us that the rise in the contribution of self-employment income to total income inequality in the period 1978-1991 is partly explained by its increasing share of total income, rising from 5% in 1978 to 8% in 1991 and going alongside a large rise in the number of

households receiving some self-employment income, from 19% in 1978 to 24% in 1991. This large rise in the role of self-employment income is consistent with Goodman and Webb (1994) and Jenkins (1995); Meager et al. (1996) partly explain the rise as the result of low-skilled unemployed workers becoming self-employed due to an inability to obtain full-time employment.

The contribution of investment income to inequality has also always mirrored that of employment income. In 1991, investment income explained 11% of total inequality, the peak in this series (as can be seen in the second panel of Table 1). The temporary nature of this rise suggests it may be explained by the spike in the nominal interest rate over this period (as seen in Figure 1), and the increasing investment income inequality during the 1980s may reflect tax changes that increased the net income received by savers.

The absolute contribution to inequality of (private) pension income rose steadily from 1978 to 1991. Tables 1 and 2 show that this occurred alongside a rise in the number of households receiving income from pensions (from 12% to 19%) and a rise in its share of total income from 3% to 5%.

On the other hand, one income source acting to reduce inequality was benefits given to non-pensioners. The size of the direct effect of benefit income for non-pensioners on inequality was roughly the same in 1978 and 1991, so this mitigating effect has come about through a greater negative correlation with other income sources over the period, and this most likely reflects the lower relative pre-benefit income of benefit recipients in 1991 compared with 1978, rather than any change in the benefit regime. Indeed, Clark and Leicester (2004) argue that changes in the benefit regime during this period may have reduced the potential equalising effect of the benefit system.

Overall therefore, income from employment provided the largest single contribution to the rise in inequality between 1978 and 1991, but self-employment, investment and pension income also played considerable roles. We now turn to consider the role played by the various income sources in explaining income inequality since 1991.

1991 to 2008-09

On the measure used in this section (half the coefficient of variation squared), income inequality in 2008-09 was very similar to the level in 1991, having risen by only 3%. However, this disguises a divergence in the absolute contributions of several income sources.

In particular, the second panel of Table 2 tells us that, were the contributions of other income sources to income inequality have remained constant, the increasing contribution of employment and self-employment income would have led to an overall rise in inequality of 9%. This larger rise in inequality was prevented by a fall in the absolute contributions of investment income, pension income and deductions.

Employment income did become less equally distributed between 1991 and 2008-09, but by less than in the previous 13 years. Furthermore, most of this rise was due to female employment income (see Table 2), which was certainly not the case in the previous period. This rise in inequality in income from female employment was from women in couples, which increased total income inequality further due to its positive correlation with income from male employment. The impact of the rise of gross employment income inequality was however mitigated by employment taxes, which offset more than half of the rise in gross employment income inequality. This dampening impact of the tax system is substantially greater than in the previous period, when employment taxes offset less than third of the impact of higher gross employment income on overall income inequality. Perhaps the largest difference between the post-1991 period and 1978-1991 is the negative absolute contribution of investment and pension income to income inequality over the latter period. In the case of investment income, this has gone alongside a fall in its share in total income (1st panel of Table 1); this may be associated with the general decline in nominal interest rates since 1991 that we observe in Figure 1. Pension income, on the other hand, has increased its share in total income, and so the reduction in its contribution to overall inequality reflects a weaker correlation with other income sources. This may be the result of the fall in investment income, as well as the fact that the receipt of private pension income spread into the middle of the income distribution during the 1990s.

Table 2 suggests that benefits received by households with children have acted to increase overall income inequality between 1995-96 to 2008-09. This appears to contradict previous findings that the benefit changes introduced by the Labour government over the period 1997 to 2010 were generally progressive and decreased inequality, particularly amongst families with children (see, for example, Adam and Browne 2010). One explanation for this is that the inequality-reducing effect of changes in the benefit regime have been cancelled out by the reduction in the quantity of benefits distributed that occurred as a result of falls in unemployment: in other words, although changes to the structure of the benefit system

considered in isolation would have reduced inequality, the large fall in the number of workless families meant the benefit system became less effective at reducing inequality.

Two other income sources appear to have sizably contributed to falls in income inequality over the period: "deductions" and tax credits. The term "deductions" refers to items subtracted from net income, such as local taxation (regular income tax and national insurance are subtracted earlier, when calculating net earnings or net income from investments). This income source increased its equalizing effect substantially in between 1991 to 2000-01 (Table 2, 2nd Panel), partly as a result of these deductions becoming larger as a share of income, and partly due to a stronger negative correlation with total income. The latter of these reflects the replacement of the community charge (commonly known as the `poll tax') with council tax in 1993: the community charge was levied at a flat rate, but council tax rates vary according to the value of residents' accommodation, likely to be correlated with their income. The first of these effects then reflects the large above-inflation increases in council tax, particularly at the end of the 1990s. Tax credits, which were introduced in 2000-01, have steadily reduced inequality since then by a similar amount to deductions.

Overall, therefore, the two periods are similar in that both saw a substantial rise in the inequality of income from employment and self-employment. But there are two major differences. First, the increases in employment and self-employment income inequality were much smaller between 1991 and 2008-09 than between 1978 and 1991, partly due to a greater mitigating impact of employment taxes. Second, investment and pension income reversed their impact on income inequality (increasing it in the first period, and reducing it in the second), and local tax changes and increases in tax credits worked to reduce inequality between 1991 and 2008-09. Together, these two differences account for a large amount of the difference in trends in income inequality over the two periods.

[Tables 1, 2 here]

Decomposition by characteristic

We now decompose inequality by three household characteristics and five characteristics of the households' principal earner(s). Decomposing by each of these variables sheds light on potential causes of changes in inequality. The household characteristics are as follows:

> **Region:** During the 1980s there were many references to an increase in the `North-South divide', whereby changes in industrial structure depressed the average incomes

in the North of the UK relative to those in the South. Such changes would lead to an increase in inequality between regions. This effect may have been reduced in more recent years as the pace of change in industrial structure has slowed. Moreover, significant growth in the public sector in the North of the UK during the period 1997 to 2009 may have led to a reduction in inequality between regions.

Household type: This variable measures the family structure of the household. Through dividing the population in this way, we can analyse the extent to which inequality has been affected by changes in the relative income of household types such as single parents and pensioners, which have fluctuated considerably over the period. The increasing number of lone parents and their relative deprivation during the 1980s has been cited as a potential cause of increasing inequality. More recently, favourable benefit changes for this group may have reduced inequality between this group and others.

In order to capture characteristics that are specific to individual household members, we focus on the highest earning household member. Where that earner is in a couple, we also consider the same characteristics of their partner. The characteristics we focus on are as follows:

Age: The demographic profile has sizably changed since 1968, with many more elderly people and fewer young people. Since the elderly are a relatively poor group, this may have contributed to increasing income inequality. This is likely to be particularly true in the 1980s when pension growth was delinked from earnings. Moreover, several studies have suggested returns to experience have also increased during this period. In the more recent periods, the increase in private pensions and the improvement in the generosity of the state pension may however have mitigated this increase.

Education (measured by age at which left full-time education)**:** As we discussed in section 2, there have been major increases in wage inequality over the period that have been driven by differences in skill levels. Inequality in the wages of household heads is then likely to translate into inequality in household income. In the more recent period, this effect may be smaller as the pool of educated people has increased substantially.

Employment status: As shown in Figure 1, there were major changes in unemployment within the UK in each of the decades we consider. Earlier studies have shown that employment status can explain a large amount of the 1980s increase in inequality due to a combination of increased unemployment and the falling relative income of the group. We may therefore expect this effect to be less strong during the more recent period, since unemployment has fallen and the benefits for at least some of the unemployed have become more generous.

For each of these categories, indicator variables are created according to which subgroup of the population the individual belongs in (details of the exact subgroups used can be found in Appendix A).

We also tried including two additional variables for those individuals in work – their occupation and the industry in which they worked. However, since these variables are only given for those employed or self-employed, there is no way to exactly decompose the amount of inequality explained by employment and the amount explained by occupation/industry. Moreover, we do not have consistent series of either variable: the Family Expenditure Survey changed its occupation categories in 1987, the Family Resources Survey changed its occupation categories in 2001-02,[17] and there is no data on industrial sectors in the Family Expenditure Survey after 1986. We, therefore, do not include these two variables in the results presented in this paper, but these results can be found in an on-line data appendix.[18]

Decomposing inequality by characteristic allows us to answer two questions. First, how do inequalities in these variables affect income inequality? Second, which groups are affected most by changes in income inequality? We use two different decomposition methodologies to answer these questions. Initially, we use the regression-based methodology developed by Fields (2003) to analyze the effects of all of our characteristics simultaneously. This allows us to get an overall view of which characteristics were most important in explaining inequality changes. We then split the population into subgroups based on these characteristics and use the decomposition methodology of Shorrocks (1984). In this way, we can understand the results of the regression-based methodology further by considering the role of each subgroup in the change. We run subgroup decompositions for each characteristic: see the on-line data appendix.

Figure 4 shows inequality over the sample period 1968 to 2008-09 decomposed using the regression based methodology. Here inequality is measured by the variance of logs, since this

allows us to decompose inequality changes in more depth than were we to use any another measure. It is worth noting however that the relative share of each characteristic in total inequality is independent of the inequality measure used. The `residual' is the part of inequality unexplained by any of the characteristics that we have entered into the regression. Since our observed variables still leave a large portion of heterogeneity in household incomes unexplained, this term explains a large amount of total income inequality.

[Figure 4 here]

[Table 3 here]

Table 4 then displays the changes in the variance of logs in each of our periods of analysis. Changes are decomposed into the `price' (P) and `quantity' (Q) effects of each characteristic. The price effect is the part of an inequality change explained by a change in the influence of a particular characteristic on income – for example, a rise in the education price effect is due to education becoming a more important determinant of an individual's income. The quantity effect is due to a change in the distribution of a characteristic amongst the population – for example, a rise in the education quantity effect might be due to education becoming less equally distributed amongst the population.

[Table 4 here]

Table 3 shows that a large portion of income inequality is not explained by inequalities within our observed characteristics. Furthermore, Table 4 confirms that changes in this residual term are responsible for a considerable amount of the rise in inequality since 1968. Some of these changes in the residual are likely to be a result of the imprecision of our measured characteristics. For example, the large rise in the residual element between 1984 and 1988 occurs alongside a substantial rise in inequality between education groups, and hence it seems likely that part of this residual term reflects increasing inequality between educational groups that we have not measured (since our education measure is relatively crude).

1978 to 1991

The employment status of men was, in general, the most important of our explanatory variables in the decomposition (see Table 3). It is also the variable that explains the greatest share of the rise in income inequality during the period 1978 to 1991. During this period,

there was a both a large price effect and a large quantity effect (Table 4). This is consistent with the subgroup decomposition by men's employment status (not reported here) which shows a large population change effect, and a large relative income effect. The population change effect was mainly a result of the rise in the number of unemployed or inactive in the 1978 to 1984 period, which increased inequality due to the relatively low income of these population groups. The relative income effect, on the other hand, occurred mainly after 1984, when the incomes of the employed and self-employed grew substantially compared to other groups, worsening inequality. Summing the appropriate terms in Table 4 tells us that together, men's employment status accounts for 18% of the overall rise in inequality between 1978 and 1991.

In 1978, the employment status of women explained a similar amount of household income inequality to the employment status of men: 13% compared to 11% (see Table 3). However, unlike the employment status of men, this variable played almost no role in the rise in total inequality between 1978 and 1991. The subgroup decomposition shows that this was partly the result of very small changes in female employment over the period: 47% of households had a woman employed or self-employed in 1991, compared to 48% in 1991. Moreover, the relative incomes of households with employed women relative to the average household did not change substantially over the period, unlike households with employed men.

The education levels of household members also explained a significant share of the rise in income inequality between 1978 and 1991. According to Table 4, this was made up of both a price effect (increasing returns to education) and quantity effect (a more unequal distribution of education) for both men and women. This is consistent with the previous literature (e.g. Gosling et al., 2000), and perhaps the surprising aspect is that the size of the effect we find is relatively small, with the regression-based decomposition assigning only 6% of the total rise in inequality over the 1978 to 1991 period to the variable. However, this may be due to the fact that our measure of education (age left full-time education) is relatively crude, rather than the characteristic's lack of importance.

Region and household type only explained a small amount of the increase in income inequality. Table 4 shows positive price effects for region during the 1980s, but these only explain about 3% of the rise in income inequality during the period. The subgroup decomposition confirms that this is explained by a relative decline in the income of the North of England and Wales/Scotland compared to southern areas, and in particular London and the

South East. This is consistent with Jenkins (1995), who finds some evidence of a growing North-South divide over the period between 1971 and 1986. On household type, the subgroup decomposition suggests that the main change was an increase in childless households, who on average have a more unequal and slightly higher equivalised household income.

Finally, over half of the rise in income inequality in this decomposition is attributed to the residual term. Some of this reflects increasing earnings inequality amongst the employed and self-employed: when we include the occupation and industry of workers in the regression, the residual only accounts for around a quarter of the rise (see the on-line data appendix). However, as described earlier, including dummies for occupation and industry makes it impossible to identify the separate impacts of employment status, industry and region.

Overall, our decompositions by characteristic have identified a number of factors behind the rise in income inequality between 1978 and 1991. A rise in unemployment and the falling relative income of the unemployed and inactive explains about a fifth, and factors such as education and region also increased income inequality, most likely through making earnings less equal. About half of the rise in inequality remains unexplained by our main explanatory factors, but a significant part of this is due to earnings inequality between workers in different industries and occupations.

1991 to 2008-09

The absolute contribution of male employment status to income inequality did not rise between 1991 to 2008-09 (Table 4). Indeed, over the period, this variable has had an equalising effect of over half of the magnitude of the dis-equalising effect in the previous period. Table 4 suggests that this was due both to a price and quantity effect. Although neither is statistically significant, both are consistent with the subgroup decomposition by men's employment status (see the online appendix)[19], which finds that the proportion of households with an unemployed man as the head of household has fallen from around 4% in 1991 to 2% in 2008-09. There was also a small relative income effect, which arose due to the higher relative income of pensioners. Women's employment has pushed inequality in the other direction, with a significant price effect pushing up household income inequality, suggestive of an increase in the income of employed women. However, no equivalent effect shows up in the subgroup decomposition, which perhaps implies that households with employed women have also lost income for other reasons, such as a fall in male employment income.

Neither education nor region appears to have had a large effect on changes in inequality since 1991. For education, positive price effects appear to have been mitigated by negative quantity effects, and the subgroup decomposition shows that this reflects an increase in returns to education alongside a greater supply of households with higher education levels.

The only other characteristic that has had a fairly large effect on income inequality since 1991 is household type: this has gone from explaining 10% of total income inequality in 1991 to explaining only 4% in 2008-09 (Table 3). This came about through a series of negative price effects (Table 4), and the subgroup decomposition reveals that this is due to the increasing income of two relatively poor groups: pensioners and households with children under five. The relative incomes of pensioners have been increasing in recent years, partly due to successive cohorts of retiring pensioners having larger private pension incomes (on average) to draw upon, and partly due to the increasing generosity of state benefits targeted at low income pensioners (such as the Pension Credit) – see Brewer et al. (2007) for more details. Meanwhile, the increasing relative income of households with children under five is likely to be the result of changes to the benefit system (in particular the rapid increase in generosity of welfare benefits and tax credits for low income families with children since 1997). Supporting evidence for this comes from decomposing employment income by household type, which shows us that the relative earnings of this group have not risen over the period; moreover, their share in the full-time work-force has not risen notably over the period. The larger effect of these benefits on households with younger children compared to other households with children is due to the nature of the changes in benefits and tax credits, and is consistent with the findings of Gregg et al. (2006).

Overall therefore, decomposing inequality by characteristic reveals several differences between the 1978 to 1991 period and the 1991 to 2008-09 period. Income inequality between households with men of different employment statuses rose notably in the earlier period, but it has since fallen. Neither education nor region acted to increase income inequality, differently from the earlier period. Furthermore, overall income inequality was reduced in the latter period by the rise in the relative income of pensioners and households with children under five, two groups that have below average incomes, some of which can be attributed to changes to welfare benefits since 1997.

V. CONCLUSIONS

Our decompositions have provided several new insights that improve our understanding of changes in income inequality over the last two decades. This has helped us to provide an answer to the question which we asked in the introduction: Why did inequality rise so rapidly in the period 1978 to 1991 but since then remain relatively flat?

In both periods employment and self-employment income became more unequally distributed amongst the economically active, but a number of factors have mitigated the effect of these increases on total income inequality since 1991. First, inequality between those with different employment statuses fell, primarily due to a fall in the number of unemployed. Second, employment taxes played a larger role in mitigating the increase in inequality of gross employment income. Third, investment income became less unequal over the period, largely due to the decline in its importance, which itself may be explained by a fall in nominal interest rates. Finally, a rise in the relative incomes of pensioners and households with children under five pulled inequality down. Overall, these four factors have almost entirely offset the impact of the rise in earnings and self-employment income inequality since 1991.

Going forward, one point of concern may be that at least two of these four factors are unlikely to continue pushing inequality down from 2008-09 onwards. Unemployment has rapidly increased since 2008 and in the medium term is unlikely to move below the low achieved during the 2000s. Meanwhile, recent changes to the benefit regime are likely to further increase inequality (see Brewer et al, 2012). Future movements in net earnings inequality are therefore likely to become central to the trend in income inequality.

More broadly, this article has underlined the importance of studying changes in the inequality of a range of economic indicators. This is clearest in the demonstration that a number of factors beyond wage inequality have impacted strongly on the inequality of household income. Moreover, we have noted that in the recent period the effect of male employment income on income inequality has been very different from the effect of female employment income. This suggests that there is a need to look further at the household level, preferably using panel data, in order to understand changes in household earnings patterns. We have also noted that our results regarding income from investments may be driven by nominal interest rates, and this exposes the need to consider changes in income inequality alongside studies of inequality in consumption and wealth.

APPENDIX A: DEFINITION OF POPULATION SUBGROUPS

This appendix details the subgroups into which the total population is divided for each characteristic.

Age: Below 25; 25-34; 35-44;45-54; 55-64; 65-74; over 75

Education: Aged 16 or earlier; Aged 17 to 19; Aged 20 or older; Unknown/still in education

Employment status: Full-time employed; Part-time employed; Self-employed; Unemployed; Inactive and above the state pension age; Inactive and below the state pension age

Household type: 1 adult, no children; 2 adults, no children; 3+ adults, no children; 1 adult, 1+ children, youngest under five; 2 adults, 1+ children, youngest under five; 3 adults, 1+ children, youngest under five; 1 adult, 1+ children, youngest over 5; 2 adults, 1+ children, youngest over 5; 3 adults, 1+ children, youngest over 5; 1 adult, household head aged 65+; 2+ adults, household head aged 65+

Region: North; Yorks and Humberside; North West; East Midlands; West Midlands; East Anglia; London; South East; South West; Wales; Scotland

APPENDIX B: ANNUAL DECOMPOSITIONS

This appendix gives the annual values of the income source and characteristic decomposition, rather than just the years of the inequality turning-points presented in the main paper.

[Tables 5, 6 here]

APPENDIX C: CONFIDENCE INTERVALS FROM BOOTSTRAPPING

This appendix gives the 95% confidence intervals that result from the bootstrapping process. Intervals are calculated by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples.

[Tables 7-10 here]

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[1] For a detailed comparison of our results for the 1971 – 1986 period with those of Jenkins, see Brewer et al., (2009, p.79).

[2] These calculations can be performed using the Stata package ineqfac, written by Jenkins (1999b).

[3] These calculations can be performed using the Stata package ineqrbd, written by Fiorio and Jenkins (2007).

[4] Cowell and Fiorio (2009) then show that there is a direct correspondence between this sum and the between-effect found using the subgroup analysis, and one can be used to measure the robustness of the other.

[5] It should be noted that the variance of logs measure is relatively bottom sensitive and can't be guaranteed to satisfy the Pigou-Dalton principal of transfers, unlike most other indices.

[6] This last component will itself affect inequality in two ways. First, the change in weights given to different groups will affect the total I_{within} term, assuming the subgroups whose populations have changed have different levels of inequality. Second, the changing weights of the groups will change the measure of inequality between them.

[7] We use the symbol I_0 since the mean log deviation is part of the generalized entropy class of inequality indices I_a where $a = 0, 1, 2, \text{etc}$. Larger values of *a* correspond to greater sensitivity to income differences at the top of the income distribution rather than the bottom.

[8] These calculations can be performed using the Stata package ineqdeco, written by Jenkins (1999a)

[9] It should be noted that one can also examine the contributions of changing subgroup inequality, income shares and population shares through employing a `shift share' approach, as carried out by Atkinson (1994) and Jenkins (1995). This has the advantage that one is not restricted to using I_0.

[10] For each year of data, we draw households with replacement from our original sample until the sum of the weights in the new sample is equal or greater to the sum in the original sample. This method preserves the clustering of individual incomes within a household.

[11] HBAI datasets also exist for the years 1961 to 1967, but we do not use these, for two reasons. First, the FES sample size was considerably smaller prior to 1967 (around 3,000 households, compared with 7,000 households from 1968 onwards). Although this smaller sample size need not prevent us using the data, there is a second problem with these early years: in both 1964 and 1967 data is only available for the first two quarters of the year (giving an effective sample size of just 1,500 households in 1964). The resulting datasets thus give an incomplete picture of incomes in those years.

[12] See OECD (n.d.). By using a constant equivalence scale, we are abstracting from any changes in equivalence scales over time – see Banks and Johnson (1994) for a discussion of the effect of choosing different equivalence scales in different years. The OECD modified equivalence scale was calculated based on analysis in 1994.

[13] Further information on the HBAI measurement of income can be found in the Appendices of DWP (2010)..

[14] Details of this process can be found in the appendices of DWPs HBAI reports. For 2008/09, for example, see Appendix 2 of DWP (2010). This process clearly reduces inequality within the top 1%; whether it affects overall inequality depends on the value of the replacement income.

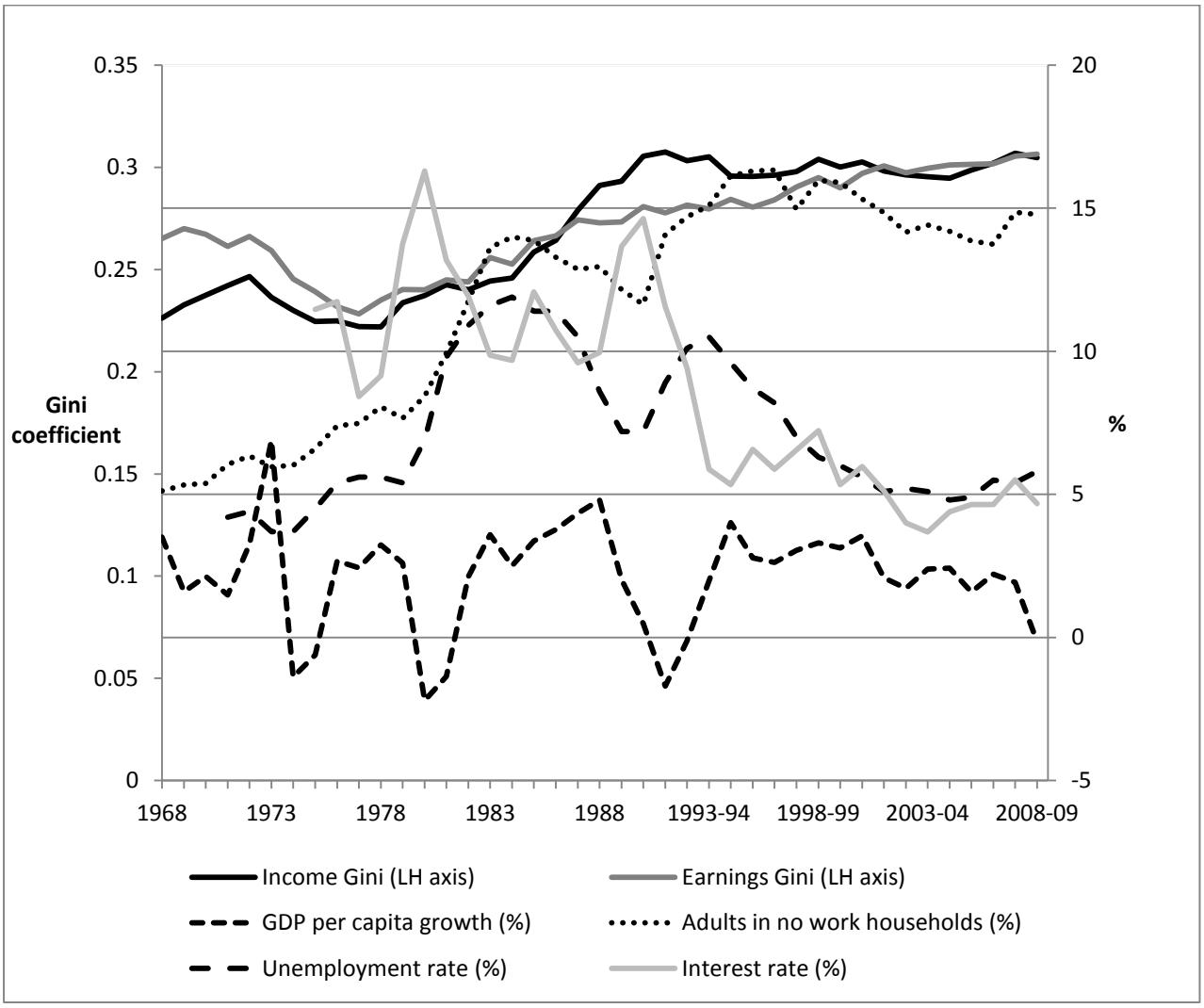
[15] The percentage of households recorded as having zero income ranges from 0.15% in 1968 to 0.8% in 2007-08.

[16] Note that the HBAI series moved from calendar years to financial years in 1993-94.

[17] The Office for National Statistics published a mapping from the pre-2001 to the post-2001 occupation categories in the FRS, but we find that it gives highly inconsistent results and so we do not use it in our analysis.

[18] This can be found at https://sites.google.com/site/liamwrenlewis/publications/Online%20appendices.zip?attredirects=0&d=1

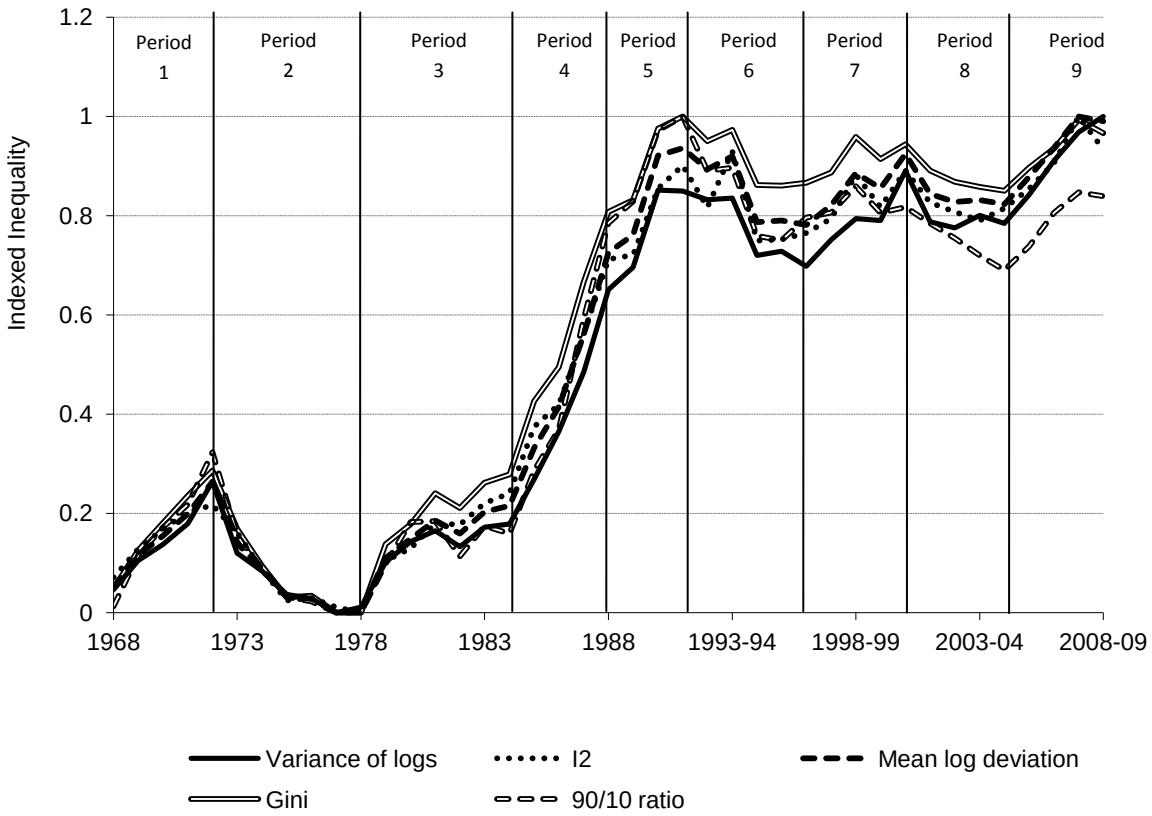
Figure 1. Household income inequality in Great Britain: the Gini coefficient, 1968 to 2008–09



Note: The Gini coefficient for income has been calculated using household incomes, before housing costs have been deducted.

Source: The Gini coefficient for income and earnings, as well as adults (16-64) in no work households, are based on authors' calculations using the sample described below from Family Expenditure Survey and Family Resources Survey, various years. The bottom and top 1% of the distribution have been trimmed from the sample – see Section 3 for details. Only full-time employees are included in the measure of earnings inequality. Unemployment is the ILO unemployment rate for those aged 16-64 from the Office of National Statistics. GDP per capita growth is from the World Development Indices. The interest rate is the Bank of England base rate.

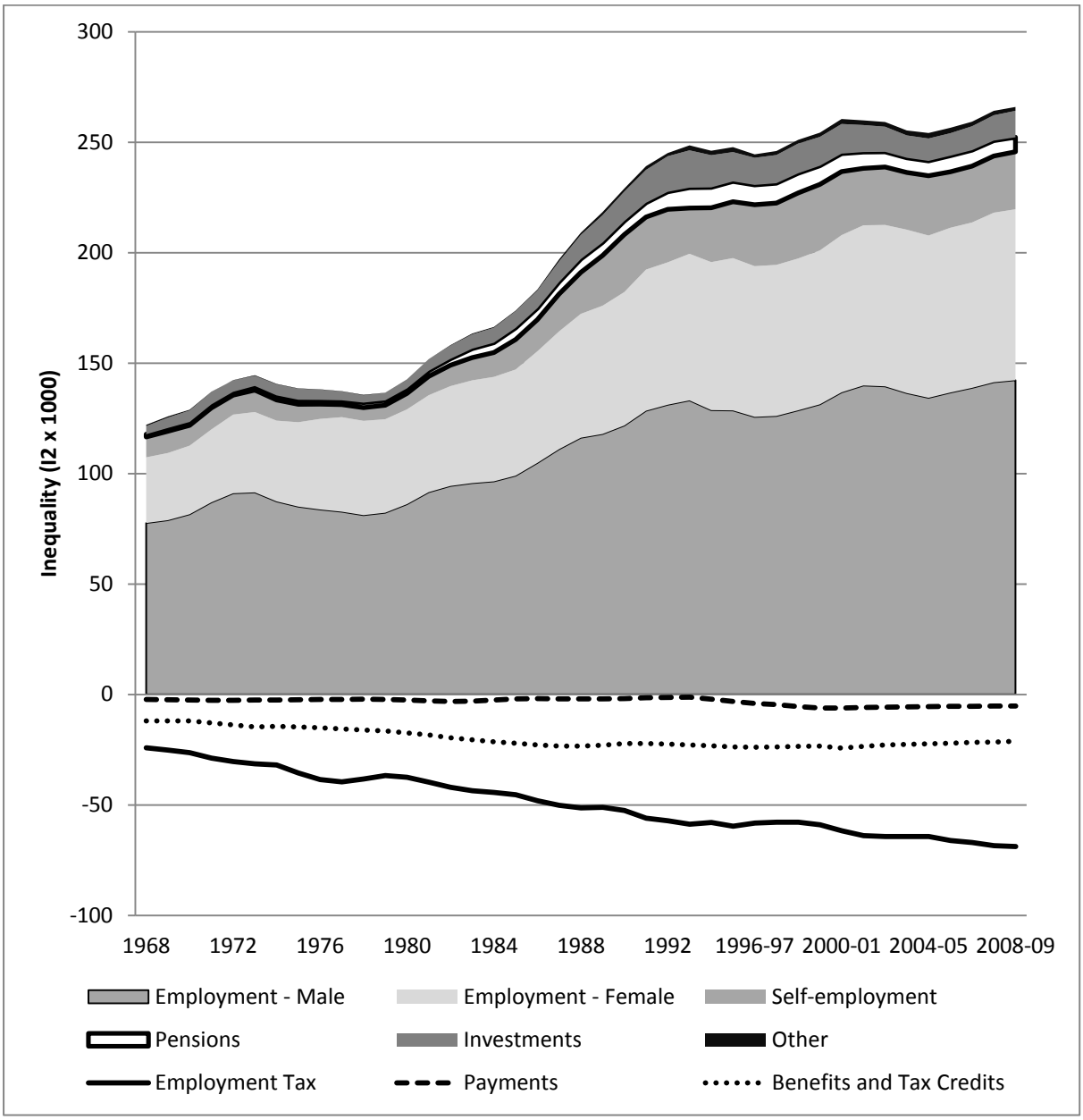
Figure 2. Income inequality periods: 1968 to 2008–09



Notes: All measures have been calculated using household incomes, before housing costs have been deducted. Each measure has been scaled so that the minimum value over the period is 0 and the maximum value is 1.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Figure 3: Income inequality by income source



Notes: Income sources that contribute positively to total income inequality are shown as stacked areas above the x-axis, while income sources that contribute negatively to total income inequality are shown as non-stacked lines below the x-axis. Total income inequality is therefore lower than the top-most line.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 1: Shares of mean income and income inequality by income source

	Year	Gross Employment		Tax	Self-employment	Pensions	Investments	Deductions	Benefits received by			Tax Credits	Other income
		Male	Female						Pensioners	Households with children	Other		
Share of mean income (%)	1968	79	19	-19	6	2	2	-4	5	5	3		1
	1972	80	21	-21	6	2	2	-4	5	4	3		1
	1978	78	26	-29	5	3	2	-4	7	7	4		1
	1984	68	27	-28	6	4	3	-4	9	9	5		1
	1988	64	27	-24	9	5	5	-4	7	6	4		2
	1991	61	28	-24	8	5	6	-4	7	6	4		2
	1995-96	56	30	-23	9	6	4	-5	8	8	5		2
	2000-01	58	31	-23	8	6	4	-6	8	7	4	1	2
	2004-05	56	33	-24	8	6	3	-6	8	6	4	2	3
	2008-09	56	33	-23	8	6	4	-6	8	6	4	2	3
Share of income inequality (%)	1968	93	36	-29	11	1	4	-3	-10	-5	0		1
	1972	95	40	-31	8	2	5	-3	-9	-5	-1		0
	1978	102	55	-47	7	3	4	-3	-12	-9	0		0
	1984	98	48	-46	11	5	7	-2	-9	-11	-2		0
	1988	81	38	-34	17	5	9	-1	-7	-6	-2		1
	1991	83	39	-36	11	5	11	-1	-5	-6	-2		1
	1995-96	79	44	-37	18	6	8	-3	-6	-8	-2		1
	2000-01	83	42	-38	15	4	8	-3	-5	-6	-2	-1	2
	2004-05	83	45	-40	17	4	6	-3	-5	-5	-2	-1	1
	2008-09	84	46	-41	14	4	7	-3	-4	-4	-2	-2	1

Note: Negative values mean the income source is on average a negative contributor to mean income or income inequality. Tax credits were only introduced in 2000 and therefore no values are displayed in earlier years.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

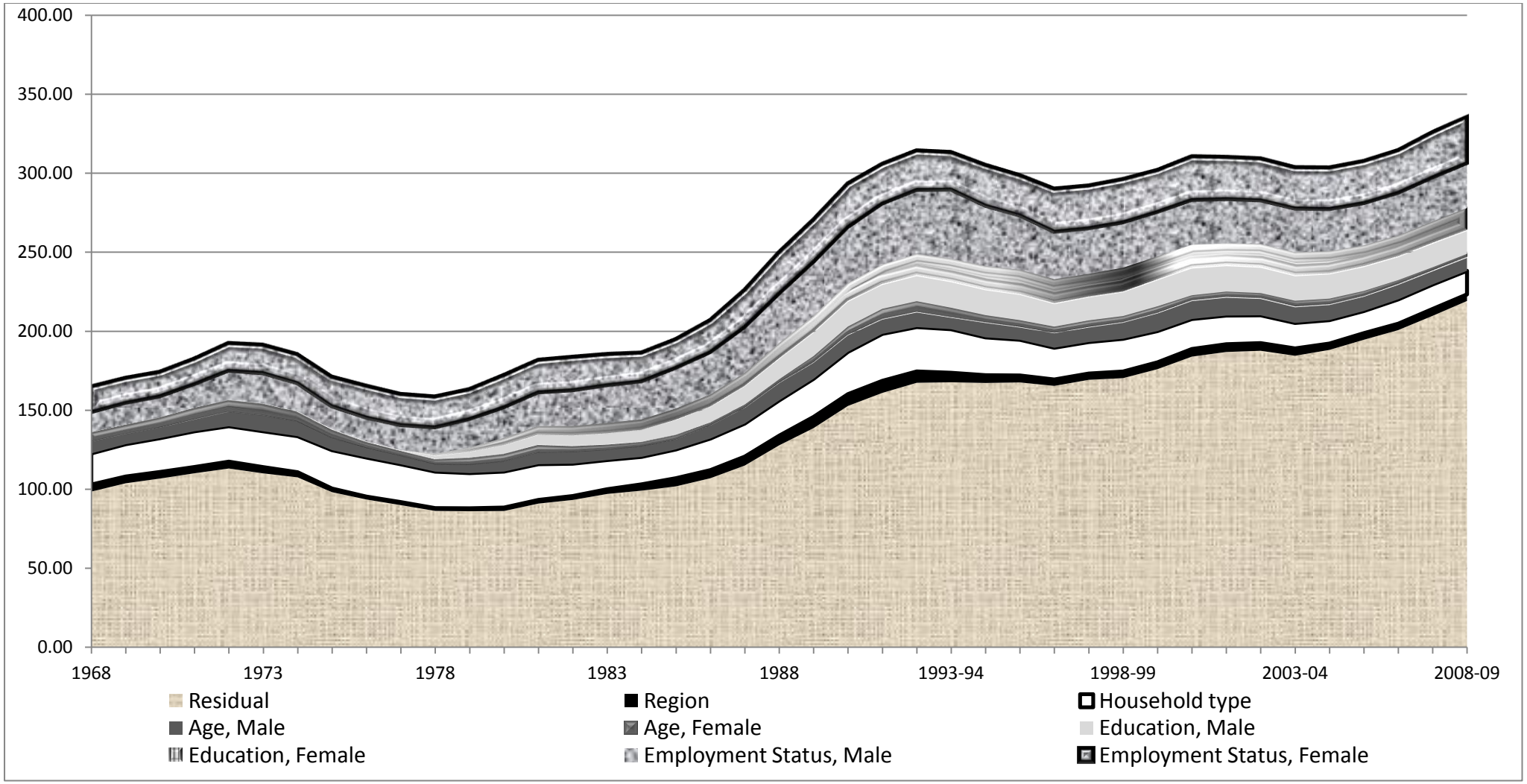
Table 2: Share of households with non-zero source income and changes in inequality decomposed by income source

	Year	Total Income	Gross Employment		Tax	Self-employment	Pensions	Investments	Deductions	Benefits received by			Tax credits	Other income
			Male	Female						Pensioners	Households with children	Other		
Share of households with non-zero source income (%)	1968	100	78	45	81	17	9	54	97	12	50	10		12
	1972	100	75	47	79	21	11	48	97	13	46	10		13
	1978	100	71	50	77	19	12	57	100	14	53	11		17
	1984	100	62	51	69	23	16	67	99	16	50	15		19
	1988	100	60	49	67	27	17	74	99	17	46	14		24
	1991	100	57	50	66	24	19	73	100	17	45	14		24
	1995-96	100	51	48	64	27	19	68	99	17	47	15		33
	2000-01	100	54	50	67	17	19	68	98	17	46	36	6	27
	2004-05	100	54	51	67	17	19	69	99	17	45	13	27	29
	2008-09	100	55	51	67	14	18	67	98	17	44	14	28	28
Change in absolute contribution to income inequality (I2 x 1000)	1968 to 1972	14	15	9	-6	-2	*0*	1	0	-1	-1	-1		-1
	1972 to 1978	-19	-12	4	-6	-2	1	-2	1	-1	-2	1		*0*
	1978 to 1984	23	19	6	-9	6	2	5	0	*0*	-4	-2		*0*
	1984 to 1988	45	20	6	-3	14	3	6	0	-1	2	-1		1
	1988 to 1991	21	21	10	-11	-7	*1*	5	1	1	-2	*0*		*1*
	1978 to 1991	88	59	22	-23	12	6	15	1	*0*	-4	-2		2
	1991 to 1995-96	-8	-14	4	*1*	11	*1*	-6	-3	*0*	-2	-1		*0*
	1995-96 to 2000-01	14	18	3	-6	*-2*	-2	2	-1	*0*	3	*0*	-1	1
	2000-01 to 2004-05	-10	-8	*1*	*-1*	*2*	*-1*	-3	*0*	0	1	1	-1	-1
	2004-05 to 2008-09	8	8	5	-3	-4	0	*1*	0	*1*	2	*0*	-1	*0*
	1991 to 2008-09	*4*	*4*	13	-9	6	*-1*	-6	-4	2	4	*0*	-3	*0*

Note: Tax credits were only introduced in 2000 and therefore no values are displayed for earlier years.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Figure 4: Income inequality decomposed through multivariate regression-based decomposition



Notes: All characteristics in general have a positive impact on income inequality, and therefore are stacked to produce total income inequality. Data on education begins in 1978 and therefore is counted as zero in years prior to then.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 3: Shares of characteristics in income inequality (%)

Year	Residual	Region	Household type	Age		Education		Employment status	
				Male	Female	Male	Female	Male	Female
1968	60	3	12	5	4			8	10
1972	57	3	10	5	3			13	10
1978	50	1	14	2	3	3	3	11	13
1984	53	3	10	3	1	5	4	13	8
1988	51	2	8	3	2	6	4	13	10
1991	53	2	10	1	3	5	5	15	6
1995-96	58	1	7	2	1	5	5	10	9
2000-01	62	2	5	3	1	5	4	8	9
2004-05	64	1	5	3	1	5	5	8	8
2008-09	66	1	4	3	1	4	4	8	9

Note: Data on education begins in 1978 and therefore is counted as zero in years prior to then.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 4: Changes in income inequality decomposed into characteristic price and quantity effects (Variance of logs x 1000)

Years	Total	Residual	Region		Household type		Age				Education				Employment status			
							Male		Female		Male		Female		Male		Female	
			P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q
1968 to 1972	41	20	1	*0*	*0*	0	*2*	*1*	*0*	*0*					*9*	4	*2*	1
1972 to 1978	-47	-30	-3	0	3	0	*-9*	*2*	*-3*	1					-12	4	*-2*	2
1978 to 1984	31	20	3	*1*	-3	*-1*	*3*	*0*	*-2*	1	*3*	1	*2*	1	*-3*	10	-6	2
1984 to 1988	88	42	2	*-1*	*2*	*1*	*1*	*1*	*3*	*0*	*6*	3	*1*	2	16	-4	11	*2*
1988 to 1991	37	25	*1*	*0*	5	4	*-6*	*1*	*3*	*1*	*-4*	*2*	*1*	*3*	*3*	7	-8	*1*
1978 to 1991	**157**	**87**	**6**	***0***	**4**	**5**	***-2***	***2***	**3**	**2**	***5***	***6***	**4**	**6**	**16**	**13**	***-4***	**4**
1991 to 1995-96	-23	*4*	-3	*0*	-11	-1	*3*	*1*	*-4*	*-1*	*-2*	*2*	*-1*	2	*-17*	*0*	3	2
1995-96 to 2000-01	30	30	1	0	-2	*0*	*2*	*1*	*-1*	*0*	*-1*	*2*	-4	2	*6*	-9	6	-2
2000-01 to 2004-05	-20	-7	-2	*0*	-3	*0*	*-1*	0	*0*	*1*	*-4*	2	*0*	1	*0*	-1	-3	-1
2004-05 to 2008-09	40	33	*0*	*0*	-2	-1	*0*	*0*	-1	*0*	*-1*	2	*-1*	2	*1*	2	5	*0*
1991 to 2008-09	**28**	**61**	**-4**	**0**	**-18**	**-1**	***3***	***2***	**-7**	***0***	***-8***	***8***	**-6**	**7**	***-11***	***-8***	**11**	**-2**

Note: Data on education begins in 1978 and therefore is counted as zero in years prior to then.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 5: Income inequality decomposed by income source, annual values

Year	Total (I2 * 1000)	Employment - Male - Single	Employment - Male - Couple	Employment - Female - Single	Employment - Female - Couple	Employment Tax	Self-employment	Pensions	Investments	Payments	Benefits received by pensioners	Benefits received by households with children	Benefits - Other	Tax Credits	Other
1968	84	23	55	10	20	-24	9	1	4	-2	-8	-4	0	0	1
1969	89	23	57	10	21	-26	10	2	6	-3	-7	-5	0	0	1
1970	91	24	63	8	24	-29	8	2	6	-3	-8	-4	0	0	0
1971	97	27	67	9	27	-32	11	1	5	-3	-9	-5	-1	0	0
1972	97	23	69	10	29	-31	8	1	5	-3	-9	-5	-1	0	0
1973	92	23	65	8	27	-32	11	3	5	-2	-9	-5	-1	0	0
1974	85	24	57	9	27	-33	9	2	6	-2	-9	-5	0	0	0
1975	81	26	59	11	32	-41	4	2	5	-2	-9	-5	-1	0	0
1976	81	27	58	11	32	-42	6	2	4	-2	-10	-6	0	0	0
1977	78	26	53	11	31	-36	6	2	4	-2	-10	-6	0	0	0
1978	78	24	56	12	31	-37	5	3	3	-2	-9	-7	0	0	0
1979	87	27	60	9	33	-37	8	2	4	-3	-11	-6	0	0	0
1980	90	26	65	11	32	-39	9	2	5	-3	-11	-7	0	0	0
1981	95	31	66	14	33	-44	9	3	7	-3	-10	-9	0	0	0
1982	94	27	69	12	34	-44	10	3	6	-3	-10	-9	-1	0	1
1983	100	25	69	15	32	-43	11	6	7	-2	-9	-10	-1	0	0
1984	101	26	72	14	34	-46	11	5	7	-2	-9	-11	-2	0	0
1985	113	31	73	14	34	-47	18	5	8	-2	-10	-11	-2	0	1
1986	118	35	76	17	37	-51	13	5	8	-2	-11	-10	-2	0	1
1987	134	36	81	19	38	-52	19	5	12	-2	-10	-11	-3	0	1
1988	145	37	81	18	37	-50	25	7	13	-2	-11	-9	-3	0	1
1989	148	34	84	21	41	-51	25	5	12	-2	-11	-9	-3	0	2
1990	164	29	100	13	52	-57	28	6	15	-2	-11	-9	-2	0	1
1991	166	31	108	13	53	-60	18	8	18	-1	-9	-11	-3	0	2
1992	163	25	100	15	49	-54	26	9	16	-1	-8	-12	-3	0	1
1993	168	30	106	12	58	-62	19	10	17	-1	-8	-13	-2	0	4
1994	158	25	101	14	54	-58	29	8	11	-4	-9	-12	-2	0	1
1995	158	25	99	13	57	-59	28	9	12	-4	-9	-12	-3	0	2
1996	159	26	101	13	55	-58	26	9	14	-4	-8	-12	-3	0	2
1997	162	24	103	13	55	-57	30	8	13	-6	-8	-12	-3	0	2
1998	171	27	105	14	57	-59	34	9	14	-7	-9	-12	-3	0	2
1999	164	29	105	12	59	-61	27	8	13	-6	-9	-12	-3	0	2
2000	172	31	113	14	58	-65	26	8	14	-6	-9	-10	-3	-1	3
2001	165	31	111	15	59	-66	25	7	10	-6	-9	-10	-3	-1	1
2002	162	24	109	13	60	-62	28	6	10	-6	-9	-9	-3	-2	2
2003	161	27	107	13	62	-65	25	7	10	-5	-9	-9	-3	-2	3
2004	162	28	107	12	61	-66	28	7	11	-6	-8	-9	-3	-2	2
2005	165	25	115	12	64	-68	23	8	10	-5	-8	-8	-3	-3	2
2006	168	23	117	12	64	-67	26	7	12	-6	-8	-8	-3	-3	2
2007	174	24	119	13	65	-70	29	6	13	-5	-8	-7	-3	-3	2
2008	171	24	120	12	65	-69	24	7	12	-5	-7	-7	-3	-3	1

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 6: Income inequality decomposed through multivariate regression-based decomposition, annual values

Year	Residual	Log variation (* 1000)	Region	Household type	Education (male)	Education (female)	Male employment status	Female Employment status	Age (male)	Age (female)
1968	98	165	4	20	0	0	13	16	8	6
1969	109	176	4	21	0	0	15	15	5	6
1970	113	182	4	23	0	0	12	15	8	7
1971	108	190	4	23	0	0	18	18	10	9
1972	118	206	5	20	0	0	26	20	10	6
1973	104	179	3	24	0	0	14	16	10	7
1974	100	172	2	24	0	0	14	19	8	6
1975	90	163	2	25	0	0	15	21	6	4
1976	90	162	1	25	0	0	16	21	6	2
1977	89	156	2	21	0	0	17	18	5	4
1978	79	158	2	23	4	5	18	20	4	4
1979	89	175	2	23	5	5	20	18	8	6
1980	90	183	3	23	6	5	20	22	9	5
1981	93	187	2	22	7	8	23	21	6	4
1982	96	181	2	16	6	6	24	20	8	3
1983	102	188	5	17	7	7	24	18	6	3
1984	100	190	5	19	9	8	24	16	7	3
1985	104	207	6	19	12	7	29	20	6	4
1986	117	225	4	22	8	9	27	25	12	-1
1987	124	247	7	22	14	11	30	25	11	3
1988	142	278	7	23	17	11	37	28	8	6
1989	151	286	7	28	13	10	35	27	11	4
1990	166	315	8	30	17	14	33	27	13	7
1991	167	315	7	31	16	14	46	20	4	9
1992	170	312	6	23	15	14	41	27	11	5
1993	167	312	5	28	18	17	43	24	6	5
1994	165	291	4	21	14	16	30	27	9	5
1995	171	292	4	19	16	15	30	26	7	4
1996	161	287	4	21	13	16	30	29	11	4
1997	176	297	4	20	15	13	27	26	9	6
1998	174	305	5	21	17	17	29	27	10	3
1999	178	304	4	18	17	15	28	26	14	4
2000	201	323	5	18	16	13	27	29	10	3
2001	182	303	5	19	15	15	28	24	10	4
2002	180	301	4	16	17	17	27	26	11	4
2003	191	306	5	13	15	14	27	28	9	5
2004	194	303	3	15	14	14	25	25	9	4
2005	199	314	4	14	16	14	27	27	10	3
2006	210	326	4	17	13	14	28	29	9	3
2007	221	337	4	15	15	15	28	30	6	2
2008	227	343	4	12	15	15	28	30	9	3

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 7: Shares of mean income and income inequality by income source, 95% confidence interval

	Year	Gross Employment		Tax	Self-employment	Pensions	Investments	Deductions	Benefits received by			Tax Credits	Other income
		Male	Female						Pensioners	Households with children	Other		
Share of income inequality (%)	1968	(90,95)	(34,37)	(-29,-28)	(10,12)	(1,2)	(4,5)	(-3,-3)	(-10,-9)	(-5,-4)	(-1,0)		(0,1)
	1972	(93,97)	(39,41)	(-32,-31)	(7,9)	(1,2)	(4,6)	(-3,-3)	(-9,-9)	(-6,-5)	(-1,0)		(0,0)
	1978	(100,104)	(54,56)	(-48,-46)	(6,8)	(3,4)	(3,4)	(-3,-2)	(-13,-12)	(-9,-8)	(-1,0)		(0,0)
	1984	(96,100)	(47,50)	(-47,-45)	(10,12)	(4,5)	(7,8)	(-2,-2)	(-10,-9)	(-11,-10)	(-2,-2)		(0,0)
	1988	(79,84)	(37,40)	(-35,-33)	(15,19)	(4,6)	(8,10)	(-2,-1)	(-8,-7)	(-7,-6)	(-2,-2)		(0,1)
	1991	(81,86)	(38,41)	(-37,-35)	(9,12)	(4,6)	(10,12)	(-1,-1)	(-6,-5)	(-7,-6)	(-2,-1)		(1,1)
	1995-96	(78,80)	(43,45)	(-38,-37)	(17,19)	(5,6)	(7,8)	(-3,-3)	(-6,-5)	(-8,-8)	(-2,-2)		(1,2)
	2000-01	(82,85)	(41,43)	(-38,-37)	(14,16)	(4,5)	(7,9)	(-4,-3)	(-5,-5)	(-6,-5)	(-2,-2)	(-1,-1)	(1,2)
	2004-05	(82,85)	(44,46)	(-41,-40)	(16,18)	(4,5)	(6,7)	(-4,-3)	(-5,-5)	(-6,-5)	(-2,-2)	(-2,-1)	(1,1)
	2008-09	(82,86)	(44,47)	(-41,-40)	(13,15)	(4,4)	(6,7)	(-3,-3)	(-5,-4)	(-4,-4)	(-2,-1)	(-2,-2)	(1,1)

Note: Confidence intervals are calculated by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples. See also notes for Table 1.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years

Table 8: Changes in inequality decomposed by income source, 95% confidence intervals

	Year	Total Income	Gross Employment		Tax	Self-employment	Pensions	Investments	Deductions	Benefits received by			Tax credits	Other income
			Male	Female						Pensioners	Households with children	Other		
Change in absolute contribution to income inequality (I2 x 1000)	1968 to 1972	(11,16)	(11,18)	(8,11)	(-7,-5)	(-3,0)	(0,1)	(0,2)	(-1,0)	(-1,0)	(-2,-1)	(-1,0)		(-1,0)
	1972 to 1978	(-21,-	(-15,-9)	(2,6)	(-7,-5)	(-4,-1)	(0,2)	(-3,-1)	(0,1)	(-1,0)	(-2,-1)	(0,1)		(0,0)
	1978 to 1984	(21,25)	(16,22)	(4,8)	(-11,-8)	(5,7)	(1,3)	(4,5)	(0,0)	(-1,1)	(-4,-3)	(-2,-1)		(0,0)
	1984 to 1988	(41,48)	(15,24)	(4,9)	(-5,-2)	(11,16)	(1,4)	(4,7)	(-1,0)	(-2,0)	(1,2)	(-1,0)		(1,1)
	1988 to 1991	(16,26)	(14,27)	(6,13)	(-13,-8)	(-11,-4)	(0,3)	(3,7)	(1,1)	(1,2)	(-2,-1)	(0,1)		(0,2)
	1978 to 1991	(84,92)	(53,64)	(20,26)	(-26,-21)	(10,15)	(4,7)	(13,17)	(1,1)	(0,1)	(-5,-3)	(-3,-2)		(1,3)
	1991 to 1995-96	(-12,-4)	(-19,-9)	(1,7)	(-1,3)	(8,14)	(-1,2)	(-8,-4)	(-4,-3)	(0,1)	(-2,-1)	(-1,0)		(0,1)
	1995-96 to 2000-01	(11,17)	(14,22)	(0,5)	(-7,-4)	(-5,0)	(-2,-1)	(0,3)	(-2,-1)	(0,0)	(2,3)	(0,0)	(-1,-1)	(0,2)
	2000-01 to 2004-05	(-13,-6)	(-12,-4)	(-2,3)	(-3,1)	(0,4)	(-1,0)	(-4,-2)	(0,1)	(0,1)	(1,1)	(0,1)	(-1,-1)	(-2,0)
	2004-05 to 2008-09	(5,12)	(3,13)	(2,8)	(-6,-1)	(-7,-2)	(-1,1)	(0,2)	(0,1)	(0,1)	(1,2)	(0,0)	(-1,-1)	(-1,0)
	1991 to 2008-09	(0,9)	(-3,10)	(9,16)	(-12,-6)	(3,9)	(-3,0)	(-8,-5)	(-4,-4)	(1,2)	(3,4)	(-1,0)	(-3,-3)	(-1,1)

Note: Confidence intervals are calculated by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples. See also notes for Table 2.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 9: Shares of characteristics in income inequality (%), 95% confidence intervals

Year	Region	Household type	Age		Education		Employment status	
			Male	Female	Male	Female	Male	Female
1968	(2,3)	(11,13)	(4,5)	(3,4)			(7,8)	(9,11)
1972	(2,3)	(9,11)	(4,6)	(2,4)			(12,14)	(9,10)
1978	(1,1)	(14,15)	(2,3)	(2,3)	(2,3)	(3,3)	(10,12)	(12,14)
1984	(2,3)	(9,11)	(3,4)	(1,2)	(4,5)	(4,5)	(12,13)	(8,9)
1988	(2,3)	(7,9)	(2,4)	(1,3)	(6,7)	(4,5)	(12,14)	(9,11)
1991	(2,3)	(9,11)	(0,2)	(2,4)	(4,6)	(4,5)	(14,16)	(6,7)
1995-96	(1,2)	(6,7)	(2,3)	(1,2)	(5,6)	(5,6)	(10,11)	(9,9)
2000-01	(2,2)	(5,6)	(3,3)	(1,1)	(5,5)	(4,4)	(8,9)	(9,10)
2004-05	(1,1)	(5,5)	(3,3)	(1,1)	(4,5)	(4,5)	(8,9)	(8,9)
2008-09	(1,1)	(3,4)	(2,3)	(1,1)	(4,5)	(4,5)	(8,9)	(8,9)

Note: Confidence intervals are calculated by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples. See also note for Table 3.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Table 10: Changes in income inequality decomposed into characteristic price and quantity effects (Variance of logs x 1000), 95% confidence intervals

Years	Total	Residual	Region		Household type		Age				Education				Employment status			
							Male		Female		Male		Female		Male		Female	
			P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q
1968 to 1972	(36,45)	(16,23)	(0,2)	(0,0)	(-1,3)	(-2,0)	(-20,15)	(-20,15)	(-6,6)	(0,1)					(-4,32)	(3,7)	(-4,8)	(0,2)
1972 to 1978	(-51,-43)	(-39,-25)	(-4,-2)	(-1,0)	(3,7)	(-3,-1)	(-21,12)	(-21,12)	(-7,0)	(0,1)					(-38,-3)	(6,14)	(-6,1)	(2,3)
1978 to 1984	(28,35)	(18,23)	(2,4)	(0,0)	(-4,0)	(-1,1)	(-7,13)	(-7,13)	(-4,1)	(0,1)	(-5,16)	(0,1)	(-2,3)	(1,2)	(-19,4)	(8,10)	(-8,-3)	(2,3)
1984 to 1988	(82,94)	(37,46)	(1,3)	(-1,0)	(-1,4)	(0,1)	(-26,12)	(-26,12)	(-2,8)	(0,1)	(-19,19)	(1,3)	(-1,8)	(0,2)	(6,46)	(-4,0)	(5,15)	(0,2)
1988 to 1991	(30,45)	(19,30)	(-1,2)	(0,1)	(1,8)	(2,5)	(-32,16)	(-32,16)	(-1,5)	(-2,2)	(-27,26)	(-2,4)	(-3,3)	(-1,3)	(-23,30)	(3,10)	(-11,-3)	(-1,4)
1978 to 1991	**(150,164)**	**(82,92)**	**(5,7)**	**(0,0)**	**(2,8)**	**(2,4)**	**(-32,8)**	**(-32,8)**	**(1,6)**	**(1,2)**	**(-13,27)**	**(-1,4)**	**(2,7)**	**(3,5)**	**(3,43)**	**(9,16)**	**(-6,1)**	**(3,5)**
1991 to 1995-96	(-29,-16)	(-1,10)	(-4,-2)	(-1,0)	(-15,-8)	(-3,-1)	(-22,28)	(-22,28)	(-7,-2)	(-1,0)	(-24,25)	(0,3)	(-4,2)	(1,3)	(-40,12)	(-2,4)	(0,6)	(1,2)
1995-96 to 2000-01	(25,36)	(26,35)	(0,1)	(0,1)	(1,4)	(-1,0)	(-23,26)	(-23,26)	(-2,1)	(-1,0)	(-30,16)	(-1,3)	(-6,-2)	(1,2)	(-19,31)	(-7,-2)	(3,7)	(-2,-1)
2000-01 to 2004-05	(-26,-14)	(-12,-2)	(-3,-1)	(0,0)	(-5,-2)	(0,1)	(-21,18)	(-21,18)	(-1,1)	(-1,1)	(-20,18)	(1,3)	(-2,1)	(0,2)	(-20,20)	(-3,-1)	(-5,-1)	(-2,0)
2004-05 to 2008-09	(33,47)	(28,38)	(0,1)	(0,0)	(-6,-2)	(-2,-1)	(-21,14)	(-21,14)	(-4,-1)	(-1,0)	(-14,21)	(0,2)	(-4,0)	(1,3)	(-15,22)	(2,5)	(5,10)	(-1,1)
1991 to 2008-09	**(20,36)**	**(55,67)**	**(-6,-3)**	**(0,1)**	**(-21,-14)**	**(-4,-1)**	**(-24,26)**	**(-24,26)**	**(-12,-6)**	**(0,3)**	**(-28,22)**	**(-1,10)**	**(-11,-4)**	**(5,9)**	**(-28,24)**	**(-11,2)**	**(10,16)**	**(-3,0)**

Note: Confidence intervals are calculated by creating 500 pseudo-samples of the entire time-series of data, and carrying out the decomposition on each of these 500 pseudo-samples. See also note for Table 4.

Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.