Accounting for changes in inequality since 1968: decomposition analyses for Great Britain

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I. Introduction

It is widely known that income inequality has risen dramatically over the past forty years. Indeed, as Figure 1 shows, the commonly used Gini coefficient measure of inequality is now at its highest level since our comparable time series began.

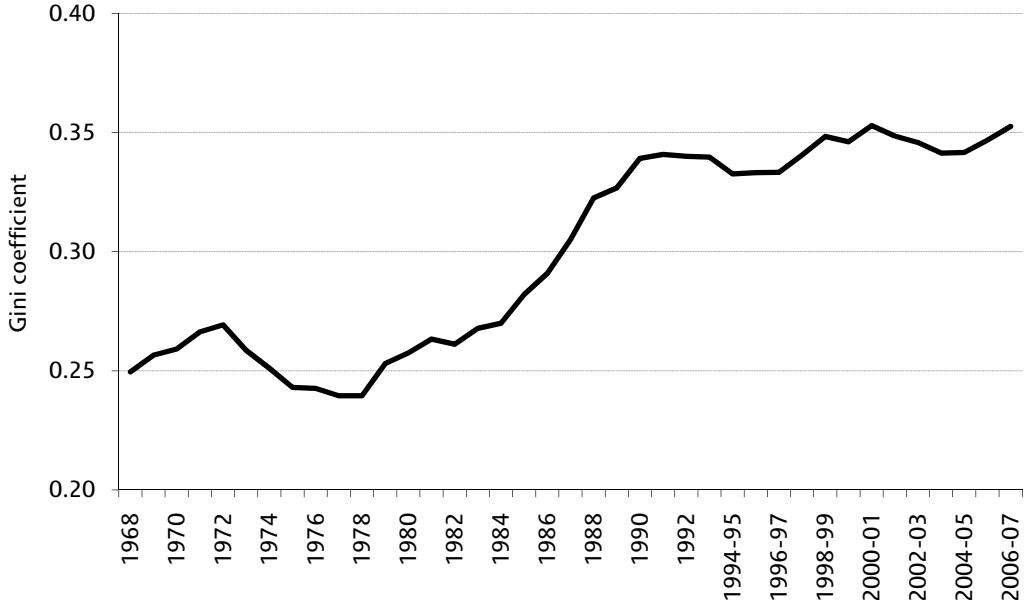
This increase in income inequality has been accompanied (and no doubt partly caused) by a significant increase in individual earnings inequality over the same period. Figure 2 shows the Gini coefficient for earnings since 1968, making clear that it, too, is close to its highest level since our comparable records began.

Many factors have contributed to these increases in inequality, and the aim of this report is to assess their relative importance. To do this, we ask three broad questions about inequality changes:

1. Which **sources of income** have contributed to changes in income inequality? Is it employment income, pensions, benefits or other sources which have been most important in a given period? To answer this question, we use regression methods to decompose changes in income inequality into changes in the inequality of investment income, earnings of the household head and so on.
2. Which **population subgroups** have influenced changes in inequality? Has the gap between women and men, for example, or between older and younger individuals, contributed significantly to changes in overall inequality? To answer this question, we decompose changes in overall inequality into changes *within* different groups and changes *between* those groups. For example:

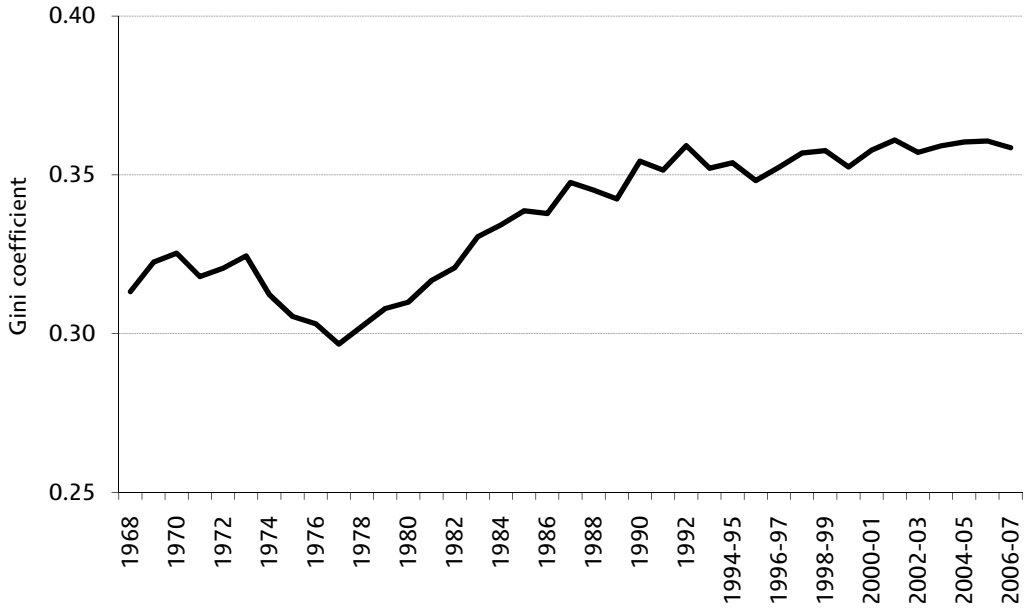
   Change in total inequality
   = Change in inequality among men
   + Change in inequality among women
   + Change in inequality *between* men and women.

Figure 1. Household income inequality in Great Britain: the Gini coefficient, 1968 to 2006–07



Note: The Gini coefficient has been calculated using household incomes before housing costs have been deducted.
Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Figure 2. Individual earnings inequality in Great Britain: the Gini coefficient, 1968 to 2006–07



Note: The Gini coefficient has been calculated using individual earnings.
Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

3. Which **factors** have contributed to changes in inequality? While the subgroup analysis allows us to consider the contributions of various characteristics separately (e.g. sex, ethnicity, age), we would like to be able to consider all these factors simultaneously. We might also state this question as 'What portion of the change in inequality is explained by changing inequality in factor X (holding other factors constant)?'. We address this question using regression-based methods, decomposing changes in inequality by various factors that we expect to influence incomes and earnings (such as age, education and sex).

In answering these questions, this report aims to provide a greater understanding of the factors responsible for changes in Britain's income distribution over the last four decades. This analysis can be considered to be an update of work by Jenkins (1995), who decomposed inequality changes in the UK in the period 1971–86 by extending the techniques developed by Shorrocks (1982, 1984). In addition to the methods used by Jenkins, we also apply the regression-based decomposition method developed by Fields (2003). More details regarding the various methods we use are provided in Section III.1.

II. Executive summary

1. Motivation and methods

- We aim to assess the relative importance of the (many) factors influencing changes in income inequality between 1968 and 2006–07.
- We assess the importance of the competing influences by decomposing changes in household income inequality, using three complementary decomposition methods:
    1. decomposition by income source;
    2. decomposition by population subgroup;
    3. decomposition by factor.
- Because inequality in earnings (among individuals in employment) is an important source of changes in overall income inequality, we perform the second and third decompositions on *individual earnings* inequality, as well as on household income inequality.

2. Data

- Our analysis uses the Households Below Average Incomes (HBAI) data sets, created by the Department for Work and Pensions to provide annual snapshots of Britain's income distribution.
- For our analysis of income inequality, we use HBAI's household measure of 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 and all state benefits and tax credits have been taken into account.
- For our analysis of earnings inequality, we use gross earnings (i.e. before taxes) at the individual level (not the household level).
- We break our 39-year time period down into nine subperiods, which roughly correspond to 'turning points' in income inequality in Britain. By 'turning point', we do not just mean periods when inequality started rising, after previously falling (or vice versa), but also periods when the rate of change in inequality increased or decreased dramatically.

3. Results summary by period

1968 to 1972

- This was a period of increasing income inequality, which can be largely attributed to a corresponding increase in earnings inequality (amongst earners).
- Much of the increase in earnings inequality can be explained by changes in the relative wages of workers in different occupations. The wages of low-earning groups such as unskilled workers and shop assistants fell relative to those of high earners such as managers, professionals and skilled manual workers.

1972 to 1978

- This period saw a fall in income inequality that more than compensated for the increase in the previous period. Again, the change in income inequality was largely due to a corresponding change (a fall, this time) in earnings inequality amongst earners.
- Occupation again played an important role, with high earners such as managers and professionals suffering falling relative wages compared with other groups.

- In addition to this occupation effect, there was a large effect resulting from the increasing relative earnings of women.
- Income inequality amongst pensioners also fell significantly. Furthermore, the mean income of pensioners gained some ground on the mean incomes of younger adults, probably partly as a result of a significant increase in the benefits received by pensioners over the period.

1978 to 1984

- The early 1980s saw the beginning of a large increase in income inequality that was to continue throughout the decade. This first increase affected mainly those of working age, with pensioner inequality remaining relatively stable.
- There appear to be two main factors contributing to rising inequality over this initial period:
  - First, the recession saw a significant rise in the number of unemployed and economically inactive adults. Because these groups have substantially lower average incomes than the employed or self-employed, their growing numbers pushed inequality upwards.
  - Second, there was a large increase in earnings inequality amongst those who remained employed. This was partly due to an increase in part-time work and a decrease in the average number of hours worked by part-time employees. There was also a marked increase in inequality among the self-employed, as the composition of the self-employed changed over the course of the recession.
- A further part of the increase in earnings inequality resulted from increasing inequality between different occupations. The relative wages of manual workers fell during the period compared with those of people working in the service sector. Even the wages of skilled manual workers, which had previously held up well compared with those of their less-skilled counterparts, fell significantly during this period.

1984 to 1988

- The very large increase in income inequality over this period can be partly explained by income inequality in employment income, self-employment income and investment income.
- Unlike in the previous period, this increase does not appear to be primarily due to increasing earnings inequality. (Earnings inequality did increase, but only modestly.) Instead, the increase appears to be largely explained by the incomes of the employed and self-employed 'pulling away' from the incomes of the economically inactive (including pensioners).
- Most measures of earnings inequality show a small increase in this period, partly as a result of the increasing importance of education, with the earnings of higher-educated workers 'pulling away' from the earnings of those with less education.
- A final contribution to the increase over this period was the increase in income inequality amongst pensioners and the unemployed. The increase in inequality amongst these groups is harder to explain, but may be partly a result of the increase in pension and investment income inequality we observe over this period.

1988 to 1991

- This period also saw rising income inequality, and it appears to be increasing earnings inequality which drove much of this increase.
- Increasing inequality in the relative wages of different occupations appears to have contributed significantly to this increase in earnings inequality.

- Inequality amongst pensioners increased during this period, apparently partly due to a decline in the equalising effect of benefits received by this group.
- Women's relative earnings continued to catch up with men's over this period, slightly offsetting the overall increase in inequality.

1991 to 1995–96

- This period saw a modest decline in income inequality, beginning a sequence of relatively small oscillations in inequality between 1991 and 2006–07.
- Relative incomes in this period exhibit many of the trends we might expect during the recovery from an economic downturn. In particular, the relative incomes of the unemployed and pensioners 'catch up' with those of employed people somewhat, during a period of slower real wage growth.
- Earnings inequality also fell somewhat during this period, with 'white-collar' workers faring comparatively poorly.
- The introduction of council tax as a replacement for the (short-lived) poll tax also contributed to the fall in inequality, since council tax bills are more strongly correlated with income than the (flat-rate) poll tax.
- Inequality also fell among pensioners during this period. In fact, the over-65s became the least unequal age group in society (having been the most unequal age group in the early 1970s).

1995–96 to 2000–01

- This period saw a small rise in income inequality, which may have been driven in part by an increase in earnings inequality towards the top of the earnings distribution.
- The increase in earnings inequality was partly caused by a recovery in the relative wages of professionals and a fall in the relative wages of manual workers.
- This period also saw the relative incomes of the unemployed and inactive fall compared with those of the full-time employed and self-employed, which held steady.

2000–01 to 2004–05

- This period saw a small fall in inequality, partly due to increasing relative incomes among pensioners and families with children (especially young children) and partly due to a modest recovery in the incomes of the unemployed (from an admittedly low base).
- Investment income inequality declined during this period (possibly in the wake of the 'dot-com bust' of the early 2000s).
- Within-group inequality amongst pensioners also decreased during this period, perhaps due in part to the decline in the inequality of investment income.
- Changes in earnings inequality over this period are ambiguous. Inequality at the bottom of the income distribution appears to have fallen, possibly due in part to the continuing rise in the relative earnings of women. However, earnings inequality towards the top of the income distribution continued to increase strongly.

2004–05 to 2006–07

- The final three years of our analysis saw a small increase in income inequality. This increase appears to be partly explained by the falling relative incomes of households headed by an

unemployed person during this period. This effect was offset, however, by a fall in the (above-average) relative incomes of the self-employed.

- Aside from this effect of employment status, however, the increase in income inequality is not explained well by any other characteristics in our factor decomposition: much of the increase shows up as a rise in 'residual' inequality.
- The change in earnings inequality was ambiguous over this period. Inequality measures that are sensitive to changes at the bottom of the income distribution (such as the mean log deviation) suggest that earnings inequality fell, while those that are sensitive to the top of the distribution (such as the coefficient of variation) suggest that it increased. This suggests that 'top earners' may have pulled away from the rest of the earnings distribution over this period.

4. *Results summary by factor*

Age

Perhaps surprisingly given the large demographic shift in Britain's population over the past forty years, age does not appear to be a major explanatory factor in changes in income inequality. Almost all changes in overall income inequality are accounted for by increased inequality *within* age groups. In particular, the large increase in inequality during the 1980s affected all age groups, not just those of working age.

When looking at earnings inequality, rather than income inequality, we do see some modest age-related trends. The relative earnings of workers towards the beginning of their careers (those aged below 25) have been falling since the 1980s, as have the relative wages of those towards the end of their careers (those aged 55–64).

Sex

Because our income measure is at the household level, we can only comment on *earnings* inequality between the sexes. The main trend to report is that earnings inequality between men and women explains an ever-decreasing share of overall inequality over the period we study.

Looking at the relative earnings of women, the pattern we see is clear – they have been 'catching up' with those of men for most of the past forty years. In only one period we study (from 1978 to 1984) does this trend briefly reverse itself. Since the start of the 1990s, we have seen a particularly strong increase in the relative earnings of married/cohabiting women.

It is worth bearing in mind that our analysis looks only at raw earnings, not at whether men and women are being paid the same amount for 'the same/similar' jobs. We therefore cannot comment on progress towards the Equal Pay Act's aim of eliminating discrimination between men and women where they are doing the same or similar work.[1] What we can say is that the raw earnings gap between men and women has been narrowing for much of the past forty years.

Region

Despite the significant changes in the industrial structure of the British economy over the past four decades – in particular, the decline of the manufacturing sector and the rise of service industries,

[1] Equal Pay Act 1970, available at http://www.opsi.gov.uk/acts/acts1970/PDF/ukpga_19700041_en.pdf.

both as a share of national product – we do not find differences in incomes between regions to be a significant explanatory factor in overall income inequality over the past forty years.

Our results do show clear income differences between regions, with household incomes in London and the South East some way above the national average, while incomes in the North and Wales have remained consistently furthest below the national average. But it is inequality increases within, rather than between, regions which account for most of the changes in the period we study.

Occupation

Our analysis of the role of occupation is complicated by the lack of a consistent classification of occupations (we are forced to work with three different classification systems over the four decades we study). Nonetheless, our results suggest that changing earnings inequality between different occupations has played a significant role in overall changes in income inequality.

In the mid-1970s, we observe generally falling earnings inequality between different occupation groups, as the relative earnings of higher-paid workers (such as professional and managerial workers) declined. Over the course of the 1980s, however, the relative wages of semi-skilled / unskilled manual workers began declining particularly rapidly. The recession of the early 1990s saw a modest reduction in earnings inequality between different occupations (though not by enough to cancel out the increase during the 1980s).

Important as the widening earnings gap between occupations has been to overall inequality, it remains only part of the story. Inequality within occupation groups also increased dramatically during the 1980s, suggesting that other forces were also at work. Nonetheless, the decline in the relative earnings of manual workers over the course of the 1980s remains a significant factor underlying the increase in overall earnings inequality.

Housing tenure

While households' tenure decisions are strongly related to their income (that is, tenure is likely to be 'endogenous' to income), we present an analysis of inequality and relative incomes among different housing tenure types, for purely descriptive purposes. The major trend we observe is the decline in Housing Association/Local Authority (HA/LA) tenants as a share of the population (while the share of households with a mortgage increases substantially), and the concurrent decline in the relative incomes of those remaining in HA/LA accommodation.

During the 1970s, the relative incomes of HA/LA households were comparable to those of renters of unfurnished accommodation (around 10% below the national average). Today, unfurnished renters still have incomes around 10% below the national average, while HA/LA tenants' incomes are more than 30% below average.

Ethnicity

Our survey data only contain information on respondents' ethnicity from 1994–95 onwards, leaving us with a comparatively short time series to study. Moreover, for all ethnic groups apart from 'white', we have relatively small sample sizes and correspondingly noisy results in our data.

Nonetheless, a reasonably clear picture emerges from these results: we observe a clear income (and earnings) gap between different ethnicities – with average incomes among households headed by

Bangladeshi and Pakistani individuals around 40% below the national average for the entire period since 1994–95.

However, we do not see much *change* in this gap during the period we study. This may be a source of concern in itself – unlike the earnings gap between sexes, the gap between ethnicities does not appear to be narrowing – but it also means that ethnicity does not contribute to the changes in income inequality since 1994–95. The source of those changes lies within, rather than between, the different ethnic groups.

Limiting health condition

As with our ethnicity measure, our measure of health only goes back as far as 1994–95. Moreover, it is a relatively crude self-reported measure, based on whether a respondent reports having a health condition that limits their capacity to work.

Our time series reveals a small decline in the fraction of households headed by an individual with no health problem (from 74% in 1994–95 to less than 70% in 2006–07), though this is largely due to an increase in the fraction with a household head reporting a *non*-limiting health problem.

Turning to relative incomes, we see that households headed by an individual with a limiting health problem have lower incomes than other households (around 20% below the national average) – but relative incomes between households headed by 'healthy' and 'unhealthy' individuals have changed very little over the period we study. They therefore contribute little to changes in overall income inequality since 1994–95.

III. Decomposition methods and data

As discussed in the Introduction, we use three different decomposition methods to analyse changes in inequality, breaking changes down **by income source**, **by population subgroup** and **by factor**. We use these three different decomposition methods, rather than focusing on a single method, because each provides us with a different insight into what drives inequality. For example, whilst the decomposition by subgroup provides us with a measure of inequality between subgroups, it cannot tell us which of two different factors contributed more to total inequality if the two factors are correlated. This is an advantage of the regression-based factor decomposition, since all the factors are included simultaneously. On the other hand, decomposing inequality by subgroups can give us a better understanding of why inequality between groups changed, and hence it is useful to run both decompositions.

Below, we give more detailed information about the methodology and data that underlie this report.

1. Decomposition methods

By income source

In order to decompose income inequality into the various sources of income, we use the methodology of Shorrocks (1982). This has the advantages of being invariant to choice of inequality measure and allowing for a simple decomposition of changes.[2] By definition, each individual's income can be broken down into the sum of income received from different sources, i.e.

(1) $$Y_i = \sum_k Y_i^k$$

where Y_i^k is the income individual *i* receives from income source *k*. The idea behind the income source decomposition is that we can similarly break down total income inequality into the part that each income source is responsible for. The *component inequality weight* of factor *k*, $s_k(Y)$, is then the covariance of this factor with total income, scaled by the total variance of income, i.e.

(2) $$s_k(Y) = \frac{\text{cov}[Y^k, Y]}{\sigma^2(Y)}.$$

These shares sum to 1 and represent the fraction of inequality that is explained by each income source. These shares are clearly invariable to the choice of inequality measure used. In order to decompose the changes in a particular inequality index, *I*, we can then calculate the share that factor *k* plays in the change between time *t* and *t´*, i.e. $s_k' I' - s_k I$.

[2] Paul (2004) points out that it is not necessarily valuable to have a decomposition rule that is invariable to the measure used, and notes that two of the conditions Shorrocks (1982) uses to arrive at the rule are not very intuitive. He proposes a different set of rules for deriving decompositions, and details the decompositions for a number of common measures.

We use half the squared coefficient of variation, $I_2 = \frac{1}{n}\sum_i \frac{(Y_i/\mu)^2 - 1}{2} = \frac{\sigma^2}{2\mu^2}$, as our measure of inequality for this decomposition, where μ is the mean population income.[3] The absolute share of source k in total inequality is then $S_k = \frac{\text{cov}(Y^k, Y)}{2\mu^2}$. Shorrocks (1982) shows that an advantage of using this measure of inequality is that it can then be further decomposed into C_A and C_B where

(3) $$C_A = \frac{\sigma^2(Y^k)}{4\mu^2} \quad \text{and} \quad C_B = \frac{\sigma^2(Y^k) + 2\text{cov}(Y^k, Y - Y^k)}{4\mu^2}.$$

We can interpret these two terms as follows. C_A represents the inequality resulting from the inequality of the particular income source, whilst C_B represents the inequality resulting from the correlation between that income source and income from other sources. To make this representation clearer, we display as part of our results the terms $2C_A/I_2$ and $(I_2–2C_B)/I_2$. The first of these can be interpreted as the income inequality that would be observed, as a fraction of current inequality, if source k were the only source of income differences. The second can be interpreted as the income inequality that would be observed, as a fraction of current inequality, if source k were distributed equally.

In order to guard against error in our own calculations, we also calculate the shares of each source in total inequality using the Stata command 'ineqfac', written by Jenkins (1999a). The ineqfac program provides an exact decomposition of the inequality of total income into inequality contributions from each of the factor components of total income.

By population subgroup

Another way of decomposing inequality is to divide the population into various subgroups, considering that total inequality is the sum of the inequalities within each group and the inequality that exists between the groups. In other words, we have the following equation:

(4) $$I_{Total} = I_{Between} + I_{Within}.$$

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 share of each group.

Given this decomposition of the levels of inequality over time, we can then decompose changes in total inequality similarly. Any change in inequality can be decomposed 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; and (iii) a change in the population shares within the different groups. This latter 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

[3] We use the symbol I_2 since half the squared coefficient of variation is part of the generalised entropy class of inequality indices I_a where a = 0,1,2,etc. Larger values of a correspond to greater sensitivity to income differences at the top of the income distribution rather than the bottom.

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.

We use the same method as used by Mookherjee and Shorrocks (1982) and Jenkins (1995), taking advantage of the additive decomposability of the mean log deviation (MLD), where $I_0 = \frac{1}{n}\sum_i \ln(\mu / Y_i)$.[4] This can then be decomposed into between and within components, i.e.

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

where $\lambda_g = \mu_g/\mu$ and $v_g = n_g/n$, with μ_g the mean income/earnings of subgroup *g* and n_g its size (μ and *n* are the mean and size of the whole population). The first set of terms in equation **(5)** 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/earnings of subgroups. We use the MLD as this has the advantage of having decomposable changes. In particular, Mookherjee and Shorrocks (1982) show that changes can be decomposed as

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

where a bar over a variable indicates an average of base and current period values.[5] Changes are thus decomposed into, from left to right in equation **(6)**, 'pure' changes in inequality within groups, changes due to changing numbers in the different groups (two terms) and changes due to shifting relative incomes between groups.[6] We can see from the equation that the population 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 is due to the fact that different groups have different relative incomes – i.e. the within and between effects.

Again, to check our calculations, the Stata command 'ineqdeco' written by Jenkins (1999b) is used to replicate some of our results. The 'ineqdeco' program estimates a range of inequality and related indices commonly used by economists, with optional decompositions of a subset of these indices by population subgroup.

An alternative approach to the exact decomposition methods used in this report is 'shift-share' simulation analysis. In shift-share analysis, the researcher considers three potential sources of inequality: relative incomes between groups, inequality levels within groups and the population shares of different groups. The researcher then holds two of these inequality sources constant, while varying the third (thus answering questions such as 'How would inequality have changed if only the proportion of individuals falling into each group had changed?'). Unlike the 'arithmetic'

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

[5] The choice of weights in this average is arbitrary.

[6] This is in fact an approximation of the exact decomposition, but it is more useful than the decomposition itself since the different components are readily interpretable. This approximation is used by both Mookherjee and Shorrocks (1982) and Jenkins (1995).

decompositions we use, shift-share simulations do at least correspond to intuitive counterfactual 'experiments'. However, Jenkins (1995) discusses the two main limitations of the shift-share approach. First, assessing a large number of potential influences (as Jenkins does in his paper, and we do in this report) is not easily handled by shift-share methods. Second, the decompositions provided by shift-share simulation are not exact: the combined impact of different influences may not sum to the overall change in inequality.

By factor (regression based)

We use the method of Fields (2003) to generate a regression-based decomposition. The technique involves estimating an income/earnings generating equation of the form

(7) $$y_i = \sum_{f=0}^{f=N} \beta_f X_{fi} + \varepsilon_i$$

where $y_i = \ln(Y_i)$, Y_i is an individual's income/earnings, $(X_{fi})_{f\in[0,N]}$ is a set of observed factors that influence this variable and ε_i is the residual term. We then estimate the coefficients β_f by using a straightforward ordinary least squares (OLS) regression at the adult level and, given these coefficients, calculate the estimated residual for each observation.

The decomposition technique comes from noting that equation **(7)** is very similar to equation **(1)** in the income source decomposition, and hence we can apply the same methodology as Shorrocks (1982). Indeed, we can again take the covariance of both sides with y, which then gives

(8) $$\sigma^2(y) = \sum_{f=0}^{f=N} \text{cov}[\beta_f X_f, y]$$

and we can then define the *relative factor inequality weight* as

(9) $$s_f(y) = \frac{\text{cov}[\beta_f X_f, y]}{\sigma^2(y)}.$$

Fields (2003) notes that the proof Shorrocks (1982) uses is equally applicable here, and hence this is a valid way of decomposing any inequality measure that is continuous, symmetric and equals 0 when all incomes are equal. Included in this class are the Gini coefficient, the Atkinson index, the generalised entropy family and various centile measures. In practice, the right-hand side of our equation will consist 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 factor. This statistic is then comparable to the 'between effect' found using the subgroup analysis, and can be used to measure the robustness of the previously found 'between effects'.

Using the shares calculated in equation **(9)**, for any suitable inequality measure we can express the contribution of factor f in the change in inequality between time t and t' as

(10) $$s_f' I' - s_f I.$$

However, disaggregating further (i.e. into price and quantity effects) is not possible for most of the inequality measures in this general class. Yun (2006) uses the Fields methodology but then goes further by focusing only on the variance of log incomes. He constructs an auxiliary distribution of

income, where $y_i^* = \Sigma_f \beta_f X'_{fi}$, i.e. the distribution of income if the quantities changed but not the coefficients. Then he shows that

(11) $$I' - I = \sum_{f=1}^{f=N} (s'_f I' - s^*_f I^*) + \sum_{f=1}^{f=N} (s^*_f I^* - s_f I)$$

where the first set of terms are the price effects and the second the quantity effects. We can hence distinguish between the effect of a factor becoming more unequally distributed and the effect of it becoming a greater determinant of income.

The Stata command 'ineqrbd' written by Fiorio and Jenkins (2008) was used to check our results. The 'ineqrbd' program performs regression-based decomposition of the inequality in a dependent variable into the contributions accounted for by each of a specified list of factors.

2. Data

We base our analysis on the Households Below Average Income (HBAI) data series, used by the Department for Work and Pensions to provide annual snapshots of Britain's income distribution.[7] The HBAI series is derived from two large cross-sectional household surveys: the Family Expenditure Survey (FES) for the years 1968 to 1993, and the Family Resources Survey (FRS) for the years 1994–95 to 2006–07.[8] The FES provides a representative sample of around 7,000 households per year, while the introduction of the FRS provides a substantially larger sample of around 24,000 households per year.

These data sets were first analysed by Goodman and Webb (1994), who used the long time series to conclude definitively that the rise in inequality during the 1980s was on an entirely different scale from the fluctuations in inequality seen in previous decades.

While HBAI data sets also exist for the years 1961 to 1967, we do not use these early years 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 are only available for the first two quarters of the year (giving an effective sample size of just 1,500 households in 1964). The resulting data sets thus give an incomplete picture of incomes in those years. These discontinuities in the early years of data make it preferable to begin our analysis in 1968, since from that year onwards we have both larger sample sizes and complete years of data.

We use HBAI's household measure of 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

[7] Data for Northern Ireland were included in the HBAI series from 2002–03 onwards. Since this introduces a discontinuity into the data, however, we exclude Northern Ireland from the analysis in this report.

[8] Note that the HBAI series moved from calendar years to financial years in 1994–95.

account the size and composition of households, using the modified OECD equivalence scale.[9] Our initial income sample (before trimming; see below) includes all individuals in Great Britain.

Our measure of earnings, in contrast to our measure of income, is a gross measure (before taxes are deducted) at the individual level. Our initial earnings sample (before trimming) includes all employed individuals who receive positive earnings.

As Section III.1 made 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/earnings at the very top and bottom of the distribution – which is unfortunate, because those are also the parts of the income distribution that household surveys are likely to measure with the most error. We might therefore worry that changes in our inequality measures may be caused by fluctuating, but mismeasured, incomes in the extremes of the distribution. In order to mitigate this risk, we 'trim' both the income and earnings distributions, by removing the top and bottom 1%.

In trimming the income and earnings distributions in this way, we certainly do not wish to downplay the importance of the 'tails' of the distribution to overall inequality trends. 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 and earnings distributions in all decompositions contained in this report, with only one exception (clearly noted in the text): when we decompose inequality by quintile groups.

3. Choosing time periods for comparisons

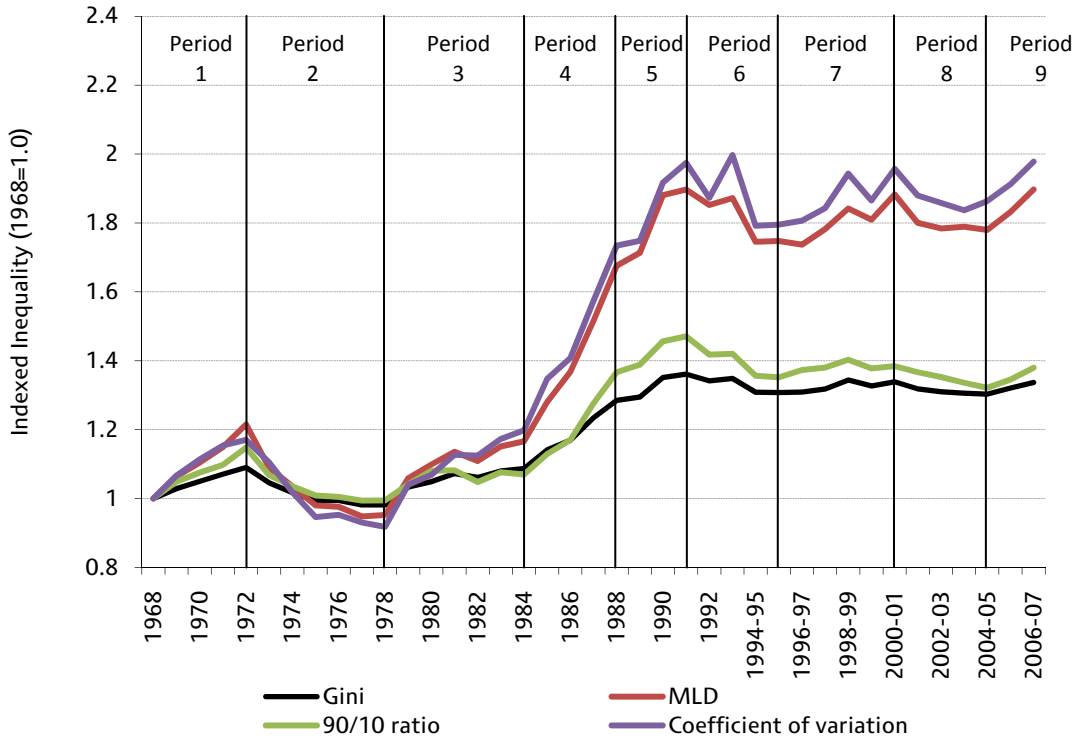
Decomposing a *change* in inequality involves choosing two years to compare (e.g. 'change in inequality from 1968 to 1969' or 'change in inequality from 1970 to 1980'). We could compare all adjacent years (1968 to 1969, 1969 to 1970, etc.) or focus on longer periods. As Jenkins (1995) emphasises, the 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 2006–07, but it is useful when presenting results to focus on specific subperiods. One obvious option would be to report results over five-year intervals (1980 to 1985, etc.), but this approach has its drawbacks. For some time periods (e.g. 1970 to 1975), inequality rose and then fell, so that our decompositions analyse only very small changes in inequality, purely as a result of the years chosen for comparison.

Since income inequality is our primary focus, we suggest a more natural approach is to choose time periods based on the behaviour of income inequality over the period 1968 to 2006–07. Specifically, we have chosen time periods that roughly correspond to 'turning points' in income inequality in Britain. By 'turning point', we do not just mean periods when inequality started rising, after previously falling (or vice versa), but also periods when the rate of change in inequality increased or decreased dramatically.

[9] For more information, see OECD (2009).

Figure 3. Income inequality periods: 1968 to 2006–07



Note: All measures have been calculated using household incomes before housing costs have been deducted.
Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Figure 3 shows four measures of income inequality over this period (the Gini coefficient, mean log deviation, variance of logs and 90/10 ratio), all indexed so that they are equal to 1 in 1968. Vertical lines show the years we have designated as 'turning points'.

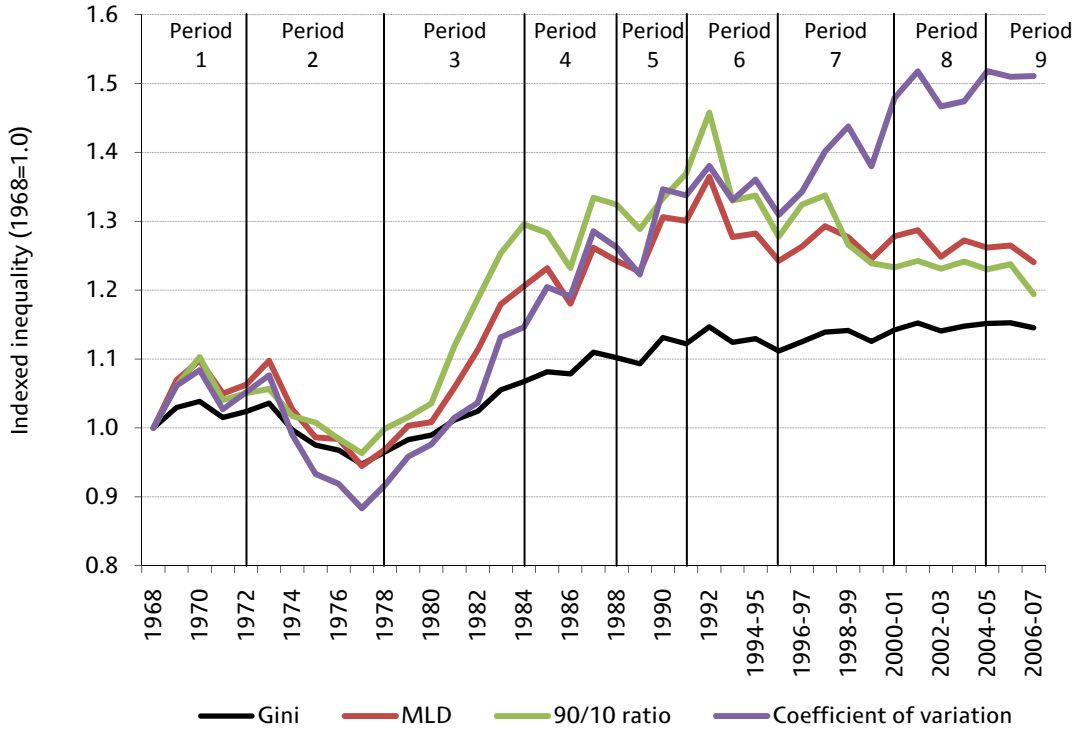
Though the inequality measures do not all 'turn' in exactly the same years, they nonetheless follow very similar trends:

- All measures rise between 1968 and 1972.
- All measures fall between 1972 and 1978.
- All measures are higher in 1984 than in 1978, but some measures (Gini and coefficient of variation) rise consistently, while others (90/10 and MLD) fall slightly in 1982 before rising again.
- All measures capture the rapid rise in inequality over the course of the mid- to late 1980s, which we have subdivided into two periods –
  - the period of very rapid growth from 1984 to 1988;
  - the period of slightly slower (but still substantial) growth from 1988 to 1991.
- All measures show a slight fall in inequality between 1991 and 1995–96.
- All measures show an increase in inequality between 1995–96 and 2000–01.
- All measures fall somewhat from 2000–01 to 2004–05.
- All measures have ticked upwards from 2004–05 to the latest year of data.

For the sake of simplicity, we use the same time periods when reporting our decompositions of earnings inequality, although they do not correspond perfectly to what we might call the 'turning

points' in earnings inequality, as shown in Figure 4. Since the primary aim of this report is to account for trends in income inequality, rather than earnings inequality, we let the behaviour of income inequality guide our choice of time periods.

Figure 4. Earnings inequality periods: 1968 to 2006–07



Note: All measures have been calculated using individual earnings.
Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

Figure 4 shows an interesting divergence in different measures of earnings inequality after 1995–96 – a divergence that we do not see for income inequality. While the coefficient of variation for earnings inequality continues to rise strongly after 1995–96, and the Gini coefficient rises slowly, the mean log deviation falls, as does the 90/10 ratio.

We suspect that this divergence arises because different inequality measures are particularly sensitive to inequalities in different parts of the income distribution. Mean log deviation is sensitive to inequalities in the bottom of the distribution; the Gini coefficient is relatively sensitive to inequalities in the middle of the distribution; the coefficient of variation is sensitive to inequalities at the top of the distribution. What the divergence suggests, then, is that inequality at the top of the earnings distribution continued to increase strongly after 1995–96 (hence the increase in the coefficient of variation), while inequality towards the bottom of the distribution fell somewhat.[10] Meanwhile, the gap between the top tail and the bottom tail (as measured by the 90/10 ratio) fell somewhat. This is an issue which we investigate in more detail in our subgroup decomposition by earnings quintile (Decomposition 20 in Section IV.2), which analyses inequality within different parts of the earnings distribution.

[10] See, for example, Jarvis and Jenkins (1998, p. 435, fn. 10).

Table 1. Time periods chosen for results summaries

Period	Years	Income inequality	Earnings inequality
1	1968 to 1972	Rose	Rose
2	1972 to 1978	Fell	Fell
3	1978 to 1984	Rose slowly	Rose very fast
4	1984 to 1988	Rose very fast	Rose fairly fast
5	1988 to 1991	Rose fairly fast	Rose
6	1991 to 1995–96	Fell	Rose then fell slightly
7	1995–96 to 2000–01	Rose	Ambiguous – depends on measure
8	2000–01 to 2004–05	Fell	Ambiguous – depends on measure
9	2004–05 to 2006–07	Rose	Ambiguous – depends on measure

The periods we have selected are listed in Table 1, along with a brief description of the behaviour of income and earnings inequality (on the measures shown in Figures 3 and 4) during these periods. Note that the HBAI series moved from calendar years to financial years in 1994–95.

An alternative method of choosing years for comparison, exemplified by Burkhauser, Oshio and Rovba (2007), would be to use peaks and troughs of the business cycle as the start and end dates for comparisons. This method is ideal for the analysis conducted by Burkhauser et al., which seeks to compare how equitably economic gains were distributed across successive business cycles in different countries. Our interest in this report, however, is not in business cycles per se, but in all changes in inequality – whether driven by the business cycle or by other forces (such as demographic and social changes). We therefore find a categorisation based on the behaviour of income inequality itself more useful for our purposes. Nonetheless, when interpreting our results, we bear the economic climate in mind at all times.

IV. Full results

1. By income source

We begin by decomposing changes in household income inequality into the contributions of the different sources of household income. Our sample for this decomposition is the entire household population of Great Britain.

Figure 5 displays income inequality (as measured by $1000 \times I_2$, where I_2 is half the squared coefficient of variation) decomposed by the various income sources. The factors that contribute positively are stacked one above another, whilst those that contribute negatively to inequality (such as income from benefits) are shown as lines below the axis. We can immediately see that the employment income of the head of household is the source that contributes most to overall income inequality, followed by the employment income of other members of the household.

Figure 5. Income inequality by income source, 1968 to 2006–07

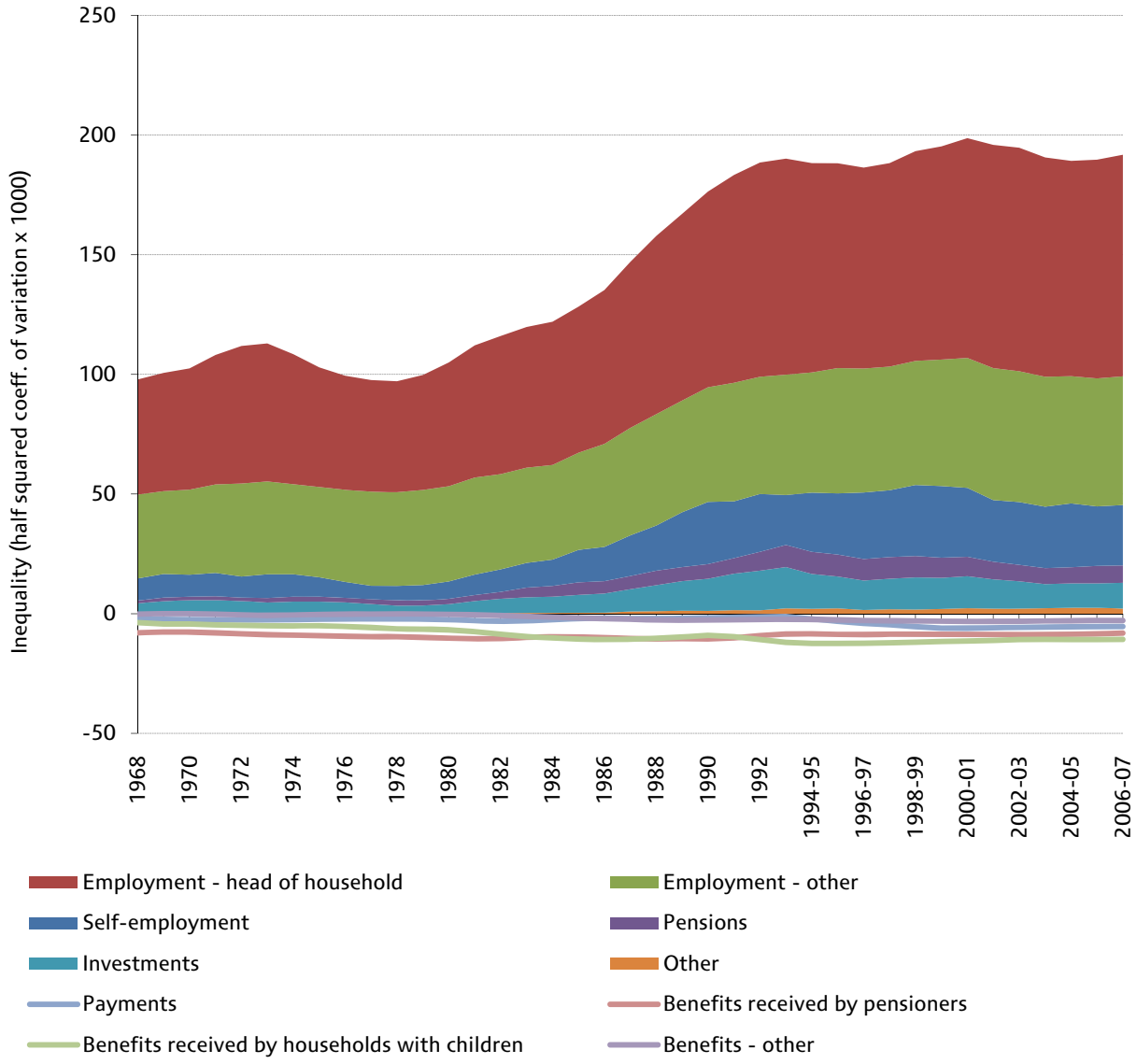


Table 2 presents the decomposition in more detail. The first panel presents the numbers underlying Figure 5 – the absolute contribution of each income source to total income inequality. The second panel shows these contributions as shares of total inequality.

Of course, in assessing the contribution of a particular income source to inequality, it is useful to know how important that source is to overall household income. The third and fourth panels therefore provide information on the share of each income source in mean income and the share of households that receive a non-zero amount of income from each source, respectively.

The final two panels relate to the decomposition of each absolute share into components C_A and C_B, as described in Section III.1. The first panel displays $2C_A/I_2$, which describes the hypothetical level of inequality were all other income sources equally distributed (as a percentage of actual inequality). The second panel displays $(I_2–2C_B)/I_2$, which describes the hypothetical level of inequality were the income source in question equally distributed (as a percentage of actual inequality).

From Figure 5 and the first panel of Table 2, we can see that changes in income from the head of household's employment were largely responsible for the changes in total inequality over the period. In all periods, the contribution of the head of household's employment income moved in the same direction as total inequality, and in most cases it accounted for over 50% of the change.

The increase in overall inequality between 1968 and 1972 was caused by changes in the inequality of employment income of heads of households, rather than by a change in the importance of this source, since the share of this source in mean income is relatively stable. Moreover, since the proportion of households with employment income does not change significantly, this increase in total inequality is probably driven by an increase in earnings inequality amongst earners.

The increase in inequality between 1978 and 1984, in contrast, appears to result partly from a fall in the proportion of households with non-zero employment income from the head of household (from 71% to 62%).

The period from 1984 to 1988 is the only one that contains a large shift in inequality where employment income of heads of households does not explain a majority of the change. In this period, the increase in inequality is the result of a combination of contributions from employment income, self-employment income, pensions and investments. Self-employment income goes from explaining 11% of inequality to explaining 17%. This increase is due to a combination of a greater share of self-employment income in total income – rising from 6% to 9% – and an increase in the inequality of self-employment income.

Goodman and Webb (1994) offer a helpful explanation for this increasing inequality among the self-employed, suggesting that the composition of the self-employed changed substantially over the course of the 1980s, with a significant increase in the number of self-employed individuals reporting zero profits.

The changes in inequality between 1988 and 1995–96 are largely driven by two sources of income: employment income and investments. In 1991, investment inequality rises to a peak of explaining 11% of total inequality before falling to 8% in 1995–96. The temporary nature of this increase suggests it may be largely led by the spike in nominal interest rates over this period.

Changes since 1995–96 are again largely the result of changes in income from employment, with a large increase between 1995–96 and 2000–01 occurring despite an increase in the number of households receiving employment income.

We can thus conclude that changes in employment income explain the majority of changes in inequality since 1968. Nonetheless, the trends in the contributions of other sources also warrant investigation, as several have played a significant role at various points.

The contribution to total inequality from the employment income of non-heads of households has generally followed that of heads of households. However, looking in more detail, we can see that changes in this source's contributions resulted largely from changes in its correlation with the rest of income inequality rather than changes in the inequality of the source. This appears to be the result of two factors. First, since non-heads of households are by definition in the same household as a head of household, increases in the inequality of employment or self-employment income of the heads of households will result in the correlation between the income of heads of households and the income of non-heads of households becoming more important. Second, there is a small fall in the number of households with non-heads receiving employment income, from 51% in 1968 to 49% in 2006–07. This may explain an increase in the contribution of employment income of non-heads of households to total inequality if the households that have stopped having two earners are the poorer ones.

Finally, it is interesting to note that the inequality of employment income of non-heads of households has remained fairly stable over the entire period, unlike that of heads of households. This strongly suggests that the factors that caused the large increase in earnings inequality in the 1980s acted most forcefully on the earnings of heads of households, rather than other earners in the household.

The contribution of investment inequality has also always moved in the same direction as the contribution of employment income, suggesting the two are closely linked. Generally, the change in the contribution of investment inequality has always had a smaller magnitude than that of employment, suggesting that investment inequality may generally follow employment inequality as employees invest a share of their income. The increasing investment inequality during the 1980s may also reflect tax changes that increased the net income savers received.

Self-employment income increased its share of total income between 1984 and 1988, from 6% to 9%, and has generally remained at a higher level since 1988. This increased share of total income has led to an increased contribution to total inequality since 1988. This share was not dented by a large fall in the number of households receiving self-employment income between 1995–96 and 2000–01.[11] A further point to note is the relationship between movements in the contribution of self-employment and that of employment. Between 1972 and 1988, self-employment income's contribution moves in the same direction as the contribution of employment income. However, the opposite is the case from 1988 – in all the periods under consideration, the absolute contribution of self-employment income in fact moves in the opposite direction to that of employment income,

[11] The significant decrease in households receiving self-employment income between 1995–96 and 2000–01 occurs due to a change in the way the HBAI variable is constructed, with households receiving very small amounts of self-employment income becoming classified as receiving none.

giving a stabilising effect on total inequality. This suggests that whilst inequality changes in the 1970s and 1980s were led by factors affecting all types of workers, changes in the 1990s and since 2000 were more dependent on one's form of economic activity. However, given the flexibility with which workers can be defined as employed or self-employed, these results should be interpreted with caution.

The absolute contribution to inequality of pension income increased steadily from 1968 to 1995–96, due to an increase in the inequality of the income source. This occurred alongside a doubling of the number of households receiving income from pensions (from 9% to 19%) and a rise in its share of total income from 2% to 6%. Since 1995–96, the share of pension income in total income has remained relatively stable, and its absolute contribution to total inequality has fallen slightly. This fall has been the result of a reduction in the correlation between pension income and other income sources, rather than a fall in pension income inequality.

Finally, we turn to components that have been equalising factors throughout the period – namely, the benefits received by households and the 'payments' made by households (deductions from income, such as council tax). Payments increased their equalising effect significantly in the period 1991 to 2000–01, partly as a result of total payments becoming larger and partly due to an increased negative correlation with total income. This is likely to be due to the introduction of council tax as a replacement for the poll tax. Where the poll tax was levied at a flat rate, council tax rates vary according to the value of residents' accommodation – which is likely to be correlated (albeit imperfectly) with their income.

Benefits given to non-pensioners became more effective at reducing inequality between 1972 and 1984, partly as a result of their increased share of total income (from 7% to 14%) and the greater number of recipients (from 56% to 65%). These shares then fell slightly by 1988, but the equalising effect of these benefits has remained at roughly the same level since 1984. The equalising effect of benefits received by pensioners has remained roughly constant over the entire period, although it has a small peak in 1988.

Table 2. Inequality decomposed by income source

	Year	Total income	Employment		Self-employment	Pensions	Investments	Payments	Benefits received by			Other income
			Head of household	Other					Pensioners	Households with children	Other	
Absolute factor contributions ($S_j \times 1000$)	1968	84	48	35	9	1	4	-2	-8	-4	0	1
	1972	97	61	40	8	1	5	-3	-9	-5	–1	0
	1978	78	47	39	5	3	3	-2	-9	-7	0	0
	1984	101	61	40	11	5	7	-2	-9	-11	–2	0
	1988	145	77	46	25	7	13	-2	-11	-9	–3	1
	1991	167	93	51	18	8	19	-1	-9	-11	–3	2
	1995–96	158	83	53	28	9	12	-4	-9	-12	–3	2
	2000–01	172	96	55	26	8	14	-6	-9	-11	–3	3
	2004–05	162	90	53	27	7	11	-6	-8	-11	–3	2
	2006–07	168	94	55	26	7	12	-6	-8	-11	–3	2
Share of income inequality	1968	100%	57%	42%	11%	1%	4%	-3%	-10%	-5%	0%	1%
	1972	100%	63%	41%	8%	2%	5%	-3%	-9%	-5%	–1%	0%
	1978	100%	60%	50%	7%	3%	4%	-3%	-12%	-9%	0%	0%
	1984	100%	60%	40%	11%	5%	7%	-2%	-9%	-11%	–2%	0%
	1988	100%	53%	32%	17%	5%	9%	-1%	-7%	-6%	–2%	1%
	1991	100%	55%	31%	11%	5%	11%	-1%	-5%	-6%	–2%	1%
	1995–96	100%	52%	33%	18%	6%	8%	-3%	-6%	-8%	–2%	1%
	2000–01	100%	56%	32%	15%	4%	8%	-3%	-5%	-6%	–2%	2%
	2004–05	100%	55%	33%	17%	4%	7%	-3%	-5%	-7%	–2%	1%
	2006–07	100%	56%	33%	15%	4%	7%	-3%	-5%	-6%	–2%	1%

Table 2 continued

	Year	Employment		Self-employment	Pensions	Investments	Payments	Benefits received by			Other income
		Head of household	Other					Pensioners	Households with children	Other	
Share of mean income	1968	56%	24%	6%	2%	2%	–4%	5%	5%	3%	1%
	1972	57%	23%	6%	2%	2%	–4%	5%	4%	3%	1%
	1978	51%	24%	5%	3%	2%	–4%	7%	7%	4%	1%
	1984	44%	23%	6%	4%	3%	–4%	9%	9%	5%	1%
	1988	44%	23%	9%	5%	5%	–4%	7%	6%	4%	2%
	1991	43%	23%	8%	5%	6%	–4%	7%	6%	4%	2%
	1995–96	39%	23%	9%	6%	4%	–5%	8%	8%	5%	2%
	2000–01	42%	24%	8%	6%	4%	–6%	8%	7%	4%	2%
	2004–05	41%	24%	8%	6%	3%	–6%	8%	8%	4%	3%
	2006–07	41%	25%	8%	6%	4%	–6%	8%	8%	4%	3%
Share of households with non-zero income from source	1968	76%	51%	17%	9%	54%	97%	12%	50%	10%	12%
	1972	74%	51%	21%	11%	48%	97%	13%	46%	10%	13%
	1978	71%	53%	19%	12%	57%	100%	14%	53%	11%	17%
	1984	62%	52%	23%	16%	67%	99%	16%	50%	15%	19%
	1988	60%	51%	27%	17%	74%	99%	17%	46%	14%	24%
	1991	58%	50%	24%	19%	73%	100%	17%	45%	14%	24%
	1995–96	51%	48%	27%	19%	67%	99%	17%	47%	15%	33%
	2000–01	56%	49%	17%	19%	68%	98%	17%	46%	35%	27%
	2004–05	56%	49%	17%	19%	69%	99%	17%	45%	13%	29%
	2006–07	57%	49%	16%	18%	67%	98%	17%	44%	14%	28%

Table 2 continued

	Year	Employment		Self-employment	Pensions	Investments	Payments	Benefits received by			Other income
		Head of household	Other					Pensioners	Households with children	Other	
$2C_A/I_2$ [Relative inequality of income source]	1968	118%	58%	36%	5%	6%	1%	12%	6%	6%	2%
	1972	113%	50%	27%	5%	5%	1%	11%	5%	5%	2%
	1978	118%	60%	25%	8%	5%	1%	20%	11%	9%	3%
	1984	105%	47%	28%	10%	7%	0%	21%	11%	11%	2%
	1988	84%	34%	35%	10%	8%	0%	10%	5%	5%	3%
	1991	77%	30%	22%	8%	10%	0%	8%	5%	5%	3%
	1995–96	77%	35%	34%	11%	6%	2%	11%	8%	7%	3%
	2000–01	81%	34%	30%	10%	9%	2%	10%	6%	5%	4%
	2004–05	81%	36%	32%	11%	6%	2%	12%	7%	5%	4%
	2006–07	80%	36%	30%	10%	8%	2%	11%	6%	5%	4%
$(I_2–2C_B)/I_2$ [Relative inequality if income source were removed]	1968	103%	74%	114%	102%	97%	106%	131%	115%	107%	101%
	1972	87%	69%	111%	102%	95%	106%	128%	116%	106%	102%
	1978	97%	61%	111%	102%	97%	106%	145%	129%	110%	103%
	1984	84%	66%	106%	101%	92%	104%	139%	133%	115%	102%
	1988	77%	70%	100%	100%	90%	103%	124%	118%	109%	102%
	1991	66%	69%	101%	98%	88%	101%	119%	118%	108%	101%
	1995–96	73%	68%	98%	100%	91%	107%	123%	124%	111%	101%
	2000–01	69%	70%	100%	101%	93%	109%	120%	119%	109%	101%
	2004–05	70%	71%	98%	102%	93%	108%	122%	121%	109%	101%
	2006–07	68%	70%	100%	102%	93%	108%	121%	119%	109%	102%

2. By population subgroup

Our subgroup decompositions seek to answer the question 'Which population groups contributed to changes in inequality?'. We divide the population into subgroups according to 12 different sets of characteristics:

- age;
- sex and marital status;
- household family structure;
- employment status;
- full-time/part-time work (among earners only);
- region;
- education;
- occupation (among earners only);
- ethnicity;
- health;
- housing tenure;
- quintile of the income/earnings distribution.

For each of our time periods, we decompose the overall change in inequality (as measured by the MLD) into contributions from three different sources:

- within-group inequality – the 'pure' changes in inequality within groups;
- population effects – inequality changes due to changing proportions of the population falling into the different groups;
- relative income effects – changes due to shifting relative incomes between groups.

In practice, the second (population) effect can be further divided into two parts:

- population effect 'within' – the population effect that arises because some groups have higher within-group inequality than others (so larger fractions of the population in those groups lead to higher inequality);
- population effect 'mean' – the population effect that arises because different groups have different mean income (so larger fractions of the population entering groups with very high/low relative income will tend to increase inequality).

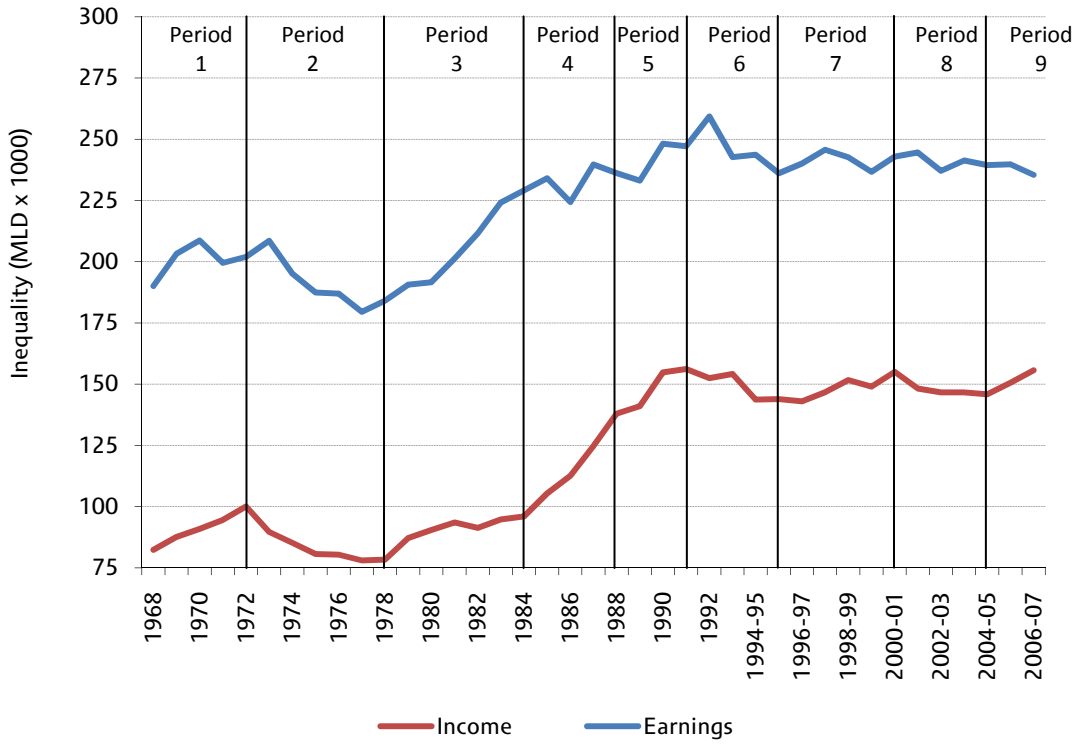
In summary, then, our tables will decompose inequality changes into four different effects – one pure within-group effect and three between-group effects:

A. '**within**' – the effect of changes in inequality within subgroups;
B. '**population change: within**' – the effect of changes in the relative populations in each subgroup since different groups have different within-group inequalities;
C. '**population change: mean**' – the effect of changes in relative populations in each subgroup since different groups have different mean income;
D. '**relative income**' – the effect of changes in relative incomes of subgroups.

Note that, for simplicity, we will refer to the second and third effects as 'population effects' in both our income and earnings decompositions (although strictly speaking, in the latter case, we might also call these 'workforce composition effects').

These decompositions use the mean log deviation (MLD) measure of inequality, also known as the I_0 measure. Figure 6 shows this inequality measure for both income and earnings since 1968, making clear exactly what changes we'll be decomposing. (Figures 3 and 4 showed the normalised MLD, but the decompositions in this section will use the absolute levels shown in Figure 6.)

Figure 6. Income and earnings inequality: mean log deviation, 1968 to 2006–07



Notes: Income inequality has been calculated using household incomes before housing costs have been deducted. Earnings inequality has been calculated using earnings at the individual level.
Source: Authors' calculations using Family Expenditure Survey and Family Resources Survey, various years.

It is clear that earnings inequality is always higher than household income inequality, but trends in the two are strongly correlated. Inequality in both income and earnings rose then fell during the 1970s, before rising strongly during the 1980s and levelling off somewhat during the 1990s. The clearest divergence between income and earnings trends comes in our final period (2004–05 to 2006–07), when the MLD for earnings falls slightly while the MLD for income rises.

Table 3 shows the level of the mean log deviation measure (multiplied by 1000 for ease of interpretation) at the start of each of our periods of analysis, and the change since the previous period, for both income and earnings inequality.

Table 3. Mean log deviation for income and earnings

Year	Income inequality		Earnings inequality	
	Level ($I_0 \times 1000$)	Change since previous period	Level ($I_0 \times 1000$)	Change since previous period
1968	82	N/A	190	N/A
1972	100	18	202	12
1978	78	–22	184	–18
1984	96	18	229	45
1988	138	42	236	7
1991	156	18	247	11
1995–96	144	–12	236	–11
2000–01	155	11	243	7
2004–05	146	–9	239	–4
2006–07	156	10	235	–4

For all our subgroup decompositions, we present a table showing the changes in aggregate inequality in each time period, and the contribution of the four within and between effects to those changes. A comprehensive set of charts in our appendix allows us to investigate the trends underlying these effects, and these are referenced in the main text wherever they help cast light on the decomposition table results.

Decomposition 1: Income inequality, by age group

In common with most developed countries, Britain has seen a significant demographic shift over the past fifty years, as increased longevity and the maturing of the 'baby boom' generation have increased the proportion of the population who are elderly relative to working-age individuals and children. Jenkins (1995) considers the possibility that this demographic shift might have contributed to increasing inequality from 1971 to 1986, but ultimately rejects this explanation: his age-group decomposition shows extremely small population effects.

We replicate Jenkins's age-group decomposition and extend it to 2006–07, dividing the population according to the age of the head of household using the following categories:

- below 25;
- 25–34;
- 35–44;
- 45–54;
- 55–64;
- 65–74;
- over 75.

Table 4 shows changes in income inequality, decomposed into within and between effects for the different age groups. We can see that the effect of changes in within-group inequality far outweighs

the effect of between-group changes – a finding that echoes that of Jenkins (1995). The between-group effects never account for more than one-quarter of the change in inequality, and they usually account for substantially less.

Table 4. **By age group** (age of head of household) – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	17	0	0	1
1972 – 1978	–22	–20	0	0	–2
1978 – 1984	18	19	0	0	–1
1984 – 1988	42	39	0	0	3
1988 – 1991	18	18	0	0	0
1991 – 1995–96	–12	–11	–1	0	–1
1995–96 – 2000–01	11	12	0	0	–1
2000–01 – 2004–05	–9	–8	0	0	–1
2004–05 – 2006–07	10	10	0	0	–1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Appendix Figure A1.2 shows us that inequality among all age groups increased substantially during the 1980s, though this increase was least dramatic for the groups with heads of households aged 65 and over – who are now the least unequal age groups in Britain, having been the most unequal forty years ago.

Figure A1.4 shows that relative incomes were reasonably stable for most age groups, but not for the oldest, whose relative incomes have increased for much of the past forty years (with the exception of the mid-1980s), which has acted to reduce income inequality. This finding echoes Goodman and Webb (1994), who point to the earnings indexation of the state pension during the 1970s as an important explanation for pensioners' relative incomes keeping pace with others, and the breaking of this indexation in the 1980s as a key factor in pensioners' incomes falling behind. The relative incomes of the youngest age group, with heads of households aged under 25, fell dramatically during the 1980s and have never recovered their previous level.

As interesting as these relative income fluctuations are, however, they cannot disguise the fact that the changing age distribution does not appear to have been a key factor in inequality changes over the periods we study. Inequality changes within age groups have contributed far more to overall changes in inequality.

Decomposition 2: Earnings inequality, by age group

We now turn to the distribution of earnings, rather than household income. We use the same age groups as the previous decomposition, but where we previously divided individuals according to the age of their head of household, we now divide them according to their own age.

Table 5 shows the results of this decomposition. Once again, we find that within-age-group effects greatly dominate between-group effects, with a dramatic increase in within-group inequality between 1978 and 1984 (accounting for most of the increase in overall earnings inequality over this period) and substantial falls in within-group inequality in the mid-1970s and early 1990s.

Table 5. **By age group** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	11	1	0	0
1972 – 1978	–18	–14	0	–1	–3
1978 – 1984	45	42	0	–2	5
1984 – 1988	7	9	–1	–1	–1
1988 – 1991	11	9	2	–1	0
1991 – 1995–96	–11	–16	3	–3	5
1995–96 – 2000–01	7	2	2	0	3
2000–01 – 2004–05	–4	–8	2	1	1
2004–05 – 2006–07	–4	–3	0	0	–1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Looking at Appendix Figure A2.2, we see that younger workers (under 35) have substantially lower earnings inequality than their older peers, while workers aged 35 to 64 have very similar levels of earnings inequality for most of the time period we study. All groups aged under 65 saw their earnings inequality fall during the 1970s, and increase over the course of the 1980s through to the early 1990s (the small sample sizes of workers aged 65 and over make their time series too volatile to draw firm conclusions). Thus the increase in earnings inequality since 1980 cannot be ascribed to increases within any one age group.

Since 1991, however, the within-age-group trends have diverged somewhat. Inequality has fallen among workers aged 35–54, whose inequality level has been high historically, and this probably accounts for the inequality-reducing within-group inequality effects since 1991. However, between 1995–96 and 2000–01, this effect was cancelled out by a rise in inequality among the youngest workers (aged 24 and under), whose level of earnings inequality 'catches up' with that of workers aged 25–34 during this period.

Figure A2.4 shows us that the relative earnings of workers towards the beginning of their careers (those aged below 25) have been falling since the 1980s, as have the relative wages of those towards the end of their careers (those aged 55–64). These groups' relative wages fell particularly sharply in the early 1990s, which accounts for the inequality-increasing relative earnings effect for this period seen in Table 5. However, their share of the workforce (as shown in Figure A2.3) was declining at the same time, leading to a partially offsetting population change (mean) effect.

In summary then, as with the previous income inequality decomposition, it appears that within-age-group inequality has been the most significant factor in overall inequality changes when decomposed by age group.

Decomposition 3: Earnings inequality, by sex and marital status

Having decomposed earnings inequality according to age, we now turn our attention to an extremely important source of earnings inequality: sex. Numerous initiatives have sought to address the fact that women's earnings are lower than men's on average, even in equivalent jobs. The Equal Pay Act of 1970 made it unlawful for employers to discriminate between men and women in their pay and conditions, where they are doing the same (or similar) work or work of equal value. Efforts to eradicate the gender pay gap continue to this day, with the government's Women and Work Commission publishing regular reports and recommendations on the issue.[12]

While we decompose earnings inequality by sex in this report, we do not carry out a similar decomposition for income. This is because our income measure is at the household level, which means that couples in the same household are allocated the same income. Differences in income by sex would therefore be driven entirely by all-male and all-female households (such as single-adult households). Our earnings measure, in contrast, is at the individual level, and therefore readily lends itself to decomposition by sex.

Rather than simply dividing our earnings sample into men and women, however, we also take account of their marital status. We may well expect the labour market behaviour of single women to be very different from that of married/cohabiting women, for example, so it is useful to be able to take this into account in our decomposition.

We do, however, run into a limitation with our early years of data on marital status. Prior to 1990, the Family Expenditure Survey did not recognise 'cohabitation' as a category in its questionnaire – individuals were classed either as married or as single. After 1990, the 'married' category was expanded to 'married or cohabiting'. This means that we have an unavoidable 'jump' in the time series in 1990, so that results for our fifth time period (1988 to 1991) must be interpreted with caution. We can still consistently decompose the large increases in inequality over the course of the 1980s, however, and also the years after 1991.

Table 6 shows the detailed decomposition of aggregate inequality into within-group and between-group components. It is clear that within-group inequality and changes in relative earnings tend to be the major forces driving changes in inequality, though there are significant population change effects in some periods (particularly 1972 to 1978 and 1988 to 1991).

Appendix Figures A3.1 to A3.4, accompanying this decomposition, give a clearer picture of what has been happening. Within-group inequality rose for both men and women throughout the 1980s (Figure A3.2), but during the 1990s inequality fell among married/cohabiting women while continuing to rise among single women and men (both single and married/cohabiting).

[12] See, for example, the latest report: Women and Work Commission (2009).

Table 6. **By sex and marital status** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	11	2	3	–4
1972 – 1978	–18	–6	4	2	–18
1978 – 1984	45	35	4	–1	7
1984 – 1988	7	14	1	–2	–6
1988 – 1991	11	12	3	5	–10
1991 – 1995–96	–11	3	1	0	–15
1995–96 – 2000–01	7	11	–1	–1	–3
2000–01 – 2004–05	–4	1	1	0	–5
2004–05 – 2006–07	–4	–2	0	0	–2

Notes: Within-group and between-group effects may not sum to overall change in inequality, due to rounding. The shading highlights a discontinuity in the data, as explained in the text.

The changing composition of the British workforce (seen in Figure A3.3) – and in particular the rising participation of women – has had somewhat contradictory effects on overall inequality. On the one hand, it has acted to decrease inequality between men and women – because the gap between women's relative earnings and men's has narrowed somewhat (Figure A3.4). On the other hand, inequality *within* female workers tends to be high, as they are more likely than men to work part-time. Moreover, inequality within female workers has not fallen fast enough to offset the inequality-increasing population change (within) force as their participation has risen. Thus an increasing share of the workforce coming from a high-inequality group (women) has acted as an upward force on overall inequality.

Decomposition 4: Income inequality, by household family structure

We now extend our decompositions to take into account households' family structure (which we will refer to as 'household type'), rather than simply the age or sex of the head of household. Numerous changes in society, such as changing work patterns and changes to the tax and benefit system, are likely to significantly affect the distribution of income both within and between different household types. For example, recent years have seen significant changes to the tax and benefit system aimed at increasing the incomes of low-income families with children (in particular, the introduction of tax credits) and pensioners (with the introduction of the pension credit). Decomposing inequality by household type gives us an important insight into the effects these changes have had on the income distribution.

We divide individuals into 11 different groups, depending on the structure of their household and the age of the youngest child (if any) in the household. The groups are:

- one adult, no children;
- two adults, no children;

- three or more adults, no children;
- one adult, one or more children, youngest under 5;
- two adults, one or more children, youngest under 5;
- three or more adults, one or more children, youngest under 5;
- one adult, one or more children, youngest aged 5 or over;
- two adults, one or more children, youngest aged 5 or over;
- three or more adults, one or more children, youngest aged 5 or over;
- one adult, household head aged 65+;
- two or more adults, household head aged 65+.

Appendix Figure A4.3 shows the fraction of the population falling into each of these groups since 1968, giving an insight into changing household structure in Britain in the last forty years. While the number of different groups makes this a complicated chart, certain clear trends stand out. Individuals living in households containing two adults and one or more children aged under 5 make up the largest share of the British population during the 1970s and early 1980s, but are overtaken by households containing two adults and no children in the late 1980s. Non-pensioner households containing three or more adults and no children make up the next largest group – generally between 12% and 15% of the population. More generally, individuals in childless non-pensioner households have risen from 35% of the population in 1968 to 38% of the population in 2006–07.

Turning to inequality, Figure A4.1 shows levels of income inequality since 1968, divided into within-household-type and between-household-type components. We can see that inequality within household types makes up the largest component of overall inequality – but inequality between household types is also a significant contributor. Between-group inequality accounts for around a quarter of overall inequality throughout the 1970s. However, while inequality within household types increased dramatically throughout the 1980s, inequality between household types appears to have held relatively steady.

Table 7. **By household type** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	14	1	0	2
1972 – 1978	–22	–21	1	1	–2
1978 – 1984	18	21	0	1	–5
1984 – 1988	42	34	1	2	6
1988 – 1991	18	17	0	3	–1
1991 – 1995–96	–12	–7	–1	1	–6
1995–96 – 2000–01	11	10	0	1	0
2000–01 – 2004–05	–9	–7	0	0	–2
2004–05 – 2006–07	10	9	0	0	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Table 7 shows the detailed decomposition of inequality changes into within-family-type and between-family-type components. The table shows that changes in income inequality are largely accounted for by within-family-type inequality changes. Changing inequality between household types contributed most to overall inequality trends between 1984 and 1988, when it rose strongly, and between 1991 and 1995–96, when it fell back substantially.

Figure A4.2 shows inequality increasing within all household types since 1980, with single-adult households without children having the highest levels of within-group inequality throughout. The household types with the lowest levels of inequality tend to be those with the lowest average incomes – in particular, lone parents and pensioner households. These household types have seen their average incomes increase over the course of the 1990s and 2000s, which has acted to reduce between-group inequality, but as we can see from Figure A4.4, their average incomes remain well below the national average.

Decomposition 5: Earnings inequality, by household family structure

We now repeat the decomposition by household family structure ('household type'), this time for earnings inequality. We divide individuals into the same groups as before, according to the structure of their household. This time, however, we are considering their individual earnings.

Appendix Figure A5.3 shows the fractions of the employed population in our sample falling into each of our household types (loosely speaking, it tells us the share of individuals from different household types in the workforce). These fractions will be affected by both changing population (more/fewer people falling into different groups) and changing working patterns (more/fewer members of a given group in the workforce).

Individuals in multi-adult households with no children make up by far the largest fraction of the workforce – accounting for more than half the workforce in most years. Workers from two-adult households with older children are the largest fraction of the workforce among household types with children. Lone parents made up around 0.5% of the workforce in 1968 and less than 3% in 2006–07.

Figure A5.1 shows the within-group and between-group contributions to overall earnings inequality over the course of the past forty years. Within-group inequality accounts for between 94% and 96% of all earnings inequality, in all years.

Table 8 gives the detailed decomposition of changes in inequality, and again we see that within-family-type inequality reigns supreme. In almost every time period, it is changes in within-group inequality which account for virtually all the change in aggregate inequality.

However, there have been some small between-group effects. In particular, population change has generally acted to reduce inequality slightly since the 1980s, with the population change (within) effect accounting for most of this effect. Figure A5.2 reveals that household types with very few workers (lone parents and the elderly) tend to have high and volatile earnings inequality, while households without children (who comprise the largest fraction of the British workforce) have the lowest levels of within-group inequality. As an increasing fraction of the workforce comes from these (low-inequality) groups without children, changing workforce composition has generally acted to

reduce earnings inequality. This accounts for the inequality-reducing population change (within) effects for much of this period.

Table 8. **By household type** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	9	3	0	0
1972 – 1978	–18	–17	2	0	–3
1978 – 1984	45	46	–2	–2	4
1984 – 1988	7	12	–4	–1	0
1988 – 1991	11	13	–2	1	0
1991 – 1995–96	–11	–13	2	–1	1
1995–96 – 2000–01	7	7	–1	0	1
2000–01 – 2004–05	–4	–4	–1	0	1
2004–05 – 2006–07	–4	–4	0	0	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

However, earnings inequality within most household types (including those without children) increased over the course of the 1980s and 1990s, and this increasing inequality accounts for most of the increase in overall inequality.

Decomposition 6: Income inequality, by employment status of household head

The employment status of a household head is likely to have a significant effect on household income. In this decomposition, we divide individuals into the following groups according to the employment status of their head of household:

- full-time employed;
- part-time employed;
- self-employed;
- unemployed;
- inactive and above the state pension age;
- inactive and below the state pension age.

Table 9 shows the results of this decomposition for income inequality. While the within-group effects are once again dominant, we also find significant between-group effects – in particular, relative income effects – over the period. The pattern of between-group changes is fairly complicated, with the different between-group effects sometimes acting to reinforce each other and sometimes cancelling each other out.

Table 9. **By employment status** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	10	0	3	5
1972 – 1978	–22	-18	1	1	-6
1978 – 1984	18	8	2	5	2
1984 – 1988	42	28	2	-2	14
1988 – 1991	18	14	1	3	1
1991 – 1995–96	–12	-8	1	1	-8
1995–96 – 2000–01	11	10	0	-6	7
2000–01 – 2004–05	–9	-4	0	-2	-3
2004–05 – 2006–07	10	7	0	0	2

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Beginning with the within-group changes, Appendix Figure A6.2 shows within-group inequality for each of our household types from 1968 to 2006–07. It is immediately apparent that inequality is highest within the group of households headed by a self-employed worker, and that for most of this period inequality was lowest within households headed by a full-time employed (but not self-employed) worker. However, rising inequality among the unemployed and falling inequality among households headed by inactive individuals above the state pension age saw the latter become the group with the lowest inequality after 2000–01. This echoes the results of our age-group decomposition, which also showed falling inequality among households headed by elderly individuals.

Inequality among the unemployed (or at least within households headed by unemployed individuals) has a strongly cyclical aspect – increasing during the recessions of the mid-1970s, early 1980s and early 1990s, and falling during the subsequent recoveries. This doubtless reflects the fact that the composition of 'the unemployed' changes significantly during recessions, as groups with historically low unemployment (such as skilled and highly educated workers) join the ranks of the unemployed in greater numbers.

Inequality also increased rapidly among the self-employed over the course of the 1980s, beginning with the recovery from the early 1980s recession. Goodman and Webb (1994) note that the composition of the self-employed changed substantially over the course of the 1980s, with a large increase in the number of self-employed individuals reporting zero profits. This change in the make-up of the self-employed group may well be partly responsible for the rising inequality of this group during the 1980s.

Turning to the between-group effects, in Figure A6.4 we see that during the 1980s there were sharp falls in the relative incomes of the unemployed, inactive and part-time employed, at the same time

that incomes were rising among the self-employed and full-time employed. This leads to a significant (inequality-increasing) relative income effect between 1984 and 1988.

Over the course of the early 1990s, relative incomes between these groups narrowed somewhat, leading to the inequality-reducing relative income effect seen in Table 9 for the period 1991 to 1995–96. At the same time, however, there was a dip in the fraction of the population in full-time employment (Figure A6.3), presumably as a result of the recession.

Overall, then, it is the significant increase in within-group inequality over the course of the 1980s which accounts for the majority of the increase in overall inequality over this time period. However, changes in relative incomes have also played a part – notably the declining incomes of households headed by unemployed or part-time employed individuals over the course of the 1980s, at the same time that households headed by self-employed and full-time employed individuals were seeing their incomes rising.

Decomposition 7: Income inequality, by household employment structure

While the employment status of the head of household is an important determinant of household income, so too is the number of other individuals in employment in the household. 'Workless households' containing multiple out-of-work adults are likely to have significantly lower incomes than what we might call 'work-rich' households, in which two or more individuals are in employment. Gregg and Wadsworth (1996) note that the number of households without a working member rose sharply during the recession of the early 1980s, but much of the subsequent recovery in employment occurred in households with one person already in work – creating many more multi-income households and twice as many workless households. This shift in the employment structure of households seems likely to have had a significant impact on inequality.

In this decomposition, we divide households into one of seven categories, according to the household employment structure:

- zero-earner households containing one adult;
- zero-earner households containing two or more adults;
- zero-earner households with a head of household aged 65 or over;
- single-earner households containing one adult;
- single-earner households containing two or more adults;
- multi-earner households containing two or more adults;
- one-or-more-earner households with a head of household aged 65 or over.

Appendix Figure A7.3 shows the population shares of the different household types. Individuals living in multi-earner, multi-adult households make up around half the population in the 1960s and 1970s, but this share begins to decline during the early 1980s. During the late 1980s, we see a modest recovery in the share of multi-earner, multi-adult households, but this share drops back again during the recession of the early 1990s. The share of individuals living in single-earner households containing multiple adults declines steadily throughout the 1970s and 1980s, from nearly a third of the population in 1968 to less than 20% by 1990.

Turning to multi-adult households containing no earners, in the early 1980s we see their share double from around 3% of the population in 1979 to nearly 7% in 1984. This share declines little over subsequent decades.

As we would expect given the demographic shift in Britain's age distribution, the share of individuals living in households headed by an individual aged 65 or over, with no earners in the household, increases steadily throughout the period we are studying.

Table 10 provides a detailed decomposition of inequality changes into those within and between the different employment structure groups. Changes in within-group inequality are always the dominant explanatory factor in changes in overall inequality, although between-group effects also contribute significantly in some periods (notably 1968 to 1972, 1984 to 1988 and 2000–01 to 2004–05). Changes in relative incomes between groups are the major source of this between-group variation, though population changes also have a particularly significant impact in the early 1980s – presumably due to the rising number of workless households seen in Figure A7.3.

Table 10. **By household employment structure** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	11	0	2	5
1972 – 1978	–22	–18	0	4	–8
1978 – 1984	18	15	0	6	–4
1984 – 1988	42	29	0	–1	14
1988 – 1991	18	18	1	2	–3
1991 – 1995–96	–12	–12	–1	4	–4
1995–96 – 2000–01	11	11	0	–1	1
2000–01 – 2004–05	–9	–4	0	–2	–4
2004–05 – 2006–07	10	9	0	–1	2

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A7.4 shows that the relative incomes of multi-earner households climbed steadily throughout almost the entire period we study (the only exceptions being the late 1970s and early 2000s). The relative incomes of workless households actually increased somewhat during the early 1980s (presumably due to slow earnings growth during the recession), but then fell back dramatically during the recovery of the mid-1980s, accounting for a significant fraction of the increase in inequality between 1984 and 1988.

Within-group inequality declined somewhat for most household types during the recessions of the 1980s and 1990s, but increased steadily for all groups during the rest of the 1980s.

Overall, our findings concur with those of Gregg and Wadsworth (1996) that the growing disparity between 'work-rich' and 'work-poor' households contributed substantially to rising inequality during

the 1980s. In more recent years, however, the share of households with two or more earners has declined somewhat, and this may have contributed to the moderation in income inequality growth during the 1990s.

Decomposition 8: Earnings inequality, by part-time/full-time

Our earnings sample includes both part-time and full-time workers. As Appendix Figure A8.3 makes clear, the part-time/full-time composition of the workforce changed significantly over the course of the 1970s and early 1980s, with part-time workers (defined as those working less than 30 hours per week) making up just 13% of the workforce in 1968 but more than 20% of the workforce by 1984.

Table 11 shows a decomposition of earnings inequality changes when we divide the workforce into full-time and part-time workers. We see that between-group effects were large (and mostly inequality-increasing) throughout the 1970s and early 1980s. These effects have largely come through population change (mean) effects – since part-time workers have lower mean earnings than their full-time counterparts (as shown in Figure A8.4), an increase in the number of part-time workers leads to an increase in earnings inequality.

We also see a large, inequality-reducing, relative earnings effect between 1991 and 1995–96. We can see from Figure A8.4 that this was a period of increasing relative earnings for part-time workers (after they had fallen for much of the 1980s), though the trend reversed again in the late 1990s, with the relative earnings of part-time workers falling again to create an inequality-increasing relative earnings effect between 1995–96 and 2000–01.

Looking at within-group inequality, Figure A8.2 reveals an interesting fact: earnings inequality among full-time workers has been increasing, uninterrupted, since 1978. The reductions in overall earnings inequality that we see in the early 1990s and 2000s are not visible at all among full-time workers.

Table 11. **By part-time/full-time** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	0	3	12	5
1972 – 1978	–18	–26	3	11	–6
1978 – 1984	45	17	4	10	14
1984 – 1988	7	11	–2	–5	3
1988 – 1991	11	6	0	2	3
1991 – 1995–96	–11	3	0	1	–16
1995–96 – 2000–01	7	6	–1	–6	8
2000–01 – 2004–05	–4	–1	1	4	–7
2004–05 – 2006–07	–4	–1	0	–1	–2

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Earnings inequality among part-time workers is substantially higher than that among full-time workers, as we would expect. Inequality among part-time workers increased substantially during the recessions of the early 1980s and early 1990s, suggesting that the composition of the part-time workforce changes substantially in economic downturns. From the mid-1990s onwards, however, inequality among part-time workers declines substantially, even as inequality among full-time workers is climbing steadily.

Overall, then, these results suggest that the part-time/full-time composition of the workforce is a highly significant determinant of earnings inequality.

Decomposition 9: Income inequality, by region

Changes in the industrial structure of the British economy over the past forty years – in particular, the decline of the manufacturing sector and the rise of service industries as a share of national product – may have manifested themselves (among other ways) in widening inequality between regions. Jenkins (1995) notes 'the many references [by various commentators] to the growth of a "North–South divide" in the 1980s', with the decline of the industrial North relative to the more service-orientated South.

While Jenkins finds some evidence of a growing North–South divide over the period 1971 to 1986, he concludes that its distributional impact was small and that 'it is the contribution from changes in inequality within regions that dominated'. We repeat Jenkins's decomposition here, extending the time period from 1968 to 2006–07.

Table 12 provides a detailed decomposition of inequality changes into within and between region components. It is immediately clear that changes in inequality within regions account for virtually all of the aggregate inequality changes over our time period. While changes in the relative incomes of different groups make some contribution to inequality changes, they are small in magnitude and always act to reinforce the within-region inequality changes.

Table 12. **By region** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	17	0	0	1
1972 – 1978	–22	–19	0	0	–2
1978 – 1984	18	15	0	0	3
1984 – 1988	42	40	0	0	2
1988 – 1991	18	18	0	0	0
1991 – 1995–96	–12	–11	1	0	–2
1995–96 – 2000–01	11	9	0	0	1
2000–01 – 2004–05	–9	–8	0	0	–1
2004–05 – 2006–07	10	9	0	0	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Appendix Figure A9.2 shows inequality within regions since 1968. While the graph is somewhat difficult to read (since it contains many lines, more or less on top of each other), this only emphasises the fact that most regions have had similar levels of inequality, and similar trends in inequality, for most of the period since 1968. The clear outlier is London, where inequality rose more sharply than anywhere else during the 1980s, leaving London the most unequal region in Britain ever since. However, the increase in inequality during the 1980s is reflected in all regions. More recently, inequality in the South East has also diverged somewhat from other regions, since (unlike most other regions) its level of inequality declined very little during the early 1990s.

Turning our attention to the (much smaller) relative income effects, we see from Figure A9.4 that during the 1980s relative incomes in London and the South East increased relatively rapidly, while in the North they fell steadily. These diverging trends explain much of the increasing inequality between regions during this time period. Since 1991, the disparities between regions have moderated somewhat, with relative incomes falling substantially in London throughout the 1990s.

Overall, however, our results for regional income inequality concur with those of Jenkins. It is within-region inequality which dominates between-region disparities, and this conclusion still holds true in more recent years.

Decomposition 10: Earnings inequality, by region

The changing industrial structure of the British economy (and resulting 'North–South divide') discussed in the previous subsection is likely to have strongly affected working-age individuals. It therefore makes sense to look at regional earnings inequality, as well as inequality in household incomes.

Appendix Figure A10.1 shows earnings inequality in Great Britain, broken down into within-region and between-region inequality. As with household income inequality (indeed, even more so), it is within-region inequality which accounts for the huge majority of overall inequality. Earnings inequality between regions accounts for a very small (but growing) fraction of aggregate inequality – never more than 4% of the total.

Table 13 shows the detailed decomposition of changes in inequality into within-region and between-region components. Once again, it is the within-region effects which dominate, accounting for more or less all changes in inequality over this period.

Exploring these within-region inequality effects further, Figure A10.2 shows earnings inequality within all regions of Great Britain since 1968. One striking difference between these results and the household income inequality results from the previous subsection is the relative position of London: where income inequality was highest for London in almost every year since 1968, earnings inequality is *lowest* in London for most of the time period we study. However, earnings inequality has increased substantially in London since 1990, which has led to London 'catching up' with inequality in other regions. The South East, in contrast, has both high household income inequality and high earnings inequality. Where most regions have seen declining earnings inequality since 2000–01, the level of inequality in the South East has remained at more or less the same (high) level.

Table 13. **By region** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	11	1	0	0
1972 – 1978	–18	–18	1	0	0
1978 – 1984	45	42	1	0	2
1984 – 1988	7	5	0	0	2
1988 – 1991	11	10	0	0	1
1991 – 1995–96	–11	–10	0	0	–1
1995–96 – 2000–01	7	4	0	0	2
2000–01 – 2004–05	–4	–4	0	0	1
2004–05 – 2006–07	–4	–3	0	0	–1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Overall, the regional earnings inequality results only underline the central conclusion from our income inequality results – that it is changes in inequality within regions which account for almost all movements in overall inequality over time. Fluctuating inequality between regions accounts for a tiny fraction of the changes seen over the last forty years.

Decomposition 11: Income inequality, by education level

One of the most frequently cited causes of increasing inequality is the 'skills-biased technological change' brought about by the introduction of information technology.[13] This technology is believed to have more strongly complemented the work of skilled and highly educated workers, leading to higher relative wages for better-educated individuals. In the next two decompositions, we look for evidence of this effect in the income and earnings distributions.

We begin by looking at incomes, according to the education level of the head of household. We divide the population into four groups, according to the age at which their head of household left education:

- aged 16 or earlier;
- aged 17 to 19;
- aged 20 or older;
- unknown / still in education.

Note that the group with 'unknown' education never accounts for more than 4% of the population.

We only have information on education from 1978 onwards, so can only decompose inequality changes from our third period onwards. Appendix Figure A11.1 decomposes inequality from 1978 to 2006–07 into within-education-group and between-education-group components. The within

[13] See, for example, Machin (2001).

component is far larger than the between component – at the start of the time series, between-group inequality accounts for less than 6% of overall inequality. However, consistent with the 'skills-biased technological change' story, between-group inequality increases substantially over the course of the 1980s and early 1990s, so that by 1995–96 between-group inequality accounts for more than 12% of all inequality.

Table 14 shows the detailed decomposition of changes in income inequality into within- and between-education-group components. The table makes clear that within-education-group changes account for most of the changes in inequality since 1978, but that the contribution of between-group (and, in particular, relative income) effects increased substantially during the 1980s.

Table 14. **By education** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1978 – 1984	18	13	0	1	4
1984 – 1988	42	34	0	2	5
1988 – 1991	18	16	0	1	1
1991 – 1995–96	–12	–13	1	1	–2
1995–96 – 2000–01	11	10	1	2	–2
2000–01 – 2004–05	–9	–10	1	1	–2
2004–05 – 2006–07	10	10	1	1	–2

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

In more recent years, relative income effects have acted to reduce aggregate inequality, but this effect has been counteracted by population effects which have increased inequality. All these factors warrant further investigation.

Beginning with the large within-group effects, Figure A11.2 shows income inequality within education groups for the years since 1978. We can see that income inequality rose within all education groups throughout the 1980s, peaking in the early 1990s. Inequality is highest in the 'unknown' education group, which is unsurprising given that this is likely to be a diverse group of individuals. Aside from this group, inequality is generally highest among those who left education aged 17–19, though in recent years inequality among the highest-educated group (who left education aged 20 or older) has overtaken inequality among those who left aged 17–19.

Turning now to the between-group effects, Figure A11.4 shows relative mean income for each education group over time. The results are again consistent with 'skills-biased technological change', as incomes for households headed by the highest-educated individuals saw their average income rise from 30% above the national average to 50% above the national average over the course of the 1980s. Over the same period, average incomes fell for households headed by an individual who left education aged 16 or younger, from 4% below the national average to more than 10% below it. These diverging trends in relative mean income account for much of the increase in between-group inequality up to the mid-1990s. From the late 1990s onwards, however, the differences in mean

incomes narrow somewhat, leading to the negative relative income effects seen in Table 14 in years after 1995–96.

The final piece of the puzzle is the population change effects, shown in the third and fourth columns of Table 14. These effects have generally been inequality-increasing throughout the period 1978 to 2006–07, and Figure A11.3, showing the fraction of households headed by individuals with different levels of education, tells us why. From the start of the 1980s, the fraction of individuals living in households headed by people who left school aged 16 or under steadily declined, from more than 80% of the population in 1980 to around 60% by 2006–07. The fraction of individuals in households headed by people who left education aged 17–19 increased from 9% in 1978 to just under 20% in 2006–07, and those in households whose head remained in education to age 20 or older increased from 7% to 18% of the population over the same time period. Since the higher-educated groups also have higher mean incomes, this population shift has had the effect of increasing income inequality.

Decomposition 12: Earnings inequality, by education level

Since skills-biased technological change affects the returns to education in the labour market, we would expect to find equally strong results when considering earnings inequality instead of the household incomes we looked at in the previous decomposition. We use the same education groups as before, but now group people according to their own education level, rather than their head of household's. Note that the group with 'unknown' education never makes up more than 4% of the workforce.

Appendix Figure A12.1 shows the fraction of overall earnings inequality accounted for by within-education-group and between-education-group inequality. As in the previous subsection, we see the share of inequality explained by between-group inequality increasing through the 1980s and early 1990s – though within-group inequality remains by far the larger component of overall inequality. The pattern of increasing between-group inequality is very much consistent with skills-biased technological change.

Table 15 shows the more detailed decomposition of changes in earnings inequality into within and between components. As in the income decomposition by education, we find that changes in within-group inequality explain almost all of the changes in aggregate inequality over this period. However, a complicated pattern of between-group effects also contributes to the overall changes. We see relative income effects acting to increase inequality through the 1980s and early 1990s, but decreasing inequality from 1995–96 onwards. The two population change effects work in opposite directions throughout this period, with the 'within' population change effect tending to reduce inequality in most time periods, while the 'mean' population change effect generally acts to increase inequality.

Figure A12.2 shows within-education-group inequality trending upwards for all groups during the early 1980s, and continuing to increase during the late 1980s for all but the highest-educated group. During the 1990s and 2000s, the trends have been less clear cut – with within-group inequality generally falling for lower-educated groups but increasing steadily for the highest-educated workers.

Table 15. **By education** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1978 – 1984	45	46	–4	0	2
1984 – 1988	7	4	–3	2	4
1988 – 1991	11	9	0	2	1
1991 – 1995–96	–11	–13	–2	2	2
1995–96 – 2000–01	7	5	–1	4	–1
2000–01 – 2004–05	–4	–8	–1	5	0
2004–05 – 2006–07	–4	–1	0	1	–3

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A12.3 shows us that the workforce has also been becoming steadily 'more educated' over time, which has had two conflicting effects on inequality. The population (mean) effect will increase inequality, because higher-educated workers also have higher relative wages than their less-educated peers, but the population (within) effect acts to reduce inequality, because highly educated workers have lower within-group earnings inequality.

While these trends in relative earnings and workforce composition have seen between-group inequality account for an ever-greater share of aggregate inequality, it remains the case that within-education-group earnings inequality accounts for the huge majority of changes in (and levels of) aggregate earnings inequality.

Decomposition 13: Earnings inequality, by occupation

Having looked at both regional and educational aspects of inequality, it also makes sense to consider the effect of occupation. The decline of manufacturing and unskilled manual work is likely to have had a significant impact on inequality – and earnings inequality in particular.[14]

Unfortunately, we do not have a consistent time series of occupational classifications. The Family Expenditure Survey changed its occupation categories in 1987 and the Family Resources Survey changed its occupation categories in 2001–02.[15] We are therefore in the unfortunate position of having three separate time series for earnings inequality by occupation:

1. 1968 to 1986, when the following categories are used:

[14] Note that we do not decompose income inequality by occupation. This is because unemployed and inactive people do not have 'occupations' in our data. While we could interact occupation with employment status to remedy this, the results would be difficult to interpret, since it would no longer be clear whether inequality changes were driven by occupation effects or by employment status effects.

[15] While the Office for National Statistics published a mapping from the pre-2001 to the post-2001 occupation categories in the FRS, we find that it gives highly inconsistent results in the FRS – leading us to reject using this mapping in our analysis.

- professional and technical workers;
- administrative and managerial workers full-time;
- teachers;
- clerical workers;
- shop assistants;
- manual workers (skilled);
- manual workers (semi-skilled and unskilled);
- other.

2. 1987 to 2000–01, when the categories are:
   - employers and managers in central/local government, industry, commerce, etc. – large establishments;
   - employers and managers in industry, commerce, etc. – small establishments;
   - professional workers;
   - intermediate non-manual workers;
   - junior non-manual workers;
   - personal service workers;
   - manual foremen and supervisors;
   - skilled manual workers;
   - semi-skilled manual workers;
   - unskilled manual workers;
   - farmers and agricultural workers;
   - other.
3. 2001–02 to 2006–07, when the categories are:
   - higher managerial occupations;
   - higher professional occupations;
   - lower professional and higher technical occupations;
   - lower managerial occupations;
   - higher supervisory occupations;
   - intermediate non-manual occupations;
   - lower supervisory occupations;
   - lower technical occupations;
   - semi-routine occupations;
   - routine occupations;
   - other.

We therefore (briefly) present all three of these time series – making clear wherever possible which trends have continued throughout. We must also work with slightly different time periods from our usual classification.

Appendix Figures A13.3, A13.7 and A13.11 show the fraction of the workforce falling into each of the (changing) occupational categories. While the different time series make it difficult to draw clear conclusions about trends in the British workforce, recurring trends include the decline in manual workers as a share of the workforce and the increasing the share of managerial and professional workers.

Table 16 shows the detailed decomposition of changes in inequality into within and between components. We see that both within-group and between-group inequality changes play a significant part in the aggregate trends over this period. Between 1968 and 1978, in particular, between-group changes account for a greater share of total inequality changes than the within-group effects. However, the rapid increase in earnings inequality between 1978 and 1986 is largely explained by a large within-group inequality increase.

Table 16. **By occupation** – subgroup decomposition of earnings inequality changes

Period	Employment categorisation	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
				Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	1	12	4	–3	4	6
1972 – 1978		–18	–7	–3	–1	–7
1978 – 1986		40	33	–8	2	12
1987 – 1991	2	7	6	0	2	0
1991 – 1995–96		–11	–7	–1	6	–9
1995–96 – 2000–01		7	3	–2	–2	8
2001–02 – 2004–05	3	–5	–8	4	0	–1
2004–05 – 2006–07		–4	–1	–2	0	–1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figures A13.2, A13.6 and A13.10 show the within-group inequality for the different occupation classifications over our three separate time series. We see that semi-skilled and low-skilled workers are the most unequal occupational groupings, and that their level of inequality is increasing over time (as their share of the workforce declines), up to around 1992. Their level of earnings inequality then falls somewhat during the 1990s, but from a high level. Earnings inequality tends to be lowest among managerial/'white-collar' workers and skilled manual workers, though their within-group inequality did increase somewhat during the early 1980s.

Figures A13.4, A13.8 and A13.12 show relative earnings for the different occupation groups. From 1968 to 1972, we see an increasing dispersion of relative wages, with low-earning shop assistants and semi/unskilled manual workers seeing their relative earnings declining. In the mid-1970s, however, the earnings distribution compresses again (leading to an inequality-reducing relative earnings effect) as higher-paid professional and managerial workers see their relative earnings decline somewhat. Goodman and Webb (1994) discuss these trends extensively, citing the 'incomes policies' put in place between 1972 and 1977 (limiting pay increases for employees in an attempt to fight inflation) as a key factor in the compression of the income distribution, and the collapse of these policies from 1977 onwards as a factor in the subsequent rapid increase in inequality.

Indeed, over the course of the late 1970s and early 1980s, we see a marked decline in the relative earnings of semi/unskilled workers, leading to a strongly inequality-increasing relative earnings effect between 1978 and 1986. During the early 1990s (Figure A13.8), we also see a decline in the earnings of manual foremen/supervisors, skilled manual workers, and some managerial workers

(those in small establishments) – all of whom had above-average earnings in this period. This led to a sizeable inequality-reducing relative earnings effect between 1991 and 1995–96. However, between 1995–96 and 2000–01, falling relative earnings among farmers, agricultural workers and skilled manual workers (whose earnings fall below the national average for the first time), combined with increasing earnings among professional workers, created an inequality-increasing relative earnings effect.

Turning to the population change effects, we see from Figures A13.3 and A13.7 that over the course of the 1980s a growing share of the workforce comprised (lower-inequality) professional, administrative and managerial workers. This explains the inequality-reducing population change (within) effects during the long period from 1978 to 1986. However, these higher-skilled groups also have higher mean incomes, leading to a slightly inequality-increasing population change (mean) effect over the same period.

The main story through the 1980s, however, is the increasing within-group inequality, with almost all occupation groups experiencing increasing inequality over this period.

Decomposition 14: Income inequality, by ethnicity of household head

We turn now to income inequality decomposed according to the ethnicity of the household's head. Unfortunately, we only have information on respondents' ethnicity from 1994–95 onwards, meaning that we can only analyse a comparatively short time series.

Our ethnicity data divide respondents into the following categories:

- white;
- black – Caribbean;
- black – African;
- black – neither Caribbean nor African;
- Indian;
- Pakistani;
- Bangladeshi;
- Chinese;
- none of these.

Appendix Figure A14.3 shows the fraction of British households with a head of household from each ethnic group. Since individuals in households with a white head of household make up a huge majority of all individuals (more than 90% in all years), they are plotted on a secondary axis, so that trends in the other groups can be seen clearly.

While individuals from households with a white head of household make up a clear majority, their share of the population is falling over time – from nearly 95% in 1994–95 to below 91% in 2006–07. Individuals from households with an Indian head of household make up the next largest share of the population in 1994–95, at over 1% of the population, but between 2000 and 2003 we see a jump in the fraction of individuals from households with a head of household from 'none of these' ethnic groups, making them the next largest population share after whites. Individuals from households with a black Caribbean or Pakistani head of household make up the next largest population shares, with some sign that their shares are increasing over time.

More than 98% of overall income inequality between 1994 and 2006–07 is explained by within-group, rather than between-group, inequality. Table 17 shows that changes in overall inequality are also almost entirely explained by within-group inequality changes.

Table 17. **By ethnicity of household head** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1994–95 – 2000–01	11	10	0	1	0
2000–01 – 2004–05	–9	–9	1	0	–1
2004–05 – 2006–07	10	9	0	0	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A14.2 shows within-group inequality in each year – the changes that drive almost all changes in aggregate inequality over this (short) time period. The volatile nature of these series (doubtless due in large part to small sample sizes for all groups apart from whites) makes this chart difficult to interpret and conclusions hard to draw. Individuals from households with a Chinese head of household appear to have the highest within-group inequality for the first half of our time series, but their level of inequality declines after 1999 to become more similar to that of other ethnic groups. Individuals from households with a black Caribbean head of household have the lowest level of within-group inequality at the start of our time series in 1994–95, but their level of income inequality increases through the late 1990s until it becomes more similar to that of other ethnic groups.

Turning to mean incomes, it is clear from Figure A14.4 that households with Bangladeshi heads tend to have the lowest household incomes, followed by those with Pakistani heads. Both these groups have incomes around 60% of the national average throughout the period from 1994–95 to 2006–07. However, relative incomes have not changed a great deal among the different groups over time, so that the contribution of relative incomes to changes in overall inequality is negligible.

Overall, our results show clear evidence that households headed by some ethnicities (especially Pakistani and Bangladeshi individuals) have lower incomes than the British average. However, we find no evidence that *changes* in the ethnic make-up of the population since 1994–95 have contributed significantly to *changes* in income inequality.

Decomposition 15: Earnings inequality, by ethnicity

We now decompose individual earnings inequality according to ethnicity, using the same categories as the previous subsection. As before, we only have information on respondents' ethnicity from 1994–95 onwards, so can only analyse the same short time series from 1994–95 to 2006–07.

Appendix Figure A15.3 shows the shares of different groups in the British workforce, and the pattern is similar to that seen in the household analysis above. Whites are by far the largest share of the workforce, but their share has been declining over time, from nearly 96% in 1994–95 to less than

92% in 2006–07. The biggest increases have been seen among Indian workers and those classifying themselves as 'none of these'.

Table 18 decomposes changes in earnings inequality, showing that within-group inequality accounts for all the change in overall earnings inequality over this period.

Table 18. **By ethnicity** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1994–95 – 2000–01	–1	–1	0	0	0
2000–01 – 2004–05	–4	–4	0	0	0
2004–05 – 2006–07	–4	–4	0	0	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A15.2 shows that Bangladeshi workers appear to have had the highest earnings inequality for much of the time period we study, though inequality has also been high among Chinese and Pakistani workers. The changes in earnings inequality over this period as a whole are not large, however, and again the small sample sizes make it difficult to draw firm conclusions. As with income inequality in the previous decomposition, we find no evidence that changes in the ethnic make-up of Britain's workforce have contributed to changes in overall earnings inequality.

Decomposition 16: Income inequality, by health of head of household

Our next decomposition looks at income inequality according to whether or not the head of household is suffering from an illness that limits their capacity to work. We (somewhat loosely) refer to this as 'health'. As with ethnicity, however, we only have information on respondents' health from 1994–95 onwards, meaning that we can only analyse a comparatively short time series.

We divide respondents into the following three categories:

- those who report having no long-term health problems;
- those with a health problem that does not limit their ability to work;
- those with a health problem that does limit their ability to work.

Appendix Figure A16.3 shows the proportion of people living in households with a head in each category. We see the fraction of households with a head with no health problem falling slightly from around 74% in 1994–95 to less than 70% in 2006–07. This is largely due to an increase in the fraction with a household head with a non-limiting health problem, which rises from 7% in 1994–95 to 10% in 2006–07.

Table 19 decomposes changes in income inequality by health, showing that within-group inequality accounts for almost all the change in overall earnings inequality over this period.

Table 19. **By health of head of household** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1994–95 – 2000–01	11	10	–1	0	2
2000–01 – 2004–05	–9	–10	1	0	0
2004–05 – 2006–07	10	10	0	0	–1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A16.2 shows us that households whose head has no health problem have the highest income inequality, followed by those with a non-limiting health problem. The chart also reveals that inequality rose among all three groups during the late 1990s but fell for all groups during the early 2000s, before ticking up again from 2004–05 onwards. Relative incomes are relatively stable during this period, with households whose head has a limiting health problem having household incomes around 80% of the national average throughout (Figure A16.4).

Note: We do not decompose earnings inequality according to whether or not individuals have a work-limiting health problem, since we only observe earnings for those who are in the labour force. This means that presence in our earnings sample is unavoidably 'endogenous' to health. Individuals who do appear in our earnings sample despite suffering a limiting illness are likely to be those with milder conditions. It would be misleading to draw conclusions about earnings inequality among different health groups based on such a biased sample of 'unhealthy' individuals.

Decomposition 17: Income inequality, by housing tenure

For this decomposition, we divide the population into six groups according to housing tenure:

- mortgaged;
- owned outright;
- rented furnished;
- Housing Association or Local Authority rented;
- other rented unfurnished;
- rent free.

Clearly, households' tenure decisions are strongly related to their incomes (that is, tenure is likely to be endogenous to income). However, analysis of inequality and relative incomes among different tenure types remains interesting from a descriptive perspective.

As shown in Appendix Figure A17.3, the 1970s and 1980s saw large changes in patterns of housing tenure in Britain, with a significant rise in the fraction of individuals taking on a mortgage to buy their home and a decline in the fraction living in Housing Association (HA) or Local Authority (LA) rented accommodation. The fraction of individuals living in homes with a mortgage rose from less than 30% in 1970 to around 50% in 1990.

Table 20 provides a detailed decomposition of inequality changes into within and between components for the six housing tenure groups. While within-group changes dominate, there are also significant relative income effects during the 1980s and early 1990s.

Table 20. **By housing tenure** – subgroup decomposition of income inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	15	–1	0	4
1972 – 1978	–22	–20	0	0	–2
1978 – 1984	18	9	0	0	8
1984 – 1988	42	28	1	–2	14
1988 – 1991	18	11	1	–1	8
1991 – 1995–96	–12	–4	2	–1	–9
1995–96 – 2000–01	11	8	2	–2	3
2000–01 – 2004–05	–9	–6	2	–2	–3
2004–05 – 2006–07	10	9	1	–1	0

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A17.2 shows that within-group inequality rose for all tenure types during the 1980s, with the exception of those in HA or LA rented accommodation, whose level of inequality is low and reasonably constant throughout the period we analyse. During the early 1990s, the rising trend moderates somewhat, with declining inequality among individuals in furnished rented accommodation. In the late 1990s, however, within-group inequality began rising again, particularly among renters, and this is a major factor in the increase in overall inequality between 1995–96 and 2000–01.

The mean incomes shown in Figure A17.4 make clear that HA and LA tenants are now a significantly worse-off group than they were in the 1970s. Their average income was just two-thirds of the national average throughout the 1990s and 2000s, compared with 90% of the British average in 1968.

During the 1980s, in particular, we observe a sharp decline in the relative incomes of HA and LA tenants, as well as other renters (furnished and unfurnished), leading to a large inequality-increasing relative income effect between 1984 and 1988. During the early 1990s, however, the relative incomes of renters recovered somewhat (though those of HA/LA tenants did not), while the relative incomes of mortgaged households declined slightly, leading to a strongly inequality-reducing relative income effect between 1991 and 1995–96.

Overall, our results suggest two major forces at work by housing tenure during the 1980s: increasing within-group inequality for all tenure types apart from HA/LA tenants; and diverging relative incomes, with the mortgaged households (increasing in number and generally better off) seeing

income gains and the HA/LA tenants (shrinking in number and generally worse off) seeing income falls.

During the early 1990s, both relative incomes and within-group inequality contributed to declining inequality, as inequality among (furnished) renters declined and the relative incomes of mortgaged households began to decline. In the late 1990s, however, within-group inequality begins rising again, while relative incomes change little, leading to increasing inequality overall.

Decomposition 18: Earnings inequality, by housing tenure

We now turn to individual earnings inequality, dividing workers according to their housing tenure type using the same categories as in the previous subsection. Appendix Figure A18.3 shows the fraction of the workforce living in households with different tenure types, and displays a similar pattern to Figure A17.3 – though, if anything, the rise in the mortgaged population and decline in Housing Association / Local Authority tenants is even stronger among this sample of workers.

Table 21 provides a detailed decomposition of changes in earnings inequality into within and between components, by housing tenure. Within-group changes are clearly the dominant force on overall inequality in all time periods apart from the late 1980s to the early 1990s.

Table 21. **By housing tenure** – subgroup decomposition of earnings inequality changes

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	10	0	1	2
1972 – 1978	–18	–16	2	0	–4
1978 – 1984	45	38	4	–1	4
1984 – 1988	7	3	2	–1	3
1988 – 1991	11	6	0	–1	7
1991 – 1995–96	–11	–8	1	–1	–3
1995–96 – 2000–01	7	7	1	–1	0
2000–01 – 2004–05	–4	–4	1	–1	0
2004–05 – 2006–07	–4	–5	0	0	1

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figure A18.2 shows that within-group earnings inequality rose for all tenure types during the 1980s, including those in HA or LA accommodation (a contrast with our results for household income inequality).

Figure A18.4, showing mean earnings for different tenure types, again highlights the decline among HA/LA tenants, whose earnings declined from 90% of the national average in 1968 to less than two-thirds of the national average by the 2000s. Earnings for other tenure types have declined as well, however, as more individuals (presumably with lower earnings on average) enter the 'mortgaged'

tenure category. Overall, this means that relative earnings effects are comparatively small in most time periods, with the within-group inequality changes largely explaining the overall trends.

Decomposition 19: Income inequality, by income quintile group

The behaviour of aggregate measures of inequality, such as the mean log deviation measure which we have been decomposing in this section, is not always particularly informative about the precise nature of the changes taking place in the income (or earnings) distribution over time. When income inequality increases, this could be because top incomes are 'racing away' from the rest of the distribution (an increase in 'top-tail' inequality), because incomes at the bottom are 'falling behind' or due to many other more subtle changes in the distribution of income.

One way to try to pin down more precisely the nature of changes in the distribution over time is to divide the population into groups according to their income level and examine the contribution of inequality within and between these groups. In this subsection, we decompose inequality with the population divided into five groups ('quintiles') according to their household income.

In this decomposition, we are particularly concerned about the effect that our 'trimming' of the income distribution (removing the top and bottom 1%) may have. This will tend to reduce measured inequality in the top and bottom quintiles. Even if we do 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. The income distribution in the HBAI data is 'left-censored' at the bottom (households with negative income are assigned a value of zero). At the top of the distribution, due to concern that the Family Resources Survey and Family Expenditure Survey may not accurately sample very-high-income households, the HBAI methodology also replaces the incomes of a significant fraction of the top 1% with a 'replacement value' derived from income tax data (the Survey of Personal Incomes, SPI). These two adjustments would reduce inequality at the tails of the distribution even without trimming. 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.

Since trimming is clearly a concern in this decomposition, however, we present two sets of results – one for the trimmed distribution (Appendix Figures A19.1 to A19.3) and one for the untrimmed distribution (Appendix Figures A19.4 to A19.6).

Table 22a shows the detailed decomposition of changes in income inequality, by income quintile, for the trimmed distribution, while Table 22b shows the same decomposition for the untrimmed distribution. By construction, the population effects are zero, because one-fifth of the population will always fall into each group. Therefore we are only interested in the within-group and relative income effects. It is immediately apparent that changes in relative incomes account for most of the changes in overall inequality over this period, both in the trimmed and untrimmed distributions.

As we might expect, the trimming makes a significant impact on within-quintile inequality, which makes a greater contribution to overall inequality changes in the untrimmed distribution. Interestingly, there are only two periods where this impact is particularly marked: the mid-1970s (when within-quintile inequality fell substantially in the untrimmed distribution) and the late 1990s (when it rose substantially in the untrimmed distribution).

Looking at Figures A19.3 and A19.6, we see that the increasing inequality over the course of the 1980s appears to have been characterised by both falling relative incomes at the bottom of the distribution and rising relative incomes at the top. This is true in both the trimmed and untrimmed distributions. In fact, the incomes of the bottom 60% of the population all fell relative to the mean over the course of the 1980s (and again this is true in both the trimmed and untrimmed distributions).

Table 22a. **By income quintile** – subgroup decomposition of income inequality changes (trimmed)

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	18	2	0	0	16
1972 – 1978	–22	–3	0	0	–18
1978 – 1984	18	2	0	0	15
1984 – 1988	42	4	0	0	38
1988 – 1991	18	2	0	0	16
1991 – 1995–96	–12	1	0	0	–13
1995–96 – 2000–01	11	5	0	0	6
2000–01 – 2004–05	–9	–1	0	0	–8
2004–05 – 2006–07	10	2	0	0	7

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Table 22b. **By income quintile** – subgroup decomposition of income inequality changes (untrimmed)

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative income
1968 – 1972	23	5	0	0	18
1972 – 1978	–37	–10	0	0	–27
1978 – 1984	24	5	0	0	20
1984 – 1988	54	8	0	0	46
1988 – 1991	25	6	0	0	19
1991 – 1995–96	–17	–1	0	0	–15
1995–96 – 2000–01	27	10	0	0	17
2000–01 – 2004–05	–14	–3	0	0	–12
2004–05 – 2006–07	13	4	0	0	9

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Figures A19.2 and A19.5 show that inequality increased markedly within the top and bottom quintiles over the course of the 1980s and 1990s, but the precise pattern we observe is dependent on whether or not we trim the data. From the untrimmed distribution (Figure A19.5), it is clear that inequality continued increasing strongly in the top quintile throughout the 1990s; but when we trim the top 1%, this effect disappears (Figure A19.2). This is an interesting result in itself – it appears that the increase in 'top-tail' inequality in Britain over the course of the 1990s was driven almost entirely by the top 1% of household incomes.

Decomposition 20: Earnings inequality, by earnings quintile group

We now repeat the quintile decomposition, this time for the earnings distribution. As in the previous decomposition, we present results for both the trimmed and the untrimmed earnings distribution.

Tables 23a and 23b show the detailed decomposition of changes in earnings inequality into within- and between-quintile components, for both the trimmed and untrimmed earnings distributions. As before, the population change effects are zero by construction, because one-fifth of the population always falls into each quintile.

The results for the earnings distribution appear to be less sensitive to whether or not we trim the distribution. The pattern that emerges from Tables 23a and 23b is one of relative earnings effects dominating in all periods apart from 2000–01 to 2004–05, when relative earnings were largely unchanged but within-quintile inequality fell somewhat.

Table 23a. **By earnings quintile** – subgroup decomposition of earnings inequality changes (trimmed)

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	12	3	0	0	9
1972 – 1978	–18	0	0	0	–18
1978 – 1984	45	4	0	0	42
1984 – 1988	7	–1	0	0	8
1988 – 1991	11	4	0	0	7
1991 – 1995–96	–11	–3	0	0	–8
1995–96 – 2000–01	7	2	0	0	5
2000–01 – 2004–05	–4	–3	0	0	0
2004–05 – 2006–07	–4	0	0	0	–4

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

Table 23b. **By earnings quintile** – subgroup decomposition of earnings inequality changes (untrimmed)

Period	Change in aggregate inequality (I_0)	Within-group inequality	Between-group inequality		
			Population change (within)	Population change (mean)	Relative earnings
1968 – 1972	11	2	0	0	9
1972 – 1978	–23	–1	0	0	–22
1978 – 1984	53	6	0	0	46
1984 – 1988	14	2	0	0	13
1988 – 1991	14	3	0	0	10
1991 – 1995–96	–6	1	0	0	–7
1995–96 – 2000–01	24	8	0	0	16
2000–01 – 2004–05	–4	–4	0	0	0
2004–05 – 2006–07	–7	–1	0	0	–7

Note: Within-group and between-group effects may not sum to overall change in inequality, due to rounding.

The increase in earnings inequality over the course of the 1980s seems to have been driven largely by strongly increasing relative earnings at the top of the distribution (see Figures A20.3 and A20.6) while the middle and bottom of the earnings distribution fell behind. The within-quintile results (Figures A20.2 and A20.5) suggest that the 1980s saw dispersing earnings more or less everywhere in the distribution, since all quintiles saw increasing within-group inequality (though the increases are largest at the top and bottom of the distribution). The modest fall in earnings inequality since the start of the 1990s has been driven by earnings at the bottom 'catching up' with earnings towards the middle of the distribution – but earnings in the top quintile have continued to race away, and the top quintile itself became substantially more unequal over the course of the 1990s.

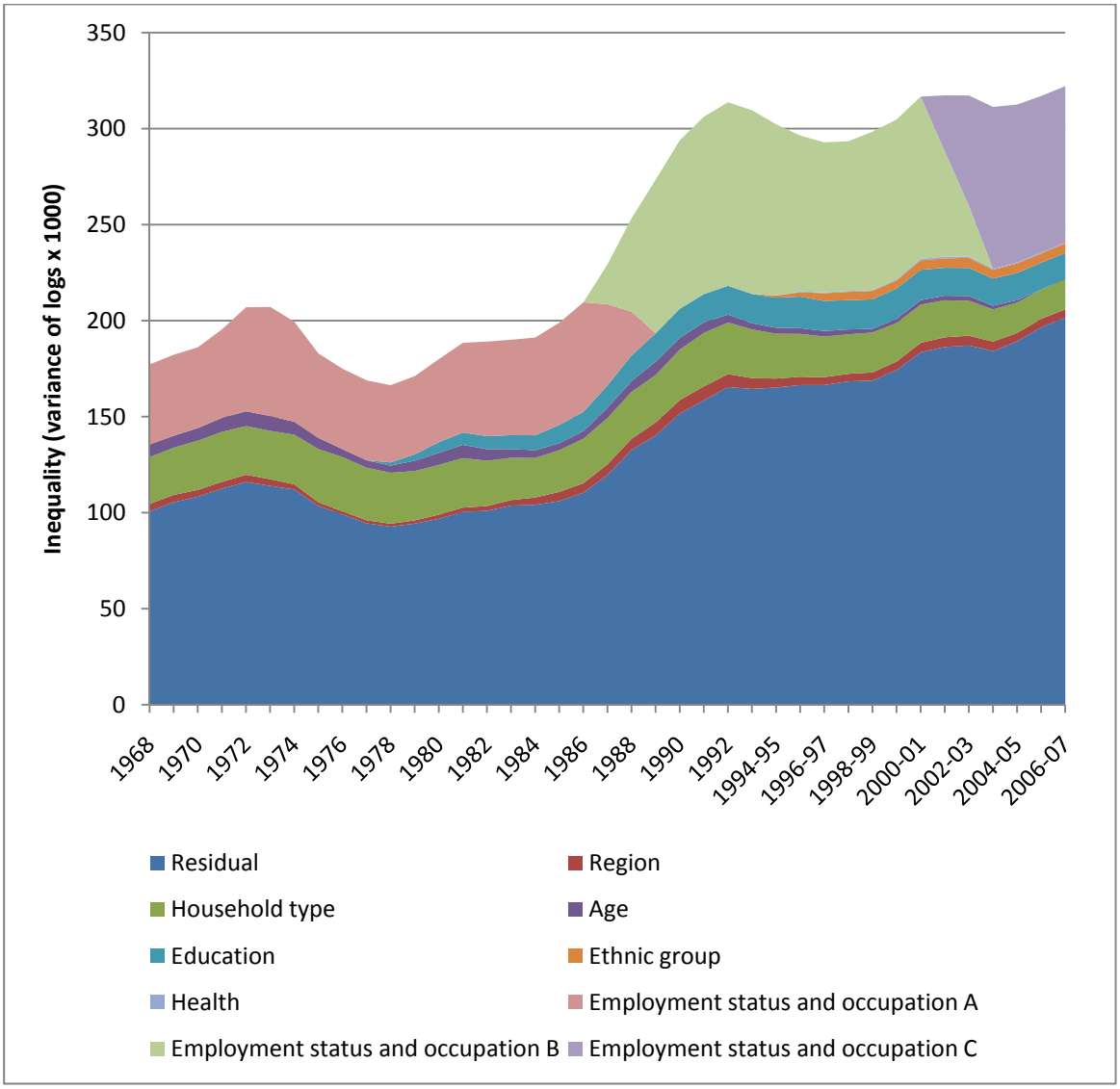
3. By factor

Income regression

We now decompose income inequality using the regression-based methodology developed by Fields (2003) and Yun (2006). This allows us to consider all of the factors previously used in the subgroup analysis simultaneously, to understand the portion each factor makes up in explaining total income inequality. Figure 7 shows inequality decomposed in this way over the sample period 1968 to 2006–07.[16] The 'residual' is the part of inequality unexplained by any of the factors that we have entered into the regression. 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 factor in total inequality is independent of the inequality measure used. These shares are displayed in Table 24 for our selected years.

[16] Note that we have not included housing tenure in our regression analysis, since it is highly endogenous with respect to household income.

Figure 7. Income inequality decomposed by factor, 1968 to 2006–07



Note: This graph is three-year smoothed using three-year moving average.

Table 25 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 factor. The price effect is the part of an inequality change explained by a change in the influence of a particular factor on income – for example, an increase in the education price effect is due to education becoming a more significant factor in explaining an individual's income. The quantity effect is due to a change in the distribution of a factor amongst the population – for example, an increase in the education quantity effect might be due to education becoming less equally distributed amongst the population.

Looking at Figure 7 tells us, somewhat disappointingly, that a majority of inequality is accounted for by the unexplained residual term. Moreover, from Table 25, we can see that this term explains a large amount of the changes in income inequality over the period – particularly the increases in inequality between 1995–96 and 2000–01 and between 2004–05 and 2006–07, where the residual explains over two-thirds of the change in inequality.

Nonetheless, many of the factors included in the regression do offer considerable explanatory power in understanding total income inequality. Household type explains a peak of 16% of total inequality in 1978, though this falls to 5% by 2004–05. This reflects the fact that household type's absolute contribution to income inequality has fallen whilst at the same time total inequality has increased largely over the period. The most significant fall in household type's contribution came through a price effect between 1991 and 1995–96. From our subgroup decomposition in Section IV.2, we can see that this reflected an increase in income of families with children over this period.

Region is a relatively minor explanatory factor, never explaining more than 3% of total inequality. This is consistent with what we found in the subgroup decomposition above, as is the increase of this variable's importance between 1978 and 1988 and its subsequent decrease between 1991 and 1995–96.

Employment status and occupation is by far the most significant of our explanatory variables, explaining almost a third of total inequality in 1972. From Table 25, we can see that it has played an important role in a number of inequality changes since 1968. The significant price-effect increase in the period 1968 to 1972, followed by a larger decrease between 1972 and 1978, reflects the effect of changing relative wages partly brought about by the incomes policy that we saw in the earnings subgroup decomposition. The significant quantity effect that helped to increase inequality between 1978 and 1984 is then the reflection of the increase in unemployment over this period, again consistent with our subgroup decomposition by employment status.

Between 1984 and 1988, about a third of the total increase in inequality was the result of a positive price effect for employment status and occupation. From the earlier subgroup decomposition, we can imagine that this reflects the increase in the income of the employed over unemployed groups during this period. Finally, a significant negative price effect in the period 1991 to 1995–96 explains about 100% of the fall in total inequality in this period. From our earlier subgroup decompositions, we can explain this as a combination of the fall in the relative income of the employed and a reduction in the relative wages of some highly paid workers.

The explanatory power of age falls consistently throughout the period, from explaining 4% of total inequality in 1968 to explaining 0% in 2006–07. This is the result of a series of slightly negative price effects, most notably between 1972 and 1978, combined with overall rising total inequality. This probably reflects the relative plight of pensioners, whose income has caught up with the rest of the population over the period.

Education has also played a significant role in inequality changes in the 1980s, with positive price effects. This effect was relatively small, however, explaining around 12% of the inequality increase between 1978 and 1988. The relatively small size of this effect may reflect the rather limited data on education that we have available. Since these changes accompany large increases in the residual, it would be very reasonable to believe that a significant portion of this residual reflects unobserved education effects, such as the quality of qualifications received.

Health and ethnicity explain a small amount of total inequality, and their contribution to inequality changes has been minimal.

Table 24. Shares of factors in income inequality

Year	Residual	Region	Household type	Age	Education	Ethnic group	Health	Employment status and occupation A	Employment status and occupation B	Employment status and occupation C
1968	57%	2%	14%	4%	n.a.	n.a.	n.a.	23%	n.a.	n.a.
1972	54%	2%	10%	3%	n.a.	n.a.	n.a.	31%	n.a.	n.a.
1978	55%	1%	16%	2%	3%	n.a.	n.a.	23%	n.a.	n.a.
1984	53%	3%	11%	2%	5%	n.a.	n.a.	26%	n.a.	n.a.
1988	51%	2%	8%	2%	6%	n.a.	n.a.	n.a.	30%	n.a.
1991	52%	2%	9%	1%	5%	n.a.	n.a.	n.a.	31%	n.a.
1995–96	58%	1%	7%	1%	6%	1%	0%	n.a.	25%	n.a.
2000–01	61%	2%	6%	1%	4%	2%	0%	n.a.	25%	n.a.
2004–05	62%	1%	5%	0%	4%	2%	0%	n.a.	n.a.	25%
2006–07	63%	1%	5%	0%	4%	2%	0%	n.a.	n.a.	25%

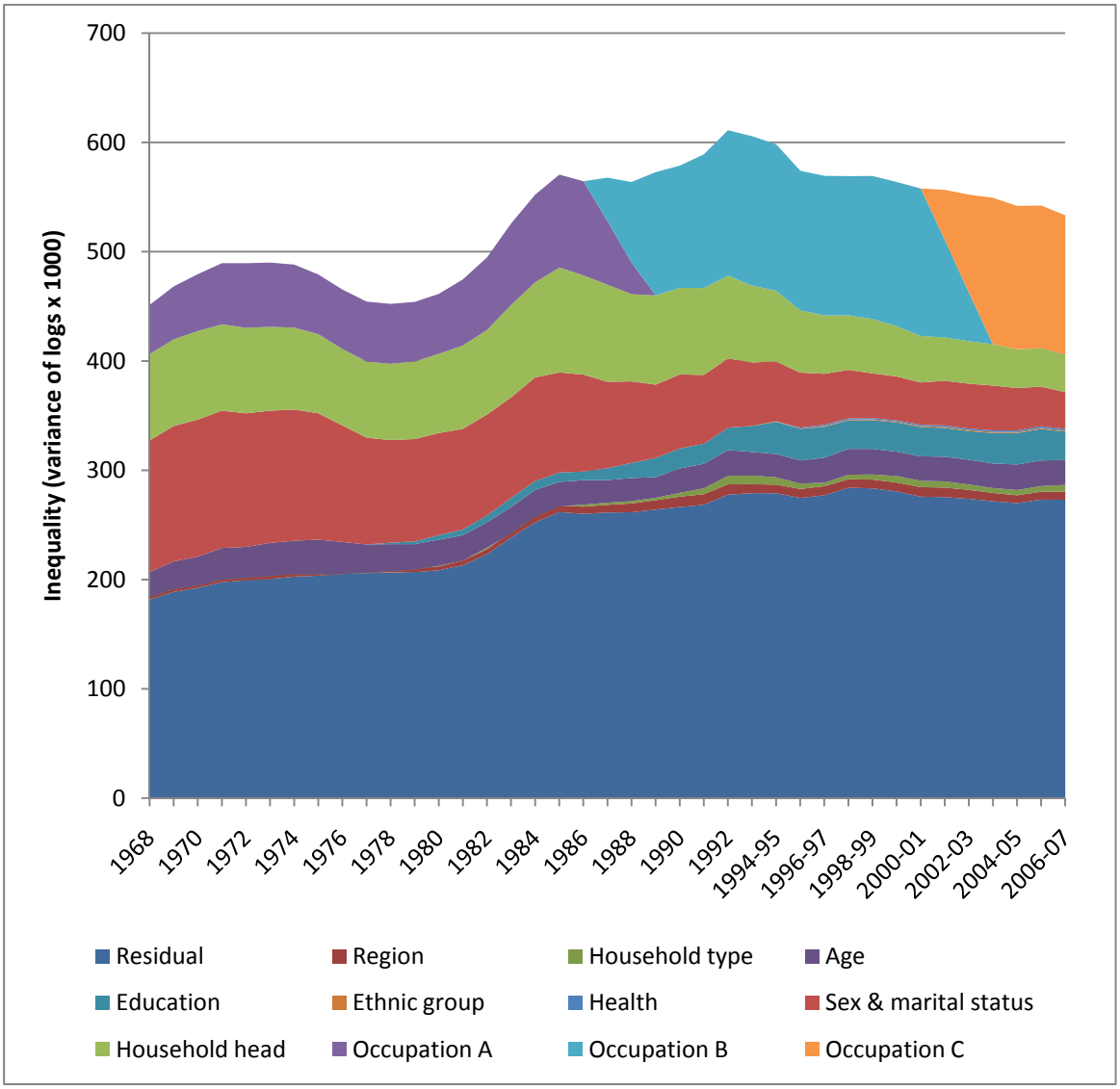
Table 25. Changes in income inequality decomposed into factor price and quantity effects

Year	Change in inequality (variance of logs x 1000)				Region		Household type		Age		Education		Ethnic group		Health		Employment status and occupation A		Employment status and occupation B		Employment status and occupation C	
	Total	P	Q	Residual	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q
1972	41	16	7	18	1	0	–1	–1	0	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16	8	n.a.	n.a.	n.a.	n.a.
1978	–48	–34	6	–20	–2	–1	6	–2	–4	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	–34	7	n.a.	n.a.	n.a.	n.a.
1984	31	3	15	14	3	0	–4	0	–1	1	4	1	n.a.	n.a.	n.a.	n.a.	1	13	n.a.	n.a.	n.a.	n.a.
1988	88	44	–5	49	3	–2	–4	6	4	–4	10	–3	n.a.	n.a.	n.a.	n.a.	10	1	22	–4	n.a.	n.a.
1991	38	6	11	21	1	–1	2	3	–2	0	–2	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	8	7	n.a.	n.a.
1995–96	–23	–35	2	10	–2	–1	–7	–1	1	0	0	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	–27	2	n.a.	n.a.
2000–01	30	8	–3	25	0	1	–2	0	–1	0	–4	2	2	0	0	0	n.a.	n.a.	13	–5	n.a.	n.a.
2004–05	–22	–7	–9	–5	0	–2	–7	4	–1	–1	5	–7	0	–1	1	–1	n.a.	n.a.	n.a.	n.a.	–6	–2
2006–07	25	5	2	17	1	0	2	–1	0	0	–1	1	0	1	–1	0	n.a.	n.a.	n.a.	n.a.	5	2

Earnings regression

Since earnings inequality makes up a large portion of income inequality, we now proceed to analyse a similar regression-based decomposition for earnings. Earnings are also the more natural measurement within which to study the effect of occupation, since this primarily affects earners. Figure 8 therefore presents total earnings inequality decomposed as above, with Table 26 giving the corresponding shares and Table 27 decomposing inequality changes.[17]

Figure 8. Earnings inequality decomposed by factor, 1968 to 2006–07



Note: This graph is three-year smoothed using three-year moving average.

[17] Note that we have not included housing tenure in this regression, just as we did not include it in the income regression of the previous subsection, since it is likely to be highly endogenous. We have also excluded the full-time/part-time work categorisation, for the same reason. We have, however, included 'health' (whether the respondent has a work-limiting health condition) as an explanatory factor, despite our reluctance to conduct a subgroup decomposition by health (see 'Note' in Decomposition 16). While the results of such a subgroup decomposition would have been difficult to interpret, including health as one of many covariates in a regression framework is less problematic.

From Figure 8, we see once again that the residual term explains a large portion of inequality, although not as much as for income. As was the case with income inequality, the explanatory power of our observed characteristics fades over time, so that residual inequality grows as a share of total inequality. Indeed, the most striking increase in the residual occurs during the period 1984 to 1988, where its rise entirely cancels out what would have been a large fall in equality led by some of our explanatory factors. Part of this residual will include the effect of education differences that are not picked up by our rather crude measure (age left education). This could well explain part of the increase in the residual in the period 1984 to 1988, as this period also saw the largest increase in the price effect of education.

The most important factor in explaining earnings inequality in 1968 was the sex of the earner, explaining 27% of total inequality. The importance of this factor has diminished consistently over the period we study, explaining only 6% of total inequality in 2006–07. This was due to a sequence of large price effects, reflecting the falling earnings differences between men and women. The largest of these falls occurred in the period between 1972 and 1978, explaining about three-quarters of the decline in earnings inequality.

The second largest factor in 1968 was the household head dummy, reflecting the fact that household members other than the head of household generally earned significantly less.[18] Price effects diminished the importance of this variable between 1968 and 1978, reflecting the increasing earnings of non-heads of households. Between 1978 and 1984, on the other hand, price effects contributed to increasing earnings inequality. This reflects a decrease in the earnings of part-time working non-heads of household, possibly due to a reduction in hours worked. There was also a large decrease resulting from a price effect between 1991 and 1995–96. This possibly reflects the fact that non-heads of household increased their hours worked when faced with the unemployment of a household head during the recession. Quantity effects were generally negative over the period, with large declines between 1984 and 1988, and again between 2000–01 and 2004–05. This former effect reflects a growing number of non-heads of households in full-time employment, whilst the latter appears to be a combination of this and an increase in the frequency of household heads working part-time.

Occupation also explains a large portion of total inequality since 1968, with a factor share of 24% in 2006–07. Table 27 shows us that a combination of price and quantity effects mean that occupation explains half of the total rise in inequality between 1968 and 1972. Between 1972 and 2000–01, a series of significant price effects contributed to inequality changes in all the periods. The direction of these effects oscillated, such that significant falls repeatedly followed increases in occupation's absolute contribution to inequality. The largest of these effects were the increases that occurred between 1978 and 1984, and again between 1988 and 1991, with the size of the occupation price effect in the latter case almost exactly the size of the total increase in earnings inequality in this period. Since 2000–01, the absolute contribution of occupation to inequality changes has been negative, accounting for about a third of the fall in earnings inequality in this period. We have discussed the various explanations for these effects in the subgroup decomposition of earnings by occupation.

[18] Our definition of household head is not necessarily the primary earner. Nonetheless, the variables are likely to be closely correlated.

Education has also come to explain an increasing share of earnings inequality, rising from 1% in 1978 (the first year in which we have data) to 5% by 2000–01. This then fell slightly to 4% by 2006–07. Looking at Table 27, this appears to be explained by large positive price effects between 1984 and 1988, and again between 1991 and 1995–96. Oscillating price and quantity effects then largely cancelled each other out between 1995–96 and 2004–05, before a small negative price effect led to a reduction in earnings inequality between 2004–05 and 2006–07. Again, these results are likely to understate the true contribution of education to overall inequality, since our measure of education is relatively coarse.

Household type and region consistently explain relatively little of inequality, never individually having a factor share of greater than 2%. Region increased its share of total inequality from 1% to 2% between 1978 and 1988, with small absolute price effects contributing to the total rise in inequality over the period. The role of age in explaining earnings inequality has remained roughly constant since 1968. Its factor share decreased between 1978 and 1988 as inequality rose, and then increased between 1991 and 2004–05 when inequality fell, suggesting its absolute contribution to inequality has remained fairly constant. This is indeed what we see in Table 27, with quantity and price effects generally cancelling each other out. Finally, ethnic group and health never explain a significant portion of inequality.

Table 26. Shares of factors in earnings inequality

Year	Residual	Region	Household type	Age	Education	Ethnic group	Health	Sex	Household head	Occupation A	Occupation B	Occupation C
1968	40%	1%	-1%	5%	n.a.	n.a.	n.a.	27%	18%	10%	n.a.	n.a.
1972	41%	1%	0%	5%	n.a.	n.a.	n.a.	24%	16%	13%	n.a.	n.a.
1978	45%	1%	0%	5%	1%	n.a.	n.a.	21%	15%	12%	n.a.	n.a.
1984	45%	1%	0%	4%	1%	n.a.	n.a.	17%	16%	15%	n.a.	n.a.
1988	47%	2%	0%	3%	3%	n.a.	n.a.	13%	14%	n.a.	18%	n.a.
1991	46%	2%	1%	4%	3%	n.a.	n.a.	10%	13%	n.a.	22%	n.a.
1995–96	49%	1%	1%	4%	4%	0%	0%	8%	9%	n.a.	22%	n.a.
2000–01	50%	2%	1%	4%	5%	0%	0%	7%	7%	n.a.	24%	n.a.
2004–05	50%	1%	1%	4%	5%	0%	0%	7%	6%	n.a.	n.a.	24%
2006–07	52%	1%	1%	4%	4%	0%	0%	6%	6%	n.a.	n.a.	24%

Table 27. Changes in earnings inequality decomposed into factor price and quantity effects

	Change in inequality (variance of logs x 1000)				Region		House-hold type		Age		Education		Ethnic group		Health		Sex		Household head		Occupation A		Occupation B		Occupation C	
Year	Total	P	Q	Residual	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q
1972	34	–2	17	19	–1	0	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	–7	4	–5	4	10	7	n/a	n/a	n/a	n/a
1978	–34	–39	–3	7	–1	0	0	1	5	–6	n/a	n/a	n/a	n/a	n/a	n/a	–26	2	–8	1	–9	0	n/a	n/a	n/a	n/a
1984	119	68	–4	55	4	0	3	–1	7	–8	4	–2	n/a	n/a	n/a	n/a	4	1	16	4	31	3	n/a	n/a	n/a	n/a
1988	0	–19	–29	48	3	–1	–3	2	2	–6	12	–1	n/a	n/a	n/a	n/a	–17	–7	0	–11	0	–3	–17	–1	n/a	n/a
1991	31	11	14	6	1	0	3	2	–3	5	–2	1	n/a	n/a	n/a	n/a	–17	4	0	1	n/a	n/a	30	1	n/a	n/a
1995–96	–39	–41	–1	4	–2	0	–2	0	4	–3	7	1	n/a	n/a	n/a	n/a	–9	–2	–26	–2	n/a	n/a	–13	5	n/a	n/a
2000–01	–1	–10	5	4	0	1	–1	2	0	2	–3	5	0	1	0	0	–9	–1	–8	–2	n/a	n/a	11	–2	n/a	n/a
2004–05	–24	21	–36	–10	1	–2	3	–1	3	–3	7	–6	0	0	0	0	8	–8	3	–9	n/a	n/a	n/a	n/a	–4	–5
2006–07	–11	–17	1	4	–1	0	1	0	–4	1	–4	0	0	0	0	0	–6	–1	1	–1	n/a	n/a	n/a	n/a	–4	2

V. Summary of results: by period

In this section, we draw together results from all our inequality decompositions to summarise, for each of the periods we study, the major changes that affected income inequality. The different decompositions each provide part of the story, but we now aim to build up a more general picture.

1968 to 1972

- This was a period of increasing income inequality, which can be largely attributed to a corresponding increase in earnings inequality (amongst earners).
- Pensioners saw no significant change in income inequality over this period.
- About half of the increase in earnings inequality can be explained by changes in the relative wages of workers in different occupations.
- The wages of low-earning groups such as unskilled workers and shop assistants fell relative to those of high earners such as managers, professionals and skilled manual workers.
- The remaining increase in earnings inequality took place mainly within these lower occupational groups.

1972 to 1978

- This period saw a fall in income inequality that more than compensated for the increase in the previous period.
- Again, the change in income inequality was largely due to a corresponding change (a fall, this time) in earnings inequality amongst earners.
- Occupation again played an important role, with high earners such as managers and professionals suffering falling relative wages compared with other groups.
- In addition to this occupation effect, there was a large effect resulting from the increasing relative earnings of women.
- This decrease in earnings inequality happened across all age groups, although the under-25s were affected more strongly than others of working age.
- At the same time as this decrease in earnings inequality amongst workers, income inequality amongst pensioners also fell significantly.
- Furthermore, the mean income of pensioners gained some ground on the mean incomes of younger adults. Both of these developments contributed to an overall decline in inequality, and were probably partly a result of a significant increase in the benefits received by pensioners over the period.

1978 to 1984

- The early 1980s saw the beginning of a large increase in income inequality that was to continue throughout the decade.
- This first increase affected mainly those of working age, with pensioner inequality remaining relatively stable.
- There appear to be two main contributory factors that led to increasing inequality over this initial period:

- First, the recession saw a significant rise in the number of unemployed and economically inactive adults. Because these groups have substantially lower average incomes than the employed or self-employed, their growing numbers pushed inequality upwards.
- Second, there was a large increase in earnings inequality amongst those who remained employed. This was partly due to an increase in part-time work and a decrease in the average number of hours worked by part-time employees. There was also a marked increase in inequality among the self-employed, as the composition of the self-employed changed over the course of the recession.

- A further part of the increase in earnings inequality resulted from increasing inequality between different occupations. The relative wages of manual workers fell during the period compared with those of people working in the service sector.
- The earlier periods generally saw the relative earnings of skilled and unskilled manual workers moving in different directions, with skilled manual workers doing well when unskilled manual workers' relative earnings fell. This time, however, the relative earnings of all manual workers fell at the same time.
- Somewhat surprisingly, education does not appear to have played a significant role during this period.

1984 to 1988

- The very large increase in income inequality over this period can be partly explained by income inequality in employment income, self-employment income and investment income.
- Unlike in the previous period, this increase does not appear to be primarily due to increasing earnings inequality (which increased only modestly).
- Instead, the increase appears to be largely explained by the incomes of the employed and self-employed 'pulling away' from the incomes of the economically inactive (including pensioners).
- Most measures of earnings inequality show a small increase in this period (although the variance-of-logs measure does not). These measures seem to increase partly as a result of the increasing importance of education, with the earnings of higher-educated workers 'pulling away' from the earnings of those with less education.
- A final contribution to the increase over this period was the increase in income inequality amongst pensioners and the unemployed. The increase in inequality amongst these groups is harder to explain, but part of it may be the result of the increase in pension and investment income inequality we observe over this period.

1988 to 1991

- Rising income inequality in this period appears to be driven in large part by increasing earnings inequality.
- This finding is corroborated by the income sources decomposition, which suggests that employment income explained a large share of the overall increase in inequality. Employment income also became more strongly correlated with investment income, which amplified this increase in inequality.
- The regression-based analysis suggests that relative occupational wages played a significant role in this rise in earnings inequality, but this does not appear clearly in the corresponding subgroup decomposition.

- Inequality amongst pensioners also increased during the period, and this appears to be partly due to a decrease in the equalising effect of benefits received by this group.
- It should be noted that women's relative earnings continued to catch up with men's over this period, slightly offsetting the overall increase in inequality.

1991 to 1995–96

- This period saw a modest decline in income inequality, beginning a sequence of relatively small oscillations in inequality that took place between 1991 and 2006–07.
- Relative incomes in this period exhibited many of the trends we might expect during the recovery from an economic downturn. In particular, the relative incomes of the unemployed and inactive (including pensioners) rose, presumably as they 'caught up' with those of employed people somewhat, during a period of slower real wage growth.
- Earnings inequality also fell somewhat during this period, with 'white-collar' workers faring comparatively poorly. The relative earnings of professional workers and some managerial workers declined slightly (though they remained well above the national average).
- Both employment income and investment income contributed to the fall in inequality, suggesting a reversal of the investment-induced inequality increase of the 1980s.
- The introduction of council tax as a replacement for the (short-lived) poll tax also contributed to the fall in inequality, since council tax bills are more strongly correlated with income than the (flat-rate) poll tax (although council tax is based on property value, not income).
- Inequality also fell among pensioners during this period, leading to the emergence of the over-65s as the least unequal age group in society (having been the most unequal in the early 1970s).

1995–96 to 2000–01

- This period saw a small rise in income inequality, which may have been driven in part by an increase in earnings inequality towards the top of the earnings distribution (which explains why not all measures of earnings inequality increase over this period – see Figure 4).
- This increase in earnings inequality was partly caused by a recovery in the relative wages of professionals and a fall in the relative wages of manual workers.
- This period also saw the relative incomes of the unemployed and inactive fall compared with those of the full-time employed and self-employed, which held steady.

2000–01 to 2004–05

- This period saw a small fall in inequality, partly due to increasing relative incomes among pensioners and families with children (especially young children) and partly due to a modest recovery in the incomes of the unemployed (from an admittedly low base).
- Investment income inequality declined during this period (possibly in the wake of the 'dot-com bust' of the early 2000s).
- Within-group inequality amongst pensioners also decreased during this period, perhaps due in part to the decline in the inequality of investment income.
- Changes in earnings inequality over this period are ambiguous. Inequality at the bottom of the earnings distribution appears to have fallen, possibly due in part to the continuing rise in the relative earnings of women. However, earnings inequality towards the top of the distribution continued to increase strongly.

2004–05 to 2006–07

- The final three years of our analysis saw a small increase in income inequality. This increase appears to be partly explained by the falling relative incomes of households headed by an unemployed person during this period. This effect was offset, however, by a fall in the (above-average) relative incomes of the self-employed.
- Aside from this effect of employment status, however, the increase in income inequality is not explained well by any other characteristics in our factor decomposition: much of the increase shows up as a rise in 'residual' inequality.
- The change in earnings inequality was ambiguous over this period. Inequality measures that are sensitive to changes at the bottom of the income distribution (such as the mean log deviation) suggest that earnings inequality fell, while those that are sensitive to the top of the distribution (such as the coefficient of variation) suggest that it increased.
- Consistent with this, our decomposition by earnings quintile group shows earnings inequality increasing within the top income quintile, while it falls within the bottom quintile. This is true using both the trimmed and untrimmed earnings distributions.
- Despite this ambiguity, our decomposition by income source suggests that employment income is a contributory factor to the increase in income inequality (along with investment income).

VI. Summary of results: by factor

Having summarised our results by period, in this section we draw our results together by 'theme', assessing how different characteristics have contributed to changes in inequality.

Age

Perhaps surprisingly given the large demographic shift in Britain's population over the past forty years, age does not appear to be a major explanatory factor in changes in income inequality. Almost all changes in overall income inequality are accounted for by increased inequality *within* age groups. In particular, the large increase in inequality during the 1980s affected all age groups, not just those of working age.

The income gaps between age groups did increase slightly in the mid-1980s, as the relative incomes of pensioners fell. More recently, however, the income gaps between age groups have narrowed somewhat, with the relative incomes of the over-65s increasing while those of 45- to 54-year-olds (households with the highest relative incomes) have declined slightly.

Households headed by individuals aged 24 and under are the one group whose incomes have fallen substantially since the 1970s. However, since this age category will include university students' group houses (whose numbers have increased substantially since the 1980s), perhaps we should not read too much into this decline.

When looking at earnings inequality, rather than income inequality, we do see some modest age-related trends. The relative earnings of workers towards the beginning of their careers (those aged below 25) have been falling since the 1980s, as have the relative wages of those towards the end of their careers (those aged 55–64). The relative earnings of these groups fell particularly sharply in the early 1990s, but since their share of the workforce was also falling, the net effect was to reduce earnings inequality.

Overall, though, the age distribution does not appear to have been a major force in changing inequality over the period we study.

Sex

Because our income measure is at the household level, we can only comment on *earnings* inequality between the sexes. The main trend to report is that earnings inequality between men and women explains an ever-decreasing share of overall inequality over the period we study.

Looking at the relative earnings of women, the pattern we see is clear – they have been 'catching up' with those of men for most of the past forty years. In only one period we study (from 1978 to 1984) does this trend briefly reverse itself. Since the start of the 1990s, we have seen a particularly strong increase in the relative earnings of married/cohabiting women.

As women's relative earnings have been rising, their labour force participation has also been increasing. This has had mixed effects on overall inequality, since women have higher within-group earnings inequality than men. A larger fraction of the workforce coming from a (high-inequality) group tends to increase earnings inequality through population (within) effects.

The large increase in earnings inequality during the 1980s affected both men and women, with a particularly sharp increase in earnings inequality among married women during the early 1980s. Since the early 1990s, however, earnings inequality has been falling among married/cohabiting women, even as it has been rising for other groups.

It is worth bearing in mind that our analysis looks only at raw earnings, not at whether men and women are being paid the same amount for 'the same/similar' jobs. We therefore cannot comment on progress towards the Equal Pay Act's aim of eliminating discrimination between men and women where they are doing the same or similar work.[19] What we can say is that the raw earnings gap between men and women has been narrowing for much of the past forty years.

Region

Despite the significant changes in the industrial structure of the British economy over the past four decades – in particular, the decline of the manufacturing sector and the rise of service industries, both as a share of national product – we do not find differences in incomes between regions to be a significant explanatory factor in overall income inequality over the past forty years.

Our results do show clear income differences between regions, with household incomes in London and the South East some way above the national average, while incomes in the North and Wales have remained consistently furthest below the national average. These income differences also widened somewhat over the course of the 1980s, with relative incomes in London, the South and East Anglia pulling away from those of the rest of Great Britain. Yet even during this period, changing incomes between regions explain only a small fraction of the changes in overall inequality. It is inequality increases within, rather than between, regions which account for most of the changes in the period we study.

Occupation

Our analysis of the role of occupation is complicated by the lack of a consistent classification of occupations (we are forced to work with three different classification systems over the four decades we study). Nonetheless, our results suggest that changing earnings inequality between different occupations has played a significant role in overall changes in income inequality.

In the mid-1970s, we observe generally falling earnings inequality between different occupation groups, as the relative earnings of higher-paid workers (such as professional and managerial workers) declined. Over the course of the 1980s, however, the relative wages of semi-skilled / unskilled manual workers began declining particularly rapidly. Indeed, the 1980s appear to have been a bad time for the relative earnings of all manual workers, including those classed as skilled, while the relative wages of professional workers increased for most of this period.

The recession of the early 1990s saw a modest reduction in earnings inequality between different occupations (though not by enough to cancel out the increase during the 1980s). This was followed by another increase between 1995–96 and 2000–01 as relative earnings fell among (lower-earning)

[19] Equal Pay Act 1970, available at http://www.opsi.gov.uk/acts/acts1970/PDF/ukpga_19700041_en.pdf.

farmers, agricultural workers and manual workers. Indeed, this period saw the relative earnings of skilled manual workers fall below the national average for the first time in our time series.

Important as the widening earnings gap between occupations has been to overall inequality, it remains only part of the story. Inequality within occupation groups also increased dramatically during the 1980s, suggesting that other forces were also at work.

Nonetheless, the decline in the relative earnings of manual workers over the course of the 1980s remains a significant factor underlying the increase in overall earnings inequality.

Housing tenure

While households' tenure decisions are strongly related to their income (that is, tenure is likely to be 'endogenous' to income), we present an analysis of inequality and relative incomes among different housing tenure types, for purely descriptive purposes. The major trend we observe is the decline in Housing Association/Local Authority (HA/LA) tenants as a share of the population (while the share of households with a mortgage increases substantially) and the concurrent decline in the relative incomes of those remaining in HA/LA accommodation.

During the 1970s, the relative incomes of HA/LA households were comparable to those of renters of unfurnished accommodation (around 10% below the national average). Today, unfurnished renters still have incomes around 10% below the national average, while HA/LA tenants' incomes are more than 30% below average.

Ethnicity

Our survey data only contain information on respondents' ethnicity from 1994–95 onwards, leaving us with a comparatively short time series to study. Moreover, for all ethnic groups apart from 'white', we have relatively small sample sizes and correspondingly noisy results in our data.

Nonetheless, a reasonably clear picture emerges from these results: we observe a clear income (and earnings) gap between different ethnicities – with average incomes among households headed by Bangladeshi and Pakistani individuals at around 40% below the national average for the entire period since 1994–95.

However, we do not see much *change* in this gap during the period we study. This may be a source of concern in itself – unlike the earnings gap between sexes, the gap between ethnicities does not appear to be narrowing – but it also means that ethnicity does not contribute to the changes in income inequality since 1994–95. The source of those changes lies within, rather than between, the different ethnic groups.

Limiting health condition

As with our ethnicity measure, our measure of health only goes back as far as 1994–95. Moreover, it is a relatively crude self-reported measure, based on whether a respondent reports having a health condition that limits their capacity to work.

Our time series reveals a small decline in the fraction of households headed by an individual with no health problem (from 74% in 1994–95 to less than 70% in 2006–07), though this is largely due to an increase in the fraction with a household head reporting a *non*-limiting health problem.

Turning to relative incomes, we see that households headed by an individual with a limiting health problem have lower incomes than other households (around 20% below the national average) – but relative incomes between households headed by 'healthy' and 'unhealthy' individuals have changed very little over the period we study. They therefore contribute little to changes in overall income inequality since 1994–95.

VII. Comparison of our results with Jenkins (1995)

Since our analysis is in many respects an update of the work of Jenkins (1995), who decomposed inequality changes in the UK between 1971 and 1986, it is worth reviewing how our results compare with those of Jenkins for the same period – as well as asking whether the important forces he identifies continued to influence inequality in subsequent years.

Jenkins's first major conclusion is that 'four influences can be acquitted of blame for the trends [in inequality] throughout the 15 year period: secular changes in the age distribution; secular changes in household composition; changes in the distributions of cash social security benefits, income tax payments and employee national insurance contributions; and changes in industrial structure, in so far as these had a regional impact' (Jenkins, 1995, p. 55).

Our results concur with all four of Jenkins's 'innocent' factors over the course of the 1970s and 1980s. Our subgroup decompositions and factor regression decomposition all suggest that age, family structure and region effects explain little of the changes in inequality over that period, and indeed that they continue to be relatively unimportant in subsequent periods, right up to 2006–07. The picture is slightly more complicated for Jenkins's third 'innocent' factor, the changing distribution of direct taxes and cash benefits. While we agree with Jenkins that changes in these factors contributed little to changes in income inequality up to the mid-1980s (the period studied by Jenkins), we do find that their 'equalising' effect on household incomes declined during the late 1980s and has not subsequently recovered.

Jenkins's next broad conclusion is that 'the principal causes of aggregate income inequality trends were a mixture of changes in earnings inequality, employment structure and unemployment and, to a lesser extent, income from capital – but this mixture changed in each successive sub-period' (Jenkins, 1995, p. 56). Again, our decompositions lead us to similar conclusions. Income from employment is usually the most important factor in our income source decomposition (suggesting that earnings inequality has played a major role in overall inequality changes), with a supporting role played by self-employment income and income from investments. As for 'employment structure and unemployment', our factor decomposition of income inequality shows employment status and occupation (broadly defined) to be by far the most important contributing factor (of those we can measure) to inequality changes during the 1980s, and this continues to be the case in more recent periods.

One of Jenkins's most striking results is the importance of self-employment income to inequality increases between 1981 and 1986: 'In this period it was changes in self-employment income, not wages, that had by far the greatest impact – about twice as large as the combined effect of the contributions from the employment earnings of both household heads and spouses' (Jenkins, 1995, p. 56). Our findings in this regard are not quite as strong as Jenkins's (possibly because we compare different years), but we certainly do find that self-employment income was a major factor in the inequality increase during this period. While we never find that self-employment income explains a majority of the change in income inequality, we do find that it explains around one-third of the change between 1984 and 1988. When we compare the same years as Jenkins (1981 to 1986), we find that self-employment income explains around half the change in inequality in this period (with employment income explaining the other half).

Jenkins goes on to conclude that 'the link between changes in wage inequality and changes in income inequality is more complicated than is often assumed' and that 'changes for income sources besides wages have become more important' (Jenkins, 1995, p. 56). Our decomposition by income source does indeed echo this conclusion throughout the 1980s, with employment income explaining an ever-diminishing share of overall inequality, as self-employment and investment income explain ever more. However, we also find that this trend has more or less run its course by the mid-1990s. From then on, employment income stabilises, both as a share of average household income and as a share of total income inequality.

Overall, then, our results confirm many of Jenkins's key findings for the 1970s and 1980s – which should not be surprising, given that we sought to replicate many of his methods in our subgroup and income source decompositions. Moreover, our results suggest that many of the factors that Jenkins found unimportant for explaining inequality changes (notably age, region and household composition) continued to be relatively insignificant in subsequent years.

VIII. Conclusions

Having summarised our results in some detail, we now offer a few concluding remarks to highlight some of the more significant aspects of our findings.

We should begin by sounding a note of humility: individuals' observable characteristics (at least the ones we have in our data) explain only a fraction of total inequality – rarely as much as half, as our factor decompositions make painfully clear. Indeed, the unexplained ('residual') portion of inequality increases over time, suggesting that incomes have become more dispersed even within tightly defined groups. This finding is echoed across our subgroup results, where changes in within-group inequality are almost always a more important determinant of overall inequality changes than changes between groups.

Despite this limitation, there are certain robust results which stand out from our analysis. Perhaps the most surprising results are the factors that do *not* appear to have influenced changes in income inequality much, such as age, region and (over a shorter time scale) ethnicity. While clear inequalities in income exist across age, region and ethnic groups, they have tended to remain relatively constant over time (which may, of course, be a source of concern in itself), so that they cannot account for changes in overall inequality. Of course, this result will be less surprising to those familiar with Jenkins (1995), who showed that region and age had relatively small impacts on inequality during the 1970s and early 1980s. It remains interesting to note that these continue to be minor factors in subsequent decades.

Another oft-cited source of inequality – the earnings gap between men and women – appears to have been narrowing substantially over time (at least in the raw earnings measure we use). Doubtless this is partly due to increased labour force participation by women, and we have been at pains to make clear that our findings say nothing about whether men and women are being equally compensated for the same (or similar) work. However, it is striking that, even in periods when inequality was increasing (notably during the 1980s), this increase would have been even greater were it not for the offsetting narrowing of the earnings gap between men and women.

With the current economic downturn in mind, still another set of reflections has to do with the impact of the economic cycle on inequality. Our long time series contains three periods of recession, and we observe no simple correlation between the economic cycle and changes in inequality. The growth of the 1980s was accompanied by a startling rise in inequality, whilst that of the late 1990s occurred alongside relatively stable inequality. However, our analysis has shown that changes in the structure and health of the economy are frequently directly connected to changes in income inequality.

One clear expression of this is that the two greatest declines in income inequality occurred in the periods after recessions, with the falling relative incomes of the employed a substantial factor in this trend on both occasions. Following the recession of the 1980s, in contrast, inequality continued increasing strongly, as the relative incomes of the unemployed fell substantially. These diverging experiences following different recessions remind us that there are numerous channels through which the economic cycle can impact upon inequality – a fact well worth keeping in mind in the current economic climate.

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Appendix A: Charts accompanying subgroup decompositions

Fig. A1.1. Income inequality – within and between age groups

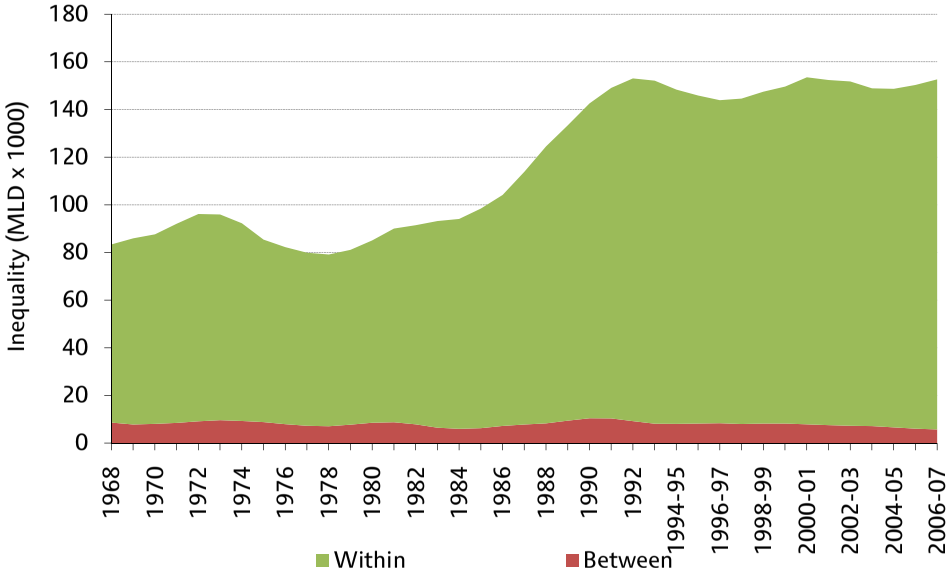


Fig. A1.2. Within-age-group income inequality

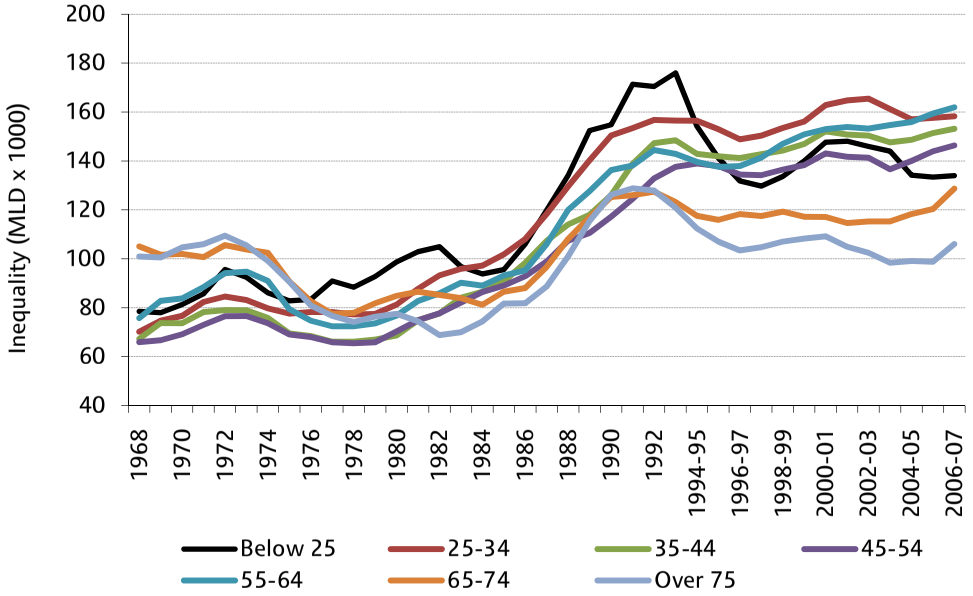


Fig. A1.3. Population shares, by age of head of household

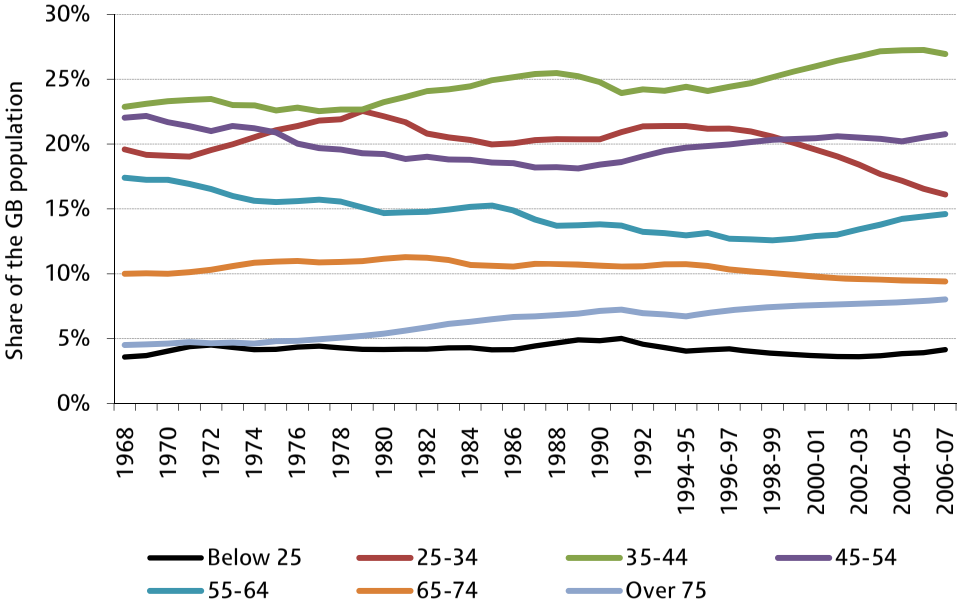
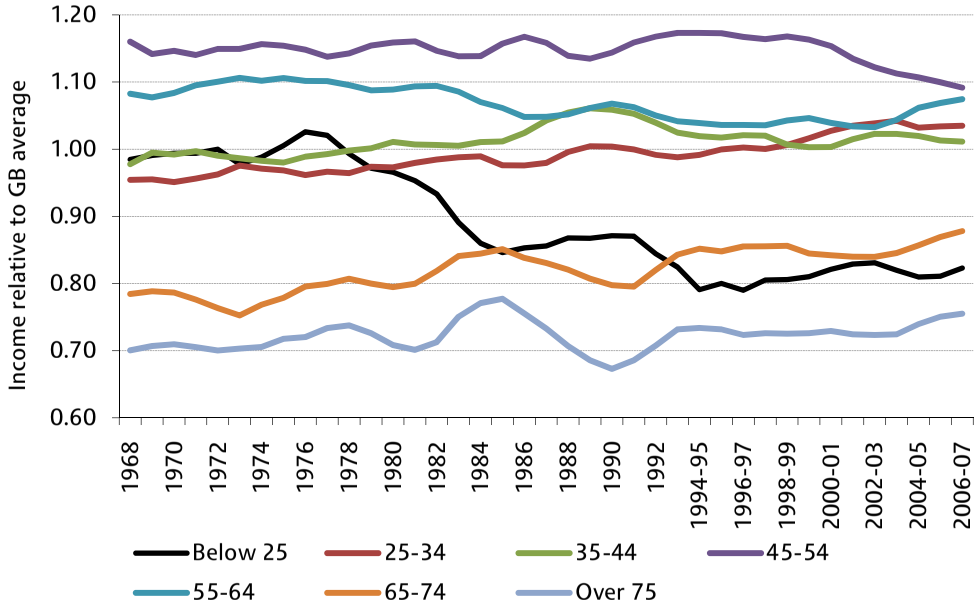


Fig. A1.4. Mean income (relative to British average), by age of head of household



Note: All figures smoothed using three-year moving averages.

Fig. A2.1. Earnings inequality – within and between age groups

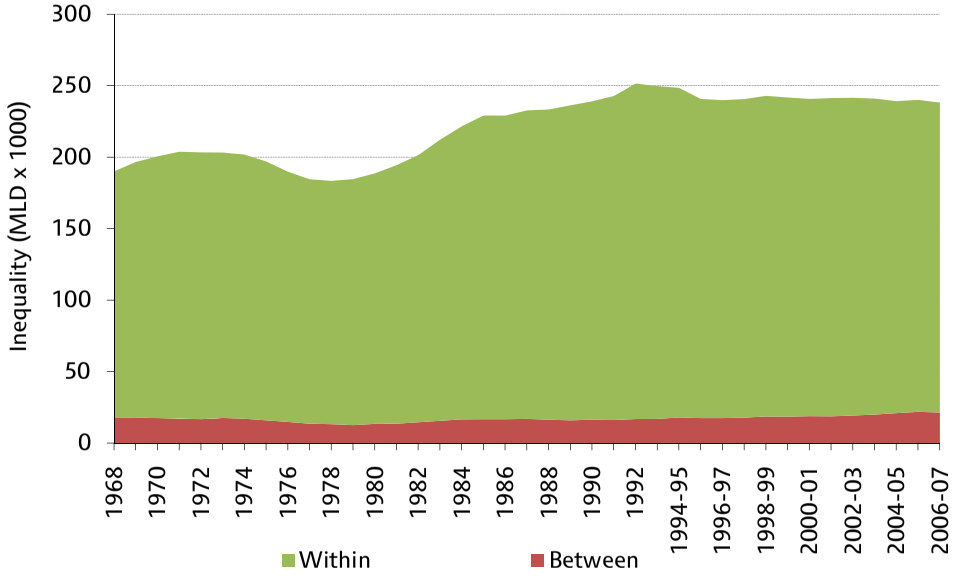


Fig. A2.2. Within-age-group earnings inequality

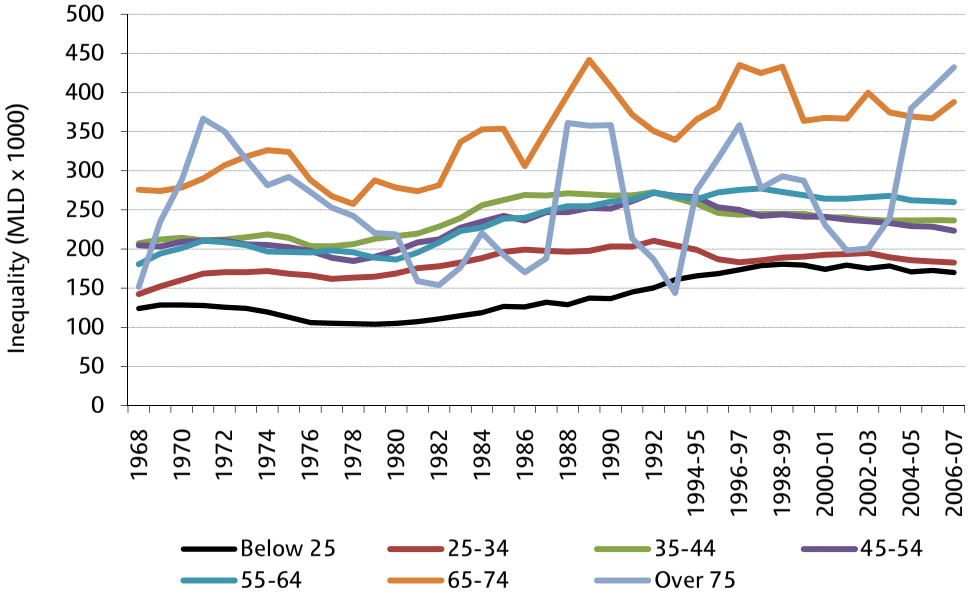


Fig. A2.3. Workforce shares, by age group

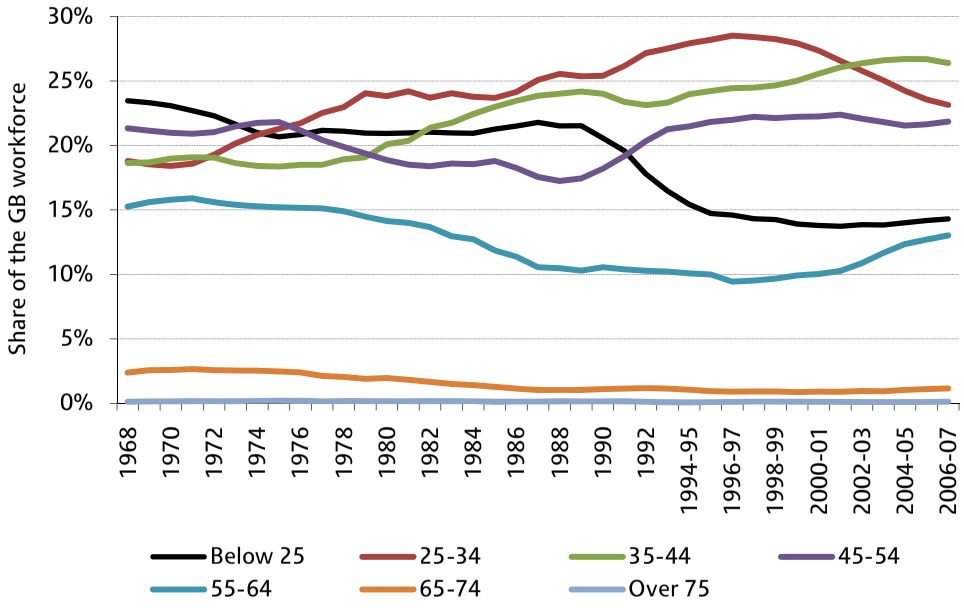
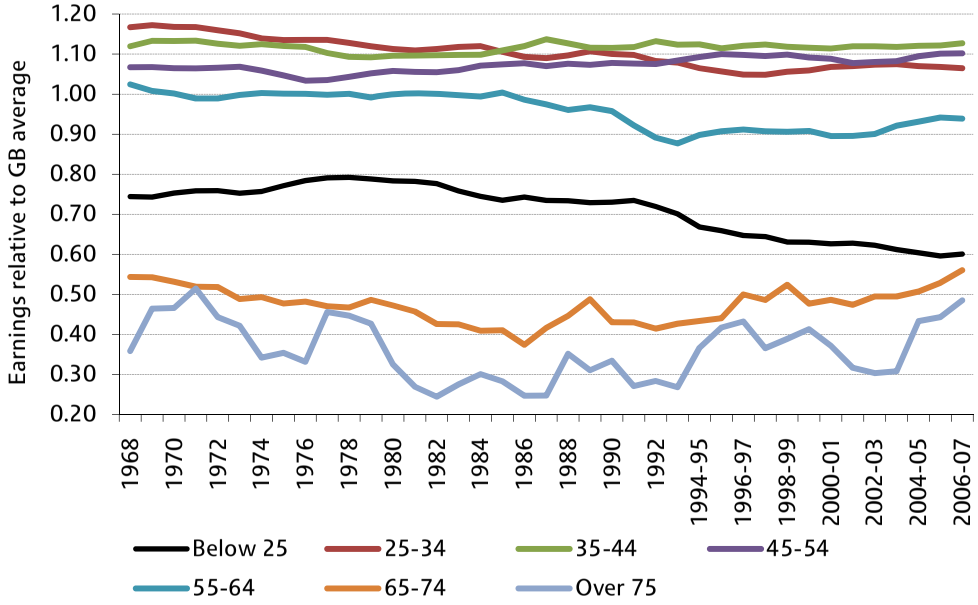


Fig. A2.4. Mean earnings (relative to British average), by age group



Note: All figures smoothed using three-year moving averages.

Fig. A3.1. Earnings inequality – within and between sex/marital status groups

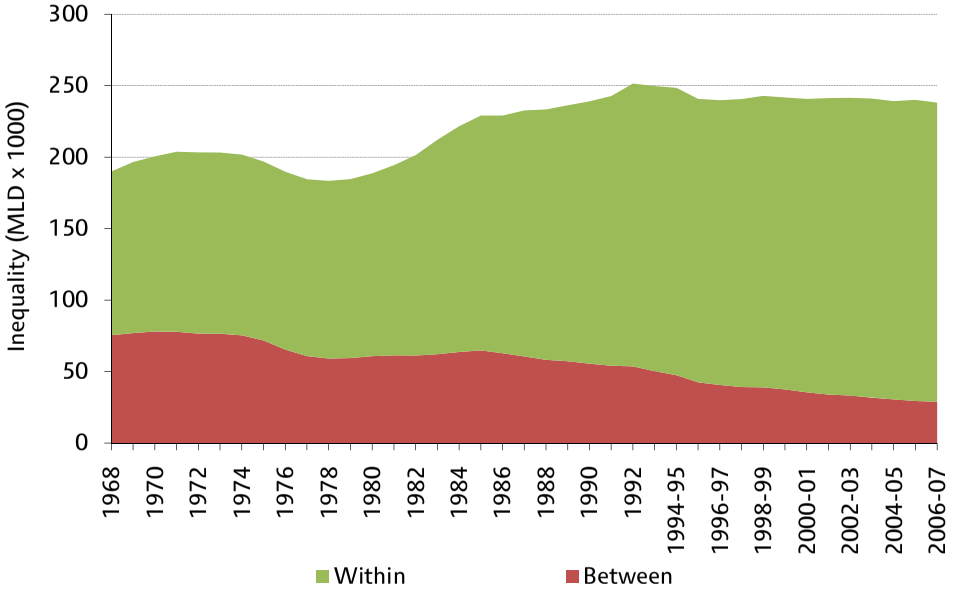


Fig. A3.2. Within-group earnings inequality, by sex/marital status

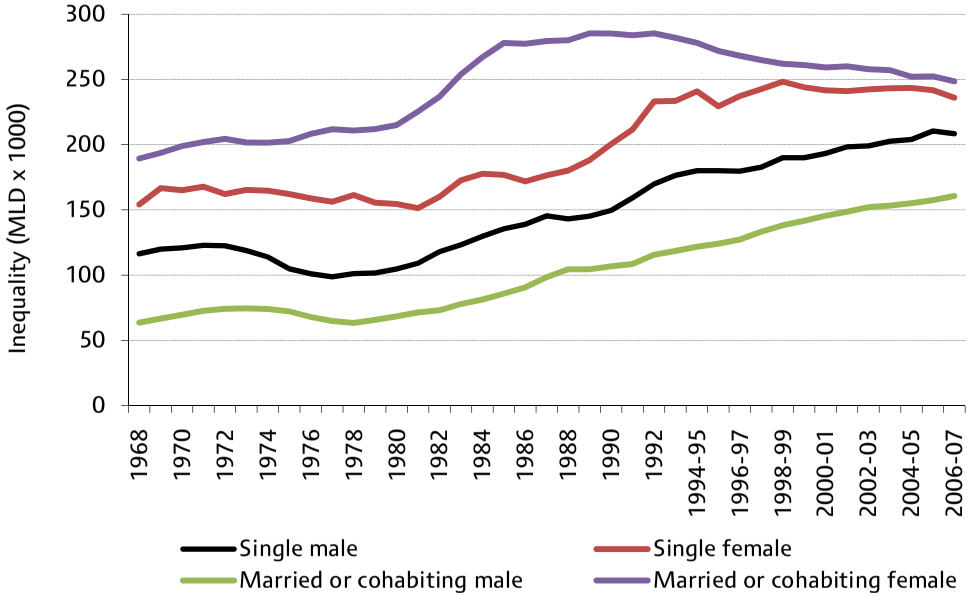


Fig. A3.3. Workforce shares, by sex/marital status

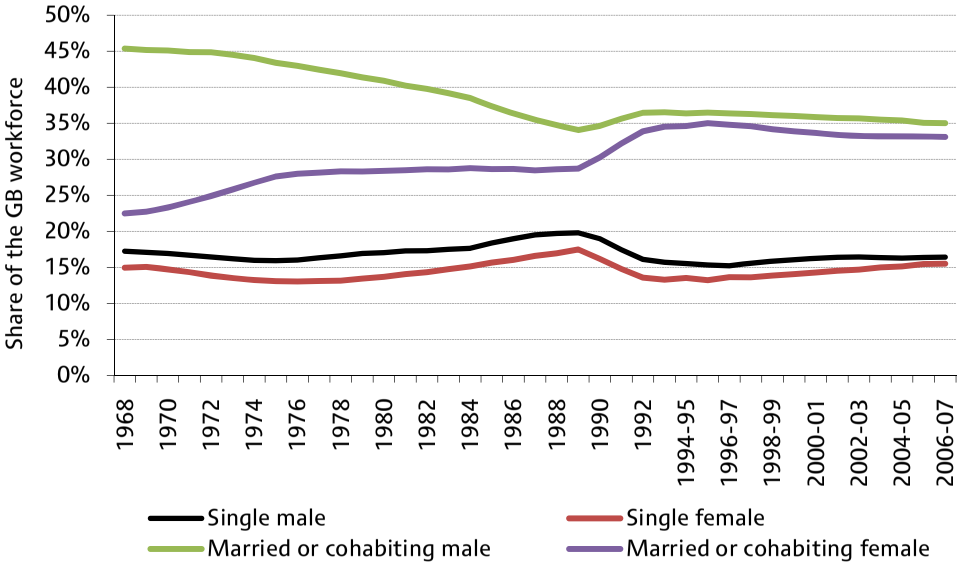
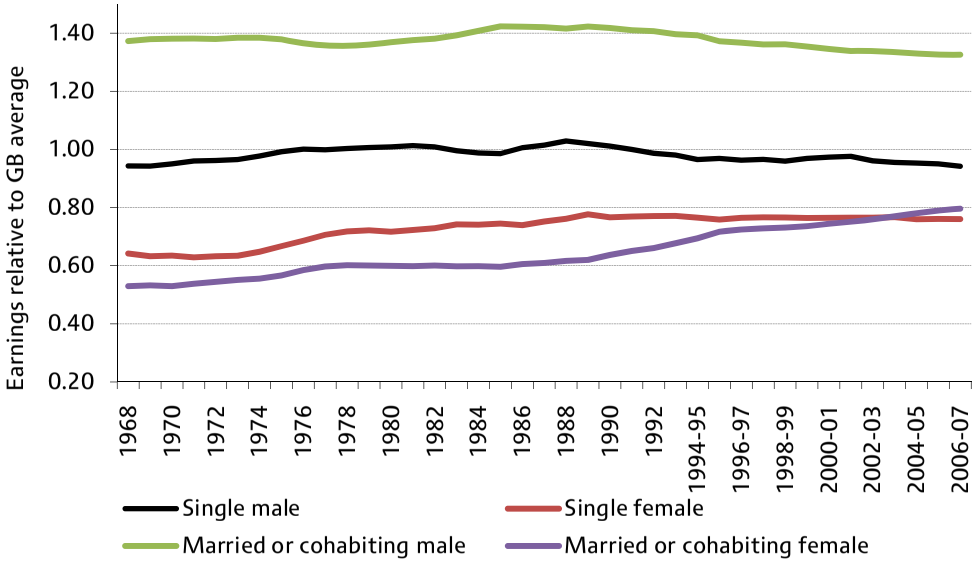


Fig. A3.4. Mean earnings (relative to British average), by sex/marital status



Note: All figures smoothed using three-year moving averages.

Fig. A4.1. Income inequality – within and between groups, by household type

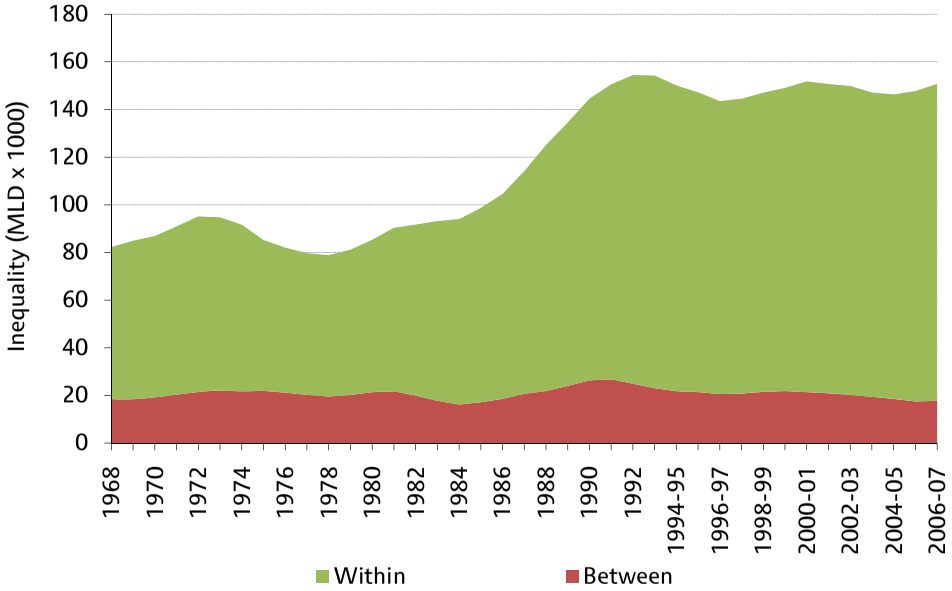


Fig. A4.2. Within-group income inequality, by household type

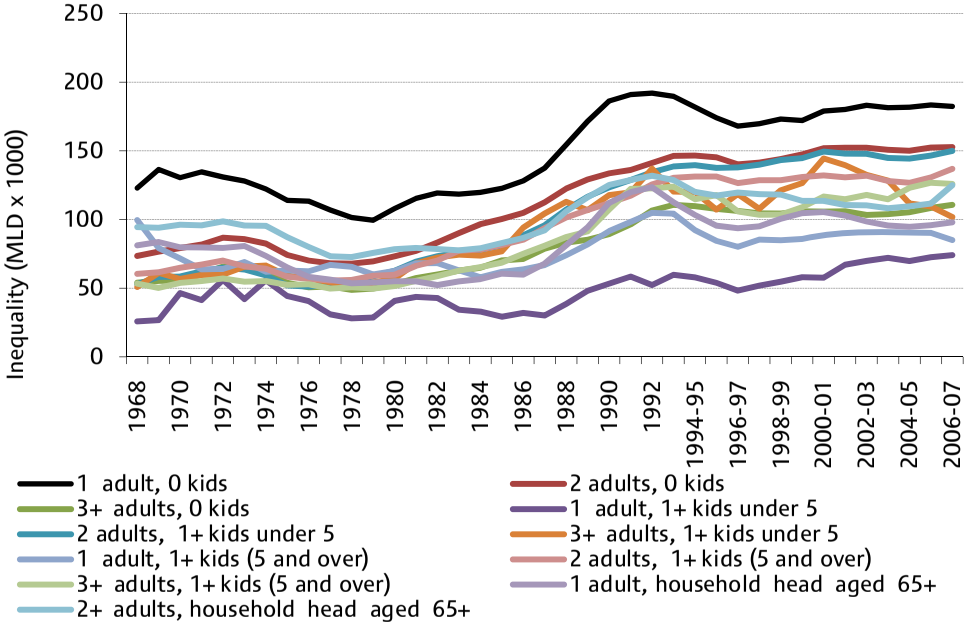


Fig. A4.3. Population shares, by household type

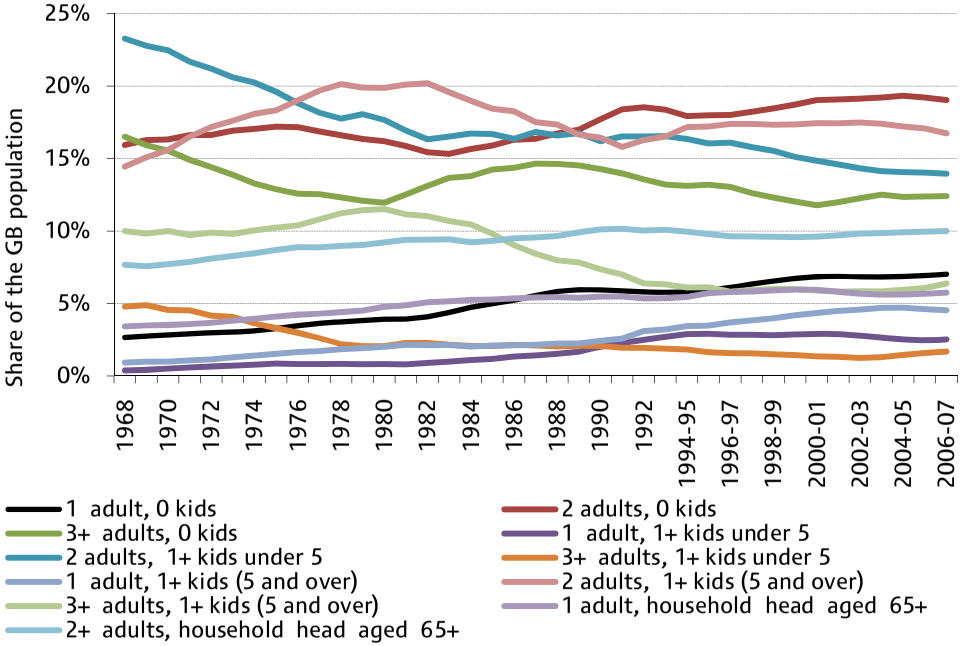
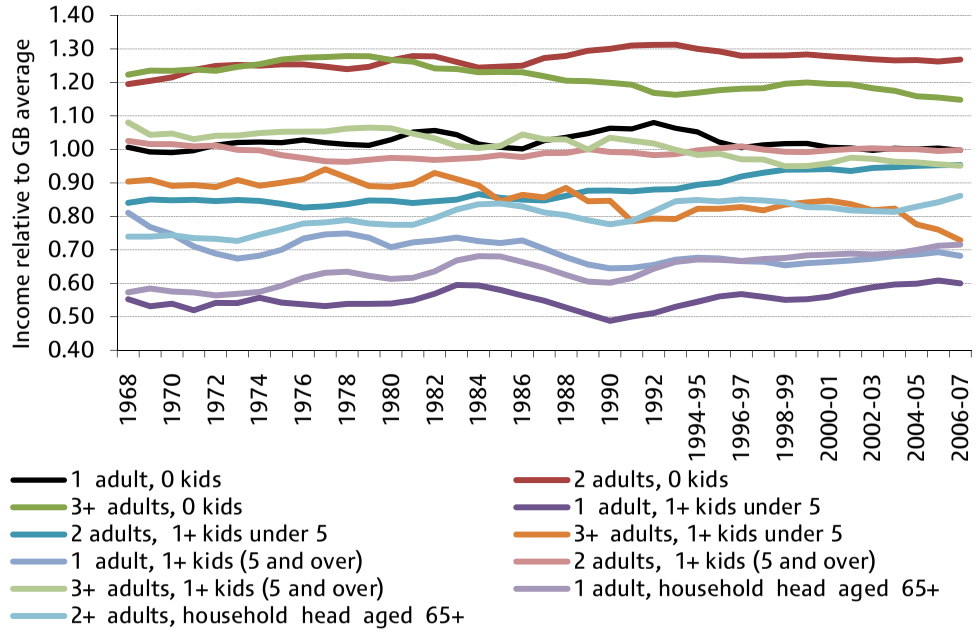


Fig. A4.4. Mean income (relative to British average), by household type



Note: All figures smoothed using three-year moving averages.

Fig. A5.1. Earnings inequality – within and between group, by household type

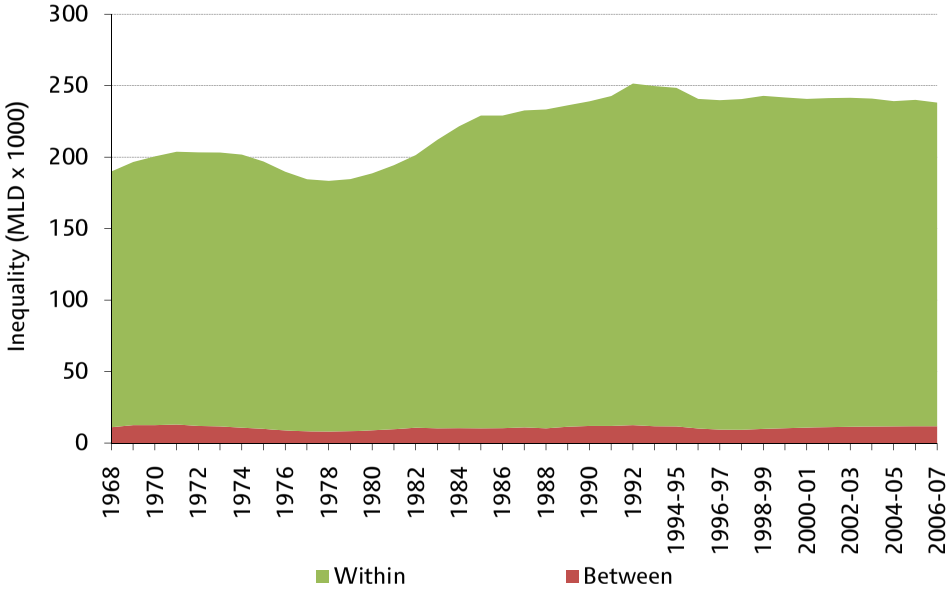


Fig. A5.2. Within-group earnings inequality, by household type

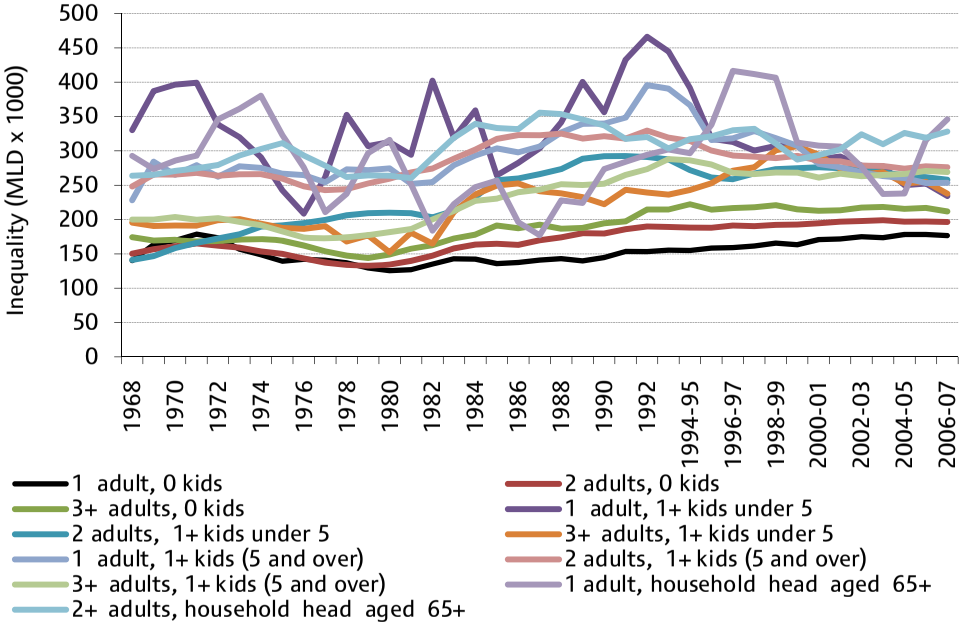


Fig. A5.3. Workforce shares, by household type

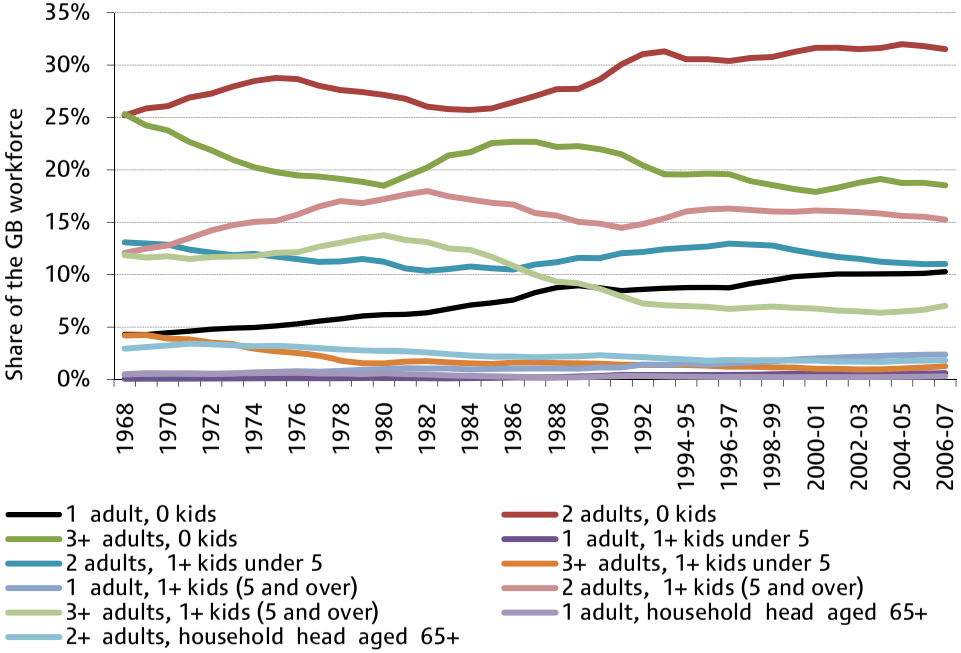
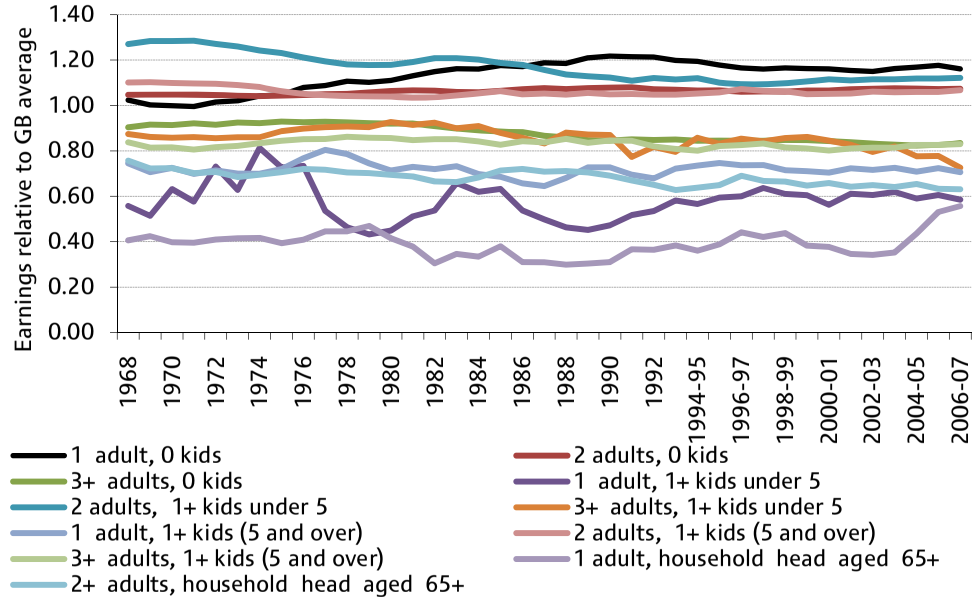


Fig. A5.4. Mean earnings (relative to British average), by household type



Note: All figures smoothed using three-year moving averages.

Fig. A6.1. Income inequality – within and between groups, by employment status of HOH

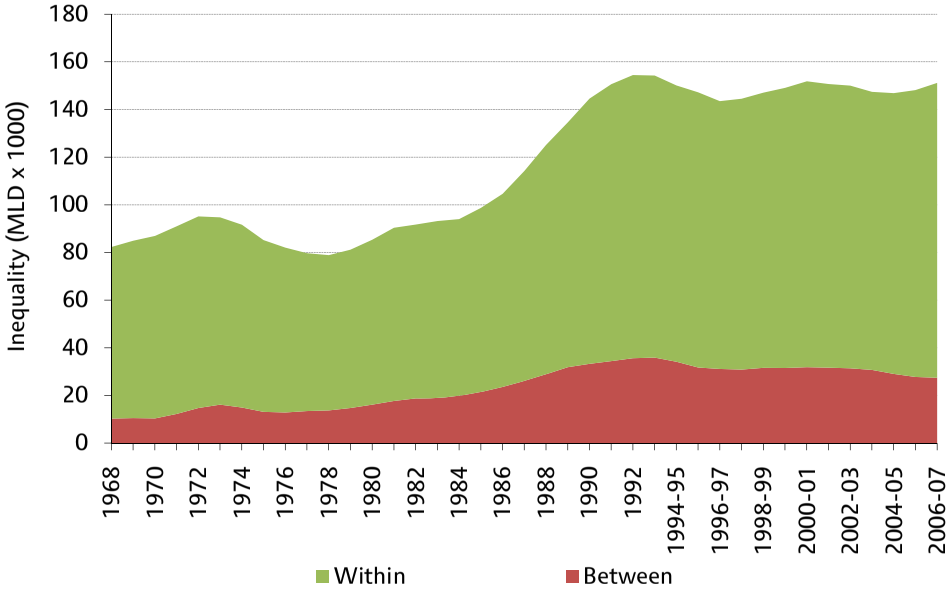


Fig. A6.2. Within-group income inequality, by employment status of HOH

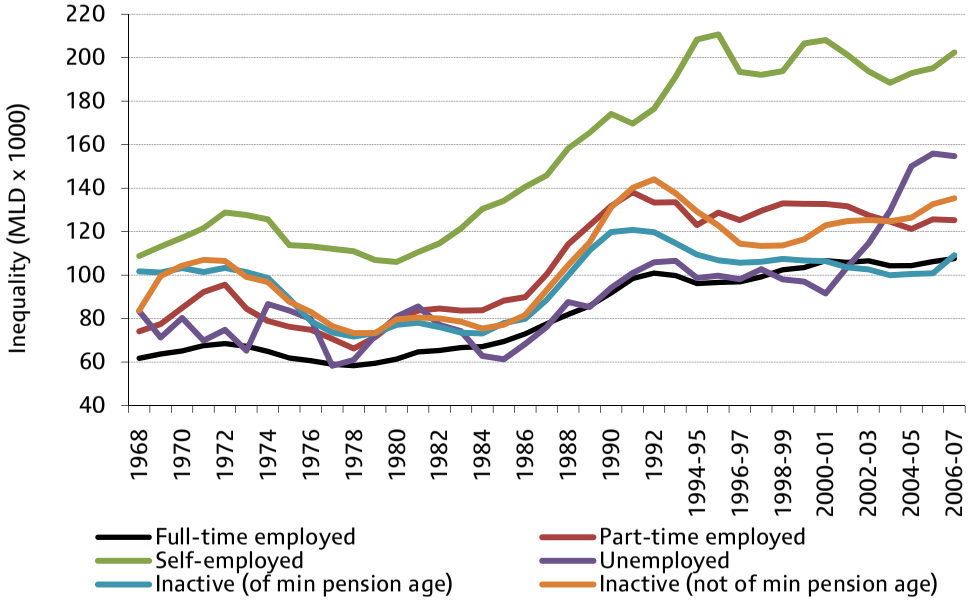


Fig. A6.3. Population shares, by employment status of HOH

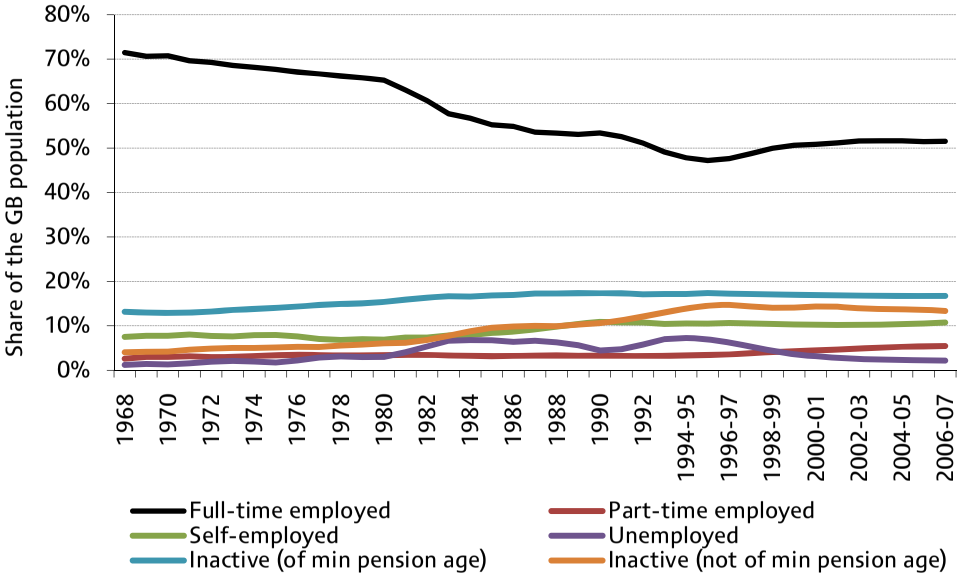
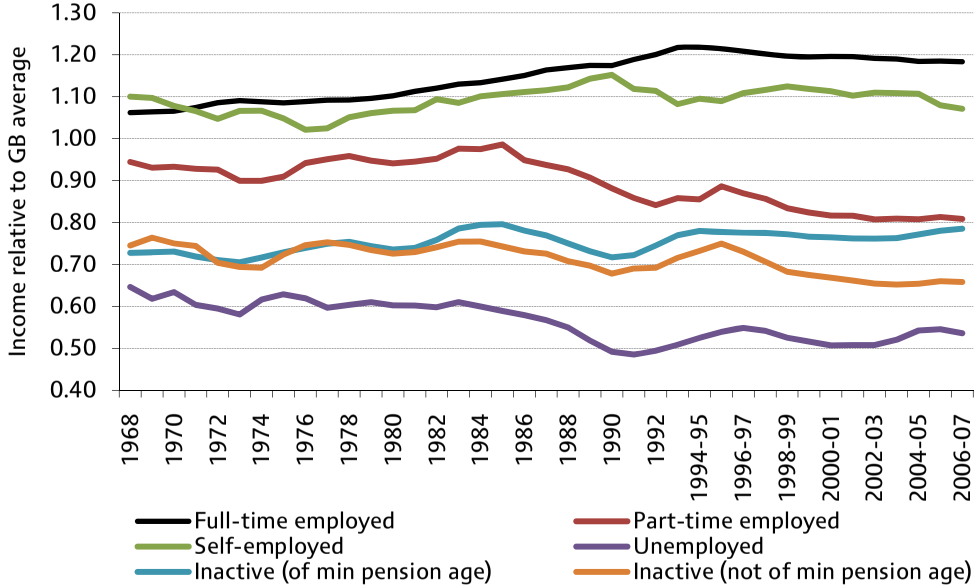


Fig. A6.4. Mean income (relative to British average), by employment status of HOH



Note: All figures smoothed using three-year moving averages.

Fig. A7.1. Income inequality – within and between groups, by household employment structure

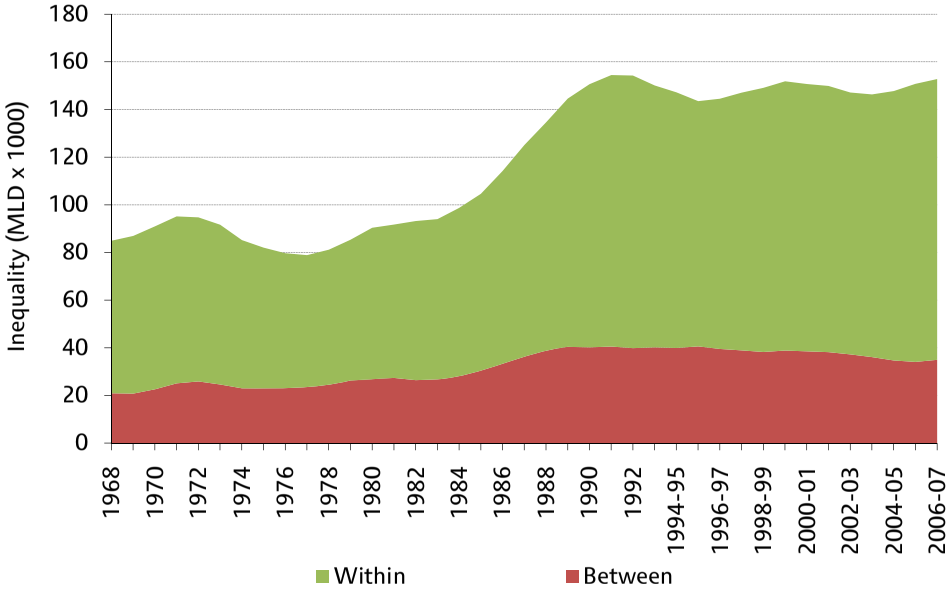


Fig A7.2. Within-group income inequality, by household employment structure

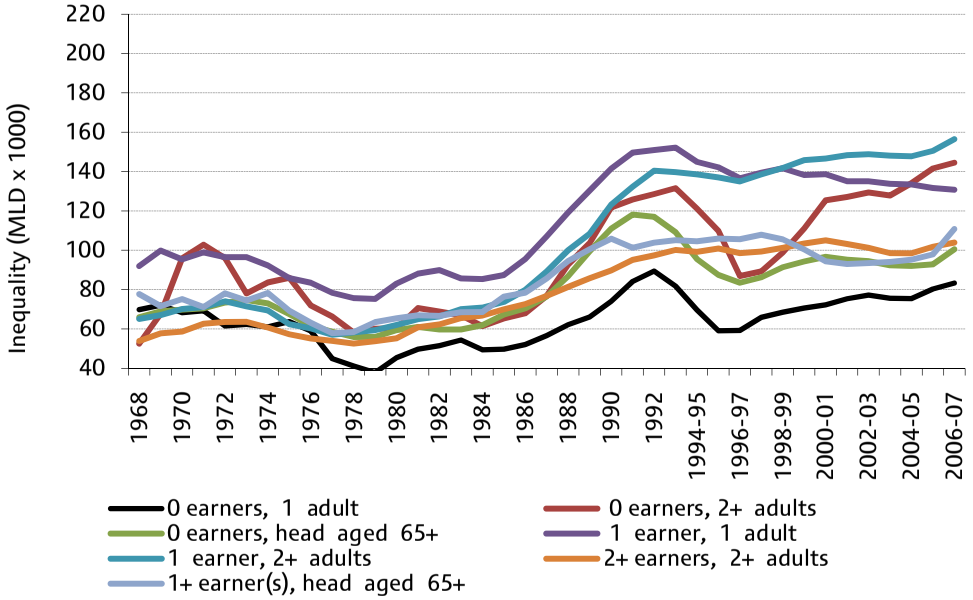


Fig. A7.3. Population shares, by household employment structure

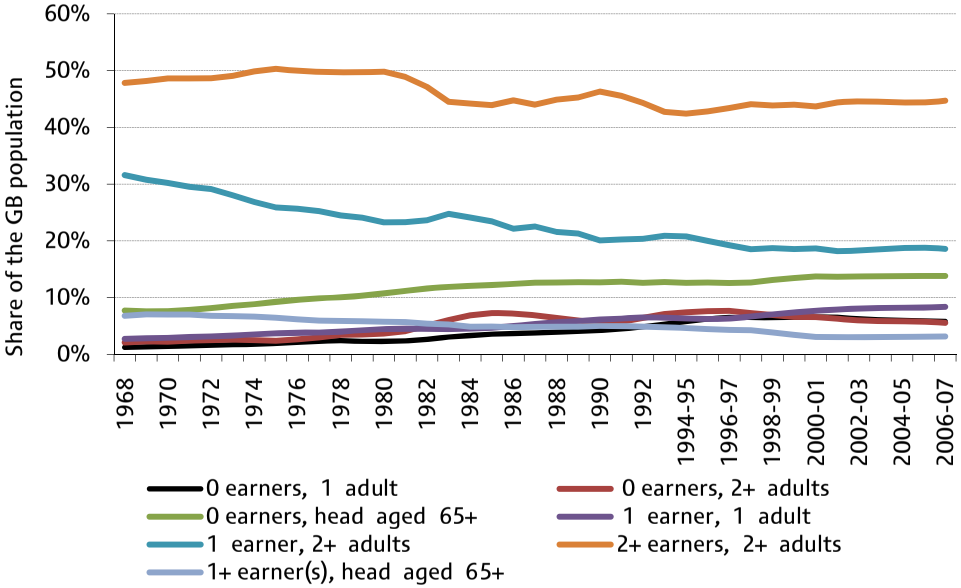
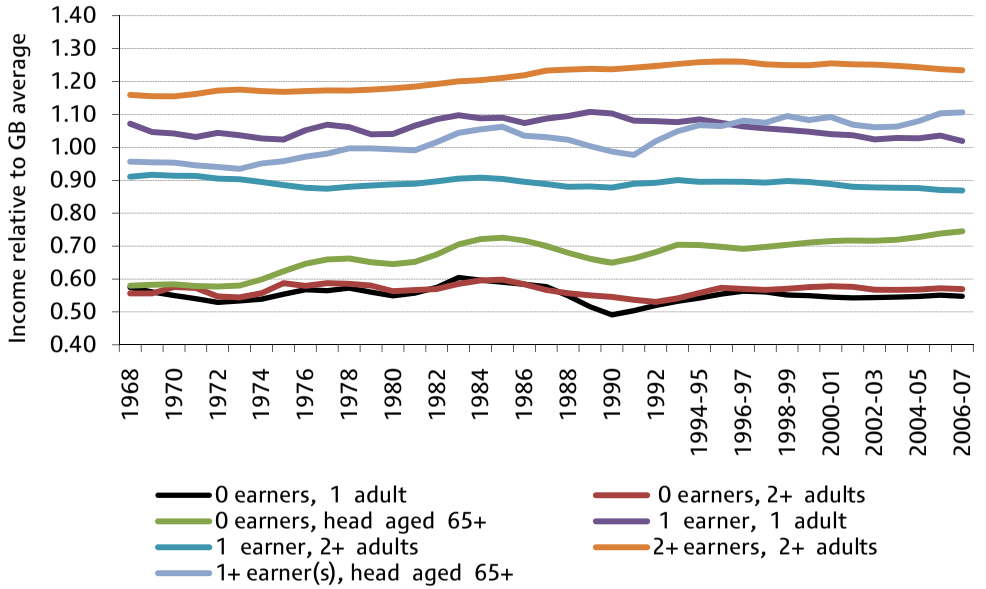


Fig. A7.4. Mean income (relative to British average), by household employment structure



Note: All figures smoothed using three-year moving averages.

Fig. A8.1. Earnings inequality – within and between part-time/full-time workers

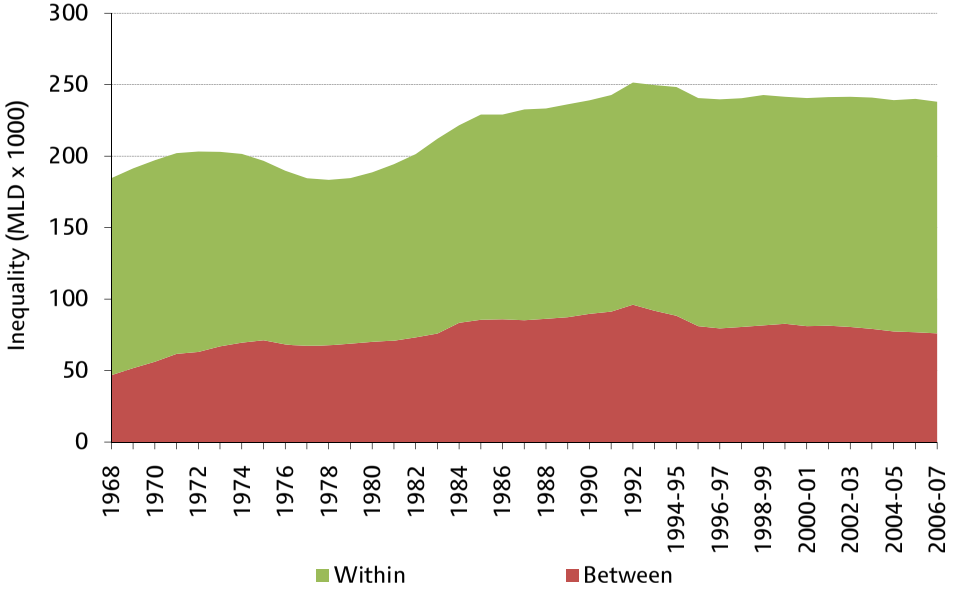


Fig. A8.2. Within-group earnings inequality, by part-time/full-time

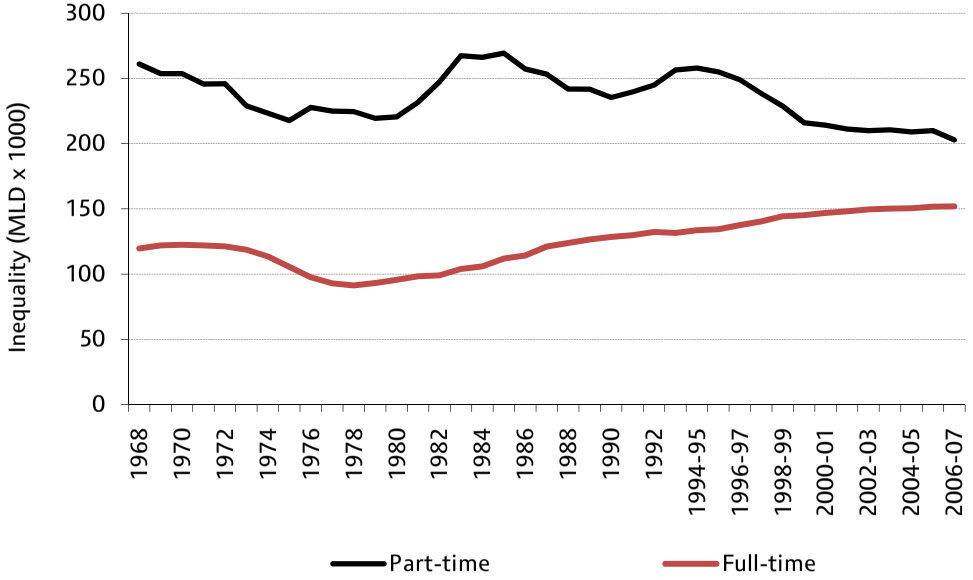


Fig. A8.3. Workforce shares, by part-time/full-time

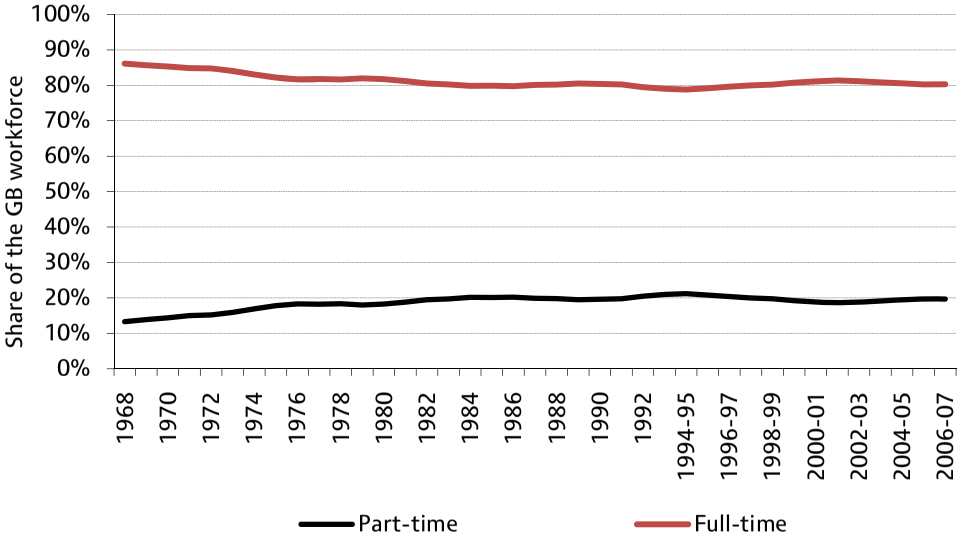
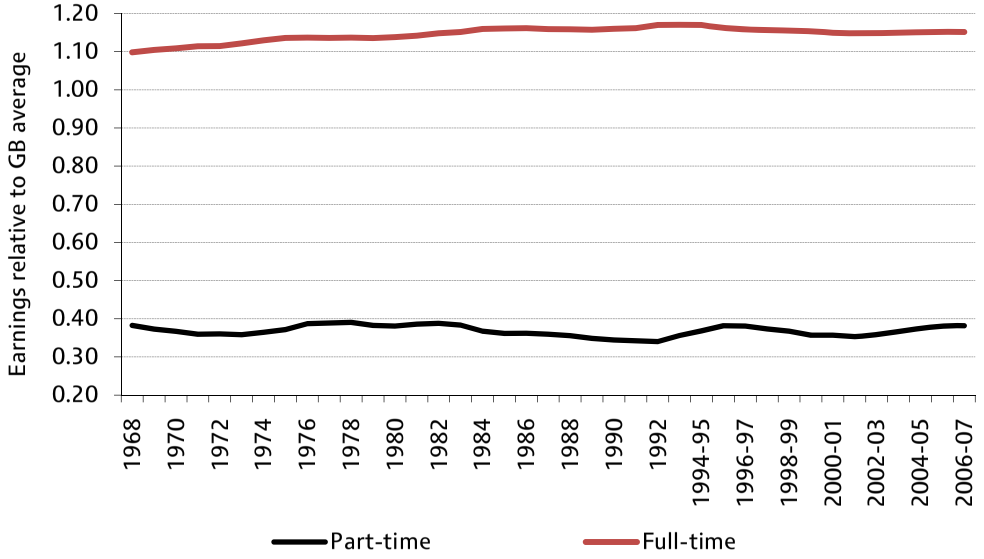


Fig. A8.4. Mean earnings (relative to British average), by part-time/full-time



Note: All figures smoothed using three-year moving averages.

Fig. A9.1. Income inequality – within and between regions

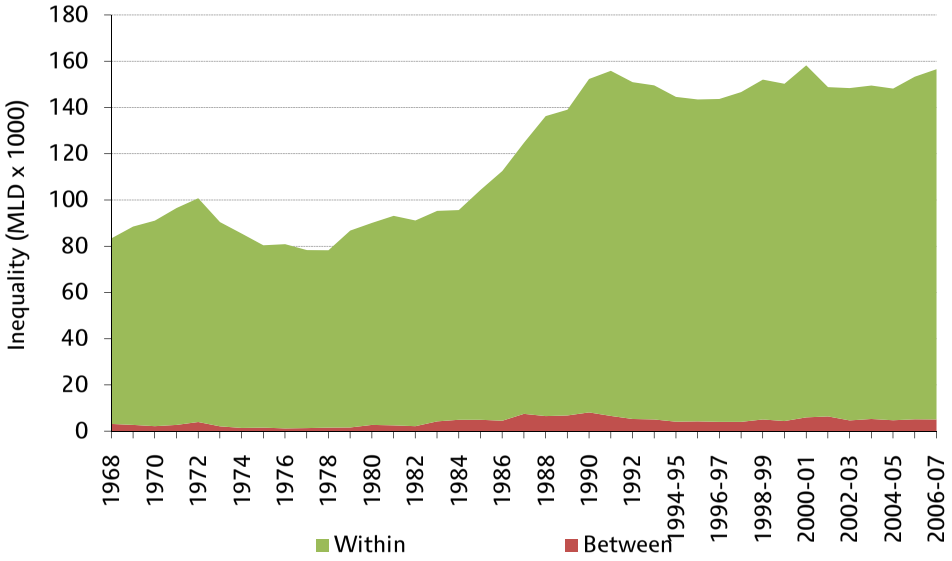


Fig. A9.2. Within-region income inequality

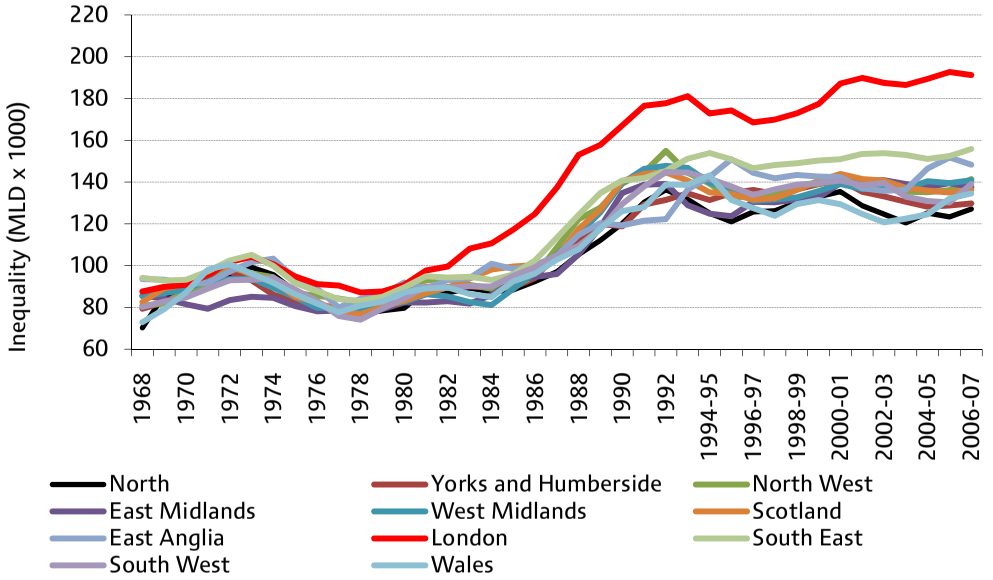


Fig. A9.3. Population shares, by region

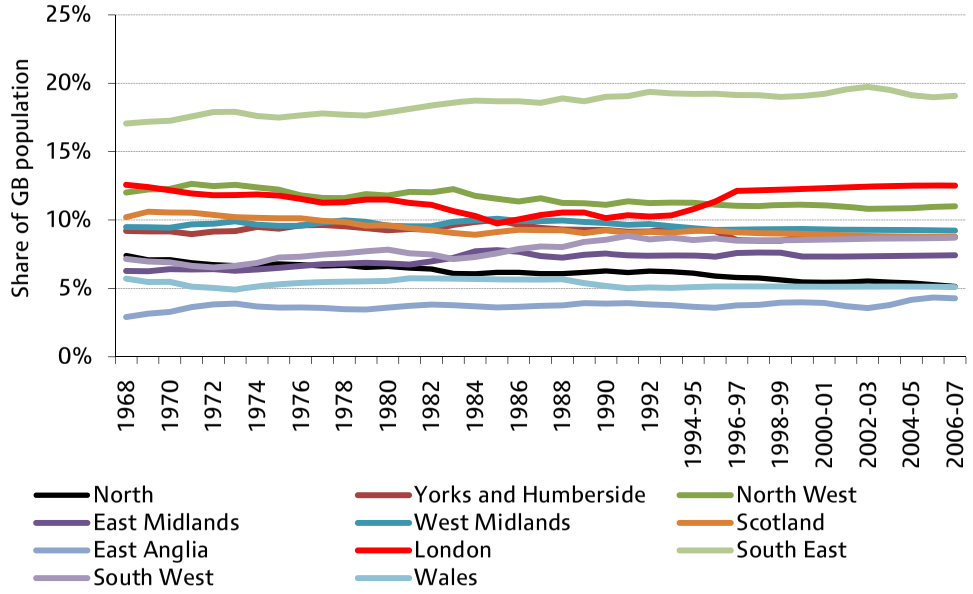
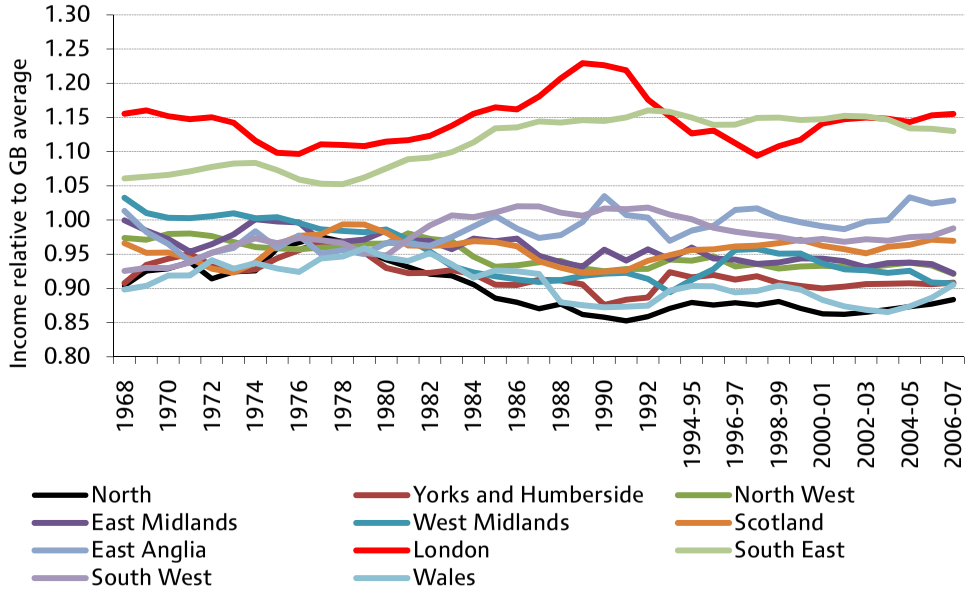


Fig. A9.4. Mean income (relative to British average), by region



Note: All figures smoothed using three-year moving averages.

Fig. A10.1. Earnings inequality – within and between regions

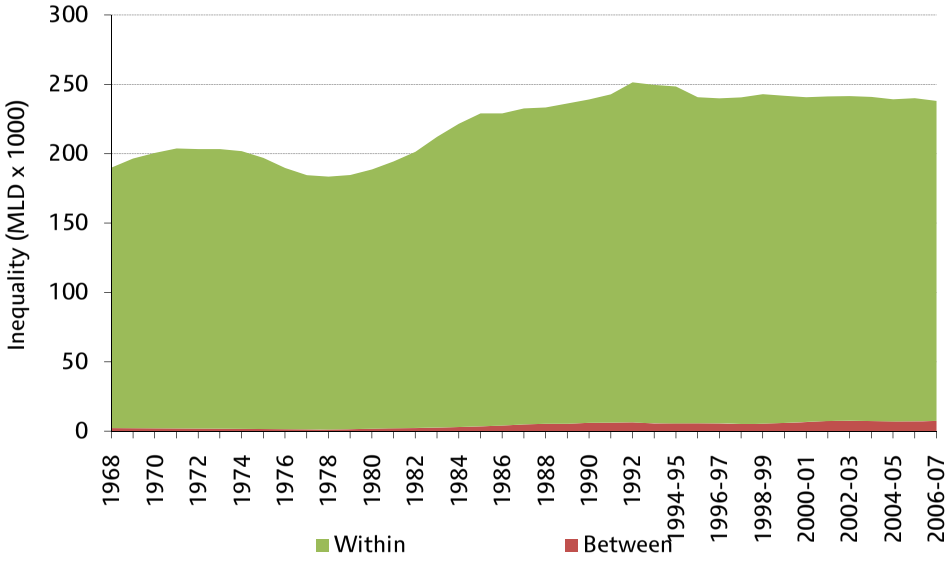


Fig. A10.2. Within-region earnings inequality

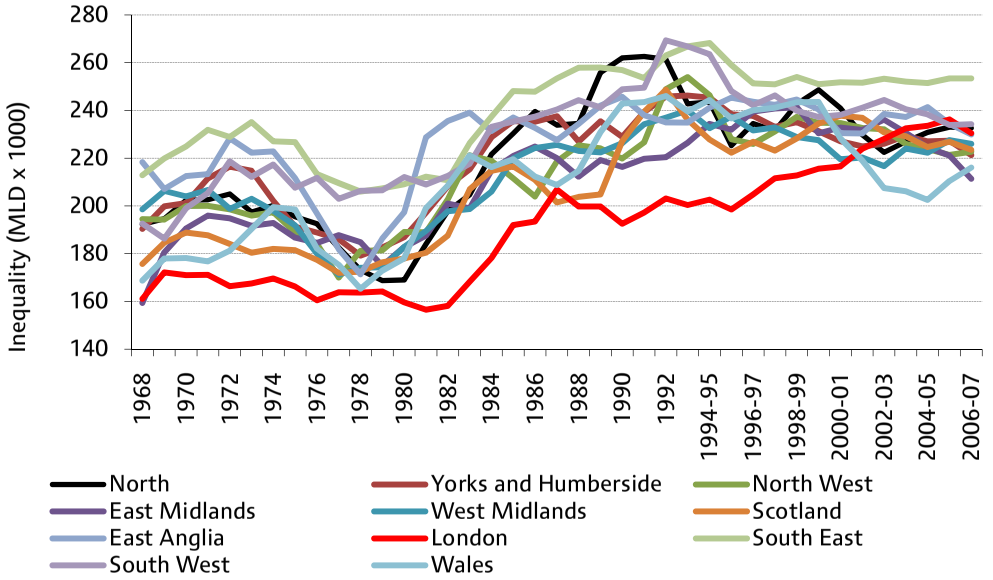


Fig. A10.3. Workforce shares, by region

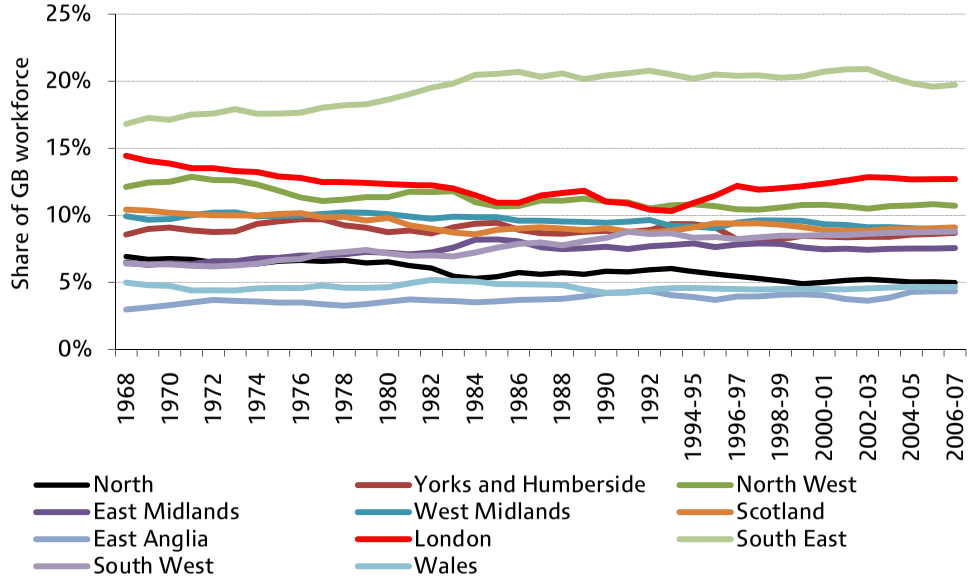
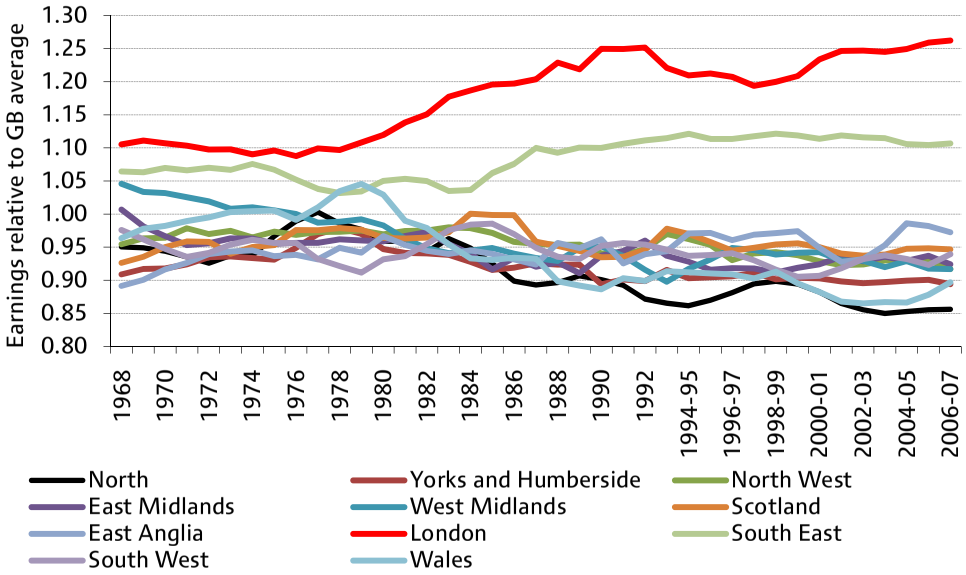


Fig. A10.4. Mean earnings (relative to British average), by region



Note: All figures smoothed using three-year moving averages.

Fig. A11.1. Income inequality – within and between education groups

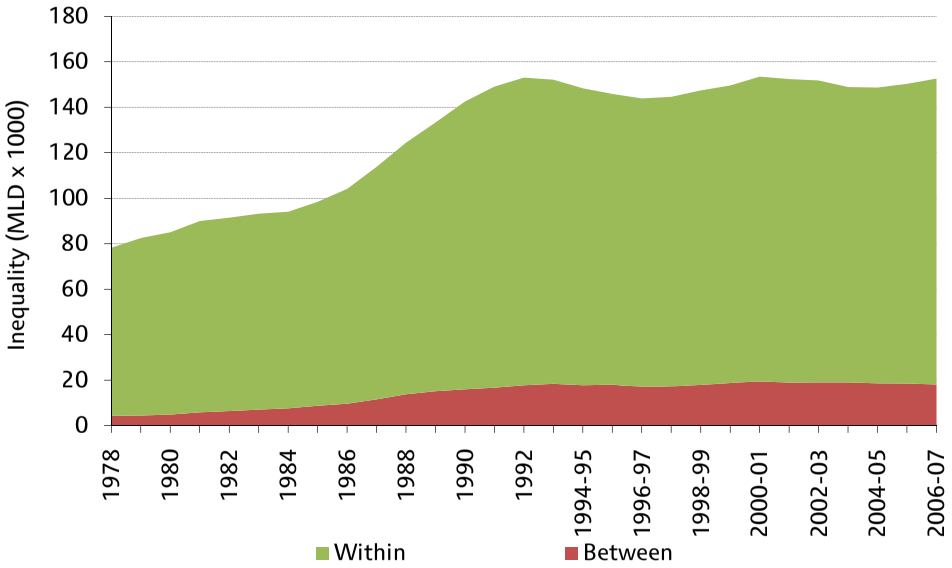


Fig. A11.2. Within-education-group income inequality

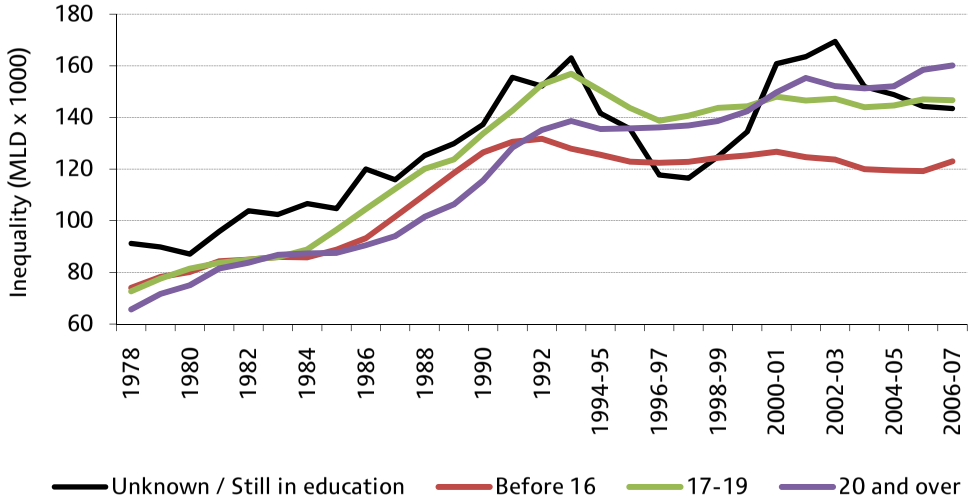


Fig. A11.3. Population shares, by education of head of household

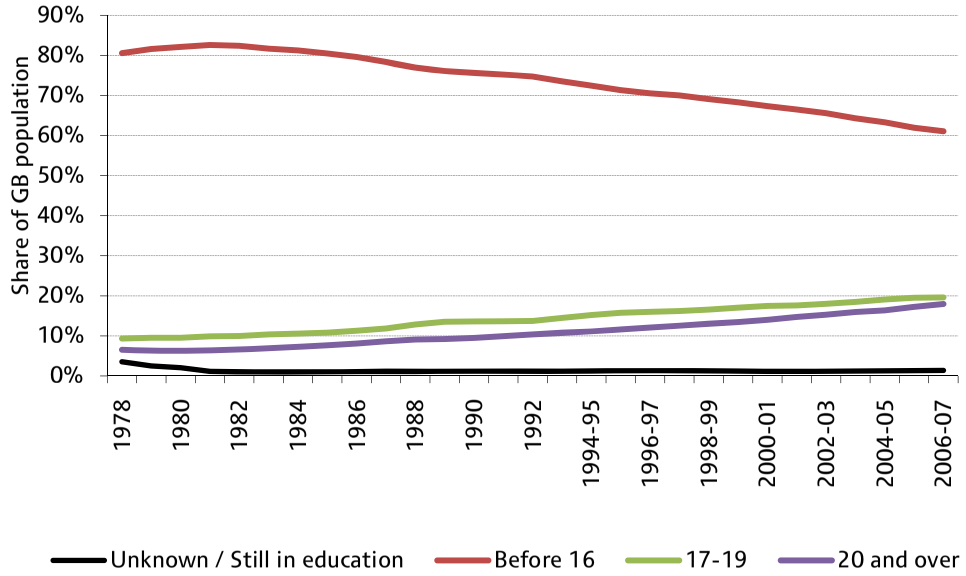
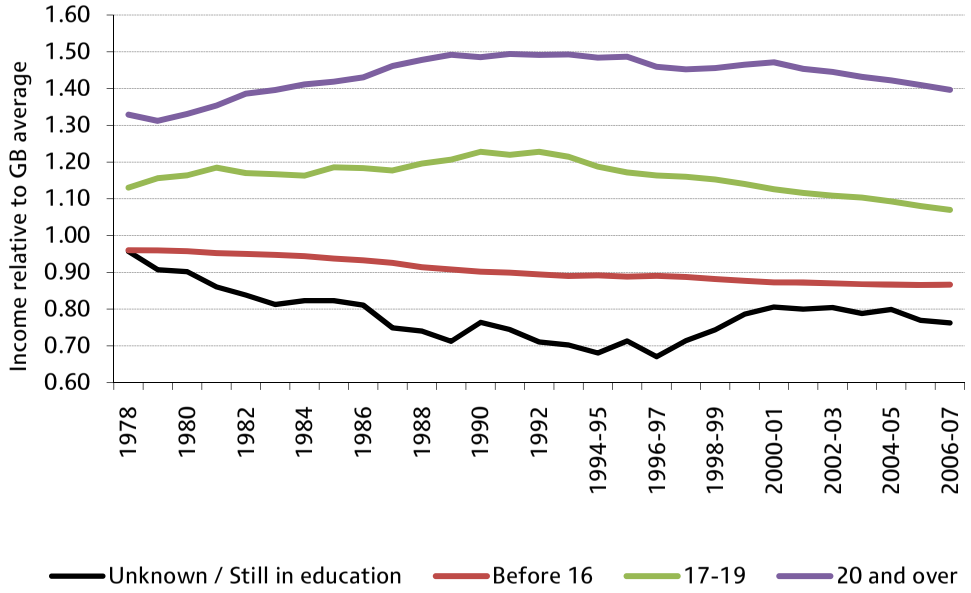


Fig. A11.4. Mean income (relative to British average), by education of head of household



Note: All figures smoothed using three-year moving averages.

Fig. A12.1. Earnings inequality – within and between education groups

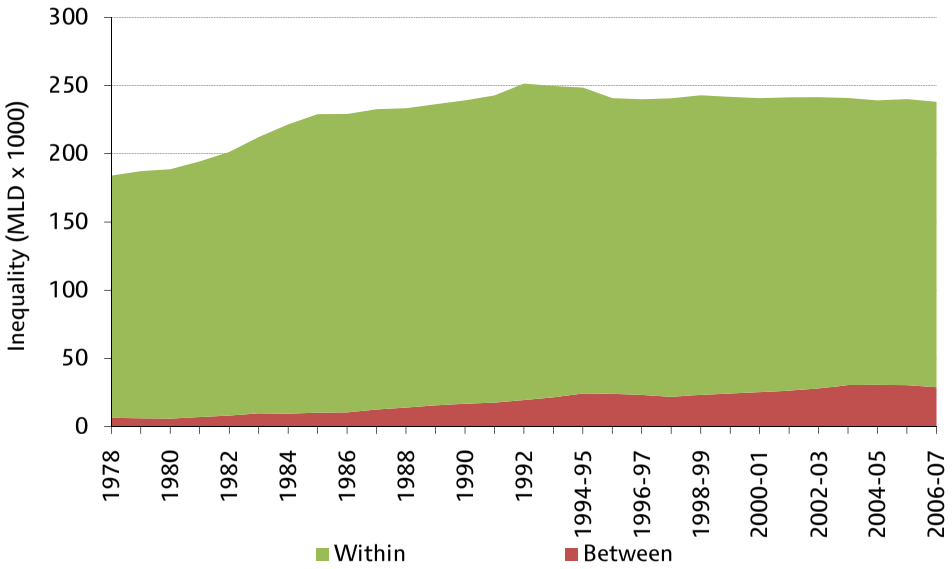


Fig. A12.2. Within-education-group earnings inequality

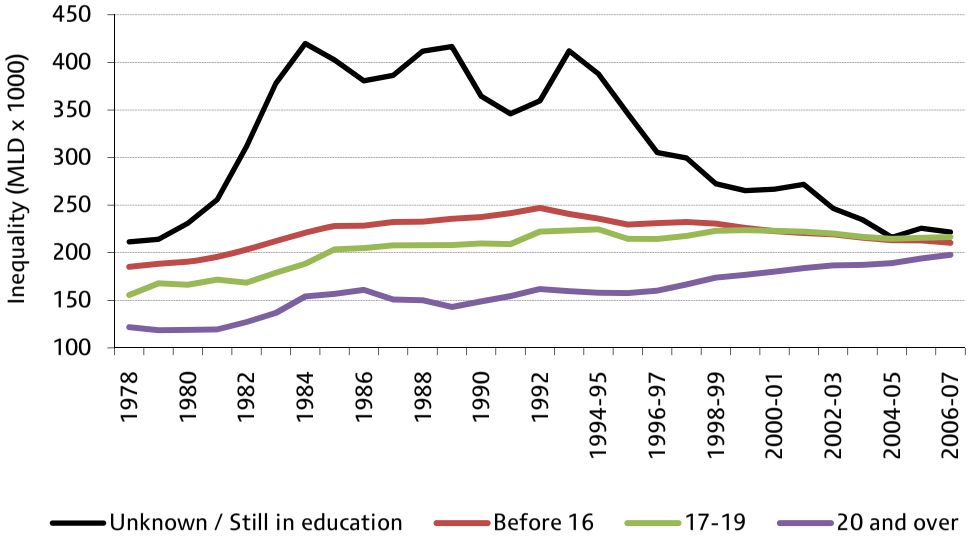


Fig. A12.3. Workforce shares, by education

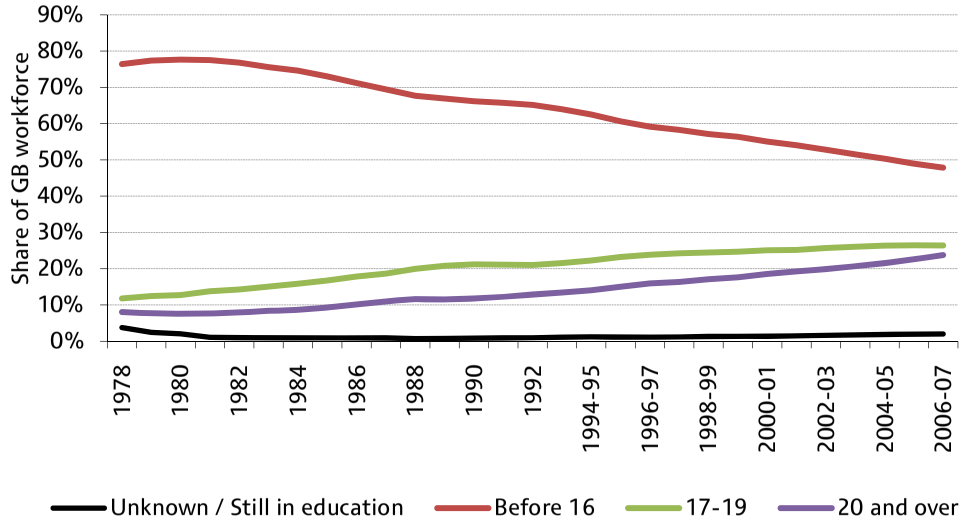
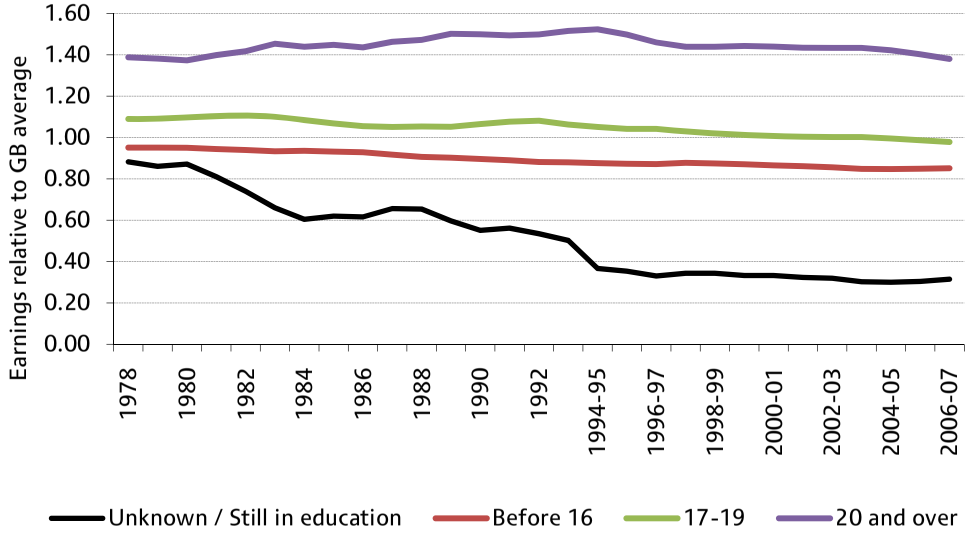


Fig. A12.4. Mean earnings (relative to British average), by education



Note: All figures smoothed using three-year moving averages.

Fig. A13.1. Earnings inequality – within and between occupation groups, 1968 to 1986

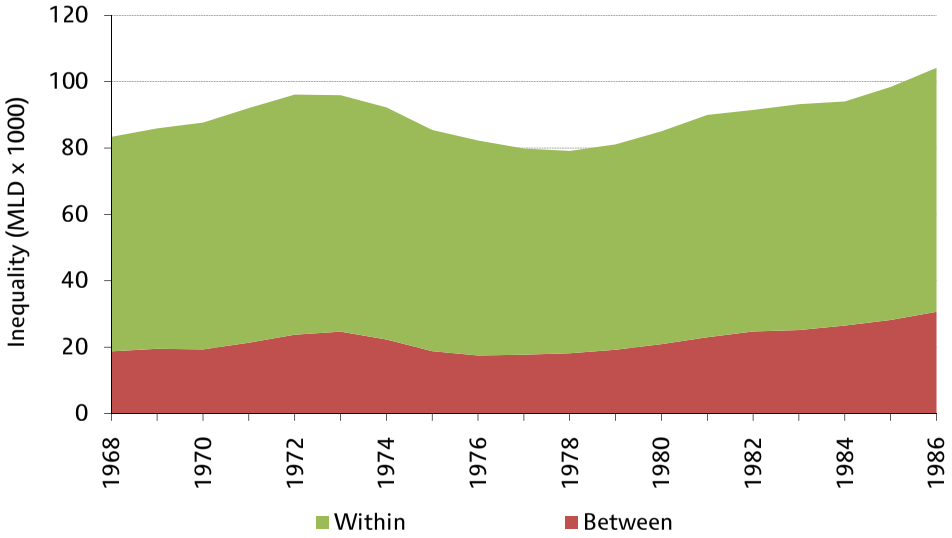


Fig. A13.2. Within-occupation-group earnings inequality, 1968 to 1986

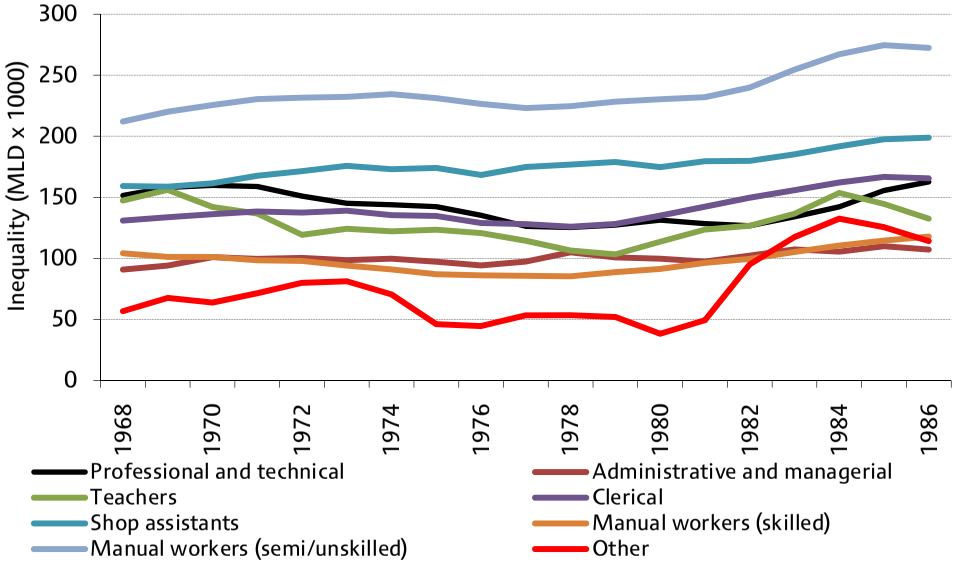


Fig. A13.3. Workforce shares, by occupation, 1968 to 1986

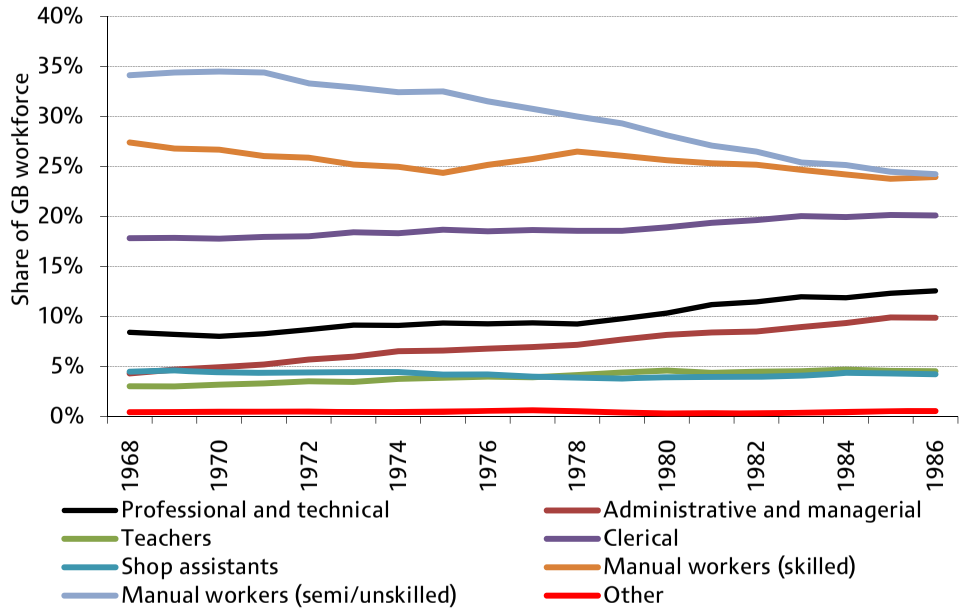
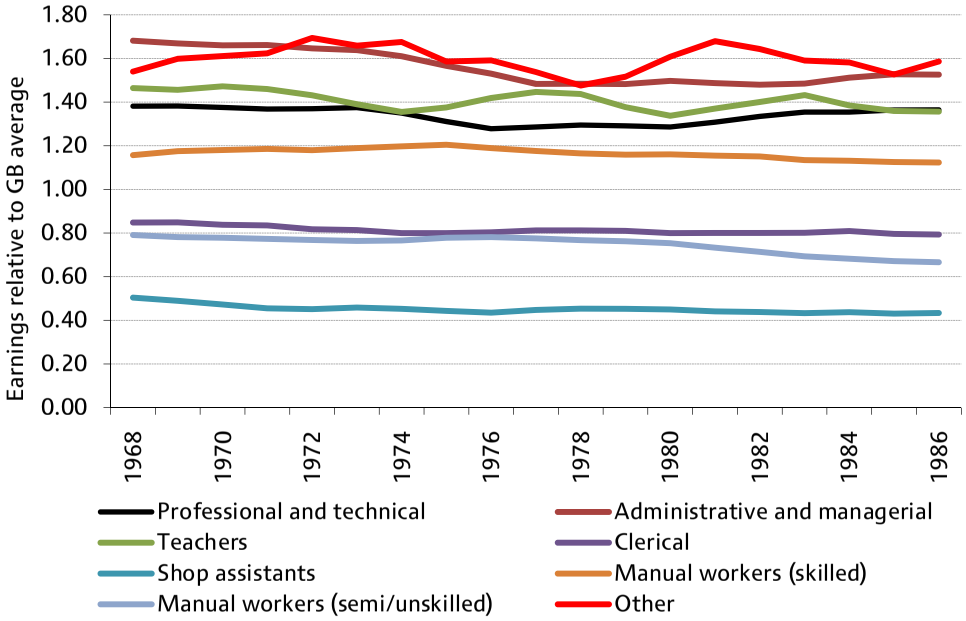


Fig. A13.4. Mean earnings (relative to British average), by occupation, 1968 to 1986



Note: All figures smoothed using three-year moving averages.

Fig. A13.5. Earnings inequality – within and between occupation groups, 1987 to 2000–01

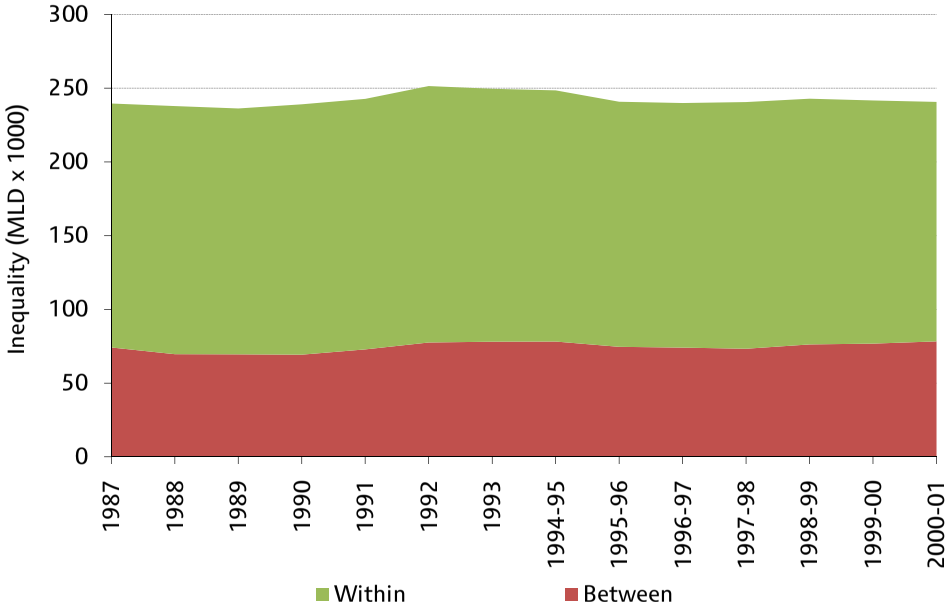


Fig. A13.6. Within-occupation-group earnings inequality, 1987 to 2000–01

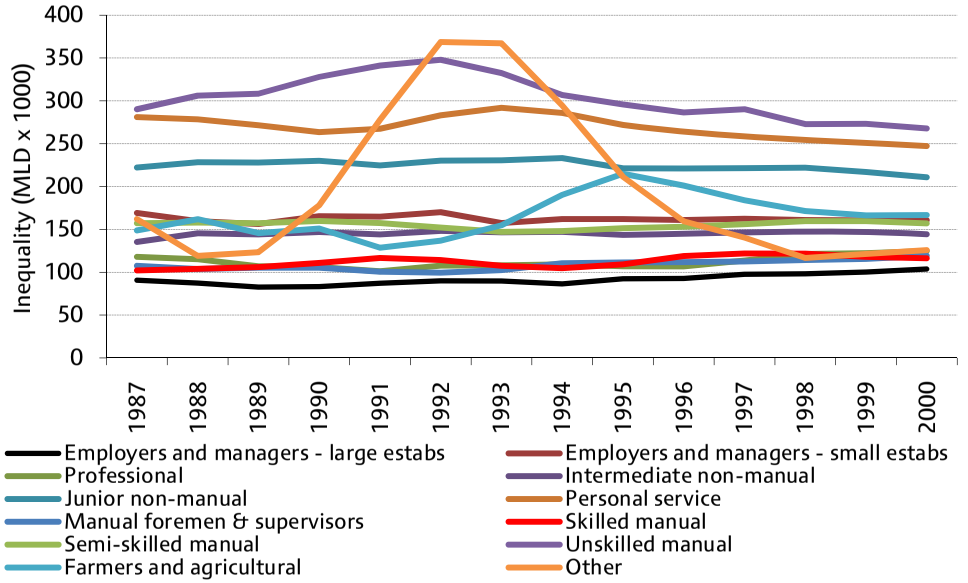


Fig. A13.7. Workforce shares, by occupation, 1987 to 2000–01

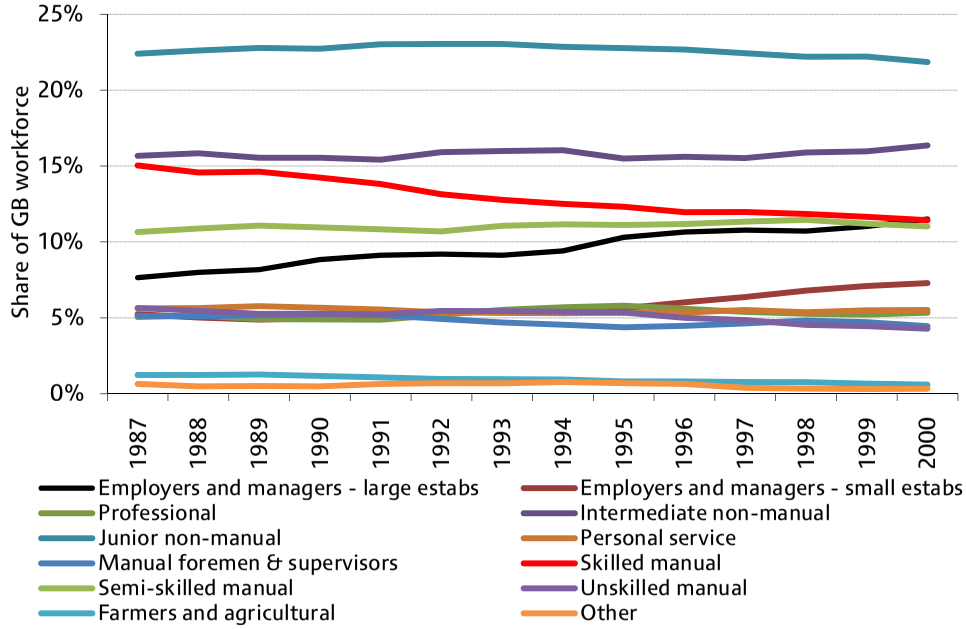
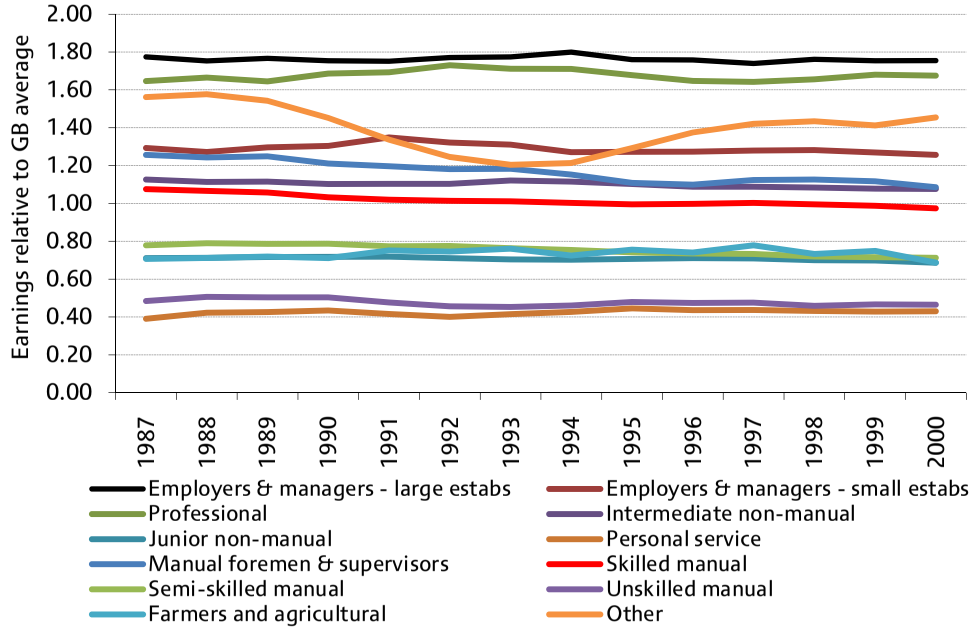


Fig. A13.8. Mean earnings (relative to British average), by occupation, 1987 to 2000–01



Note: All figures smoothed using three-year moving averages.

Fig. A13.9. Earnings inequality – within and between occupation groups, 2001–02 to 2006–07

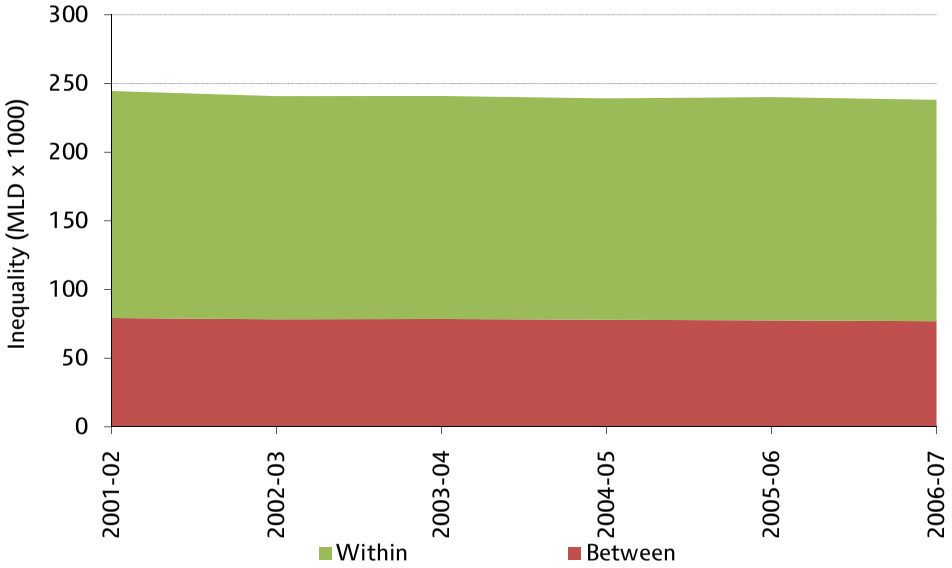


Fig. A13.10. Within-occupation-group earnings inequality, 2001–02 to 2006–07

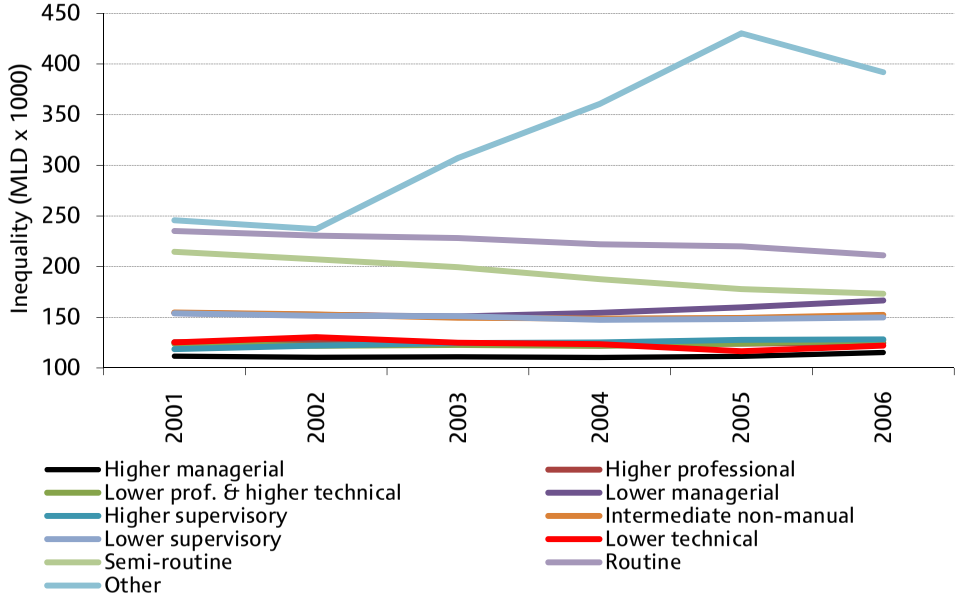


Fig. A13.11. Workforce shares, by occupation, 2001–02 to 2006–07

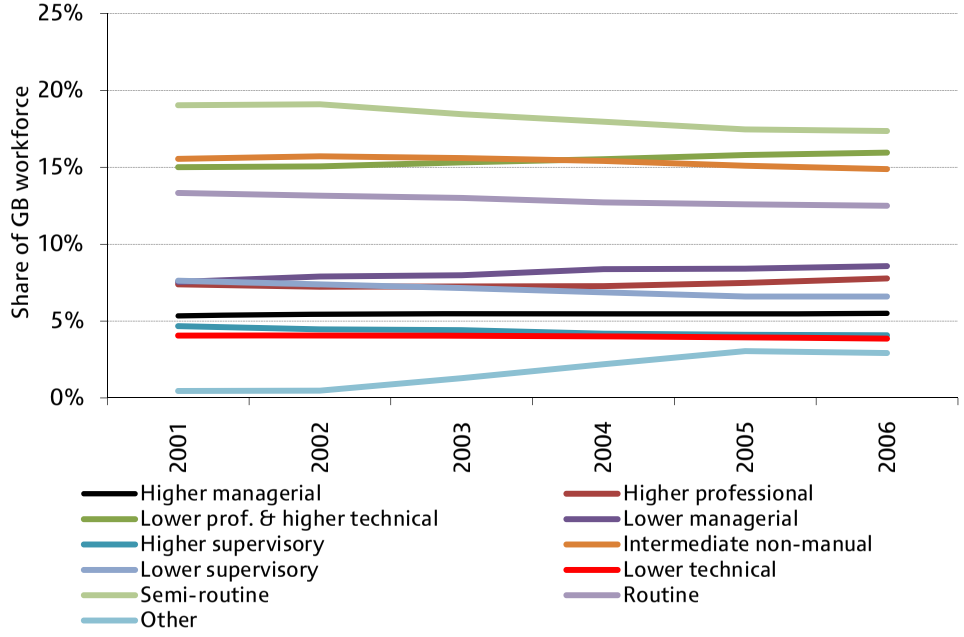
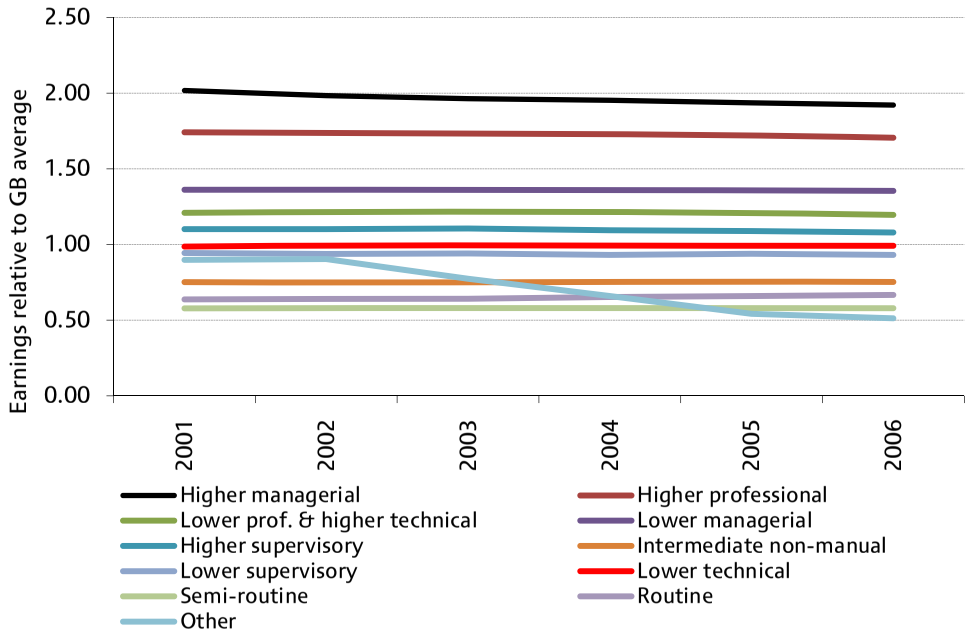


Fig. A13.12. Mean earnings (relative to British average), by occupation, 2001–02 to 2006–07



Note: All figures smoothed using three-year moving averages.

Fig. A14.1. Income inequality – within and between ethnic groups

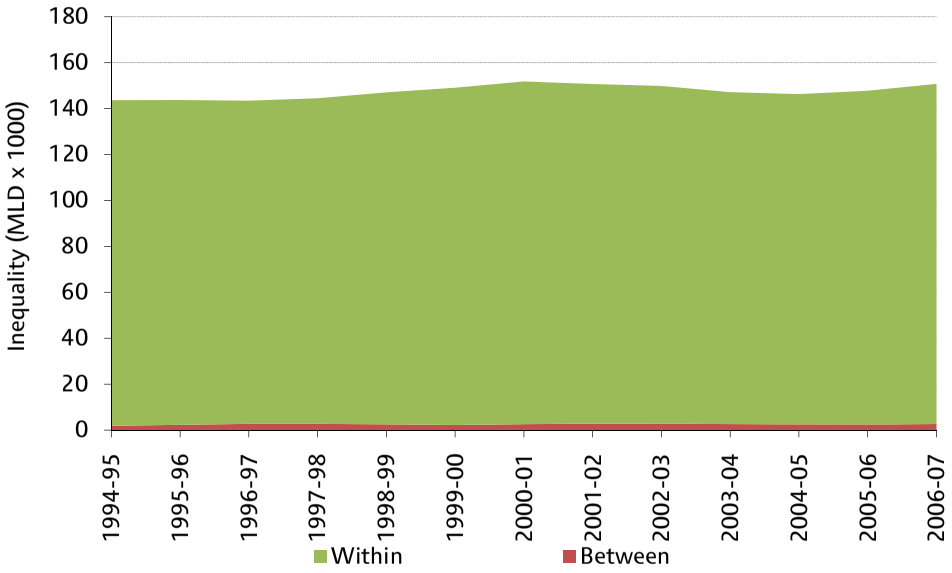


Fig. A14.2. Within-group income inequality, by ethnicity of head of household

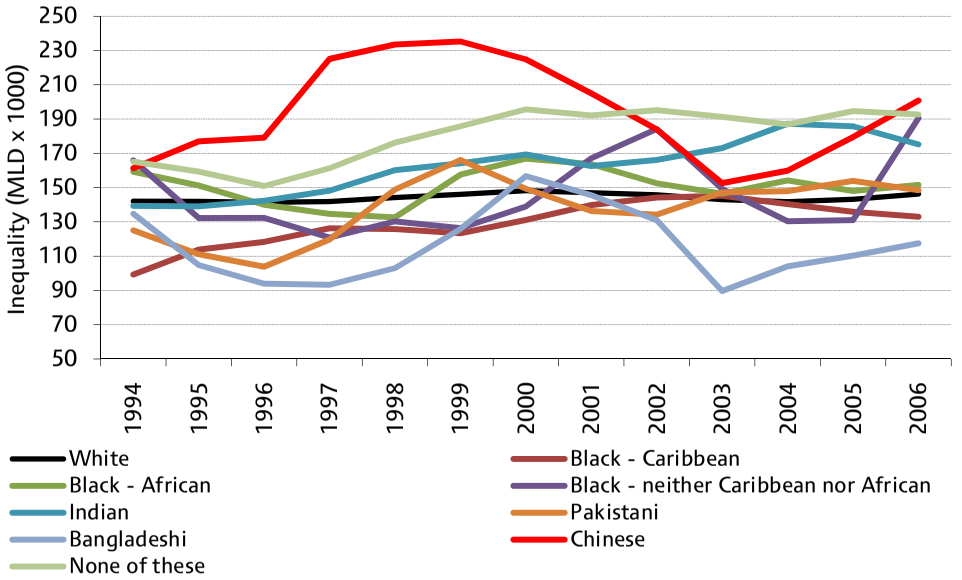


Fig. A14.3. Population shares, by ethnicity of head of household

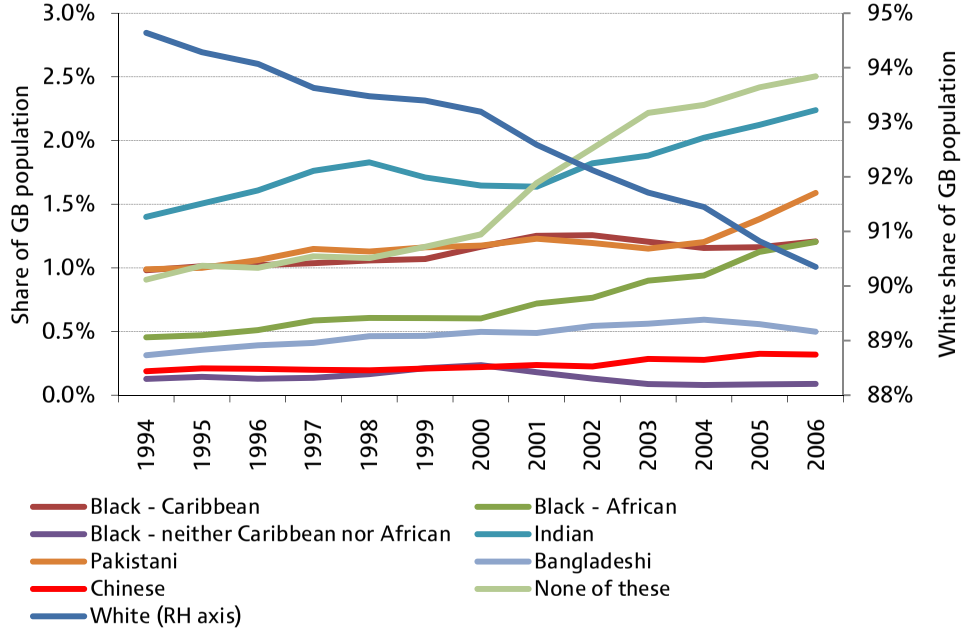
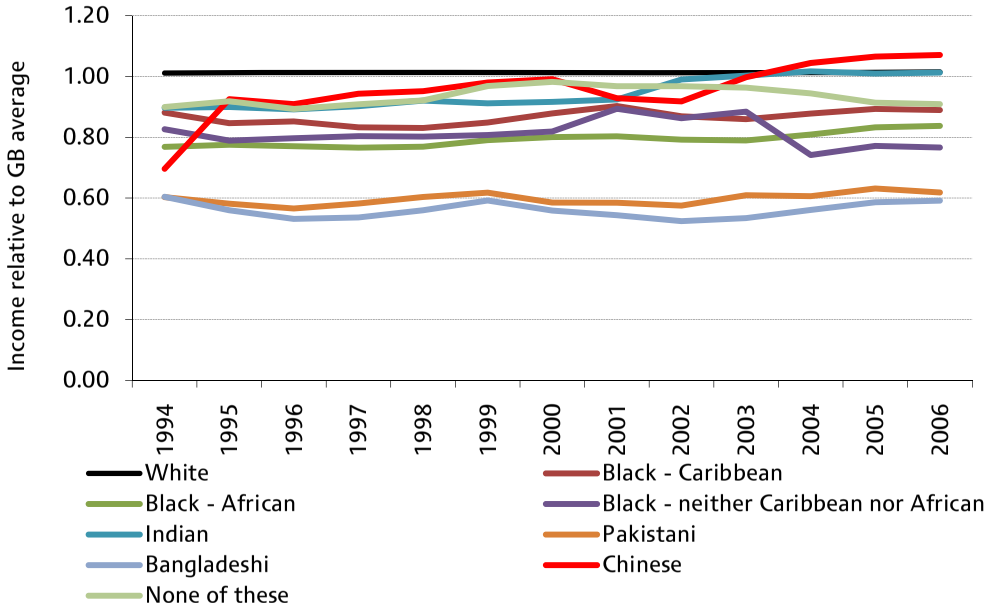


Fig. A14.4. Mean income (relative to British average), by ethnicity of head of household



Note: All figures smoothed using three-year moving averages.

Fig. A15.1. Earnings inequality – within and between ethnic groups

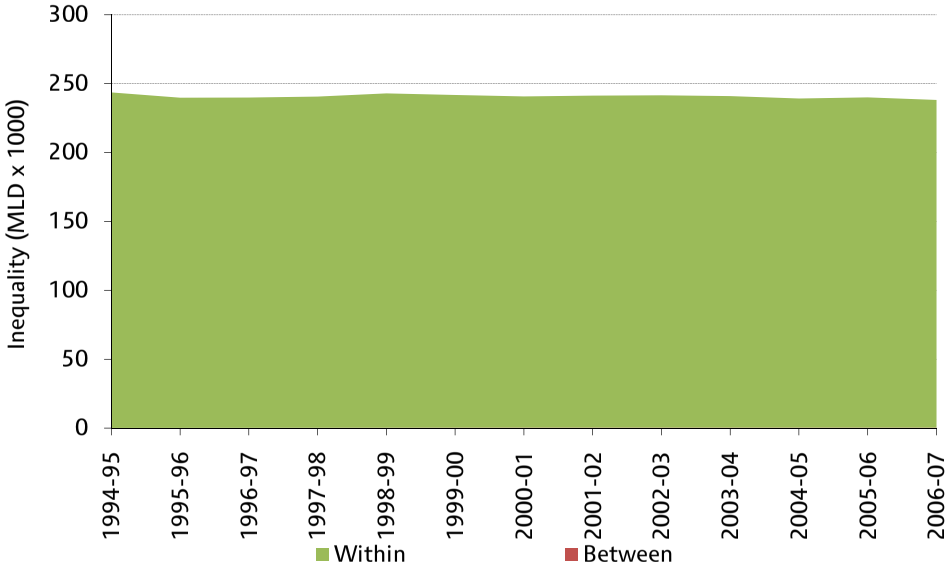


Fig. A15.2. Within-group earnings inequality, by ethnicity

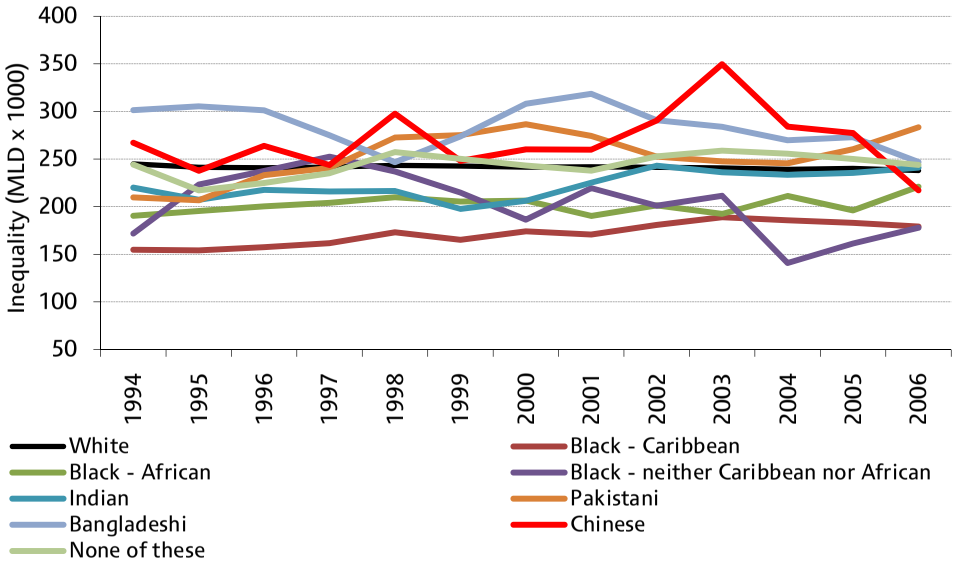


Fig. A15.3. Workforce shares, by ethnicity

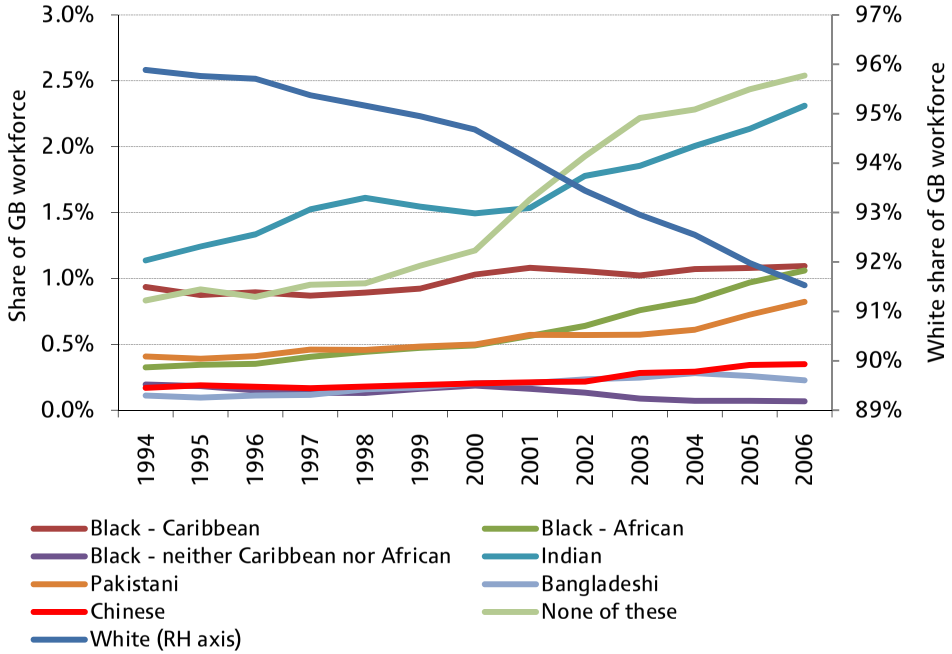
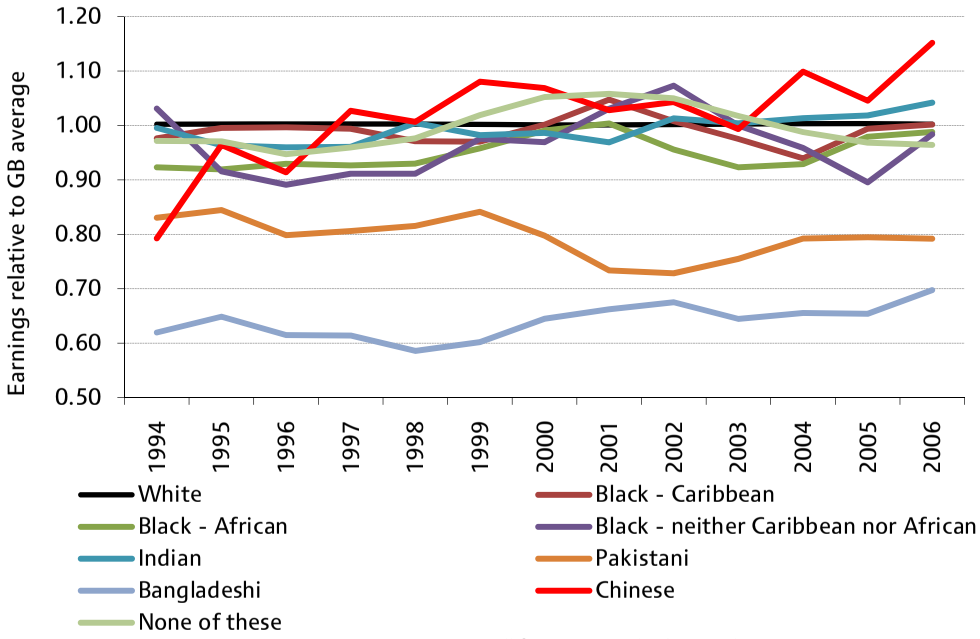


Fig. A15.4. Mean earnings (relative to British average), by ethnicity



Note: All figures smoothed using three-year moving averages.

Fig. A16.1. Income inequality – within and between groups, by health of HOH

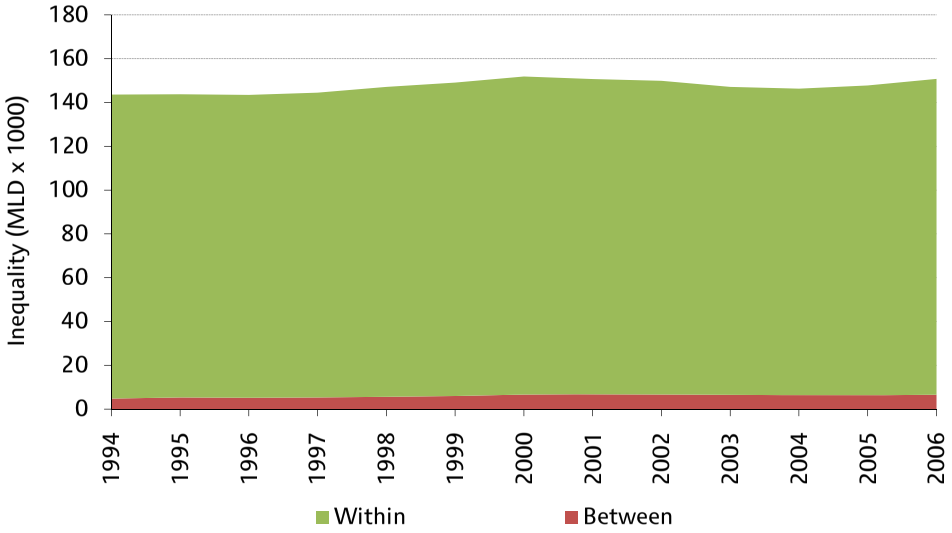


Fig. A16.2. Within-group income inequality, by health of head of household

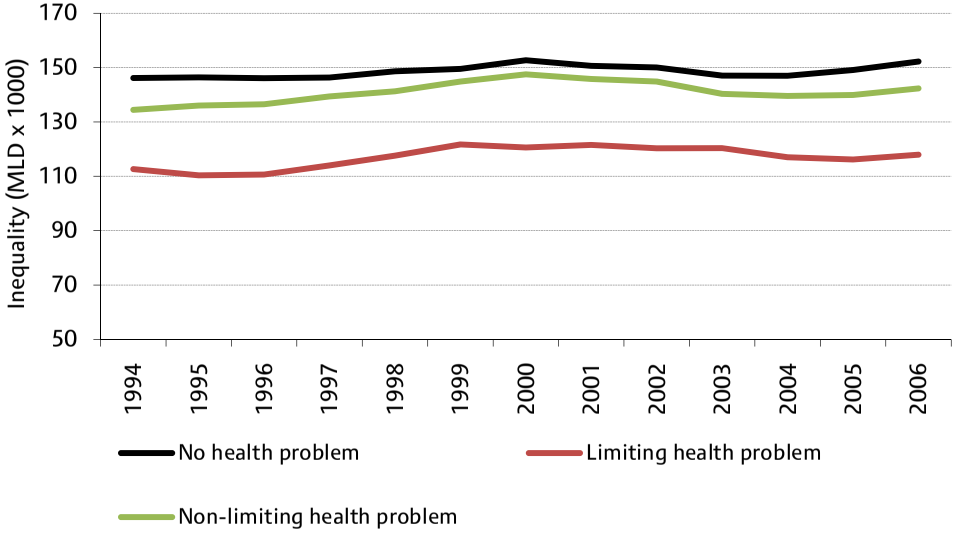


Fig. A16.3. Population shares, by health of head of household

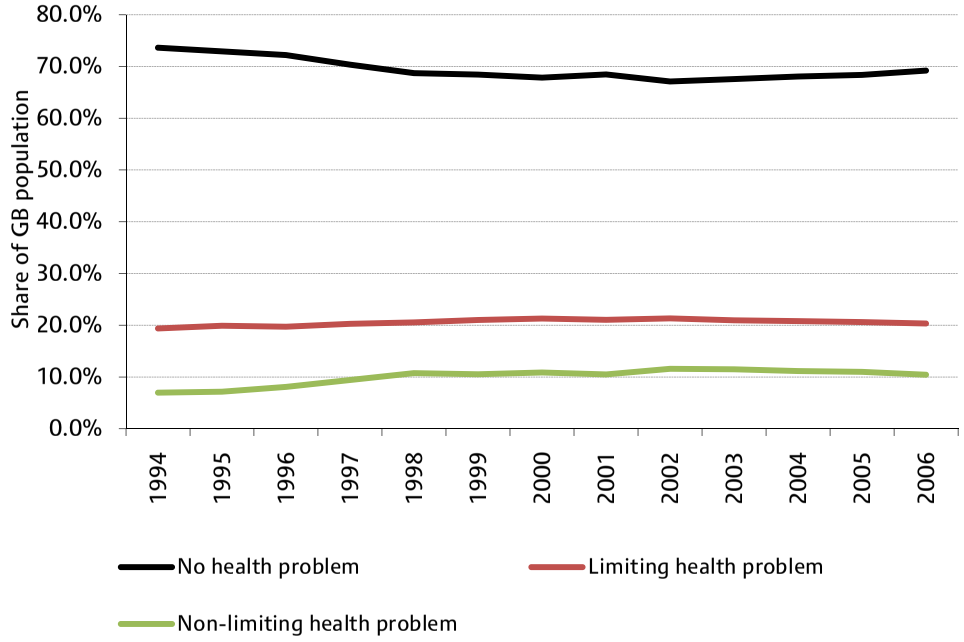
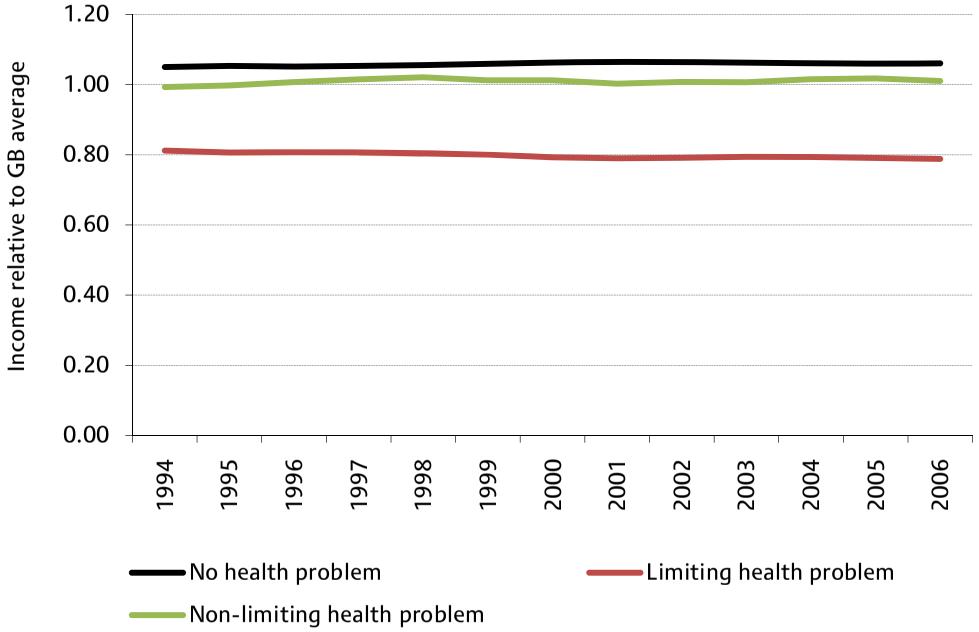


Fig. A16.4. Mean income (relative to British average), by health of head of household



Note: All figures smoothed using three-year moving averages.

Fig. A17.1. Income inequality – within and between groups, by housing tenure

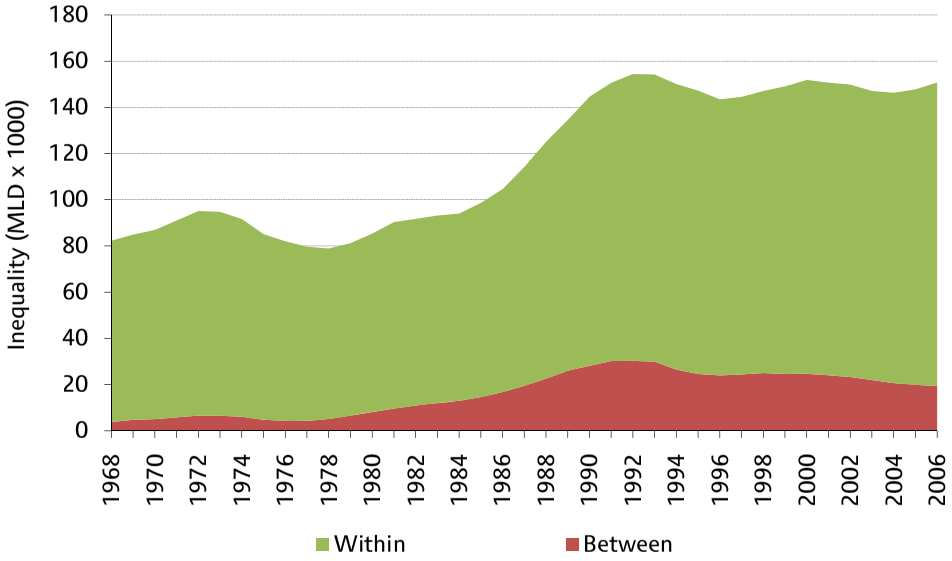


Fig. A17.2. Within-group income inequality, by housing tenure

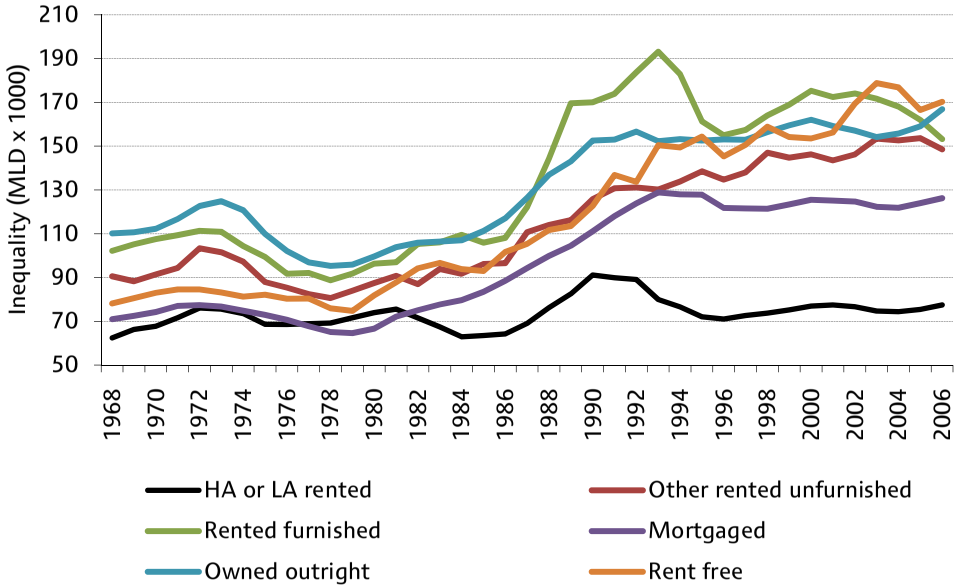


Fig. A17.3. Population shares, by housing tenure

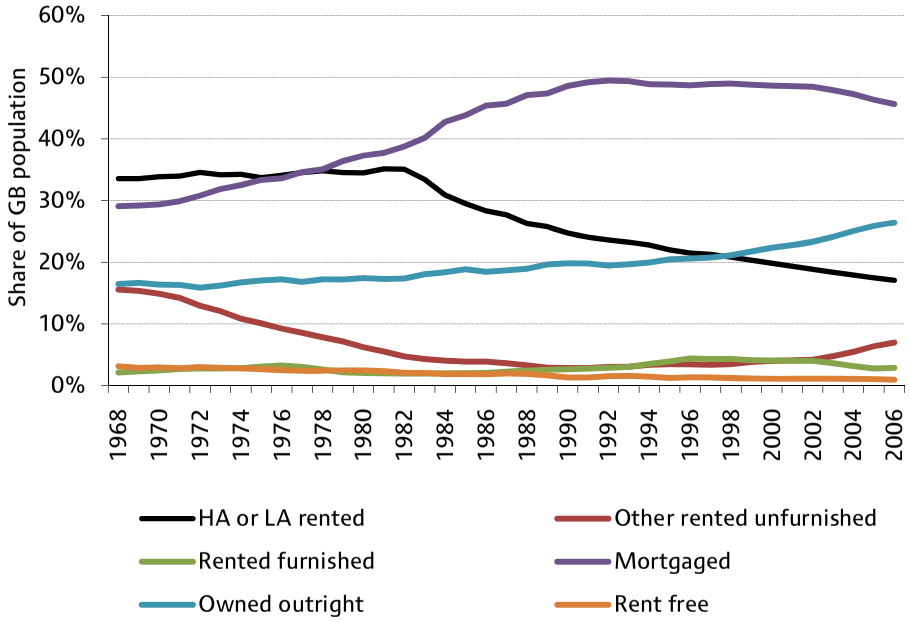
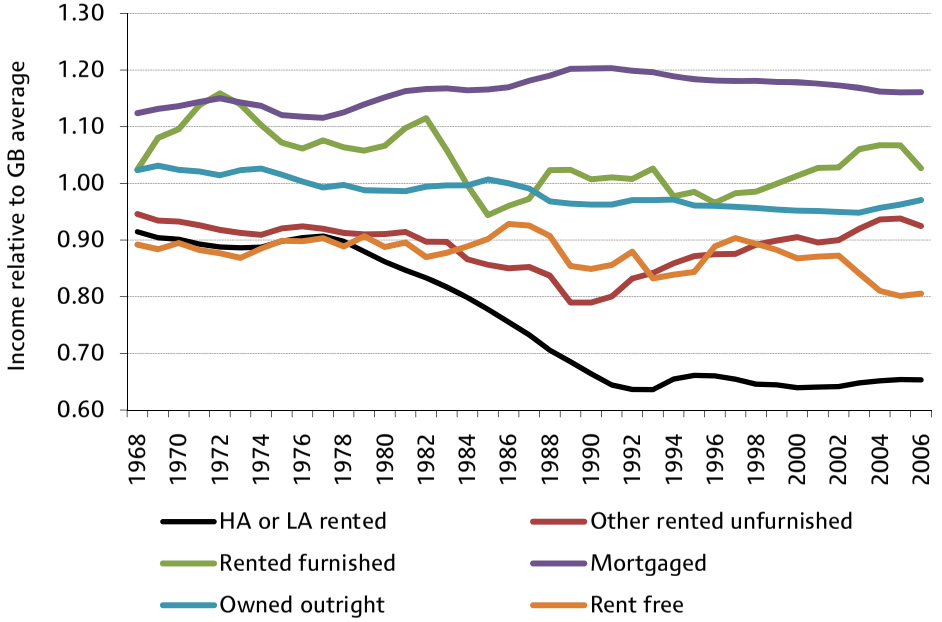


Fig. A17.4. Mean income (relative to British average), by housing tenure



Note: All figures smoothed using three-year moving averages.

Fig. A18.1. Earnings inequality – within and between groups, by housing tenure

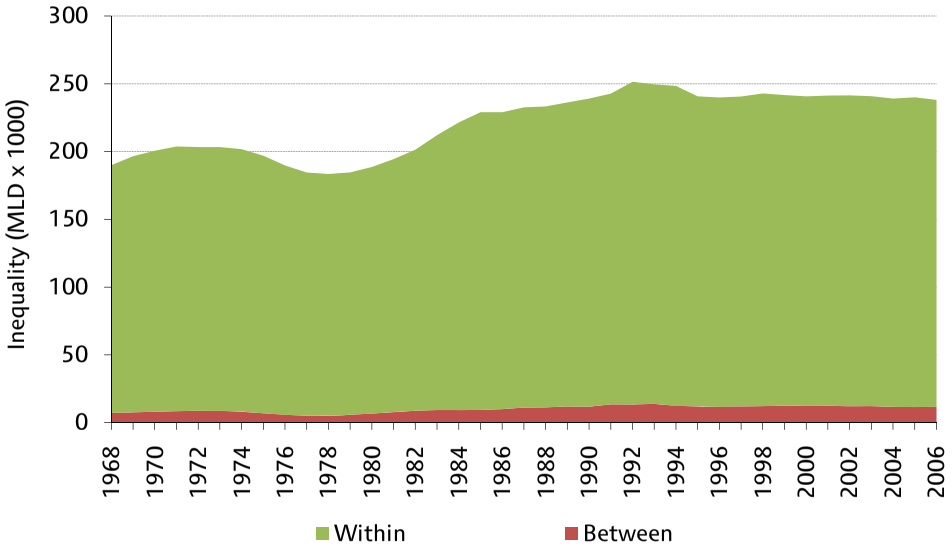


Fig. A18.2. Within-group earnings inequality, by housing tenure

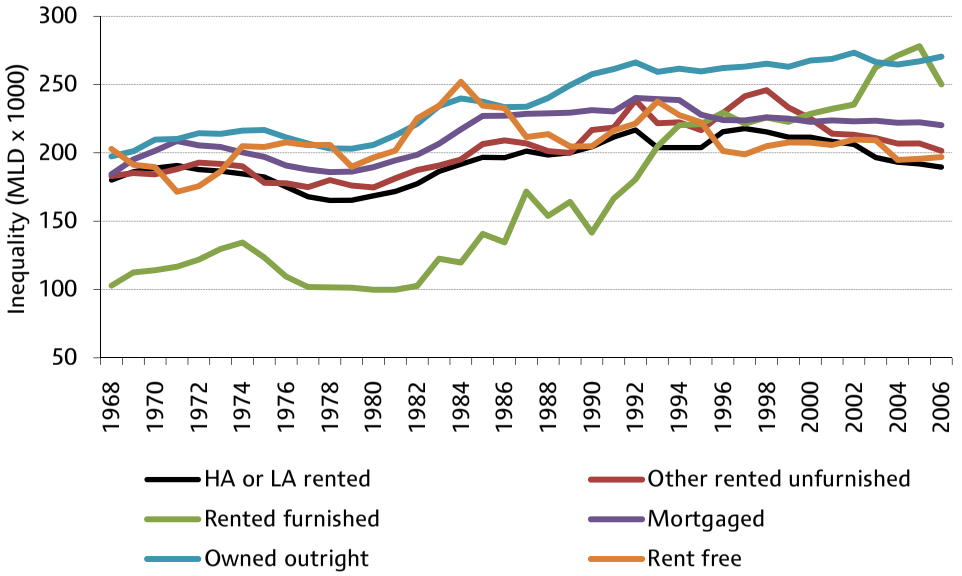


Fig. A18.3. Workforce shares, by housing tenure

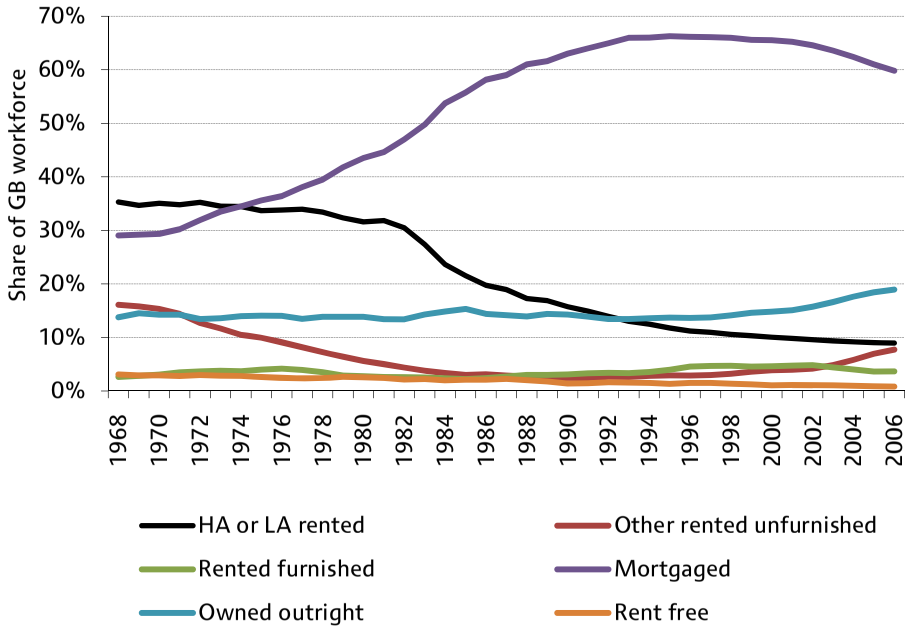
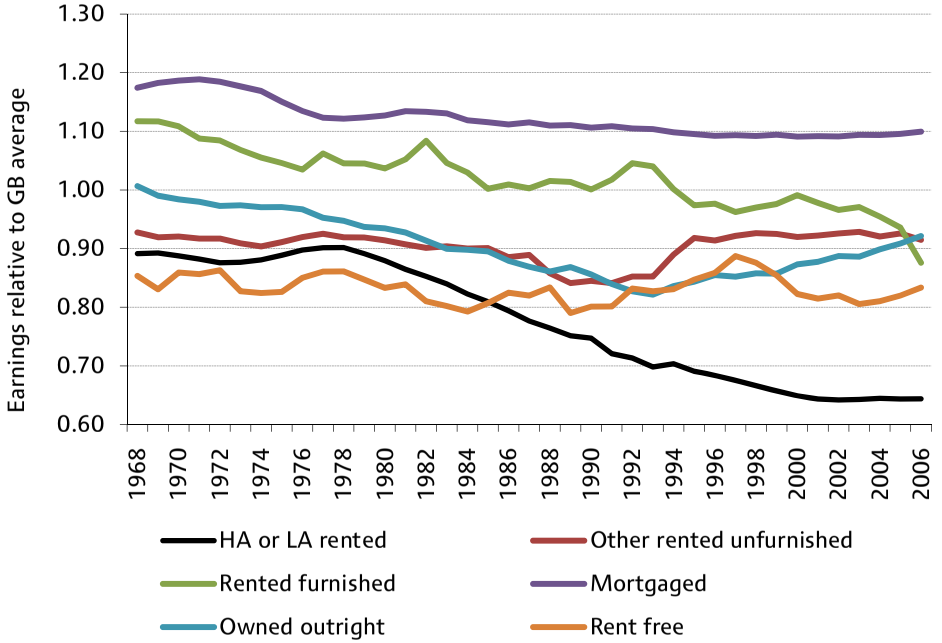


Fig. A18.4. Mean earnings (relative to British average), by housing tenure



Note: All figures smoothed using three-year moving averages.

Fig. A19.1. Income inequality – within and between groups, by income quintile (trimmed)

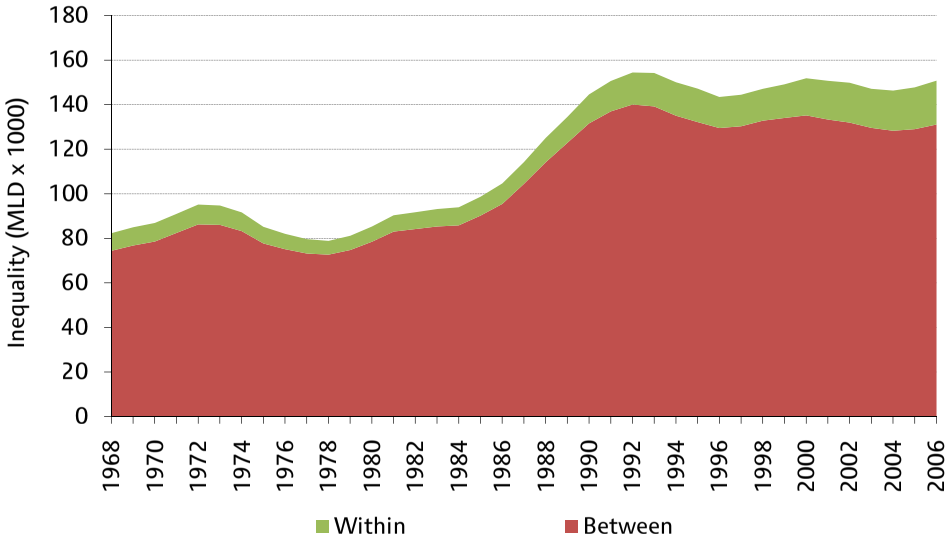
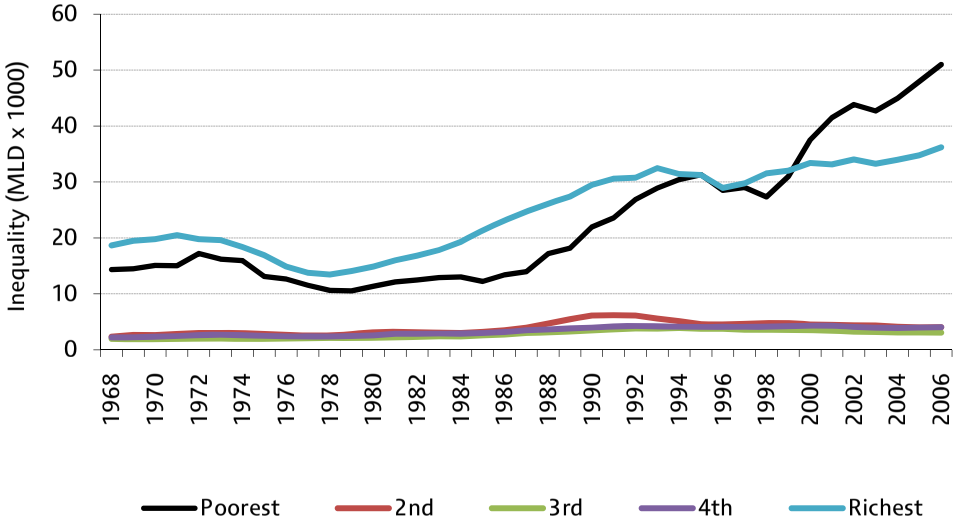


Fig. A19.2. Within-group income inequality, by income quintile (trimmed)



Note: All figures smoothed using three-year moving averages.

Fig. A19.3. Mean income (relative to British average), by income quintile (trimmed)

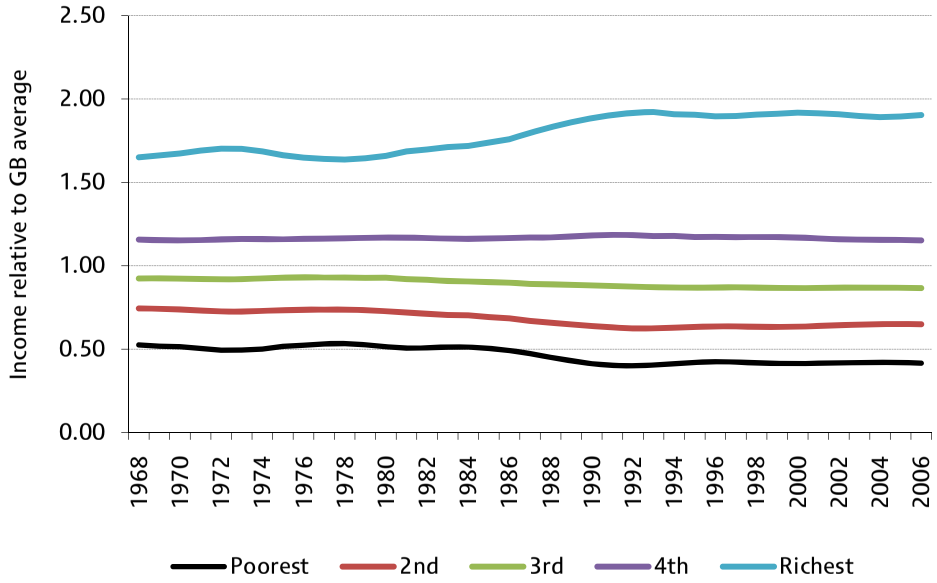


Fig. A19.4. Income inequality – within and between groups, by income quintile (untrimmed)

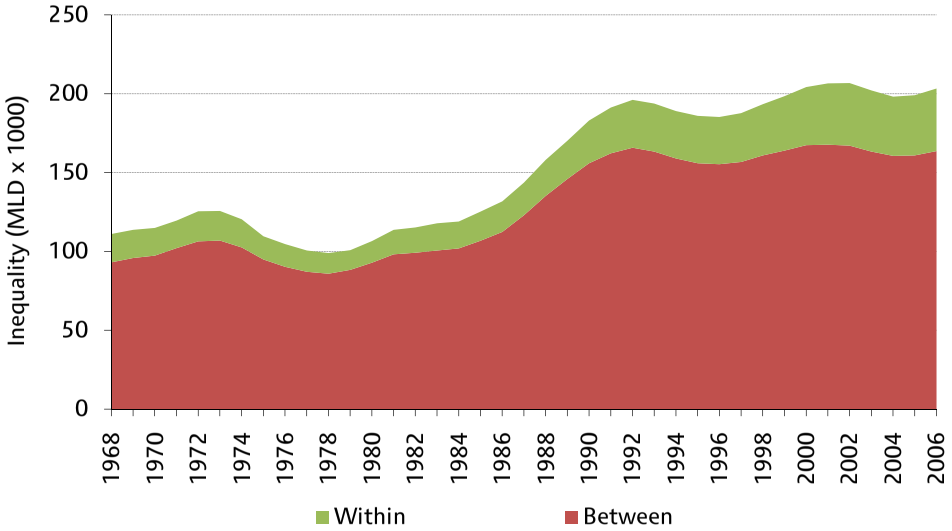
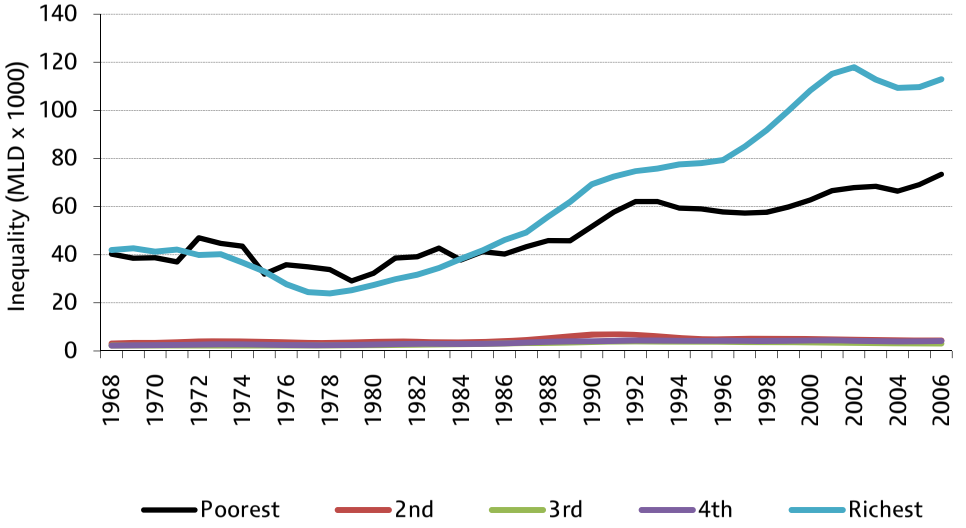


Fig. A19.5. Within-group income inequality, by income quintile (untrimmed)



Note: All figures smoothed using three-year moving averages.

Fig. A19.6. Mean income (relative to British average), by income quintile (untrimmed)

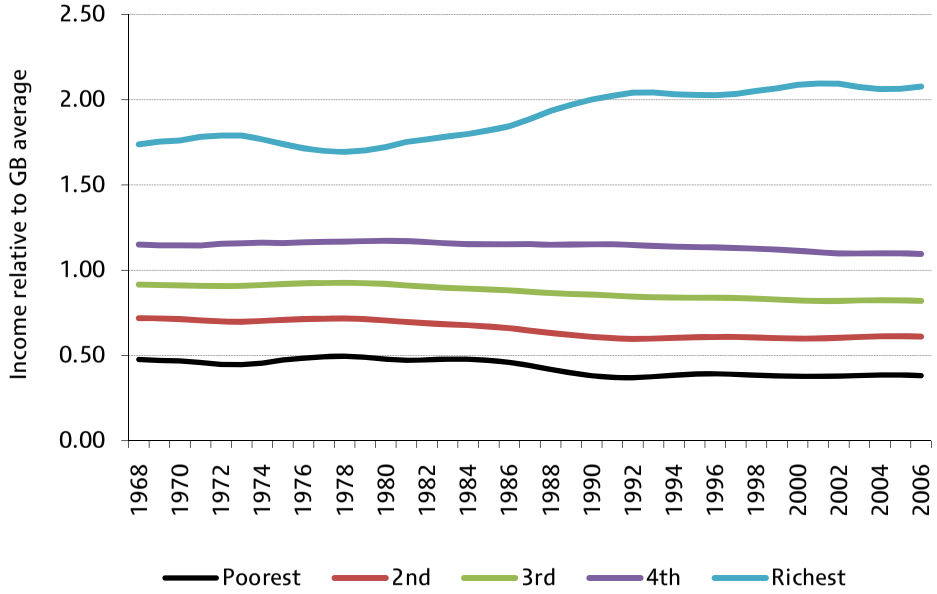


Fig. A20.1. Earnings inequality – within and between groups, by earnings quintile (trimmed)

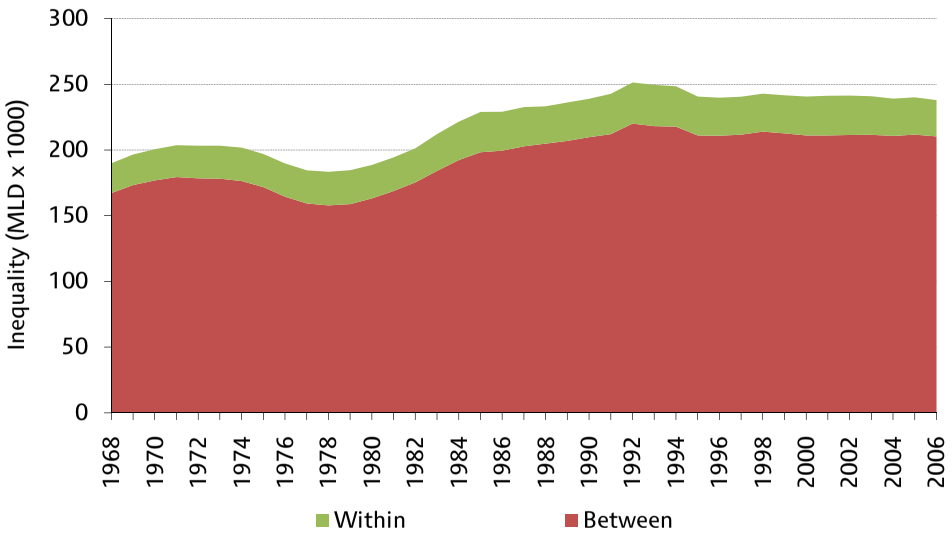
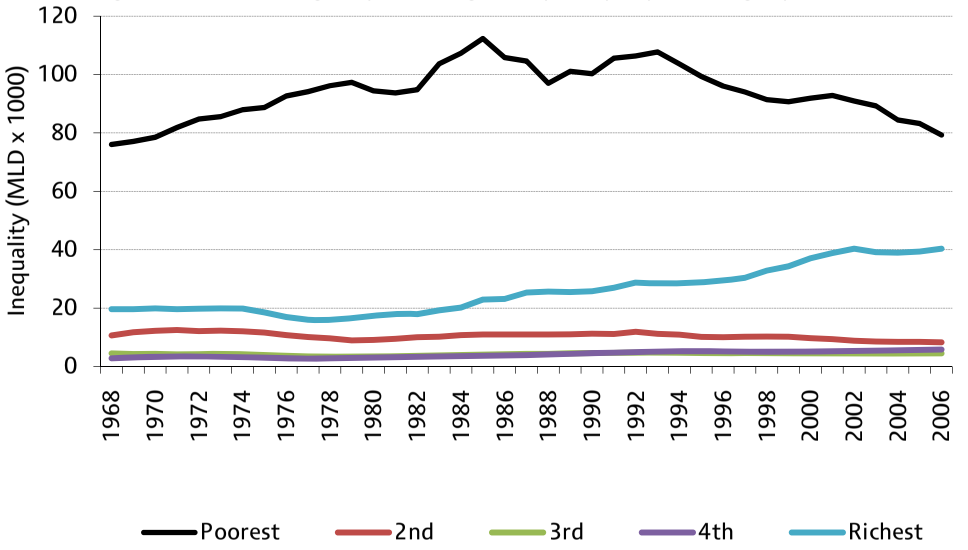


Fig. A20.2. Within-group earnings inequality, by earnings quintile (trimmed)



Note: All figures smoothed using three-year moving averages.

Fig. A20.3. Mean earnings (relative to British average), by earnings quintile (trimmed)

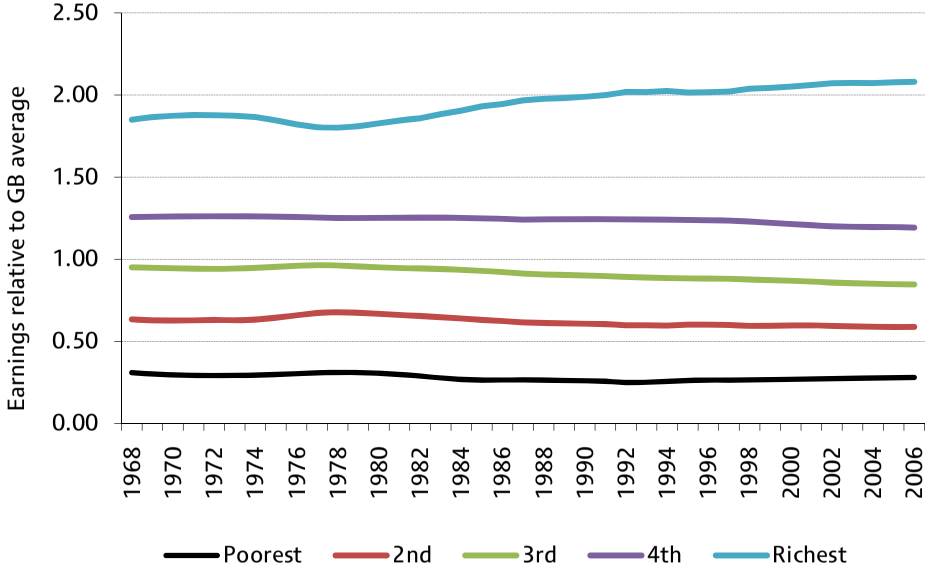


Fig. A20.4. Earnings inequality – within and between groups, by earnings quintile (untrimmed)

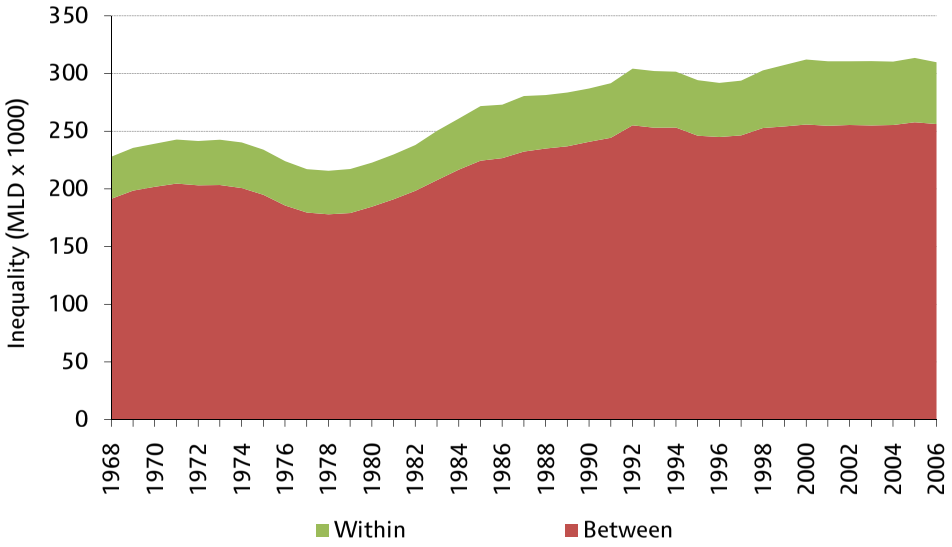
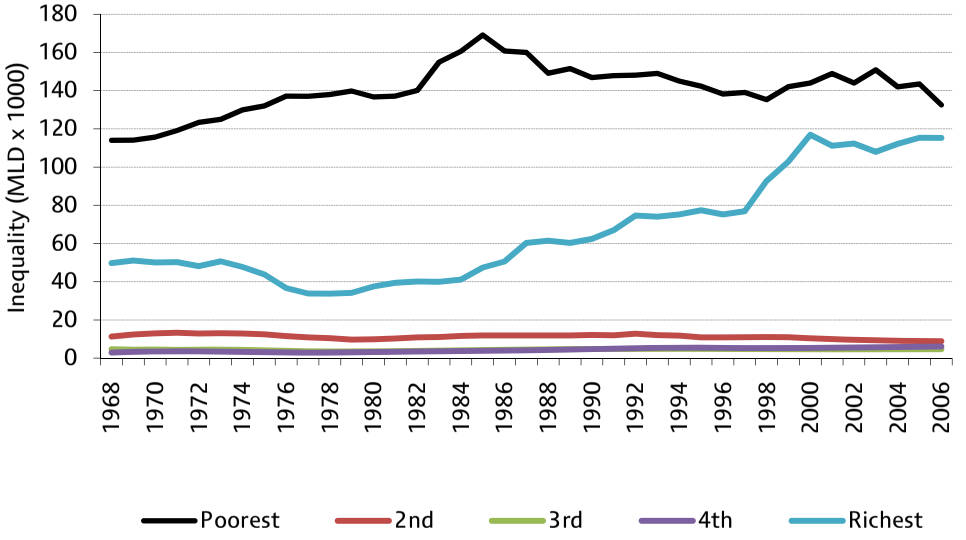


Fig. A20.5. Within-group earnings inequality, by earnings quintile (untrimmed)



Note: All figures smoothed using three-year moving averages.

Fig. A20.6. Mean earnings (relative to British average), by earnings quintile (untrimmed)