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# Why has in-work poverty risen in Britain?

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# Why has in-work poverty risen in Britain?

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**Abstract**:

An increasing proportion of people towards the bottom of the UK's income distribution are in a household where someone is in paid work. Working households comprised 37% of those below the official poverty line in 1994–95 and 58% in 2017–18. Much of that increase is due to trends that seem straightforwardly positive: lower poverty rates among pensioners and workless working-age households, and less household worklessness. But about a third of the increase is due to an increase in the rate of poverty in households where someone works. We examine the reason for the increased in-work relative poverty rate in Britain over the last 25 years, which has risen by almost 5 percentage points to reach 18% in 2017–18. We identify two reasons why even that rise in the in-work relative poverty rate is partly a reflection of positive trends. First, the catch up of pensioner incomes (driven by higher state and private pensions) has pushed upon median income, and hence the relative poverty line. Second, falls in worklessness have brought relatively low-earning types of households (such as lone parents) into work. We show that increases in household earnings inequality among households with someone in paid work since 1994–95 explain 1.4 percentage points of the rise. The fact that housing costs have risen much more for low income households than for higher income households explains 2.4 percentage points of the rise. Working against this, increases in re-distribution towards low-income working families pushed down relative in-work poverty by 2.1 percentage points. This was due to benefit changes in the early 2000s and between 2007–08 and 2010–11 which acted to reduce relative in-work poverty, though this has been partially reversed by reductions to benefit entitlements since 2010–11.

JEL codes: I32, I38, J21, J31, H53

Keywords: Poverty, employment, housing costs, redistribution, micro-simulation

Interest from policymakers, politicians, civil society and the media in trends and causes of poverty in the United Kingdom and elsewhere is as high as ever. Measured against an absolute poverty line – one that only rises in line with household inflation – overall poverty in the UK is unrecognizably lower than only a few decades ago, although the falls in recent years have been much smaller than historically (see Bourquin et al. 2019). However, measures of relative poverty (those living below 60% of contemporaneous median net income) have changed much less. Official government statistics show the relative poverty rate, after accounting for differences in housing costs, as we do throughout unless otherwise stated, has fluctuated between 21% and 23% since the turn of the century.

But, as has been shown by Joyce and Ziliak (2019) the composition of those in poverty has been changing dramatically. In particular, there has been an increasing fraction of those in poverty live in a household with at least one adult in paid work, rising from 37% to 58% of those in relative poverty since 1994. While still below the levels seen in the United States, the face of British poverty is increasingly a face that receives a pay-packet – albeit often a small one. This change has been much commented on by those engaged in public policy debates and has been raised by leaders of the main political parties in Britain and discussed in the UK Parliament.[1]

At least two thirds of this increase in the fraction of people in poverty who live in working households is due to some notable policy successes: the reduction of pensioner poverty over the last 25 years, the reduction in poverty for workless households, and large increases in employment that have substantially reduced the number of workless households. But the relative poverty rate of those in working households has also risen by almost 5 percentage points since 1994–95 to reach 18% in 2017–18, the latest year of available data. This paper seeks to explain the underlying causes of this rise in the poverty rate of those living in working households.

We use nationally representative survey data from the UK that is used to calculate the government's official poverty statistics to examine the drivers of the in-work poverty. We analyse the effect that 1)

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[1] See here for former Prime Minister David Cameron's 2015 Conservative Party conference speech (https://www.politicshome.com/news/uk/social-affairs/politics/news/60763/david-camerons-speech-tory-party-conference), here for Leader of the Opposition Jeremy Corbyn's letter to the Prime Minister (https://labour.org.uk/press/scale-poverty-britain-national-emergency-corbyn-writes-pm/).

rising pensioner incomes, 2) rises in households earnings inequality and of changing composition of the working population, 3) reforms to the tax and benefit system, and 4) changes in housing costs have had on in-work poverty.

We find that the rise in relative in-work poverty has been driven by a range of factors. The factor that has increased in-work poverty the most has been increased housing costs for lower income households compared to higher income households. This has pushed up in-work poverty by 2.4 percentage points since 1994. This is the result of much higher growth in private and social rental costs, compared to owner occupied housing costs, which have fallen, and the falling proportion of low-income households that own their own home.

Higher inequality in household earnings has pushed up in-work poverty by 1.4 percentage points since the mid-1990s. Even substantially lower household earnings inequality does not reduce in-work relative poverty by more because more equal earnings growth benefits middle income households as well as low income households, because only half of the net income of poor working households comes from employment, and because low-earning households face high effective marginal tax rates due to means-tested cash transfers.

We show that – at least in part – some of the increase in household earnings inequality can be explained by a fall in household worklessness from 18% of people in working-age families to 11% since 1994. This has meant higher household employment rates for types of households that have low earnings, in particular lone parents. This shows one problem of focusing purely on in-work poverty to the exclusion of overall levels of poverty: when households with relatively low earnings potential move into work, this can increase in-work poverty rates even though it has only increased the incomes of low-income households. To this extent, the rise in-work poverty also probably reflects the "good news" story of lower worklessness.

In addition, the fact that pensioner incomes have risen faster than working-age incomes over the last 25 years has meant that the relative poverty line has risen faster than it would have if pensioner incomes has grown at the same rate as the working-age population. Pensioners – who have

historically been a relatively poor group – have seen their incomes catch up with the rest of the population, mainly due to higher state pension payments, but also increases in private pension incomes too. Excluding pensioners from poverty line calculations, in-work poverty would only have risen by 3.3 percentage points between1994–-95 and 2017–18 and, instead of 4.7 percentage points, thereby explaining 1.4 percentage points of the rise.

Finally, we find that there is a key factor that does **not** explain the rise in in-work poverty and which has in fact acted to mitigate it: changes to the tax and benefit system that have occurred since the mid-1990s. This is because the tax and welfare system have redistributed significantly towards poor working families since then, pushing **down** in-work relative poverty by 2.1 percentage points.

However, cuts to benefit entitlements since 2010–11 have been a key driver of the increase in relative poverty since 2010–11 (indeed, they explain essentially all the increase in in-work relative poverty since then). However, the increase in the income tax personal allowance means that, when taken together, the direct tax and benefit changes since 2010–11 have not acted to increase *absolute* in-work poverty overall.

This paper contributes to a wider literature that seeks to understand the drivers of poverty in industrialised countries (for example, Bourquin et al. 2019 for the UK, Hoynes et al. 2006 and Haveman et al. 2015 for the United States), although we focus on a particular form of income poverty: those living in working households, in a particular country: the United Kingdom. As we focus on a relative measure of poverty, we also build on the literature examining changes in income inequalities in the UK since the 1990s, such as Atkinson and Jenkins (2019), Belfield et al (2017), Brewer and Wren Lewis (2016), Blundell et al (2018) and Jenkins and Van Kerm (2016). As well as seeking to understand trends in overall poverty, our analysis contributes to literatures seeking to understand the effect of changes to the welfare system and labour market on levels of poverty.

In particular, we examine how the tax and benefit system affects poverty for working households. This builds on research in the UK that examined how poverty changed in the early 2000s after the Labour government increased benefits and tax credits (Brewer et al. 2003) and the reductions in

welfare spending made by the Coalition and Conservative governments (De Agostini et al. 2017). More generally, there has been particular interest in the effectiveness of government welfare programmes and anti-poverty policies, across the world, not least in the United States, where Bitler et al. (2017) find that in work tax credits are not an effective "automatic stabilizer" of incomes for single parents but are for couples with children. Like Bitler and Hoynes (2016), who find that the US safety net during the Great Recession did less to provide protection than in previous recession, we focus on how the tax and benefit system has changed in different periods, although our findings are the opposite: that changes in the UK in the Great Recession pushed down poverty, providing more protection for low income households.

We also contribute to a literature that examines how changes in labour market status (either the amount of earnings, or the employment rate) affects poverty rates. Biewen and Jenkins (2005) have shown previously that the UK has higher poverty rates than Germany *despite* a more favourable employment structure, while Jenkins and Schluter (2003) find that negative labour market events (such as a fall in earnings) are more likely in the UK to lead to families with children moving into poverty compared to Germany. Our focus in particular is on how changes in earnings growth between low and high income households can affect in-work poverty. This therefore builds on work examining the effectiveness of a higher minimum wage (which is explicitly aimed at raising the earnings of those with low hourly pay) on poverty. For example, Sabia (2014) and Sabia and Burkhauser (2010) argue that higher minimum wages do little to reduce poverty, although Dube (2019) argues it more effective than suggested by these papers.

The rest of this paper proceeds as follows. Section II describes the data that we use, the measurement of relative poverty in the UK, and the methodologies that we employ to explain changes in poverty. Section III sets out trends in in-work poverty in the UK and examines among which groups it has risen, and analyses the effect of rising pensioner incomes on the relative poverty line, and therefore on in-work poverty. Section IV examines three distinct reasons for the trends in in-work poverty: i) changes in the labour market and the distribution of earnings, ii) changes in the tax and benefit system, and iii) changes in the cost of housing. Section V concludes.

## II. Data and methodology

### *II.a    Data*

Our analysis is consistent with the measurement of poverty used by the UK government's Department for Work and Pensions, who produce their official statistics on poverty and the income distribution each year. These statistics are derived from a survey of around 20,000 households, undertaken annually since 1994–95, called the Family Resources Survey (FRS – see Office for National Statistics et al. 2019). The latest data is available for 2017–18.  Because data on Northern Ireland has only been included in the data since 2002–03, we exclude it, and focus only on Great Britain. The FRS is run on a UK financial year basis (from April to the following March). Where we refer to a single year (e.g. 1994) we are referring to its financial year (1994–95).

The FRS is a survey which collects comprehensive information on all the sources of income from all members of a surveyed households – including their income from employment and self-employment, savings and investments, occupational and private pensions, (all measured before and after direct taxes), as well as any state benefits and tax credits (transfer payments) that they receive, including the state pension for pensioners. Income is measured as current income rather than annual income, for example employee earnings, are the earnings from the last point the employee was paid, rather than the total earnings over the previous year.

 Payments of council tax (a local property tax) are recorded and deducted from income. Housing costs (of which the most important parts are rents and mortgage interest payments) are recorded. The FRS also contains standard measures of demographics and background characteristics on each member of the household. A small proportion of answers, most frequently regarding profits from self-employment, suffer from non-response and missing values are imputed, though the imputed cases are not identifiable to the researcher. Although there is some under-reporting of benefit and tax credit income, Belfield et al. (2014) show that the FRS captures around 80% of benefits and tax credit income that is known to be paid out (from administrative data sources) – higher than is seen in most

US survey data (see Meyer et al. 2009) – and that the growth in benefit and tax credit incomes are similar in administrative and FRS data over time.[2]

We conduct our analysis at the individual level, meaning that we look at the proportion of people in poverty, rather than the proportion of households. However, incomes are measured as the household level (adding up the income of all members of a household), net of taxes and benefits, and equivalised using the OECD modified equivalence scale.

Income poverty is defined in this paper the same way as for UK official statistics. Relative income poverty is defined as having a net equivalised household income of below 60% of contemporaneous median income. Absolute poverty is defined as having a net equivalised household income of below 60% of 2010–11 median. We focus entirely on income poverty, although there will be some households categorised as being in income poverty even though other measures of their material living standards (for example their expenditure) are much higher due to transitory low income (Brewer et al. 2003) or under-reporting of income (Brewer et al. 2017).

In general, we focus on measures of income after housing costs have been deducted ("AHC") although we also show measures before housing costs are deducted ("BHC"). There are a number of reasons that we think that AHC measures are more appropriate. First, AHC measures will provide a better indicator of living standards for those who have little choice over their housing, and for whom changes in housing costs do not represent changes in quality, such as those in the social rented sector. Second, the existence of housing benefit (HB) means that BHC incomes can rise even if the amount of income going to the household is unchanged if rising rents are met by higher housing benefit payments. Third, measuring income AHC is more appropriate when comparing those who own a house (particularly if it is owned outright) with those who rent. On a BHC basis, two otherwise identical individuals, one of whom rents and one whom owns a property, may look to have a similar

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[2] To address under-reporting of top incomes, we follow the Department for Work and Pensions who adjust the incomes of (approximately) the highest income 1% of individuals in the data, replacing their individual incomes with the mean of those with income above that level as calculated from a sample of administrative tax data (known as the Survey of Personal Incomes). Burkhauser et al. (2018) show the limitations of this approach, however, since our interest is in poverty, and these high income people do not affect either the incomes of the poor, nor the median (needed to calculate the relative poverty line), the limitations of this approach are not important in this context.

living standard, even though the one who owns their home benefits from the flow of housing services that their ownership of a property provides. Using an AHC measure corrects, at least in part, for this. Finally, AHC incomes will be a better measure of living standards when different households see massively different changes in housing costs – such as seen since 2008 when mortgage interest rates fell, cutting the housing costs of mortgagees relative to renters. Each of these reasons is discussed in more detail in Appendix A of Bourquin et al. (2019).

In this paper, our focus is on working-age families in working households. In this context, a "family" is defined as "benefit unit" – made up of a single person or a couple, and his/her/their dependent children.[3] We defined working-age families as those that do **not** contain any woman aged 60 or over nor any man aged 65 or over (these are the state pension ages for men and women prior to the rises that started in 2010). Having defined working-age family, we split these families into two groups depending on whether there is, or is not, any adult in the household in paid employment. For ease, we refer to these groups as being "working households" and "workless households" respectively.[4] All cash amounts in this paper are expressed in 2017–18 prices, and growth in cash amounts are expressed after adjusting for inflation. Consistent with UK official statistics, we adjust for inflation using a version of the Consumer Prices Index that include mortgage interest payments (when looking at BHC incomes) and that excludes all housing costs (for AHC incomes).[5]

*II.b.    Methodology*

We use the measures of household income, the components of income and the individuals within the household that receive them, combined with detailed demographic data on each individual in the household, to understand the changes in in-work poverty in Britain, and the drivers of these changes. We use a number of statistical tools to help us do so.

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[3] A dependent child is one aged 15 or under or one aged 16-19 who is living with their parents and in full-time education.
[4] Being in paid employment is defined in a way consistent with the International Labour Organisation, as being an employee or self-employed in a reference week, or being in a job in that week but temporarily away from work for a reason such as being on annual leave, sick leave etc.

[5] See
https://www.ons.gov.uk/economy/inflationandpriceindices/adhocs/008572consumerpriceindicesseriesexcludingrentsmaintenancerepairsandwaterchargesfortheperiodjanuary1996toapril2018

First, we statistically decompose changes in in-work poverty (and other outcomes) into the change that is driven by changes in the poverty rate for mutually exclusive and exhaustive subgroups, and the change that is driven by the change in the composition of working households. If the subgroups are indexed by $i$, and time by $t$, and the poverty rate for group $i$ in time $t$ is $pov_{i,t}$, and the proportion of people that are in each subgroup in time $t$ is $prop_{it}$, then the contribution to the change in overall poverty $\overline{pov_t}$ from the change in poverty from subgroup $i$ between $t$ and $t+1$ (the "incidence effect") is shown in equation (1):

$$Incidence_i = (pov_{i,t+1} - pov_{i,t}) \times (prop_{i,t+1} + prop_{i,t})/2 \qquad (1)$$

And the contribution to the change in poverty between $t$ and $t+1$ from the change in the proportion of the relevant population in subgroup $i$ (the "compositional effect") is in equation 2:

$$Compostion_i = (prop_{i,t+1} - prop_{i,t}) \times \left(pov_{i,t+1} - \overline{pov}_{t+1} + pov_{i,t} - \overline{pov}_t\right)/2 \qquad (2)$$

Second, we examine the changing composition of working households, to see to what extent this might have led to lower earning "types" of households entering the workforce, and potentially changing the distribution of household earnings.

Third, we undertake some simulations to understand how poverty would have evolved in different counterfactual scenarios. For example, to investigate how differences in earnings growth across the earnings distribution have affected household incomes, and how the tax and benefit system has changed, we use the Institute for Fiscal Studies' (IFS) tax and benefit microsimulation model TAXBEN.[6] TAXBEN is used to calculate the benefit entitlements and direct taxes paid on market incomes for different tax and benefit systems. It is a static microsimulation model that does not account for any behavioural responses. We use it for two purposes in this paper.

First, we estimate how poverty would have changed if pre-tax household earnings had grown equally (in percentage terms) across the household earnings distribution, instead of (as is shown in Belfield et al. 2017, and Blundell et al. 2018) growing faster for higher earning households.

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[6] For a fuller description of TAXBEN, see Giles and McCrae (1995) and Waters (2017).

To conduct this exercise, we calculate what earnings in each of the 100 centiles of the household earnings distribution would have been in 2017–18 had growth across the distribution been equal to actual average (mean) growth. We then calculate, for each centile, the proportional difference between earnings in that counterfactual world and in the actual 2017–18 data. We use these factors to scale up or down earnings for every individual in the 2017–18 data, which leaves average earnings the same as in 2017–18 but inequality in those earnings the same as in 1994–95. To simulate incomes, we then use TAXBEN, to estimate net household incomes using both the actual 2017–18 data (the 'base' data) and the counterfactual data. Some families do not claim all of the benefits to which they are entitled. We account for this by assuming that a family that does not take-up a benefit to which they are entitled in the base data will not take it up in the counterfactual data either. If a family is entitled to a benefit in the counterfactual data, which they are not in the base data, we randomise take-up in the former by assuming that the probability of take-up is equal to the overall take-up rate for that benefit and that family type.[7]

This procedure gives us a simulated income, for both the base and counterfactual data. Even in the case of the base data, these incomes are not identical to those in the HBAI data, principally because the level of benefit entitlement or tax liability that TAXBEN simulates can differ to the amount reported by the household. However, the working poverty rates estimated with this approach are similar to the rates observed in the actual HBAI data.

Second, we estimate how different relative in-work poverty would have been in 2017–18 if tax and benefit systems from previous years had been in place assuming that the distribution of pre-tax incomes is exogenous. This ignores the behavioural impacts of welfare reforms, such as the increase in lone parent employment driven by the Labour government's tax credit reforms (see Gregg et al. 2009; Brewer et al. 2006), or any of the behavioural effects of other tax and welfare reforms that have boosted labour supply (see Avram et al. 2018).

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[7] For this we use administrative take-up rates - https://www.gov.uk/government/collections/income-related-benefits-estimates-of-take-up--2; https://www.gov.uk/government/statistics/child-benefit-child-tax-credit-ctc-and-working-tax-credit-wtc-take-up-rates-2016-to-2017.

To do this, we take earlier tax and benefit systems and uprate the parameters of the system (e.g. tax thresholds and benefit entitlements) to 2017–18 terms in line with average earnings. In all cases we set the incapacity and disability benefit parts of the system to the 2017–18 structure, because it is not easy to know what entitlements people would have had to incapacity and disability benefits of earlier systems that in reality had already been abolished by 2017–18. We then use these systems, combined with the 2017–18 FRS data to simulate incomes. As with the simulation for equal earnings growth, we adjust for take-up.[8]

## III. Trends in in-work poverty in Britain

Figure 1 shows the proportion of people living in relative (AHC) poverty in each of the three family types set out in section IIa (pensioner families, working age families in a working household, and working age families in a non-working household) from 1994–95 until 2017–18. It shows that there was a very large increase in the proportion of people in poverty living in a working household, rising by 21 percentage points from 37% of those in poverty in 1994–95 to 58% by 2017–18.[9] There were corresponding decreases in the proportion of those in poverty in pensioner families (from 22% to 18%) and in workless families (from 42% to 24%).

To a large extent, these trends reflect three positive trends in British society since the mid 1990s. First, there has been a large fall in the proportion of people living in (working-age) workless households, from 14% of the population to 8%, as shown in Appendix Figure 1, and a rise in the proportion of people who are pensioners. These compositional changes explain around 8 percentage points of the 21 percentage points rise in the fraction of people in poverty living in a working household. Second, there has been a fall in the relative poverty rate of workless households, from 72% to 66% as shown in Appendix Figure 2. This explains a further 1 percentage point of the 21 percentage points change. Third, there has been a decline in pensioner poverty, from 27% to 18%

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[8] One added complication here is that earlier tax and benefit systems have family credit (FC) and working families tax credit (WFTC), but not modern tax credits (child tax credit and working tax credit). For families entitled to FC or WFTC, we assume that they would take it up if in the data we observe them claiming modern tax credits.

[9] Although this fraction is high by British historical standards, Joyce and Ziliak (2019) show that it is still below the fraction seen in the United States (although they use – comparable – measures of BHC relative poverty).

over the same period, which increased the fraction of those in poverty who are in a working household by 5 percentage points.

However, 7 percentage points of the 21 percentage point increase in the proportion of those in poverty in a working household has been driven by a rise in the relative poverty rate for those in working households (i.e. the in-work poverty rate). Figure 2 shows that this rose from 13.5% to 18.2% from 1994–95 to 2017–18, an increase of 4.7 percentage points (or 35 percent). This rise was gradual, although the rise was more pronounced in the period from 2004–05 to 2008–09 and again from 2010–11 to 2017–18. It is this rise that we seek to explain in this paper. Appendix Figure 2 also shows that, while *absolute* in-work poverty was lower in 2017–18 than it was in the mid-1990s, at 16% it remained essentially from 2001 on, and the falls in pensioner and workless absolute poverty were much larger than the falls in in-work poverty were over the 20 years leading up to 2017–18.

**Figure 1: % of people in relative AHC poverty who are in different family types**
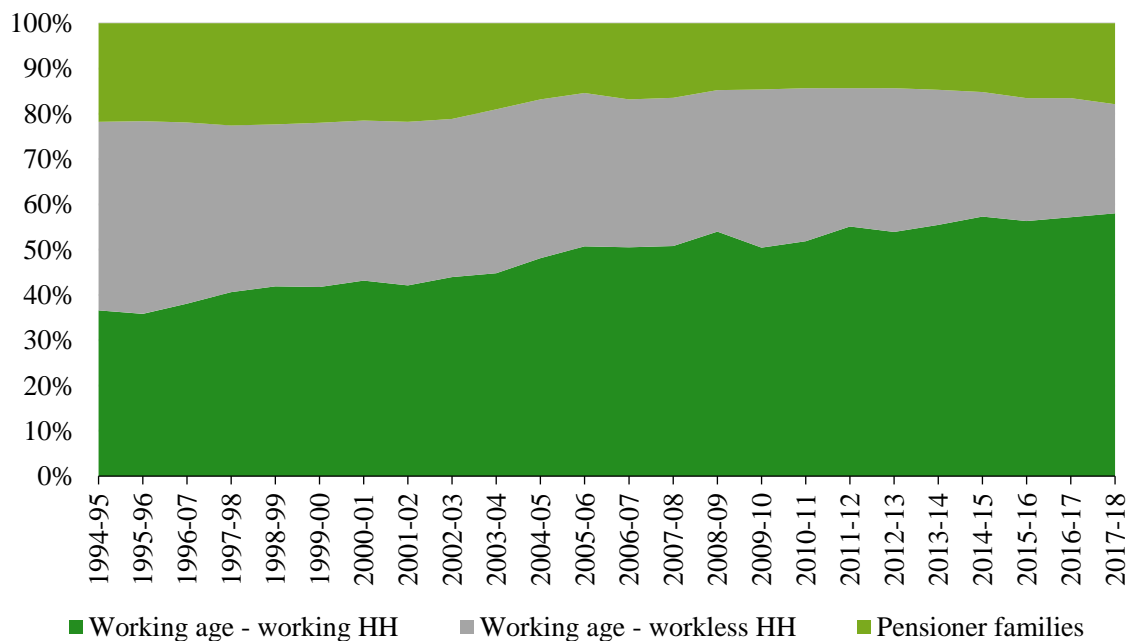


Note: Pensioners defined as women aged 60+ and men aged 65+. Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

**Figure 2: Relative AHC poverty rate, working age families in a working household**
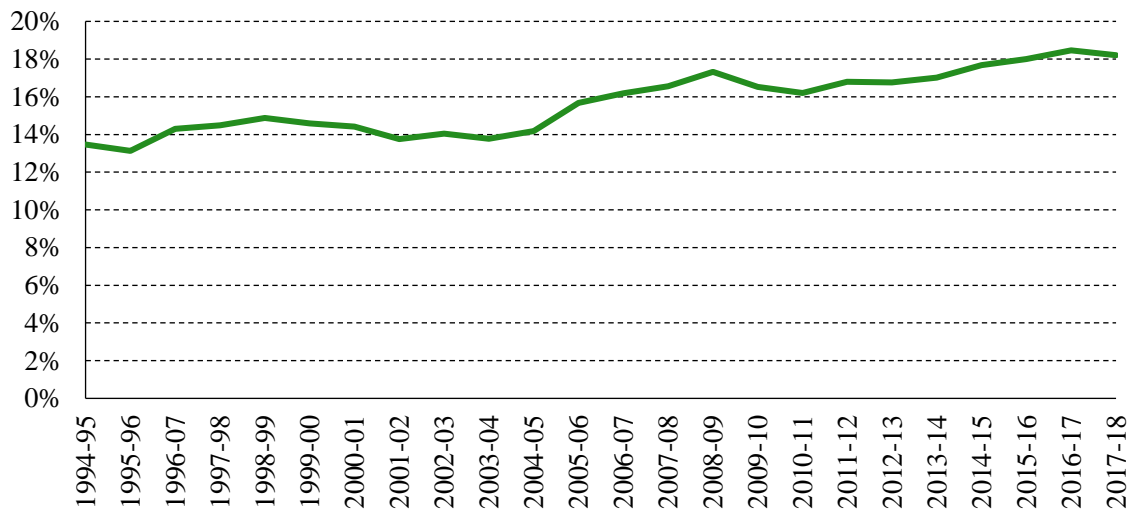
It should be noted that the rise in in-work poverty seen in our headline AHC relative measure is not completely replicated in other measures of relative poverty. The solid grey line in Figure 3 shows the relative BHC in-work poverty rate, compared to the sold green line for the relative BHC measure. It shows that while there was an increase in BHC in-work poverty (from 10% to 13%) from 1994–95 to 2017–18, it rose by less than the AHC measure did. This suggests that changes in housing costs may play an important role in explaining the trends, a hypothesis that we investigate in section IVc.

In addition, Figure 3 also shows how relative measures of poverty would have evolved if pensioners had been excluded when calculating the median income used to define the poverty line. Pensioners – who have historically in the UK been a lower-income group on average – have seen large increases in average incomes in the last few decades, such that median pensioner incomes in 2017–18 were equal to non-pensioners on an AHC basis (see Bourquin et al. 2019), up from only 81% of non-pensioner incomes in 2002–03. Their incomes have been boosted by large increases in state benefits (most notably higher state pensions) plus higher private pensions and labour income. This is shown in Appendix Figure 4 and discussed in more details in Brewer et al. (2007). Again, while there is still growth in relative in-work poverty excluding pensioners, some of the increase in relative in-work poverty is therefore because pensioners – as a group – have done so much better than working-age

families, and poorer working families in particular. For relative in-work poverty measured AHC, when we exclude pensioners when calculating the relative poverty line, the rise is only 3.3 ppts rather than 4.7 ppts since 1994–95. This highlights one potential oddity of a relative measure of poverty, in which pensioner incomes rising can lead to higher relative poverty for working-age families, as some working-age families subsequently fall behind the rising poverty line. [10]

**Figure 3: Measures of relative in-work poverty**
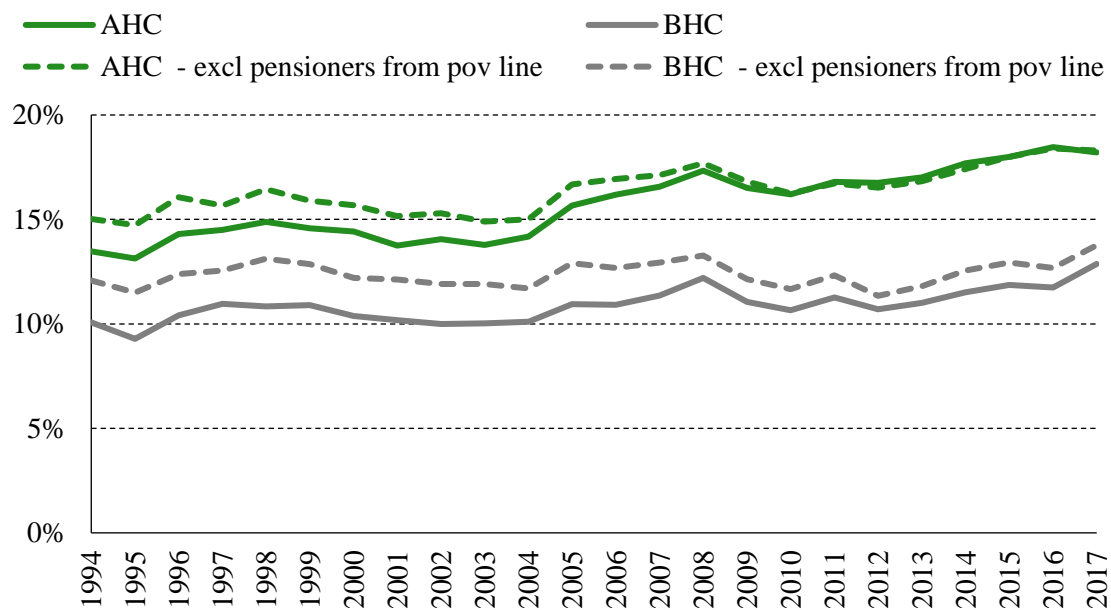


Note: Pensioners defined as women aged 60+ and men aged 65+. Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

Changes in in-work poverty have not been the same for all groups. And indeed, the changing composition of the working household population could be one explanation for the rise in in-work poverty. Table 1 looks at how in-work poverty has changed for different family types (i.e. number of adults in family, and whether they have children), by whether anyone is self-employed, and by

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[10] Former Prime Minister David Cameron criticised the relative poverty statistics for this reason in a speech in 2015, saying, ""[B]ecause of the way it is measured, we are in the absurd situation where if we increase the state pension, child poverty actually goes up". See: https://www.gov.uk/government/speeches/pm-speech-on-opportunity

housing tenure.[11] It also shows the percentage of working households in each group, and the "incidence" and "composition" effects on in-work poverty as described in Section II.

The table shows that there have been increases in in-work poverty across the four family types shown, but that these have been smallest (in ppt terms) for couples without children, and largest for single adults with children (lone parents). Because of the size of the group and the increase in their in-work poverty rate, the increase for couples with children explains 2.1 ppts of the 4.7 ppt increase in in-work poverty. However, there were also some compositional effects, with higher proportions of working families being lone parent families pushing up in-work poverty in particular. As discussed in the following section, this is due to a higher fraction of lone parents in work, rather than there being more lone parents in the population.

The Table also shows that the increase in in-work poverty occurred entirely in those families without a self-employed worker, and there was little compositional effect too, suggesting that the rise in (predominantly low-paid) self-employment was not a major driver of the trend.

In contrast, there were substantial differences by housing tenure. The in-work poverty rate of social rented households rose from 24% to 38%, pushing up overall in-work poverty by 2 percentage points alone, while there were no rises for the other groups. At least in part, this will very likely reflect the change in composition of types of people in each group (private renters, for example became an increasingly higher-income group as homeownership fell). Moreover, the fall in owner occupation amongst working households, and the commensurate rise in private renting, pushed up poverty. This also suggests that changes in housing costs and in housing tenure may play an important part in explaining the rise in in-work poverty.

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[11] One interesting, and potentially important, characteristic that is not included in this Table is whether anyone in the family is an immigrant (often defined as being born abroad). Unfortunately, the FRS does not measure whether someone was born abroad until 2008, and so it is not included in our analysis.

**Table 1 In-work relative poverty rate by family characteristics, and decomposition of change in in-work poverty 1994-2017**

| | Relative AHC poverty rate | | % of working households | | "Incidence" Effects (ppts) | "Compositional" Effects (ppts) |
|---|---|---|---|---|---|---|
| | 1994 | 2017 | 1994 | 2017 | | |
| *Family type* | | | | | | |
| Single adult, no children | 11% | 17% | 19% | 21% | 1.1 | 0.0 |
| Single adult, with children | 25% | 33% | 4% | 7% | 0.5 | 0.4 |
| Couple, no children | 7% | 9% | 26% | 23% | 0.6 | 0.2 |
| Couple, with children | 17% | 21% | 51% | 48% | 2.1 | -0.1 |
| | | | | | | |
| *Employment status* | | | | | | |
| At least one self employed | 25% | 23% | 20% | 21% | -0.4 | 0.1 |
| No one self employed | 11% | 17% | 80% | 79% | 5.0 | 0.0 |
| | | | | | | |
| *Housing tenure* | | | | | | |
| Own | 10% | 10% | 79% | 64% | -0.3 | 0.9 |
| Private rent | 31% | 30% | 7% | 22% | 0.0 | 2.2 |
| Social rent | 24% | 38% | 15% | 14% | 2.0 | 0.0 |
| | | | | | | |
| All | 14% | 18% | 100.0% | 100.0% | N/A | N/A |

Note: Incidence and compositional effects calculated as shown in equations (1) and (2). Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

Table 2 shows a final stylized fact regarding trends in in-work poverty: that differences across regions increased over time. While there were increases in in-work poverty in every region, the largest increase occurred in London, where it rose from 15% in 1994–95 to 24% in 2017–18, driving up overall in-work poverty by 1.2 percentage points. With London being the area with the highest growth in rental costs and house prices since the mid-1990s, this again suggests that housing costs may play an important role in these trends. This is discussed in detail in section IV.c.

**Table 2 In-work relative poverty rate by region and nation of Great Britain, and decomposition of change in in-work poverty 1994–95-2017–18**

| | Relative AHC poverty rate | | % of working households | | "Incidence" effects (ppts) | "Compo-sitional" effects (ppts) |
|---|---|---|---|---|---|---|
| | 1994 | 2017 | 1994 | 2017 | | |
| Wales | 16% | 19% | 5% | 6% | 0.2 | 0.0 |
| South West | 15% | 17% | 8% | 8% | 0.2 | 0.0 |
| North East | 15% | 17% | 5% | 5% | 0.1 | 0.0 |
| London | 15% | 24% | 12% | 15% | 1.2 | 0.1 |
| North West | 15% | 19% | 11% | 10% | 0.4 | 0.0 |
| Yorkshire | 14% | 18% | 8% | 8% | 0.3 | 0.0 |
| East | 13% | 17% | 4% | 4% | 0.1 | 0.0 |
| East Midlands | 13% | 17% | 8% | 7% | 0.3 | 0.0 |
| West Midlands | 13% | 19% | 9% | 9% | 0.5 | 0.0 |
| South East | 12% | 16% | 21% | 20% | 0.8 | 0.0 |
| Scotland | 11% | 15% | 9% | 8% | 0.3 | 0.0 |

Note: Incidence and compositional effects calculated as shown in equations (1) and (2). Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

## IV. Explaining trends in in-work poverty in Britain

*IV.a    The role of changes in households earnings inequality*

The most important form of household income for working households is income from employment and self-employment. Changes in the amount of labour income going to richer and poorer households is therefore an obvious potential driver of in-work poverty.

There are two key stylized facts that we must note when analyzing the role of household earnings inequality in driving in-work poverty: 1) As shown in Table 3, the proportion of people in working-age families that live in a workless household has fallen by over a third from 18% to 11% (i.e. the proportion in a working household has risen from 82% to 89%). This fall in worklessness mostly reverses the large increase in worklessness that occurred between the late 1970s and early 1990s (see Gregg and Wadsworth 2008)[12]. (2) As shown in Figure 4 (and discussed previously in Belfield et al.

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[12] Gregg et al. (2010) shows that the increase in worklessness between the late 1970s and 1990s was larger than in Germany, United States, Australia and Spain.

2017 and Blundell et al. 2018), for working households, across most of the distribution pre-tax

household earnings (our term for the total amount of pre-tax income from employment or self-

employment of all members in the household) have grown considerably more in percentage terms

for higher earning households that for lower earnings households. In other words, there has been

an increase in household earnings inequality for working households.[13]

In this section, we attempt to do two things. First, we examine potential reasons for increases in

higher household earnings inequality, starting with the possibility that it is (at least in part) driven by

compositional change as a result of lower levels of worklessness. Second, we ask to what extent lower

earnings inequality can lead to lower in-work relative poverty.

**Table 3: Percentage living in a working household (working age families only), by family characteristic**

|  | % in a working household | | | Median weekly earnings (for working HHs) in 1994 (2017-18 prices) |
|---|---|---|---|---|
|  | 1994 | 2017 | Change (ppt) |  |
| All | 82% | 89% | 7 | £657 |
|  |  |  |  |  |
| *Family type* |  |  |  |  |
| Single, no children | 63% | 69% | 6 | £427 |
| Couple, no children | 88% | 94% | 6 | £708 |
| Multi family HH, no children | 88% | 92% | 4 | £764 |
| Single, with children | 34% | 64% | 30 | £166 |
| Couple, with children | 89% | 95% | 6 | £662 |
| Multi family HH, with children | 88% | 94% | 6 | £683 |
|  |  |  |  |  |
| *Age of oldest household member* |  |  |  |  |
| 16 to 30 | 70% | 78% | 8 | £554 |
| 31 to 39 | 84% | 91% | 7 | £641 |
| 40 to 49 | 89% | 93% | 4 | £775 |
| 50 to 64 | 82% | 90% | 8 | £637 |

Notes: Median household earnings for working households expressed in 2017–18 prices.

Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

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[13] Figure 4 shows unequivalised gross household earnings, including self employment income. Neither equivalisation nor the exclusion of self-employment income make a material difference to the picture.

**Figure 4: Real growth in gross household earnings by percentile group, 1994 to 2017**
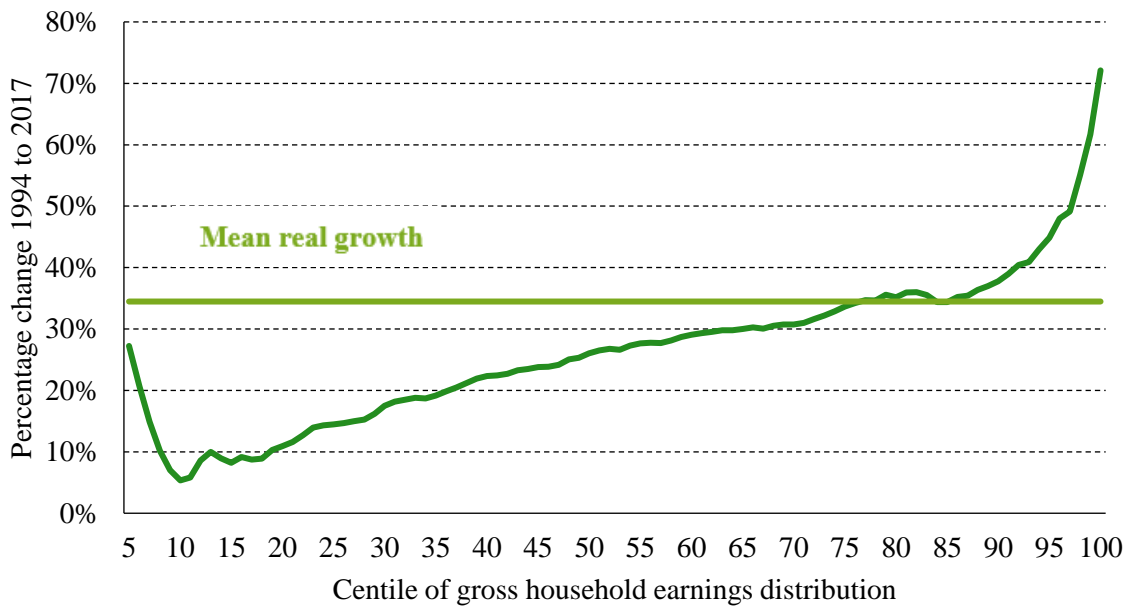


Notes: Working-age working households only. Centiles 1-4 excluded from this picture though there is very high growth for those centiles. Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

*Compositional changes and their effect on household earnings inequality*

To understand all of the reasons for the increase in household earnings inequality show is beyond the scope of this paper. However, there is an important factor which is often overlooked: the groups which have seen the largest falls in worklessness since the mid-1990s are those with the lowest household earnings.

Table 3 shows that while household employment has increased across all family types, the proportion of lone parent families ("single, with children") in a working household has almost doubled from only 34% in 1994–95 to 64% in 2017–18. This is the group that had – by far – the lowest household earnings in 1994–95. This suggests that as household employment has risen, more low-earning "types" of people (such as lone parents) are now in employment, potentially "pulling down" the bottom of the household earnings distribution. A similar pattern is seen by age, with the smallest increase in household employment coming for the 40-49 year old group (who had the highest household earnings in 1994–95). All these "compositional effects" could be affecting the distribution of household earnings.

Estimating the extent of this "compositional effect" of higher household employment on the household earnings distribution is very difficult; because those who have entered work are likely to be different from those who were in paid work already, and in particular they are likely to be "negatively selected" (have lower earnings potential than those already in work).

We therefore undertake two exercises to help show whether the changing composition of the workforce – in particular the changing composition of working households, can explain increases in household earnings inequality for working households. We do not present these as *estimates* of the effect of compositional change on the distribution of earnings, but as scenarios that can help us understand how important compositional change might be.

In our first scenario, we categorise each family into one of 24 mutually exclusive and exhaustive groups, based on the interaction of family type and age group in Table 3. [14] Taking 2017–18 data, we then randomly remove households from work such that the household employment rate in each cell is reduced back to its level in 1994–95. This exercise gives us an overall household employment rate very similar to the level in 1994–95. We do this 100 times to average out any simulation error and we compare the resulting simulated distribution of 2017–18 household earnings (with 1994–95 household employment rates) to the actual distribution of household earnings in 2017–18. This scenario **only** allows for the composition of the workforce to change between the 24 groups we set out (family type interacted with age group). But it is instructive to see if even just allowing for this form of compositional change generates higher earnings inequality. The results of this exercise are shown in Figure 5, in which we show the actual distribution of household earnings in 2017–18, the simulated distribution in this exercise (both shown on the left hand axis) and percentage difference between the percentiles of each distribution.

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[14] One thing that we do not control for in this exercise is the level of education. Less educated individuals have seen big increases in their employment rates since the mid 1990s. However, the fact that the fraction of individuals who left education at 16 (or below) has fallen so much since the 1990s (and the fraction with a degree has risen so much), makes it hard to compare education groups over time. In addition, for our purpose, if we define "cells" of households using education (interacted with age and family type), the changing fraction with different education levels makes it hard to "hit" the same level of overall household employment in 1994 by changing the "within-cell" household employment rates as we do in this exercise.

Figure 5 shows that – controlling only for changes in family type and age (interacted) – the rise in household employment (fall in worklessness) has changed the composition of working households in a way that reduces households earnings for working households more towards the bottom of the distribution than the middle or top – e.g. in this exercise, household earnings in 2017–18 are 8% lower at the 10th percentile, but only 3% lower at the median, that the simulated distribution which has the 1994–95 household employment rate. However, because this only allows for changes in family type and age, it is almost certainly an under-estimate of how important compositional change is at driving the rise in household earnings inequality.

**Figure 5 Actual distribution of household earnings for working households in 2017 and simulated distribution allowing for changing age and family type composition of working households**
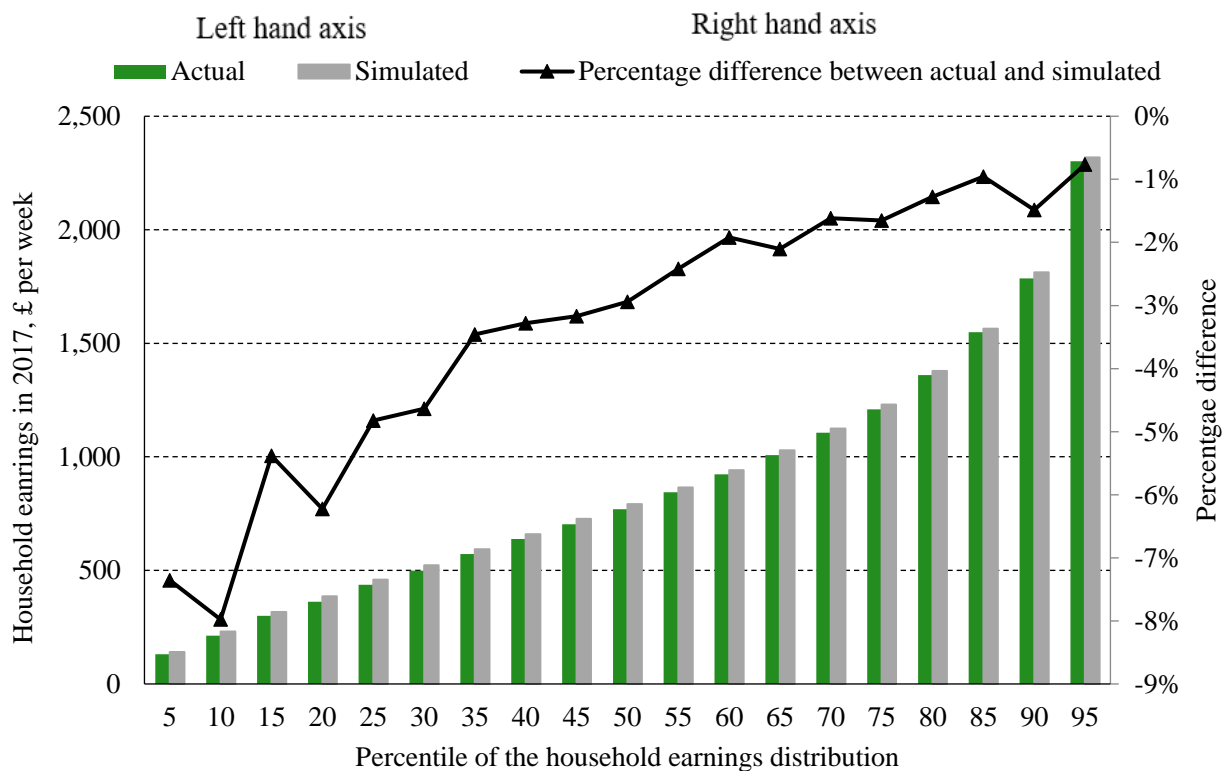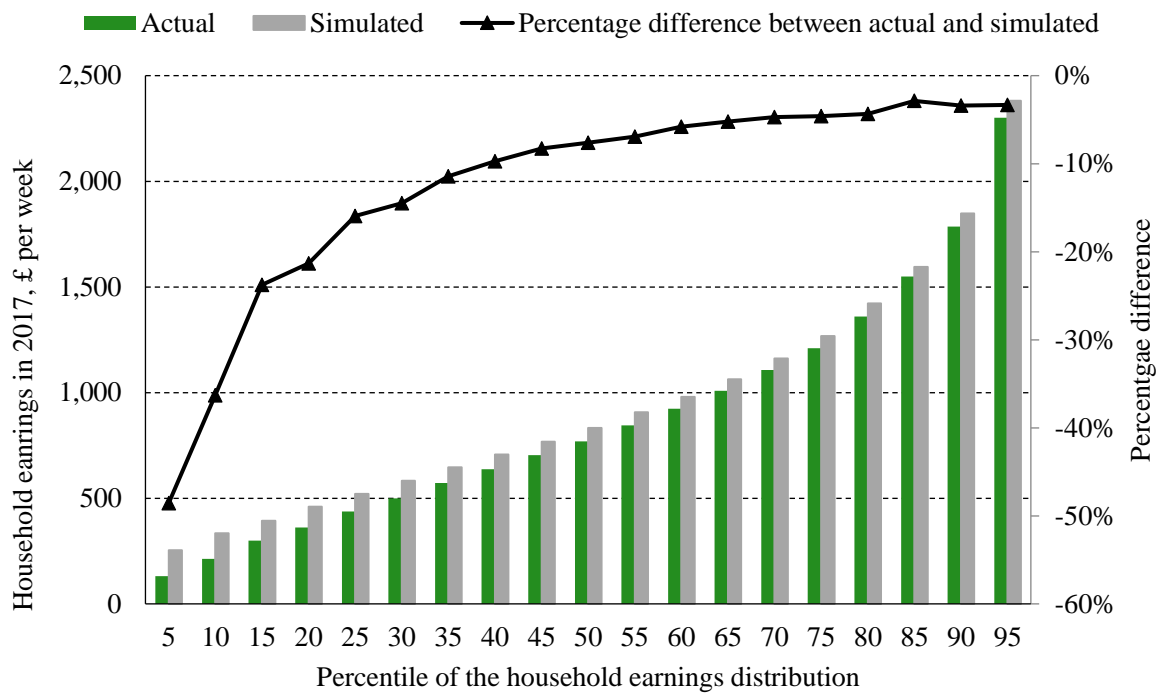


Source: Authors' simulation exercise (described in the main text), in which 2017 data is used to simulate how the household earnings distribution would change purely as a result of changes in household employment rates by family type interacted with age group. Using FRS data from 1994 and 2017.

In a second scenario, we present a bound of how important it could be that low earning "types" of households might be entering the workplace. To do this, we divide the working population in 2017

into the same 24 groups by age and family type. Instead of randomly simulating out households to reach the 1994–95 household employment rate, we remove the lowest earning households from each group until we reach the 1994–95 household employment rate for that group. This therefore assumes that, within each cell, the households that are in work in 2017–18 but would not have been in 1994–95 are the very lowest earners. The results of this, displayed in a similar way to the results of the first scenario, are shown in Figure 6.

The results of this scenario are much more dramatic. By removing the lowest earners from each group until the 1994–95 household employment rate is reached, the low percentiles of the simulated distribution are much higher than the actual distribution. The black line shows the resulting difference in the distributions. This exercise implies at the 10th percentile, the 2017–18 distribution could be up to 36% lower as a result of compositional change, compared to only 8% lower at the median. This implies that – at a maximum – all of the increase in household earnings inequality between the 10th and 50th percentiles between 1994–95 and 2017–18 might be explained by the compositional change. In truth, this is an extreme exercise, and the compositional effects are unlikely to be this dramatic.

**Figure 6 Actual distribution of household earnings for working households in 2017 and simulated distribution in which lowest earners in each family type and age group are simulated not to be in work**



Source: Authors' simulation exercise (described in the main text), in which 2017 data is used to simulate how the household earnings distribution would change as a result of removing the lowest earners within each family type and age group cell until the 1994 household employment rate is reached. Using FRS data from 1994 and 2017.

Overall these two scenarios show the compositional change is important in driving higher earnings inequality for working households. Even just allowing for changes in family type and age group and assuming away any "negative selection" implies the composition has modestly increased household earnings inequality. Our second scenario shows that at the most it may have dramatically increased household earnings inequality.

Either way, there is a key conclusion to take from this. One implication of the fall in worklessness, has been to lead to higher household earnings inequality – and in-work poverty – which in fact arises purely from a situation where some poor households have in fact increased their incomes by moving into work. This therefore highlights a problem with looking only at working household and trends in-work poverty in isolation from wider poverty trends.

*Alternative reasons for increased household earnings inequality*

There are other reasons to believe that there are other trends that increase household earnings inequality. First, as Blundell et al. (2018) show, there has been in general a higher percentage increase in the hourly wages of higher-earning people than middle or low earner (except for the very bottom which has benefitted from the introduction, and expansion of the minimum wage). Second, Belfield et al. (2017) find that increases in household earnings inequality are in large part driven by higher male earnings inequality. This is itself, in large part driven by falling hours of work for low paid men. This is clearly important, as lower hours pull down weekly earnings. Having said this, these papers do not show that these changes are not caused – at least in part – by the kind of compositional changes discussed earlier.

There is another important trend that is not due to the compositional changes described above. This trend is the increase in the number of families which are made up of two working adults. This has increased substantially as female employment has risen. Appendix Figure 4 shows that the proportion of low earning households (bottom quintile) that have only one working adult in them was 77% in both 1994–95 and 2017–18. In comparison, the fraction with only one worker for middle earning households fell from 27% to 19% over the same period and from 13% to 9% for high earning households. In other words, one reason for rising household earnings inequality is that is increasingly hard for low earning households with only one worker (often single adults who have no partner) to "keep up" with households with two adults because increasingly, both of those adults will be in work. This is another of the multiple reasons for higher household earnings inequality over the last 25 years.


*How much would lower earnings inequality have reduced in-work poverty?*

Whatever the exact reason for higher household earnings inequality, we now consider the impact of this pattern of household earnings growth on in-work poverty.  In order to do this, we estimate what in-work poverty would be in 2017–18 had earnings growth since 1994–95 been the same across the household earnings distribution (but leaving everything else – the tax and benefit system, unearned

income, hours worked and so on – unchanged from that seen in 2017–18)[15]. In other words, we

estimate in-work poverty in a world where earnings growth had been equal across the household

earnings distribution and so looked like the 'mean' line in Figure 4 above, rather than the actual

growth that occurred. This implies higher earnings for those with household earnings between the 5th

and 80th percentiles, and lower earnings for those outside that range. Notably it also implies

considerably larger increases in real earnings for those most of those in low earning households (20%

to 30%) than for those in middle earning ones (6%).

**Table 4: Simulated in-work poverty rates (working households) and overall median income (all households) in 2017–18 , actual and counterfactual earnings**

| Earnings growth 1994–95 to 2017–18 | In-work poverty | | | | Median income (overall) | |
| | Absolute | | Relative | | | |
| | AHC | BHC | AHC | BHC | AHC | BHC |
|---|---|---|---|---|---|---|
| Actual | 15.5% | 9.3% | 19.5% | 12.5% | £452 | £520 |
| "Equal growth" | 12.6% | 7.0% | 18.1% | 11.4% | £474 | £544 |
| Difference | –2.9ppts | –2.3ppts | –1.4ppts | –1.1ppts | +4.9% | +4.6% |
| *Memo: actual change 1994 to 2017* | –11.7ppts | –11.8ppts | +4.7ppts | +2.8ppts | +50% | +43% |

Notes: The absolute poverty line used for this analysis is based on the median of actual incomes in 2010–11, rather than simulated incomes. The relative poverty line however is based on simulated incomes. Note that the in-work poverty rates shown, and the median incomes under 'actual' earnings growth are based on simulated incomes, and are slightly different to the true values in 2017–18.
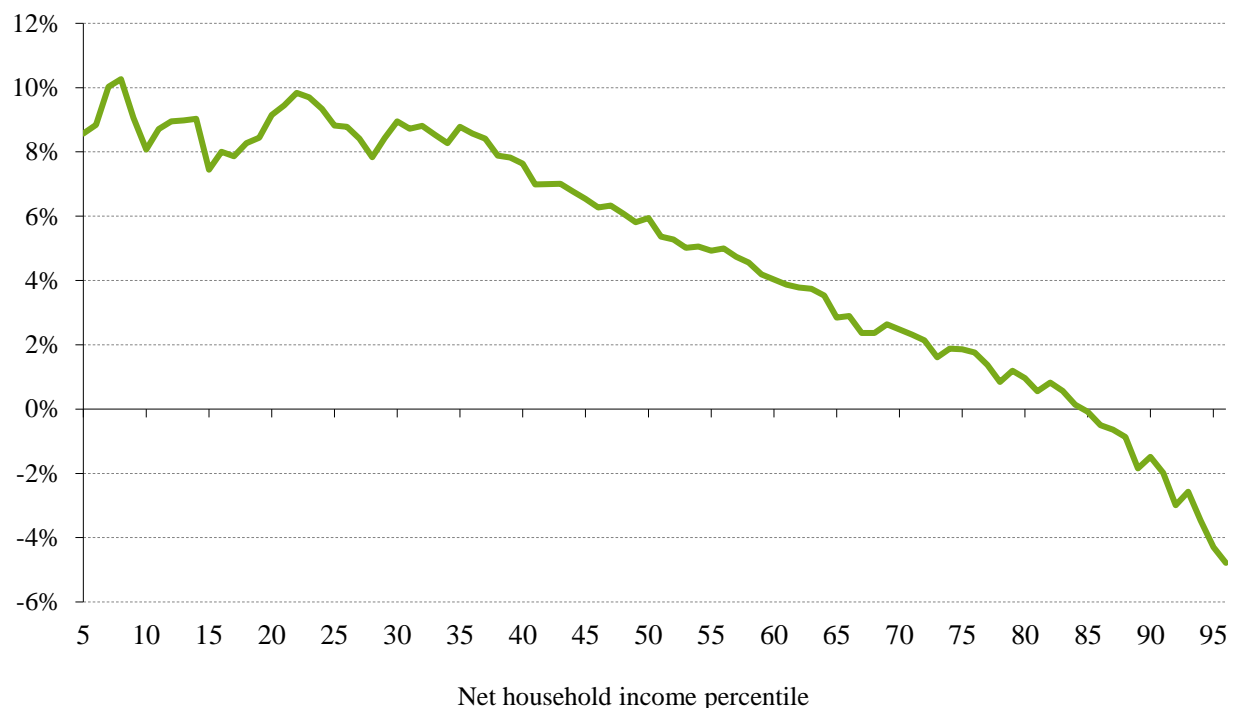
Source: Authors' calculations using the Family Resources Survey, 1994–95 and 2017–18, and TAXBEN, the IFS microsimulation model.

The results from this exercise are seen in Table 4. Not surprisingly, raising the earnings of those with

household earnings between the 5th and 80th percentiles reduces *absolute* in-work poverty, by 2.9

percentage points on an AHC basis. Equal earnings growth across the household earnings growth

would have also reduced relative in-work poverty, but by less – around 1.4 percentage points

measured AHC – because median income would also have been higher under this scenario. Therefore,

the increase in inequality in household earnings between 1994–95 and 2017–18 explains only 1.4

percentage points of the 4.7 percentage point rise in in-work poverty over the same period, using the

relative AHC measure of poverty.

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[15] We set out the full methodology for this in section 2.

The key reason why relative poverty would not be radically lower had earnings growth been equal across the household earnings distribution is that the increase in income among poorer working households would not be dramatically different to the increase in median income. This point is made by Figure 7, which shows how equal earnings growth would affect AHC incomes among working-age families in working households across the distribution. Poorer working families would see incomes 8-10% higher, while middle income working families would see incomes about 6% higher (note that this is slightly different to the change in *overall* median income, which Table 4 shows would be about 5% higher). Because poorer working families see incomes rise only a few percentage points more than median income, relative in-work poverty would does not drastically change.

**Figure 7: Change in AHC income by percentile point in 2017–18 under "equal earnings growth" scenario, among working-age families in working households**



Net household income percentile

Notes: This shows the difference between the income distributions of the 'equal' and 'actual' earnings growth simulations described in the text, among working-age families in working households only. Percentiles 1-4 excluded due to high statistical uncertainty.
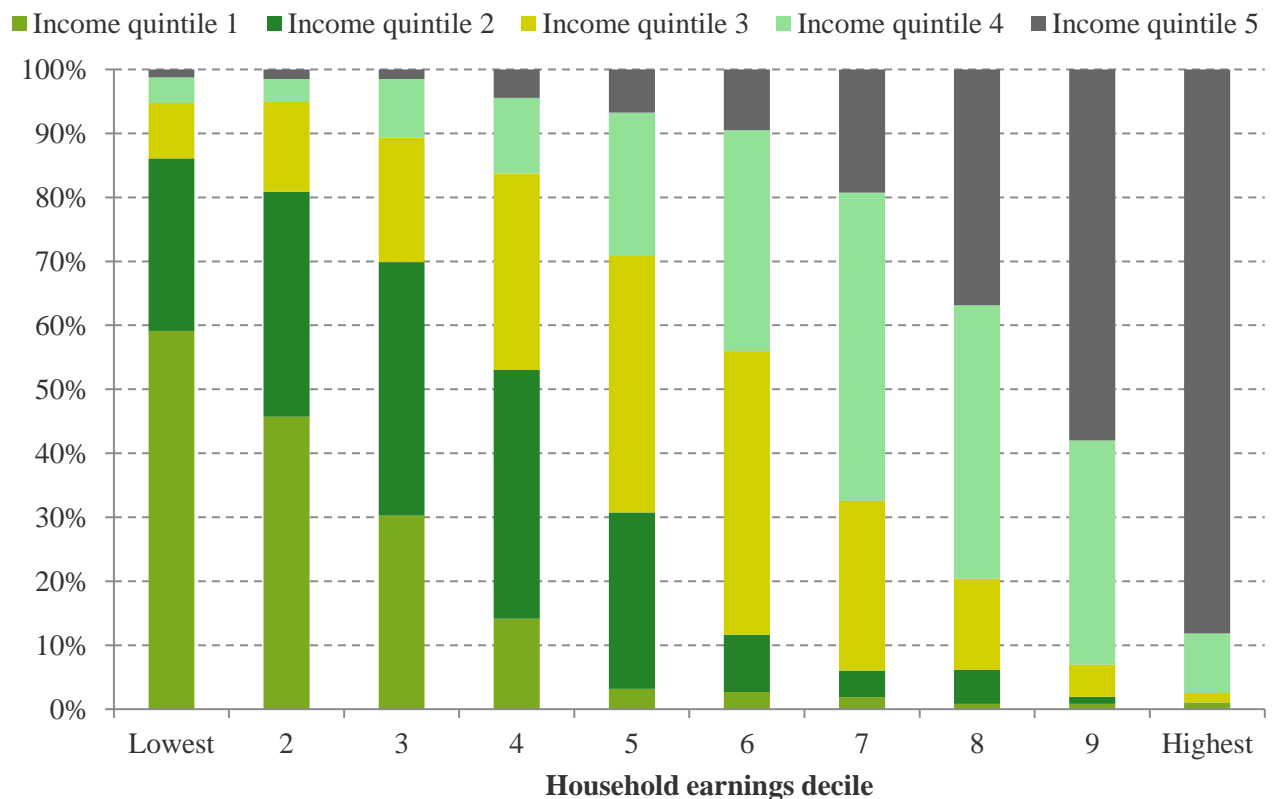
Source: Authors' calculations using the Family Resources Survey, 1994–95 and 2017–18, and TAXBEN, the IFS microsimulation model.

These results present us with a puzzle: we showed in Figure 4 that equal earnings growth would boost the earnings of those in low earning households considerably more than those in middle earning

households, but Figure 7 shows that those in low *income* working households would only see their incomes grow by a bit more than those in middle *income* working households. This apparent puzzle is reconciled by three things.

First, household earnings are only imperfectly correlated with household income. This point is made by Figure 8, which shows how the fraction of those in different household *net income* quintiles varies across the household *gross earnings* distribution. Clearly those with higher household earnings are more likely to be in higher income quintiles. But there are still a significant number of people with low household earnings and high household income and vice-versa. This means that boosting the incomes of those towards the bottom of the household *earnings* distribution (as would happen in the equal growth scenario) affects those with middle incomes as well as those in poverty.

**Figure 8: Share of those in working-age families in working households in different AHC net income quintiles, by household earnings decile, 2017–18**



Notes: Income quintiles are calculated using the whole population. Household earnings deciles are calculated using only those in working-age families in working households and are measure pre-tax.

Source: Authors' calculations using the Family Resources Survey 2017–18.

Second, low-earning households get a much smaller share of their income from employment. This can be seen in Figure 9, which shows the composition of income for working-age families in working households, split by household earnings quintile. Those in the bottom fifth of the household earnings distribution receive only about half their income from employment on average, while those around the middle receive almost all of it (96%) from employment. This means that a given proportional increase in earnings has a bigger impact on the incomes of those at the middle than it does on those at the bottom. This helps explain why equal distribution of earnings growth would not increase incomes of low-income working households by much more than those with middle income.

**Figure 9: Composition of income among working-age families in working households, by household earnings quintile, 2017–18**
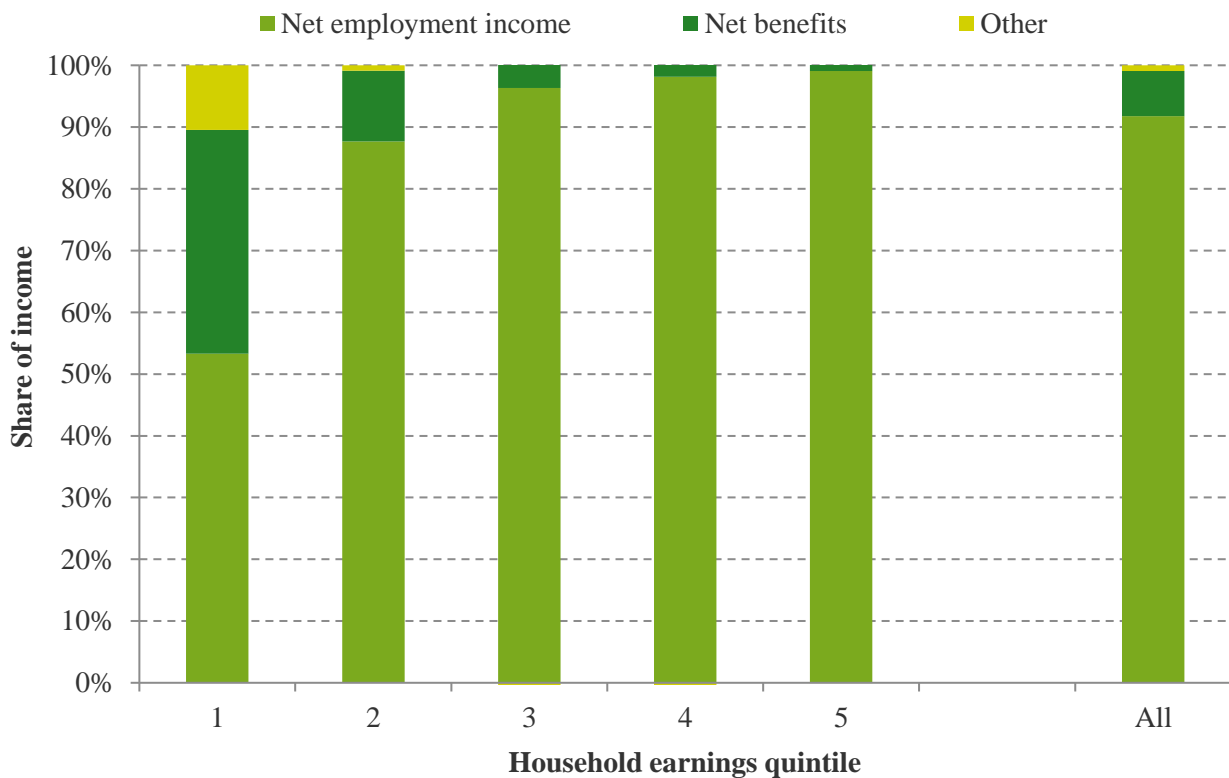


Notes: "Other" includes income from savings and investments, occupational pensions, income from children, other miscellaneous income and deductions (most important of which is council tax). Source: Authors' calculations using the Family Resources Survey 2017–18.

Third, workers in in lower earning households face higher 'effective marginal tax rates' (EMTRs) than those in middle earning ones. An EMTR is the amount a household would lose in tax and reduced benefit entitlements if their earnings were slightly increased. Figure 10 shows average

EMTRs across the earnings distribution. EMTRs are considerably higher for workers in low earning households than middle earning ones, since the former are more likely to be on means-tested benefits and so when their earnings rise they see those benefits withdrawn. This implies that a given cash increase in earnings for all households would have more effect on the incomes of middle-earning households than low-earning ones.

**Figure 10: Average effective marginal tax rate for workers in working-age families in 2017–18, by household earnings centile**
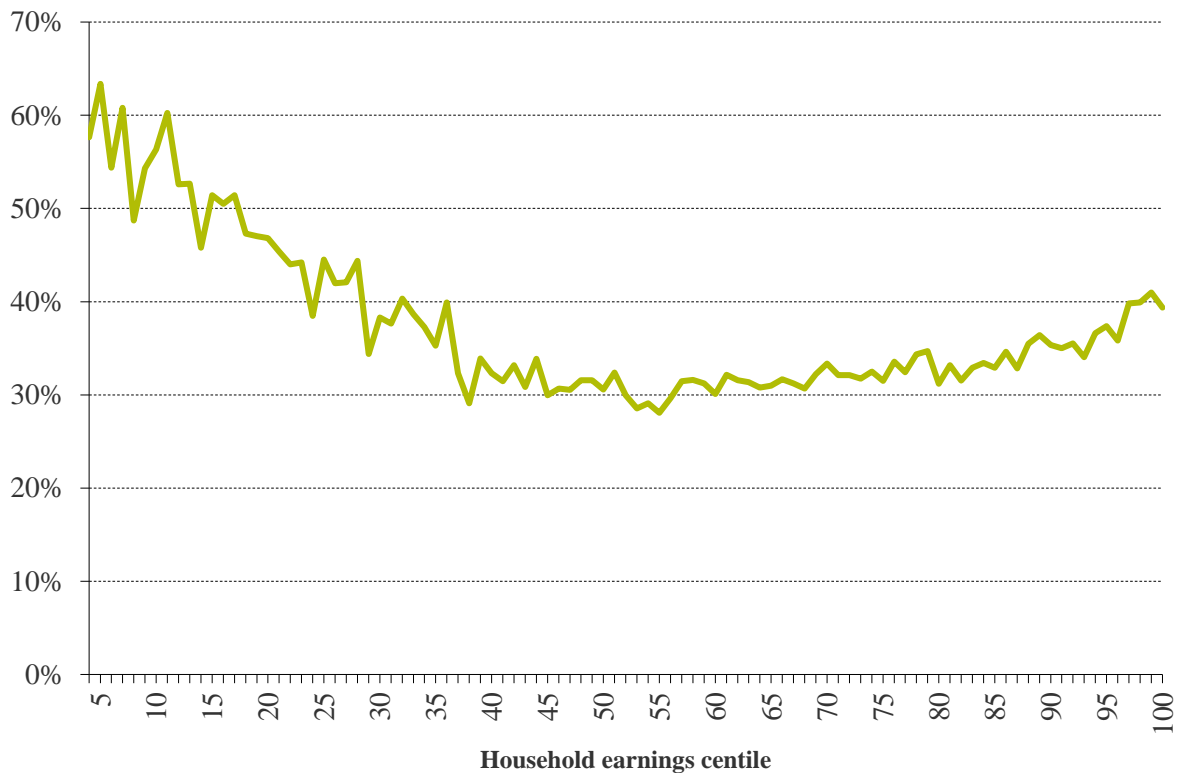


Notes: Assumes full take-up of benefits and tax credits. Centiles 1-4 excluded.

Source: Authors' calculations using the Family Resources Survey 2017–18, and TAXBEN, the IFS microsimulation model.

So, to bring these results together: those in lower earning households get less of their income from earnings and have higher EMTRs than those in middle earning households. That means that a given increase in earnings has less impact on their incomes. Earnings are also only an imperfect predictor of income. Because of these factors, more equal household earnings growth would boost the incomes of those in low *income* working households only modestly more than those in middle income ones. That in turn means that only 1.4 percentage point of the 4.7 increase in in-work relative poverty between 1994–95 and 2017–18 can be attributed to higher earning households seeing faster earnings growth

than lower earning households. This means that while it has been an important factor in increasing in-work relative poverty, it is not the only (or necessarily the key) reason.

*IV. b    The role of changes in the tax and benefit system*

With over a third of the income of low-earning working households coming from benefit and tax credits, changes to the tax and (in particular) the benefit system have the potential to have changed incomes of low-income working households in a substantial way. Indeed, Blundell et al. (2018) find that the tax and benefit system has played an important role in preventing a rise in income inequality since the mid-1990s. In that context, we want to examine how changes to the tax and benefit system have affected in-work poverty.

Figure 11 implies that the welfare system has played an important role in affecting in-work poverty. It shows real mean benefit and tax credit income received by each quintile of the gross household earnings distribution. It is clear that there have been large increases in benefit incomes for low-earning households since the mid 1990s, with the largest increases coming in the early 2000s (that to a lesser extent benefitted middle earnings households too) with the major expansion of the tax credit system by the Labour government. The second period of increases is in the early aftermath of the Great Recession, in which the Labour government substantially increased the values of some benefits (in particular tax credits). After 2010–11 average benefit incomes flattened and fell, across all groups, though in cash terms the most for low-earning families, as that Coalition and Conservative governments have reduced the real value of working-age benefit entitlements. Appendix Figure 5 shows that looking at the percentage of net income received in benefits (rather than the real £ per week) shows much the same picture.

**Figure 11 Real mean benefit and tax credit incomes, by quintile of the gross household earnings distribution among working households (£ per week)**
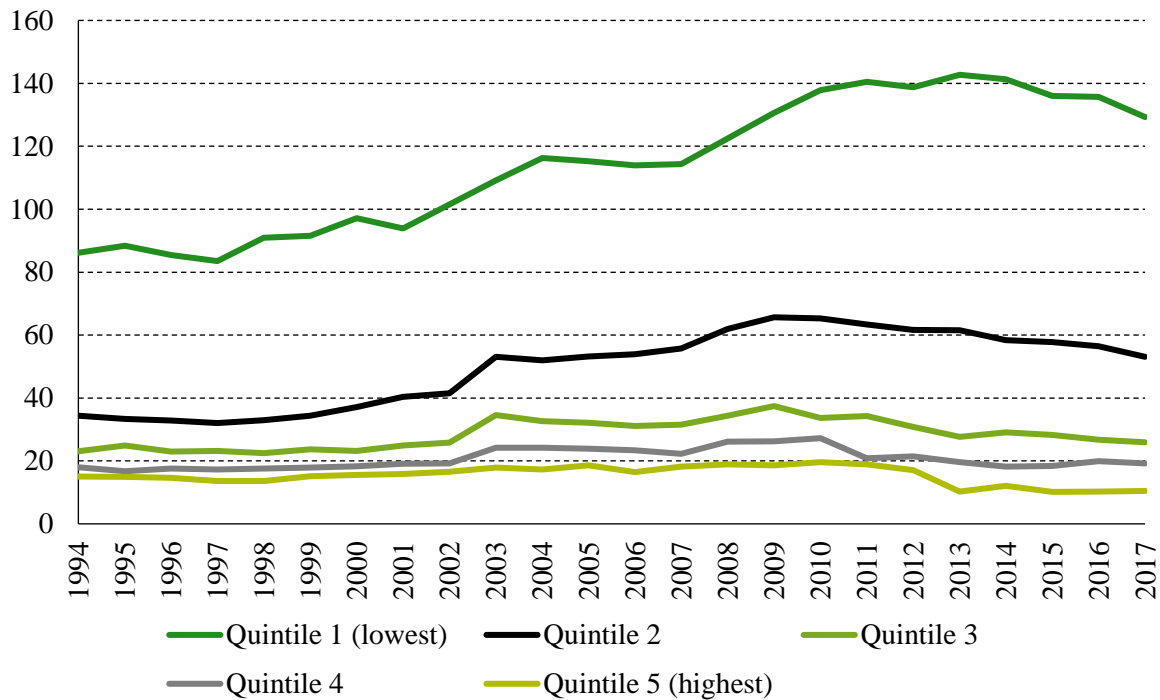


Notes: All cash amounts expressed in 2017–18 prices.

Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

It is important to understand to what extent the reforms that have driven changes in benefit incomes have impacted in-work poverty. To answer this question, we estimate what in-work poverty would be in 2017–18 if the tax and benefit system had been unchanged since earlier years (specifically, if the cash amounts in the system – things like benefit levels and tax thresholds – had been uprated in line with average earnings). A variant is shown in Appendix Table 2 where all parameters are uprated in line with CPI inflation. Everything else – such as earnings, working patterns and so on – are left unchanged from that seen in 2017–18, as set out in the methodology section in section 2.

The results are shown in Table 5. There are several things to note. First, in-work poverty rates – absolute and relative, AHC and BHC – are considerably lower in 2017–18 as a direct result of the changes to the tax and benefit system since 1994–95 (this analysis assumes no behavioural impacts of changes to the tax and benefit system). Second, these differences are more than accounted for by changes that happened between 1997–98 and 2010–11. This is partly due to the introduction of modern tax credits in the early 2000s, and the large increases to them seen in the wake of the Great

Recession (as shown in Figure 11), which considerably increased state support to poor working families, especially those with children. Third, tax and benefit reforms between 2010–11 and 2017–18 had essentially no impact on absolute in-work poverty, but raised relative in-work poverty. This difference is because median income – which varies very little due to changes between the 1994–95 and 2010–11 systems – have been boosted due to changes between 2010–11 and 2017–18.[16] This is due to the very large increase in the income tax personal allowance threshold (the amount of taxabale income that can be received without paying income tax) under the Coalition and Conservative governments.

The change in the personal allowance is important in understanding the simulation results of the effect changes since the 2010–11 tax and benefit system. Since 2010–11 entitlements to working age benefit and tax credits have been cut, which has suppressed the incomes of poor working families. But the increase in the personal allowance has benefitted some low-income working families. These two effects essentially offset each other when looking at absolute poverty; there is little difference in absolute in-work poverty rate as a direct result of the changes between 2010–11 and 2017–18. But when looking at relative in-work poverty (which is of course the focus of this paper), the increase in the personal allowance since 2010–11 has also pushed up median income, meaning that as a result of direct tax and benefit changes since 2010 – 11 low income working families have fallen behind the middle, increasing relative AHC poverty by 1.8 percentage points.

In Appendix Table 2 we also show a variant of the result assuming that the parameters of the tax and benefit system had been uprated in line with CPI inflation instead of average earnings. The results imply that changes to the tax and benefit system since 1994 have reduced in-work poverty to an even greater extent than the headline results in Table 5.

In summary, therefore, changes to the tax and transfer system do **not** explain why relative in-work poverty is higher in 2017–18 than it was in 1994–95. This is because the tax and welfare system have redistributed significantly towards poor working families since then, pushing down in-work relative

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[16] Note that this analysis excludes changes to indirect taxes, such as VAT which was increased from 17.5% to 20% in January 2011.

poverty. The changes to the tax and transfer system actually increase the "puzzle" as to why in-work poverty has been rise.

However, cuts to benefit entitlements since 2010–11 have been a key driver of the increase relative poverty since then (indeed, they explain essentially all the increase in in-work relative poverty since then) although the personal allowance increase means that the direct tax and benefit changes since then have not acted to increase *absolute* in-work poverty.

**Table 5 Simulated change in-work poverty rates and overall median income from different years to 2017–18 as a direct result of changes to the tax and benefit system**

| Changes to tax and benefit system since: | In-work poverty | | | | Overall median income (£ per week) | |
|---|---|---|---|---|---|---|
| | Absolute | | Relative | | | |
| | AHC | BHC | AHC | BHC | AHC | BHC |
| 1994–95 | –4.3ppt | –4.3ppt | –2.1ppt | –2.9ppt | +18 | +17 |
| 1997–98 | –4.6ppt | –4.7ppt | –2.4ppt | –3.2ppt | +19 | +17 |
| 2007–08 | –3.0ppt | –2.2ppt | –1.1ppt | –0.6ppt | +24 | +24 |
| 2010–11 | +0.2ppt | –0.1ppt | +1.8ppt | +1.3ppt | +17 | +15 |

Notes: The absolute poverty line used for this analysis is based on the median of actual incomes in 2010–11, rather than simulated incomes. The relative poverty line however is based on simulated incomes. Note that the in-work poverty rates shown under the 2017–18 tax and benefit system are based on simulated incomes, and are slightly difference to the true poverty rates in 2017–18. Rates shown are for working-age families.

Source: Authors' calculations using the Family Resources Survey 2017–18, and TAXBEN, the IFS microsimulation model.

Before we turn to an examination of the role of housing costs, it is worth reflecting on the analysis so far. In this section we have so far discussed three ways in which changes in policy and the labour market may have affected in-work poverty: growth in employment among low earning households, increasing inequality in earnings, and reforms to the tax and benefit system. We have considered these in isolation – in other words, estimating the impact of each in turn while holding the others constant.

However, all three of these changes are likely to be related to one another. Increased benefits for working families (compared to out of work families) incentivises more to get into work. But those who start working as a result are more likely to have lower earnings; both because they on average earn less per hour, and because the tax credits system incentivises some (lone parents) to work part time. This in turn tends to reduce earnings at the bottom of the household earnings distribution, contributing to the increased inequality in earnings seen over the period. Therefore, while looking at

these changes in isolation – as we have done – is still useful, we should remember that they are all likely to be related in a way that is very difficult to confidently disentangle.

*IV.c. The role of changes in housing costs*

So far we have almost entirely focussed on AHC measures of poverty. That is, poverty measured using income after housing costs such as rent payments and mortgage interest payments[17] have been deducted. This is because, as discussed earlier, there are good reasons to believe that AHC poverty rates provide a better indicator of (changes in) living standards than BHC ones do. That said, comparing BHC and AHC income measures can be useful, as it may shed some light on whether recent trends observed with respect to UK in-work poverty are partly driven by trends in housing costs. As was shown in Figure 3, relative in-work poverty measured AHC has risen by 4.7 percentage points, compared to only a 3.6 percentage point rise measured BHC.

In addition, relative in-work poverty has risen much more measured AHC than BHC in one particular region: London. While the gap between relative in-work poverty measured AHC and BHC rose on average by 1 to 2 ppts for all other regions/ nations from 1994–95 to 2017–18, the gap for London – also the region with the highest increase in AHC poverty rate – increased by 6 ppts over the same period (as shown in Appendix Table 3).

With high housing costs coinciding with strong increases in poverty rates, the following question arises: Have low-income working households experienced faster than average increases in their total housing costs in a way that is important in driving changes in AHC poverty rates? Studying developments in housing costs across time and across the income distribution may help us partly understand the rise in in-work poverty that has occurred over the last couple of decades. In this analysis, we focus on housing costs net of (i.e. minus) housing benefit payments. This is because

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[17] Housing costs also include water rates, community water charges, council water charges, structural insurance premiums for owner-occupiers, and ground rents and service charges. Mortgage capital repayments are not included as they represent the accumulation of an asset (increase in housing wealth). Therefore, they are better thought of as a type of saving than as a housing cost. Maintenance, repairs and contents insurance are also not included under housing costs.

changes in housing costs that are met by higher housing benefit would not affected AHC measures of poverty.

Figure 12 presents the average change in equivalised housing costs (net of housing benefit) for individuals in working households by AHC income quintile. It shows that average net housing costs of the bottom quintiles (most notably the second) have increased by more than the average between 1994–95 and 2017–18.[18] Growth in housing costs between 1994–95 and 2007–08 (pre-crisis) was slightly higher for low income working households than middle income working households, but the period in which the trends in housing costs were most different since 2007–08, after which mortgage interest rates for homeowners fell dramatically.[19] In total real mean housing costs (net of housing benefit) across the whole population rose by 27% over the period, and by 23% for working households.

**Figure 12: Change in real housing costs (net of housing benefit) of in-work households since 1994–95, by overall AHC household income quintile**



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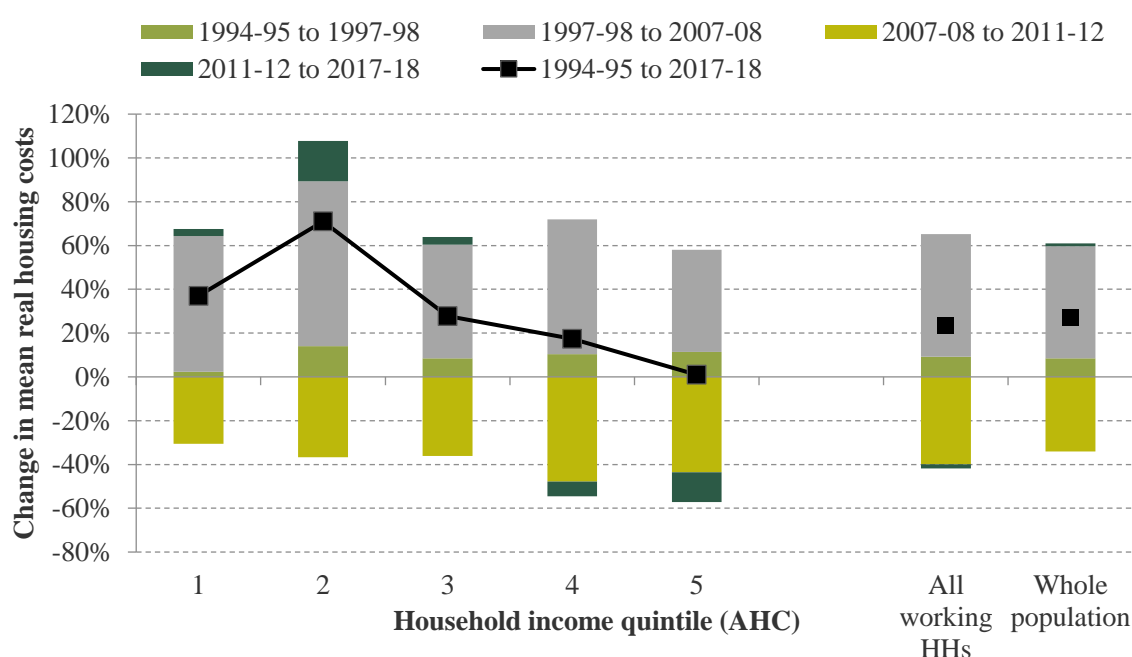
[18] Falls in housing costs for poorer families in the latest year of data (2017-18), in part due to falling social rents, mean that the change 1994 to 2016 is even more pronounced with higher growth in housing costs for low income working households.

[19] The results shown in Figure 12 are similar when we look at all households, not just working households.

In order to understand what is driving the difference in changes in real housing costs across the distribution, it is important to examine how 1) trends in housing tenure have varied across the distribution and 2) how have average housing costs for each type of tenure changed over time.

The graphs in Figure 13 plot the fraction of such individuals living in different types of accommodation for each income quintile, once for 1994–95 and once for 2017–18. There are three things worth highlighting about the tenure of individuals in low-income working households: First, they historically have been (and still are) more likely to live in social-rented or private-rented housing than are those in higher-income working households. Second, there have been larger changes in tenure composition over time for lower-income working households than for middle or high income households, with a big move towards private renting, and a large decline in homeownership. Third, there has been an increase (5 ppt) in the fraction of low-income working households who are social renters. This is not because low-income households on average are more likely to be social renters (see Appendix Figure 7), but because many more social renting households live in a working household as worklessness has fallen, as discussed.[20]

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[20] For individuals in non-pensioner households belonging to the bottom income quintile, the fraction of social renters decreased by 6ppts and less than they did for individuals in working households of the bottom quintile.

**Figure 13: Housing tenure composition of individuals in working households in 1994–95 and 2017–18, by AHC household income quintile**
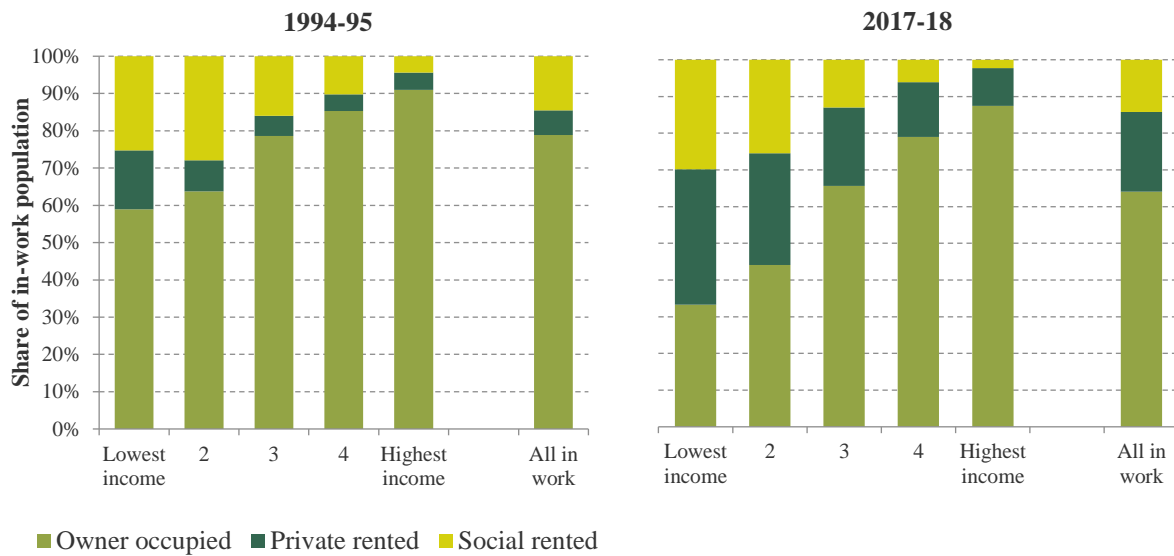


Note: Income quintiles are defined among the entire population using income after housing costs have been deducted.

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

These observations help to explain the relatively high growth in housing costs among individuals in low-income working households, as housing costs differ by tenure and have followed different trajectories over the last two decades or so. Figure 14 shows that average housing costs (net of housing benefit) were considerably higher among private renters than they were among social renters or owner-occupiers for the whole of the last 25 years. The solid lines are shown for all households, with the dashed lines showing that they were slightly higher, on average, for working households, but that the trends have been very similar.

The Figure shows that individuals in working households that live in social rented housing have experienced nearly a doubling in mean real housing costs (net of HB) since 1994–95. This is consistent with the policy of the 1997–2010 Labour government to increase social rents (see House of Commons Library 2019). Those in private-rented housing have experienced around a 40% increase. This compares to a fall of around 18% in housing costs for owner-occupiers. These falls are driven by

the falls in mortgage interest rates after the Bank of England reduced its Base Rate during the 2008–09 financial crisis, from where they have not recovered.[21]

**Figure 14: Mean real housing costs net of housing benefit for whole population and for people in working households since 1994–95, by housing tenure**



Note: Real housing costs net of housing benefit are equivalised using the modified OECD after-housing cost equivalence scale and deflated using an after-housing cost deflator. Solid lines are for the whole population, dashed for working household only.
Source: Authors' calculations using the Family Resources Survey, various years.

Table 6 brings the effect of the previous charts together, presenting statistics on how much the changes in tenure composition and the change in housing costs for each tenure type contributed to the change in average housing costs for individuals in working households by AHC income quintile (i.e. for richer versus poorer working households). It shows that changes in housing tenure composition – a shift away from owner-occupation and towards private renting – explain a large part average increase in the housing costs of individuals in households in work belonging to the bottom two to

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[21] These trends are similar for the full sample of individuals in non-pensioner households, however they did experience a smaller increase in mean housing prices in private renting as well as social-renting.

three AHC income quintiles.[22] But a big difference between lower and middle income quintiles is that higher social rents and higher private rental costs push up the housing costs of lower income households relative to lower income households, while this does not happen for higher income households.

**Table 6: Decomposition of changes in mean housing costs (net of HB) between 1994–95 and 2017–18 by tenure and AHC income quintile for people in working households**

| AHC income quintile | Overall change in mean housing costs (%) | Percentage point change in housing costs due to change in: | | | |
|---|---|---|---|---|---|
| | | Social rented costs | Private rented costs | Owner occupied costs | Housing tenure composition |
| 1 | 37% | 16 | 11 | −13 | 23 |
| 2 | 71% | 20 | 30 | −8 | 29 |
| 3 | 28% | 7 | 14 | −16 | 23 |
| 4 | 17% | 5 | 10 | −14 | 16 |
| 5 | 1% | 2 | 5 | −15 | 9 |

Note: Real housing costs are equivalised using the modified OECD after-housing cost equivalence scale and deflated using an after-housing cost deflator. Income quintiles are defined among the entire population using income after housing costs have been deducted.
Source: Authors' calculations using the Family Resources Survey, various years.

The presented statistics suggest that at least a part of the increase in AHC in-work poverty can be explained by there have been increases in the proportion of low income working households who are private renters (and to a much lesser extent social renters). At the same time, mean housing costs for private renters and even more so those for social renters increased substantially between 1994–95 and 2017–18, while those for owner occupiers decreased. This means that individuals of low-income working households disproportionately saw their housing costs increase, causing an increase in the gap between in-work AHC and BHC poverty rates.

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[22] Trends are similar for individuals in non-pensioner households, however, housing tenure composition explained 10 ppts less of the overall change in mean housing costs for the bottom quintile. This is intuitive, as though across this population there is a larger fraction of social and private renters for the bottom of the distribution, this fraction did not increase (but decreased) for social-renters and increased less for private renters over the observed time period than it did for all individuals in working households.

To understand how the trends in housing costs – and how they have been less favourable for lower-income households than higher income households (including for working households) – have affected in-work poverty, we perform two simulation exercises.

First, we ask how much lower in 2017–18 would in-work poverty be simply if housing costs (net of HB) for private renters, social renters, and owner-occupiers had all grown at the same rate since 1994–95 (i.e. the average growth rate for total housing costs)? This exercise does not allow for the effects of changing housing tenure composition (or for example, for private rents to grow by different amount for higher or lower income households).

Second, to allow more fully for changing housing costs across the distribution, we calculate changes in housing costs across the deciles of the AHC income distribution (separately for pensioners, working households and workless households).[23] These changes are shown in Appendix Table 4. We ask what if, instead of growth in housing costs being higher towards the bottom of the income distribution and lower (or negative) towards the top, if housing costs across the income distribution had all grown at the same, average rate. This scenario allows for more of the changes in housing costs across the distribution than the first scenario. [24] For example, it implicitly allows for the fact that lower income households will have been affected by the reductions in the generosity of housing benefit – particularly in the private rented sector – since 2010–11, whereas middle and high income households will not have been affected by this.

The results of these two simulation exercises are presented in Table 7.

The first scenario with equal housing cost growth across the three housing tenures since 1994–95 implies that relative in-work AHC poverty would be 1 percentage point lower as a result purely of change in the cost of private renting, social renting and owner occupation (all net of HB) being the

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[23] Given there are not many workless households, particularly high income ones, we do not look at deciles for this workless households, but split them into three groups: the first containing those in the bottom AHC income quintile, the second those in the second AHC income group, and the third those in the top 3 AHC income quintiles.

[24] We allow for differences by household type (pensioner/working HH/workless) as, conditional on income decile, these groups may experience different housing cost growth (for example, because more pensioners are owner occupiers) and because we are interested specifically in working households, and so do not want to have the estimate of their housing costs affected by trends for other groups.

same. We also find a similar, albeit slightly smaller, drop for absolute in-work poverty in this scenario.

The second scenario – with equal housing cost growth across the income distribution since 1994–95 – implies that relative in-work poverty would be 2.4 percentage points lower in 2017–18, again with similar sized reduction in absolute in-work poverty. The reason that changes in relative and absolute poverty are similar is that change in housing costs for middle income households has been similar to that for the total on average, meaning that this simulation does not change median (AHC) income very much, as shown in the Table.

**Table 7: Simulated in-work poverty rates (working households) and overall median income (all households) in 2017, actual and counterfactual gorwth in net housing costs**

| Net housing costs growth scenario | In-work poverty (AHC) | | Median AHC income (whole population) |
|---|---|---|---|
| | **Relative** | **Absolute** | |
| Actual | 18.2% | 16.1% | 437 |
| "Equal growth across housing tenures" | 17.2% | 15.4% | 434 |
| Difference to actual | –1.0ppts | –0.7ppts | –3 |
| "Equal growth across income distribution" | 15.8% | 13.8% | 437 |
| Difference to actual | –2.4ppts | –2.2ppts | 0 |

Notes: Absolute poverty is defined as less than 60% of the median income from 2010–11. Cash amounts are in 2017–18 prices. Real housing costs are equivalised using the modified OECD after-housing cost equivalence scale and deflated using an after-housing cost deflator.

Source: Authors' calculations using the Family Resources Survey, 1994–95 and 2017–18.

These results show that a large fraction of the increase in the in-work relative poverty rate (2.4 ppt of the 4.7 ppt increase) that has been seen over the almost two and a half decades between 1994–95 and 2017–18 can be attributed not to changes in the employment incomes or the tax and benefit systems, but the fact that housing costs (net of housing benefit) have grown massively more for poorer families than on average. In part, this is due to increases in social rents, and to a lesser extent private renting. It is also due to the fact that higher income households have benefited more from the fall in mortgage interest rates. Finally, it is in part due to the fact that more and more working households, particularly on lower incomes, live in the relatively expensive private rented sector because they are not able to purchase their own home.

## V. Conclusion

The fraction of those in relative income poverty who live in a working household has risen steadily between 1994–95 and the latest data in 2017–18, which has generated significant attention in policy and political circles in the UK. In large part, this reflects falling relative poverty rates for workless households, pensioners, and a fall in worklessness which means there are more working households that there used to be. However, it also reflects an increasing probability of being in poverty for those living in working households, from 13% to 18% between 1994–95 and 2017–18. It is this rise that this paper has sought to explain.

Two of the reasons that the in-work poverty rate has risen reflect positive trends in British society. First, the incomes of pensioners have grown substantially in the last 25 years, boosted by increases in the state and private pensions. From being a relatively poor group in the mid 1990s, average pensioner incomes are now equal to average incomes for the rest of the population. Re-calculating median income, and hence the relative poverty line, to exclude pensioners from the calculations, the rise in in-work poverty is only 3.3 percentage points as opposed to 4.7 percentage points. Second, the large fall in household worklessness has – in particular – brought into the working population lone parents who have relatively low earnings. This compositional change has increased earnings inequality and pushed up in-work poverty, despite the fact that there are in fact better off from being in work. This highlights a danger of focusing on in-work poverty if it is done in isolation from a proper understanding of trends in poverty more generally.

Irrespective of how much the increase in household earnings inequality has been driven by the changing composition of the workforce, we find that increased household earnings inequality has been one driver of higher in-work poverty, explaining around 1.4 percentage points of the rise in in-work poverty. The beneficial impact of higher earnings growth for lower earning households has on reducing in-work poverty is mitigated by higher effective marginal tax rates for low earning households, the fact that they receive a large share of their income from the state rather than in labour

income, and the fact that some low earnings households are closer to the middle of the after-housing-costs income distribution.

A larger driver of in-work poverty has been the large rises in housing costs for low-income working households compared to those for middle- or high-income households. This is a result of large increases in private rents and social rents, and a fall home-ownership (which tends to involve lower housing costs that private renting). These trends pushed up relative in-work poverty by 2.4 percentage points between 1994–95 and 2017–18.

The key factor acting against the rise in relative in-work poverty has been the increases in the generosity of the benefit system towards low-income working families, which have pushed down relative in-work poverty by 2.1 percentage points. In particular, the tax credit reforms of the early 2000s, and the increases in benefit rates between 2007–08 and 2010–11 acted to reduce working poverty. This has been partially reversed since 2010–11, with reductions in real benefit entitlements (though the changes since 2010–11 have not pushed up absolute in-work poverty, as poor working households have also benefitted from increases in the personal allowance).

These results can help academics and policymakers understand the changes in British society in the last 25 years and speak to some of the policy responses. To some extent, the rises in in-work poverty rates are the result of positive trends – and these should be painted as such. Where they are the result of negative trends, they point towards effective policy solutions. Even significant increases in the pay of low-earning households (proposed through interventions such as a higher minimum wage) is unlikely to radically reduce in-work poverty. On the other hand, action on reducing housing costs for poorer households, and increases in benefit entitlements to poor working families could prove more effective, in particular if the welfare system can continue to change to encourage more people to enter work.

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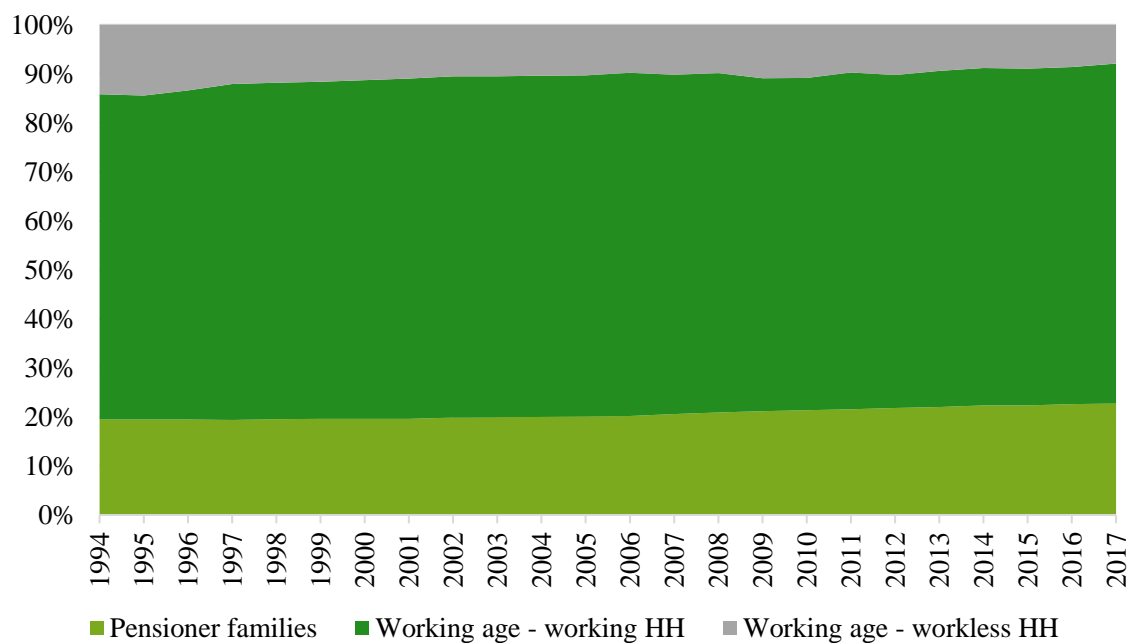
**Appendix**

**Appendix Table 1: Relative and Absolute AHC poverty lines in 2017–18 for households with different sizes and structures (£ per week)**

|  | Childless couple | Single adult | Lone parent, one child | Couple, one child | Couple, two children |
|---|---|---|---|---|---|
| Relative poverty line | 247 | 143 | 193 | 296 | 346 |
| Absolute poverty line | 262 | 152 | 204 | 314 | 367 |

Note: Incomes have been measured net of taxes and benefits and after housing costs have been deducted. The children in these example families are assumed to be aged 13 or younger. For families with older children, the poverty lines are slightly higher. The absolute poverty line is defined as 60% of median income in 2010–11 and the relative poverty line as 60% of median income in 2017–18.
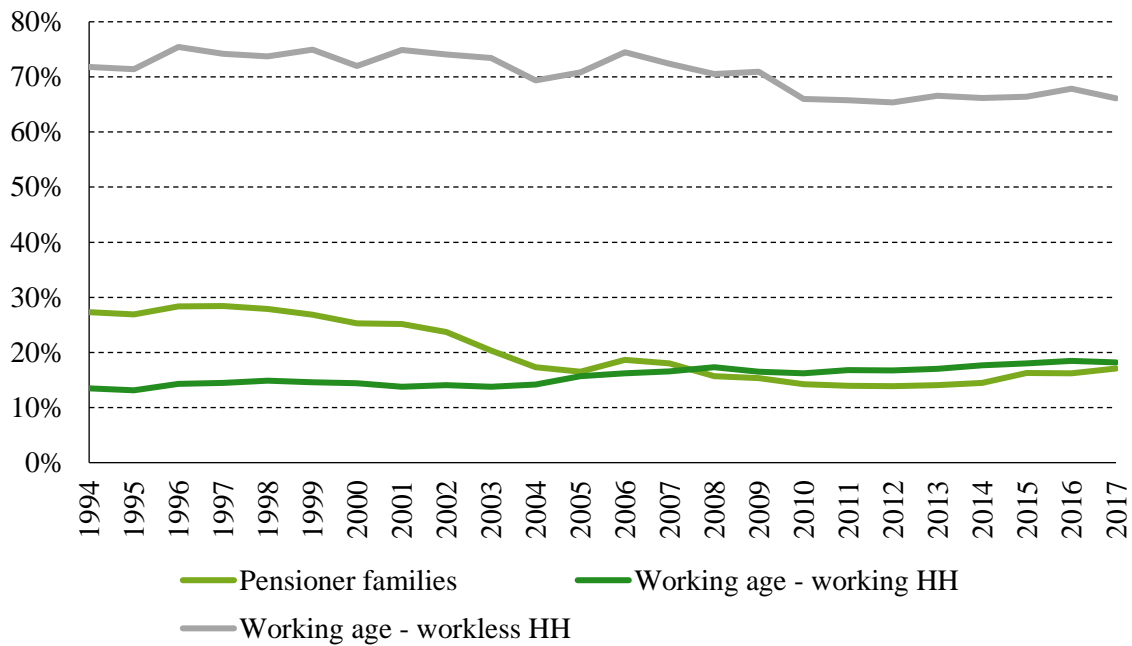Source: Department for Work and Pensions (2019)

**Appendix Figure 1 Percentage of population living in each family type, 1994 to 2017**



Note: Pensioners defined as women aged 60+ and men aged 65+.

Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.
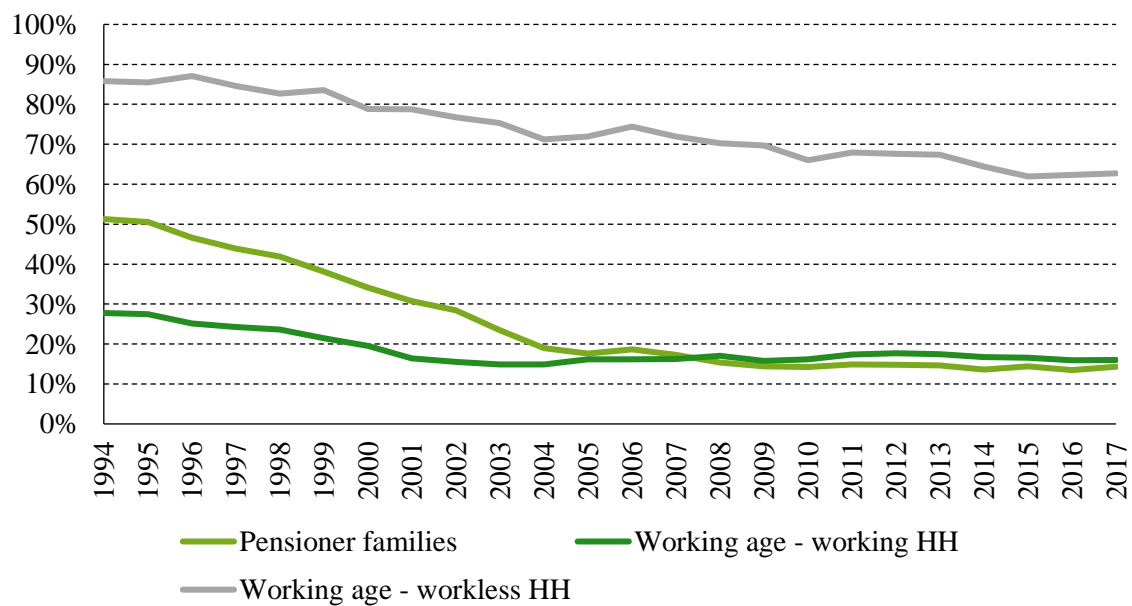
**Appendix Figure 2: Relative AHC poverty rates, by family type, 1994 to 2017**



Note: Pensioners defined as women aged 60+ and men aged 65+.

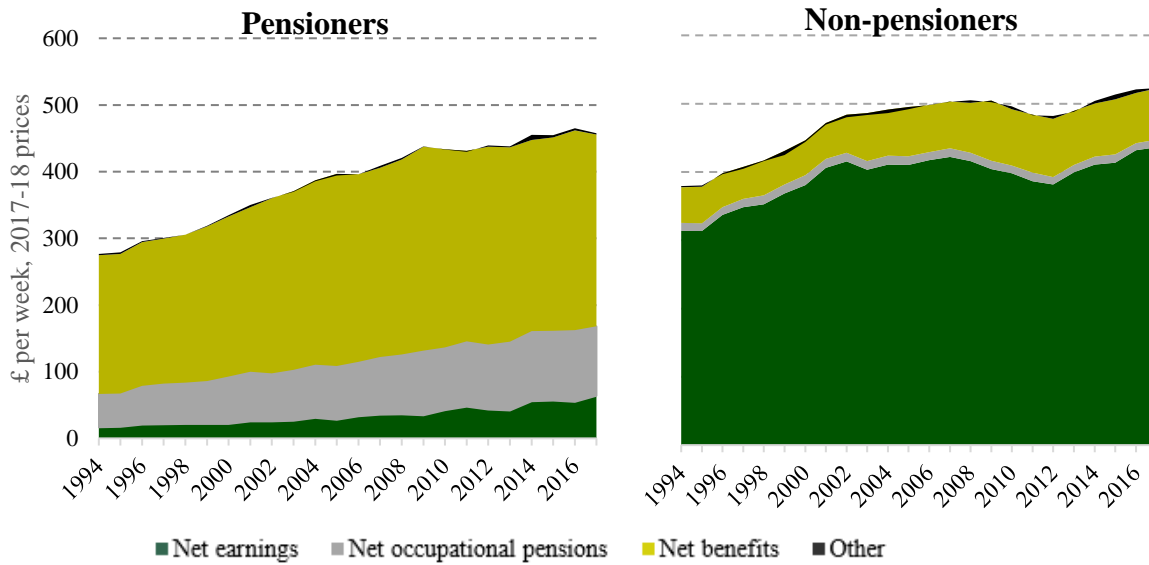Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

**Appendix Figure 3 Absolute AHC poverty rates, by family type, 1994 to 2017**



Note: Pensioners defined as women aged 60+ and men aged 65+. Absolute poverty defined as having an income of below 60% of median AHC income for 2010–11.

Source: Authors' calculations using the Family Resource Survey, 1994 to 2017

**Appendix Figure 4: Components of income for the middle income quintile of pensioners and the middle income of working age families, 1994 to 2017**



Note: Quintiles of income distribution are calculated separately for pensioners and non-pensioners.
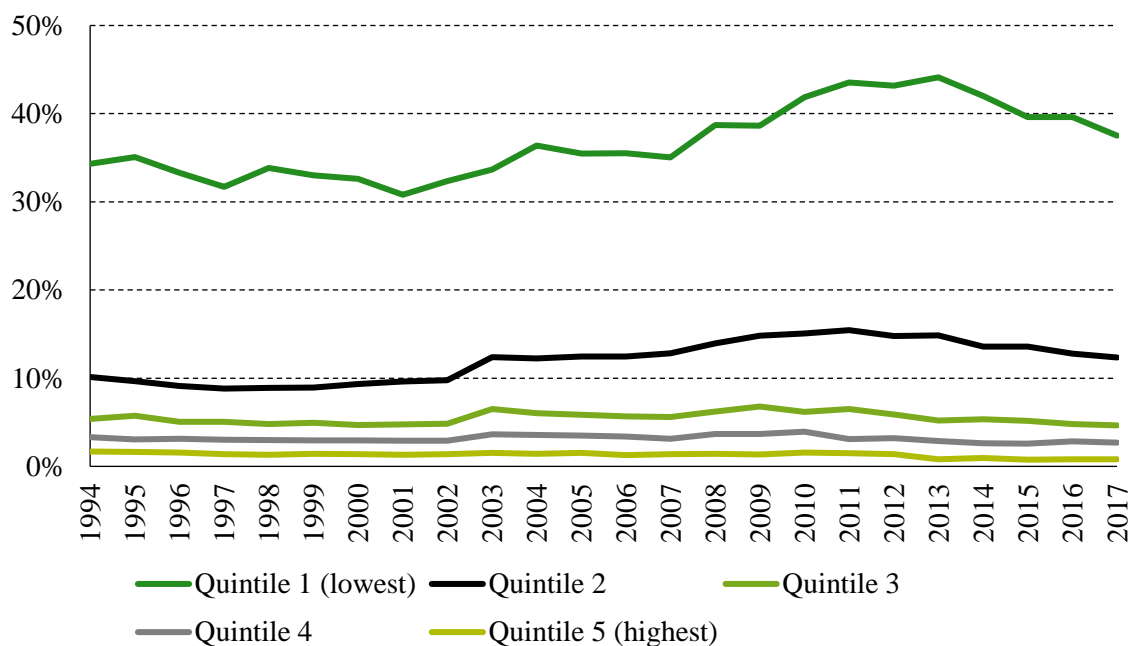
Source: Authors' calculations using the Family Resources Survey, various years.

**Appendix Figure 5: Proportion of working households with only one worker, by quintile of the gross household earnings distribution, 1994, 2007, and 2017**
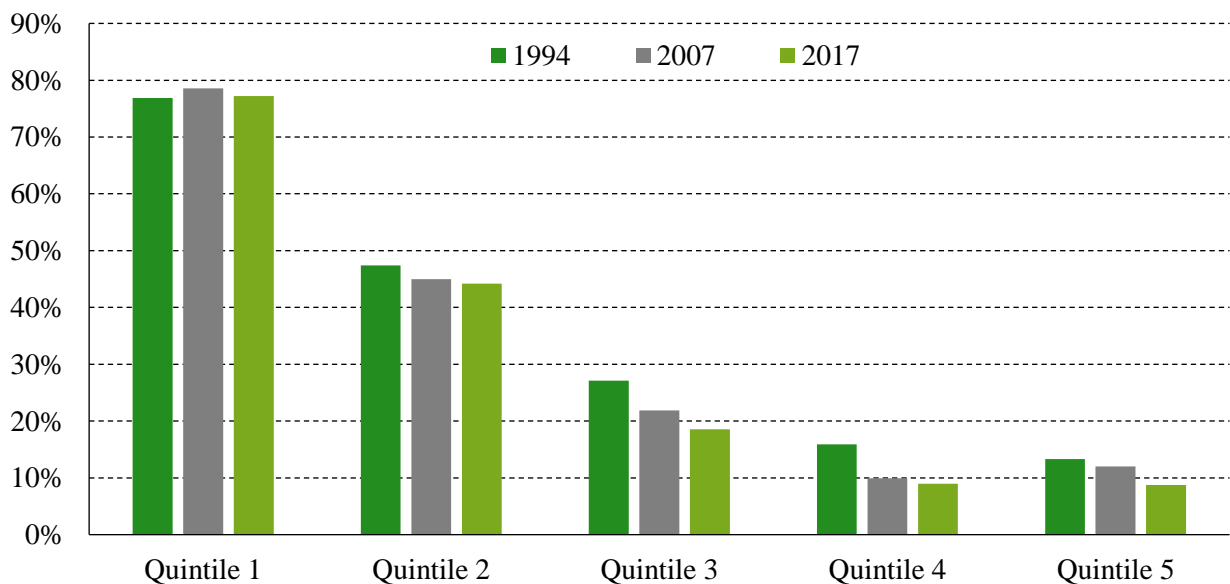


Source: Authors' calculations using the Family Resource Survey, 1994, 2007 and 2017.

**Appendix Figure 5: Proportion of net housing income coming from benefits and tax credits, by quintile of gross household earnings distribution, 1994 to 2017**



Source: Authors' calculations using the Family Resource Survey, 1994 to 2017.

**Appendix Table 2: Simulated change in-work poverty rates and overall median income from different years to 2017 as a direct result of changes to the tax and benefit system (CPI uprating of parameters of tax and benefit system)**

| Changes to tax and benefit system since: | In-work poverty | | | | Overall median income (£ per week) | |
| | Absolute | | Relative | | | |
| | AHC | BHC | AHC | BHC | AHC | BHC |
|---|---|---|---|---|---|---|
| 1994–95 | –7.0ppt | –7.1ppt | –2.9ppt | –3.9ppt | 42 | 41 |
| 1997–98 | –6.5ppt | –6.6ppt | –2.9ppt | –3.9ppt | 36 | 35 |
| 2007–08 | –1.7ppt | –1.2ppt | –0.6ppt | +0.0ppt | 19 | 18 |
| 2010–11 | +0.4ppt | +0.1ppt | +1.9ppt | +1.4ppt | 15 | 14 |

Notes: The absolute poverty line used for this analysis is based on the median of actual incomes in 2010–11, rather than simulated incomes. The relative poverty line however is based on simulated incomes. Note that the in-work poverty rates shown under the 2017–18 tax and benefit system are based on simulated incomes, and are slightly difference to the true poverty rates in 2017–18. Rates shown are for working-age families.
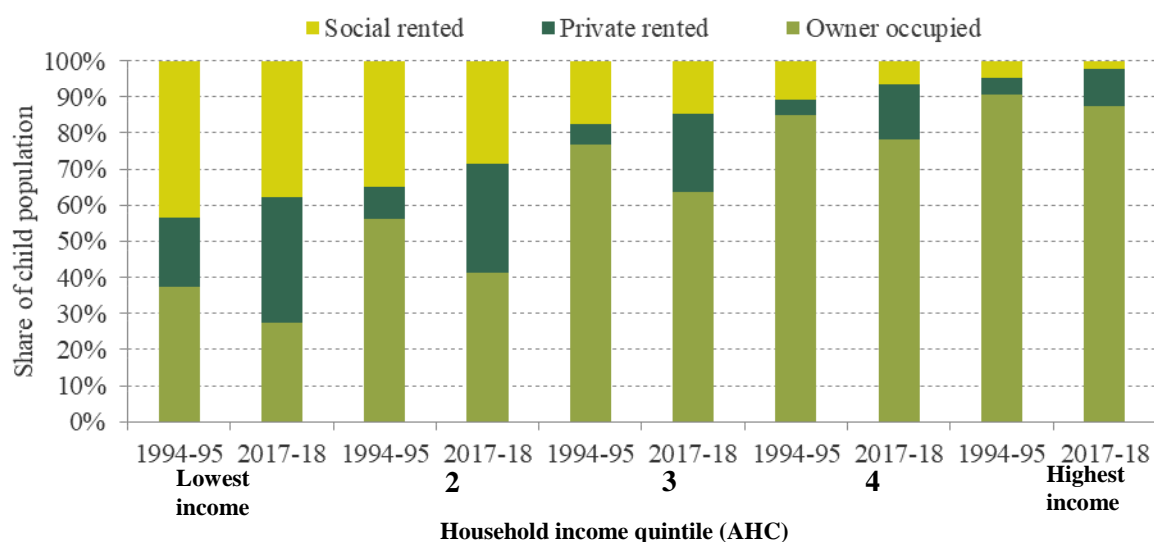
Source: Authors' calculations using the Family Resources Survey 2017–18, and TAXBEN, the IFS microsimulation model.

**Appendix Table 3: Average relative AHC and BHC in-work poverty rates and real mean housing costs in 1994-1996 and 2015-2017 by UK region and nation**

|  | Relative in-work poverty (1994–96) | | Relative in-work poverty (2015–17) | | Equivalised real mean housing costs | |
|  | BHC | AHC | BHC | AHC | 1994–96 | 2015–17 |
|---|---|---|---|---|---|---|
| North East | 13% | 13% | 15% | 17% | £49 | £60 |
| Wales | 12% | 14% | 16% | 19% | £48 | £56 |
| Yorkshire | 12% | 14% | 14% | 18% | £51 | £62 |
| North West | 11% | 14% | 15% | 19% | £54 | £64 |
| West Midlands | 10% | 15% | 13% | 19% | £54 | £64 |
| South West | 10% | 10% | 15% | 17% | £63 | £83 |
| East Midlands | 10% | 13% | 13% | 17% | £52 | £63 |
| Scotland | 10% | 12% | 11% | 15% | £49 | £63 |
| East | 10% | 11% | 13% | 16% | £60 | £74 |
| London | 8% | 12% | 15% | 24% | £95 | £143 |
| South East | 8% | 9% | 12% | 16% | £81 | £95 |

Note: Years refer to financial years (three year averages). Cash amounts expressed in 2017–18 prices. The relative AHC/BHC poverty line is defined as 60% of median AHC/BHC income in each year. Real housing costs are equivalised using the modified OECD after-housing cost equivalence scale and deflated using an after-housing cost deflator. We pool three years of data for each observation point to obtain a large enough sample size for each region/nation.
Source: Authors' calculations using the Family Resources Survey, various years.

**Appendix Figure 7: Housing tenure composition of individuals in non-pensioner households in 1994–95 and 2017–18, by AHC household income quintile**



Note: Income quintiles are defined among the entire population using income after housing costs have been deducted.
Source: Authors' calculations using the Family Resources Survey, various years

**Appendix Table 4: Growth in real mean housing costs (net of housing benefit), by family type and position in the AHC income distribution, 1994 to 2017**

| Family type and AHC income decile | Real mean housing costs (£ per week, 2017–18 prices) | | Real growth 1994 to 2017 |
|---|---|---|---|
| | **1994** | **2017** | |
| *All* | *49* | *62* | *27%* |
| *Pensioner families* | | | |
| Decile 1 | 67 | 75 | 12% |
| 2 | 24 | 36 | 47% |
| 3 | 21 | 29 | 34% |
| 4 | 22 | 29 | 33% |
| 5 | 21 | 24 | 10% |
| 6 | 23 | 24 | 5% |
| 7 | 20 | 23 | 12% |
| 8 | 20 | 26 | 30% |
| 9 | 25 | 24 | -2% |
| Decile 10 | 29 | 34 | 16% |
| *Working age - working HHs* | | | |
| Decile 1 | 78 | 99 | 26% |
| 2 | 42 | 72 | 72% |
| 3 | 41 | 77 | 89% |
| 4 | 45 | 72 | 58% |
| 5 | 51 | 67 | 33% |
| 6 | 54 | 66 | 23% |
| 7 | 56 | 70 | 25% |
| 8 | 58 | 64 | 10% |
| 9 | 69 | 72 | 4% |
| Decile 10 | 92 | 91 | -1% |
| *Working age - workless HHs* | | | |
| Quintile 1 | 32 | 52 | 63% |
| Quintile 2 | 18 | 33 | 82% |
| Quintiles 3-5 | 38 | 55 | 46% |

Note: Income quintiles are defined among the entire population using income after housing costs have been deducted.
Source: Authors' calculations using the Family Resources Survey, 1994 to 2017.