The short and longer term impacts of the recession on the UK income distribution[1]

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Abstract

We study the immediate and longer-term impacts of the recent recession on the distribution of net household income in the UK. Using official data, we document trends in the distribution of income during and immediately after the economy's 7.1% contraction between 2008Q1 and 2009Q2. We then use a tax and benefit micro-simulation model combined with macroeconomic and demographic forecasts to simulate the distribution of income up to 2015-16. As in other countries, immediate impacts of the recession on net household incomes are remarkably hard to detect, but the pain was merely delayed: between 2009-10 and 2012-13, we predict the largest 3-year fall in real median income in the UK for 35 years, with the median still 4.5% below its 2009-10 level in 2015-16, a collapse in average incomes unprecedented since at least 1961. We forecast rises in poverty (using fixed and moving poverty lines) in the post-recession period, despite the relative stability of these indicators during the recession itself, partly because of cuts to welfare benefits. We explore the sensitivity of the results to different scenarios for employment and earnings: the central and qualitative conclusions prove robust.

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1. Introduction

The UK recently experienced its deepest recession since the Second World War, during which GDP fell by over 7 per cent between the first quarter of 2008 and the second quarter of 2009. We would naturally expect this fall in national income to have consequences for households' living standards: but when, how, and for whom? This paper examines the immediate consequences of the recession on the distribution of net household income in the UK, and uses microsimulation methods to predict the likely longer-term consequences (up to 2015-16), given current government policies and the latest available economic forecasts. We separately identify the likely impact on the distribution of income of the package of welfare cuts and changes to personal taxes that have been implemented from April 2011 (in other words, since the last change of government in the UK) or are planned for implementation between now and March 2016.

As we shall show, the most obvious effects of the recession on the income distribution, via labour market trends and fiscal responses, were by no means immediate, and indeed are expected to continue for some time. In addition, official data on household incomes in the UK is invariably out-of-date. For these reasons, relatively little analysis of the relationship between the recent recession and the distribution of income in the UK currently exists.

Of course, we are not the first to consider this important issue. Ozdemir et al. (2010) combine observed changes in the labour market from the start of the crisis with simple statistics relating labour market status to the risk of poverty to assess how the recession might have affected poverty across the European Union. Jenkins et al. (2011) provide a comprehensive survey of changes in the labour market and the income distribution for six countries (Germany, Ireland, Italy, Sweden, UK and US) during and immediately after the recession, from 2007-08 to 2010-11.[3] They include an analysis of actual household income data, but also the use of micro-simulation techniques to "nowcast" the present income distribution.[4] It highlights that average incomes tended to hold up surprisingly well during the recession itself, and that inequality measures tended to remain quite stable or to fall slightly. As we describe below, we extend their work for the UK in this paper. Callan et al.

[3] The UK contribution to Jenkins et al (2011) was produced by some of the authors, and we draw on it in the analysis in this paper.

[4] In this paper, we use the word 'nowcasting' to describe a situation in which an estimate of the current income distribution is produced given information on the past income distribution and information on some current demographic and economic aggregate statistics.

(2011) simulated the distributional impacts of fiscal austerity measures that had been implemented by summer 2011 in Estonia, Ireland, Greece, Spain, Portugal and the UK. They suggest that these early elements of fiscal consolidation packages reduced incomes on average, but generally had little impact on income inequality. Brewer et al. (2011) forecast median income and poverty rates in the UK (against a moving and fixed poverty line) in the post-recession period from 2010-11 to 2015-16, and in 2020-21, accounting for official macroeconomic forecasts available at that time.

This paper studies the UK case in detail by updating the UK work in Jenkins et al. (2011), and combining it with analysis of the contribution of direct tax and benefit changes to household incomes which updates Brewer et al. (2011). Section 2 describes our methods. Section 3 presents our central estimates, and Section 4 presents counter-factuals and sensitivity tests. We conclude in Section 5.

2. Data and methodology

The UK's primary source of information about the household income distribution is the official *Households Below Average Income* (HBAI) series. This series is currently based on data from the Family Resources Survey (FRS), an annual repeated cross-section of about 25,000 UK households administered by the Department for Work and Pensions. Official reports based on the HBAI data are available up to and including 2010-11[5], although the most recent micro-data available to researchers at the time of writing is from 2009-10.[6] The micro-data is supplied with a set of weights which are intended to correct for non-random non-response, and to gross up to known population aggregates (see Department for Work and Pensions, 2005).

The UK economy began to contract in the first quarter of 2008. In order to assess the impact of the recession on the distribution of household incomes, we perform three pieces of analysis:

[5] See Department for Work and Pensions (2012).

[6] We plan to update this analysis when the 2010-11 Family Resources Survey is available to academic researchers.

- we analyse actual micro-data on the household income distribution in 2007-08 and 2008-09, and draw upon published statistics about the household income distribution in 2009-10;
- we nowcast the household income distribution in 2010-11[7];
- we forecast the household income distribution in 2011-12 to 2015-16.

To implement the nowcasting and forecasting, we use micro-simulation techniques. This allows us to simulate the entire distribution of income (rather than just average incomes or some other statistics), and to incorporate precisely the impact of tax and benefit changes (including often complicated interactions between them) on that distribution. Our method is as follows:

1. Begin with base micro-data (the 2008-09 FRS[8]) on the distribution of private incomes and household characteristics.
2. Up-rate financial variables in the data (e.g. earnings) to their forecast future levels.
3. Adjust certain characteristics of households to reflect major policy changes due between 2008-09 and 2015-16.[9]
4. Re-weight the data (using the algorithm set out in Gomulka, 1992) to account for forecast changes to employment and other socio-demographic variables: loosely speaking, this increases the relative weights given to types of people and households forecast to become relatively more common.
5. Simulate the personal direct tax liabilities, and benefit and tax credit entitlements, of each household, given expected future tax and benefit systems (as indicated by stated government policy). This is done using the Institute for Fiscal Studies' static tax and benefit micro-simulation model, TAXBEN.[10] This does not allow for behavioural responses to tax and benefit changes at the micro level, although we

[7] Since completing the empirical work for this draft, official data has become available for 2010-11, and we will reflect this in future drafts of this paper.

[8] Since completing the empirical work for this draft, official data has become available for 2009-10, and we will reflect this (or the micro-data for 2010-11) in future drafts of this paper.

[9] We do this only for the rise in the state pension age for women, which will rise from 60 in April 2010 to 63 by April 2016. Our adjustment increases the labour supply (and thus earnings) of some women aged 60 to 63, and gives other women of a similar age entitlement to Employment and Support Allowance, a benefit for those of working-age who cannot work through ill-health or disability. No adjustment is made to women of any other age, nor to their partners. See Appendix A of Brewer et al. (2011) for a full description of the methods used. The fact that we do not do this for other changes should be interpreted as our considering that the economic forecasts of the Office for Budget Responsibility fully reflect the likely behavioural response to important policy changes due over this period.

[10] For a description, see Giles and McCrae (1995). The basic structure of the model has not changed since then.

account for them at the aggregate level to the extent that they are incorporated in the employment and average earnings forecasts of the Office for Budget Responsibility that we make use of (see above).

6. Adjust simulated benefit and tax credit entitlements to account for the fact that not everyone who is entitled to such payments actually claims them, and not everyone who claims them correctly reports that they receive them to the household survey.
7. Construct a measure of simulated net household income as close as possible to that used in the official HBAI series.

This yields a simulated distribution of net household income in future years that is consistent with stated government policy on personal taxes and benefits, and with the latest official economic and demographic forecasts. As in the HBAI series, the measure of income is net of taxes, inclusive of benefits and tax credits, and equivalised using the modified OECD equivalence scale; and the unit of analysis is the individual, although incomes are measured at the household level (in other words, we attribute to each individual the total equivalised income of the household in which they live; this implicitly assumes full income sharing within households). We use a before-housing-costs measure of income.[11]

Below we elaborate on the incorporation of macroeconomic forecasts into our micro-simulation model (steps 2 and 4). Full details of the modelling approach are described in Appendix A of Brewer et al. (2011).

Up to 2010-11[12], we make use of the detailed information that we have from other data sources about actual labour market trends, in view of the fact that heterogeneity in such trends can be important for simulation results (Dolls, Fuest, and Peichl 2009). We account for changes in average pre-tax earnings (step 2 above) using the Office for National Statistics' (ONS) Average Weekly Earnings index; but we incorporate heterogeneity, allowing for differential earnings growth in each quintile of the distribution of jobs by gender and full-time/part-time status (i.e. a total of 5 x 2 x 2 = 20 cells), based on the Annual Survey of Hours and Earnings (ASHE). We account for employment changes using Labour Force Survey

[11] Further details on the measure of income used can be found in Appendices A and B of DWP (2011).

[12] Future versions of this paper will use similar information for 2011-12.

(LFS) data within subgroups defined by age and gender (jointly), and family type (couple or single) and part-time/full-time status and gender (jointly).[13] These employment and earnings changes by subgroup are shown in Tables 1 and 2.

When looking beyond 2010-11[14], we use forecasts of employment and average earnings growth from the Office for Budget Responsibility (OBR), the government's independent fiscal forecaster. The forecasts that we make use of were published on 29th November 2011 (OBR 2011), and the actual values that we make use of are reproduced in Table 3. The OBR forecasts only total employment and average earnings, so for our central simulations we assume no changes in the composition of the employed population and uniform earnings growth across the earnings distribution after 2010-11. In Section 5, we examine the sensitivities of our results to variation in the OBR's forecasts, or scenarios where the earnings distribution widens or narrows.

All of our simulations also account for actual or forecast changes in demographic characteristics. As with expected employment changes, these are accounted for by reweighting the data (step 4 above; the full set of such characteristics that we incorporate when re-weighting the data is given in Table 4).

We take a relatively simple approach to forecasting the incomes of elderly households. For such groups, a sophisticated forecast would use dynamic micro-simulation methods to age the current population, thus capturing automatically the increasing private incomes received by successive generations of pensioners. For simplicity, we do not model such cohort effects explicitly, but instead assume that private pension incomes grow in line with average earnings. We also do not report statistics which are heavily dependent on the incomes of such households, although they are, of course, included in our simulation of the income distribution as a whole.

As is typical of survey data, the coverage of very rich individuals in the FRS data is poor and our methods are a relatively crude way of forecasting trends in the incomes of the very rich (we assume that investment income grows in line with forecasts of nominal GDP). We

[13] For both earnings and employment, we apply the changes (in proportionate terms) in these variables observed in labour market data sources to the FRS data (rather than imposing the levels of these variables observed in labour market data on the FRS data), to ensure that the simulated path of net household income is not affected by any systematic differences between data sources.

[14] Future versions of this paper will use similar information from 2011-12.

therefore do not report statistics which are highly sensitive to such trends (e.g. mean income and the Gini coefficient).[15]

3. Household incomes since the start of the recession

Despite falls in GDP per head and increases in unemployment during the recession, average net household incomes actually increased, and at virtually identical (albeit sluggish, by recent historical standards) rates to those in the immediate pre-recession years. Between 2007–08 and 2009–10, average annual real-terms growth was 1.3 percent at the mean and 0.8 percent at the median, the latter of which is statistically significant from zero at the 5% level (see Jin et al. 2011).[16] As Figure 1 shows, a key driver of this fact is the lag between the contraction in GDP and the fall in real earnings; a fiscal loosening also contributed to average income growth in both 2008 and (particularly) 2009 (see Office for National Statistics 2011, and discussion below). This experience of continued household income growth during the recession mirrors that of other developed countries such as Sweden, the USA, and even Ireland (Jenkins et al. 2011).

Figure 1 suggests that changes in real earnings over this period did not vary widely across the earnings distribution, although the median, if anything, seems to have performed slightly better than earnings at either end. However, the growth incidence curves for net household income, shown in Figure 2, indicate that income growth was most robust towards the bottom, particularly in 2009–10. Jin et al. (2011) attribute this to the fact that state benefit and tax credit amounts are customarily increased each April in line with inflation measured in the previous September: as a result of the then-government's decision to temporarily reduce the standard rate of VAT, inflation fell markedly from 5.0% in the year to September 2008 to just 0.5%, on average, in 2009-10, resulting in substantial real annual increases in benefit and tax credit amounts in that year.

Figure 2 also includes our simulated growth incidence curve for 2010–11. The surprisingly benign initial trends in net incomes after the recession hit were dramatically reversed in

[15] This also means that we do not need to make an explicit assumption about behavioural changes among the very rich who have been affected by the considerable changes to the income tax system for those with incomes exceeding £100,000 per year.

[16] All references to historical trends or levels of income in this paper are derived from the Institute for Fiscal Studies' time series of the income distribution, for which key summary statistics are available online at http://www.ifs.org.uk/fiscalFacts/povertyStats (accessed 06/01/12).

2010–11: we simulate that a real fall in median household income of about 4.0 per cent took place. This would leave the 2010–11 median close to its 2003–04 level, and would be the largest one-year fall since 1981.

Across most of the income distribution, the simulated falls in income in 2010–11 are sufficiently large to more than offset the small income gains in the previous two years; exceptions are the second and third income decile groups, where real income levels remained broadly stable overall, mostly due to robust growth in 2009-10. The magnitude of these simulated losses over the period 2007-08 to 2010-11 is clearly increasing with income across the bottom half of the distribution, with a flatter picture in the top half. The 90/10 inequality ratio fell by almost 4%; the 50/10 ratio fell by 3%; and the 90/50 ratio stayed essentially the same (see Table 5). Reductions in the 90/10 and 50/10 ratio measures of inequality were driven largely by the progressive nature of income changes in 2009–10.

Given the progressivity of changes in the income distribution between 2007–08 and 2010–11, particularly in the bottom half of the distribution, we would generally expect declines in rates of relative income poverty. Using a poverty line of 60% of the contemporary median, Table 5 shows that this was indeed the case for families with children, but not for working-age adults without children.[17] Tax and benefit policy seems very likely to be key to the explanation.[18] Low-income families with children are far more likely to be entitled to state support than those without children, and so benefitted disproportionately from the large real increases in most state benefits and tax credits that occurred in 2009–10, when relative child poverty fell particularly noticeably. There were also real increases to the Child Tax Credit in both 2008-09 and 2009-10. By contrast, those of working-age without children would not have benefitted to the same extent from the large real increases in most state benefits and tax credits in April 2009; and they were not major beneficiaries of any discretionary state benefit or tax credit changes during the recession.

[17] We distinguish between families with and without children when discussing poverty rates, because poverty trends between these groups have differed very substantially in recent decades (and, as will become clear, the trends also differ under our forecasts). We report figures for child poverty (this is a high-profile statistic of considerable policy relevance, given the Government's 2020-21 child poverty targets that were enshrined in the Child Poverty Act (2010)) and for poverty among those of working-age without dependent children,

[18] Brewer et al. (2010) show that tax and benefit policy was been a very important determinant of trends in child poverty over the past decade.

Of course, with median income and hence the relative poverty line falling substantially, trends in relative poverty are not a good guide to the evolution of absolute living standards. Using a fixed poverty line set at the level of the 2010–11 relative poverty line in real terms, Table 5 shows that between 2007-08 and 2010-11 the proportion of children falling below the absolute low income threshold fell by about one and a half percentage points, but the number of such working-age adults without children rose by about two percentage points. Again, there is a clear difference between the fortunes of families with and without children.

4. Household incomes in the aftermath of the recession

There are reasons to expect that much of the decline in living standards associated with the recession is happening only now, or is still to come. First, the government has embarked on a huge fiscal tightening intended to restore the cyclically adjusted current budget balance to surplus by 2016-17, and to have government debt falling as a proportion of national income in 2015-16. At the time of writing, about 12% of this is due to come from cuts to investment spending, 48% from current public service and other non-investment spending, 14% from cuts to welfare spending, and 20% from increases in tax revenues (Crawford et al, 2012).[19] Second, as set out in Table 3, current and expected near-term growth in real earnings is negative.

Table 5 presents median incomes, poverty rates and inequality ratios from our simulated net household income distributions for each year up to 2015-16. It shows a fall of 7.2% in real median income between 2009-10 and (our simulation of) 2012-13: a delayed, but surely inevitable, consequence of the 7.1% contraction in the economy between early 2008 and the middle of 2009. A fall in real median income of that size has not occurred since the three-year fall of 7.5% between 1974 and 1977 (a fall that was swiftly offset by a real rise in median income of nearly 10% in 1978, reflecting the volatility of inflation at that time).

Given the economic forecasts of the OBR, we expect that 2012-13 will be the trough for real median income. But even after that, its recovery is expected to be slow, and we forecast

[19] The remaining 7% is to come from reductions in debt interest payments.

that real median income will still be more than 4.5% below its 2009-10 peak in 2015-16. This leads to an even more unfavourable historical comparison, as it is by far the largest fall in median income over a 6-year period since our consistent series began in 1961. In fact, because income growth was slow before the recession as well (Jin et al. 2011), our simulated level of real median income in 2015-16 would be no higher than it was in 2002-03. This would be by far the longest period of no overall growth in median income since consistent records began in 1961. The previous longest such periods were the 5 years between 1972 and 1977 and between 1990 and 1995-96.[20],[21]

Between 2010-11 and 2012-13, we expect poverty assessed against the fixed real line to increase by almost three percentage points among children and by one percentage point among working-age adults without children. Thereafter, our forecasts suggest absolute low income poverty will stabilise, continuing to rise slightly among children but falling slightly among working-age adults without children. Given that median income, and hence the relative poverty line, is falling in the period up to 2012-13, our simulated trends in relative income poverty up to 2012-13 look more benign; but the opposite is true after 2012-13, as median income is expected to recover thanks to real growth in income from employment (which forms a substantial proportion of household income for those close to the middle of the income distribution).

Our central forecasts suggest that, if anything, the 90/10, 50/10 and 90/50 ratio measures of inequality will increase between 2010-11 and 2015-16. However, because of the rather different trends during and immediately after the recession, the 50/10 and 90/10 inequality ratios are still forecast to be lower in 2015-16 than before the recession hit in 2007-08, and the 90/50 ratio is forecasted to have remained stable over the same period. Indeed, as the simulated growth incidence curve between 2007-08 and 2015-16 in Figure 3 makes clear,

[20] The series switched from calendar years to financial years in 1993-94.

[21] The OBR itself forecasts another (similar, though not identical) measure of disposable income: the Real Household Disposable Income (RHDI) series from the National Accounts. When converted into per-capita terms using the ONS' official population projections (giving a measure of mean income), the OBR's forecasts imply that per-capita RHDI will be lower in 2015 than in 2005, and that its peak-to-trough fall between 2009 and 2012 will be the largest since records began in 1955. Per-capita RHDI is ONS series IHXZ. For the OBR's forecasts of RHDI, see page 100 of Office for Budget Responsibility (2011). The outlook for per-capita RHDI would look even worse if the RHDI series used the same deflator as the HBAI series. The RHDI series uses a chained volume consumer expenditure deflator (ONS series YBFS), whereas the HBAI series uses a deflator based on the Retail Prices Index.

forecast income losses over this period are quite smoothly increasing within the bottom half of the income distribution, but relatively flat in the top half.

5. Household incomes up to 2015-16: counterfactual and sensitivity analysis

Finally, we consider how the distribution of net household income would evolve under different scenarios from those underlying our central estimates. The purpose of this is two-fold. First, we redo our simulations under the counterfactual scenario in which direct tax and benefit policy had not been changed since April 2010 (given that changes since then reflect decisions made by the current UK government). This enables us to isolate the effect of much of the post-recession fiscal consolidation on the distribution of income (most notably, separating these effects from the effects of the labour market changes that have occurred and are expected to occur over the period), yielding a better understanding of what is ultimately driving the 'impacts' of the recession on that distribution. Second, we redo our simulations under different macroeconomic scenarios – specifically for employment and earnings – to those implied by the OBR's current central forecasts. This gives us a means of quantifying some key dimensions of the considerable uncertainty that clearly surrounds any forecasting exercise such as this (particularly at present).

In the case of our counterfactual tax and benefit policy scenario, it is important to note that this simulation takes as given the expected macroeconomic environment as forecasted by the OBR. If the coalition government's tax and benefit reforms have (positive or negative) impacts on macroeconomic variables such as employment and earnings, then in reality that will have an impact on the income distribution.[22] It is beyond the scope of this paper to estimate all possible effects of the fiscal consolidation on the income distribution, including any feedback effects it has on the macroeconomy (for example, via fiscal multipliers or effects on market sentiment) and through behavioural responses. But our subsequent

[22] In particular, the impacts of indirect tax changes – most importantly the 2.5 percentage point rise in VAT in January 2011 – are therefore incorporated in both our central forecasts in the previous section and our counterfactual policy scenario here, via effects on the general price level as forecasted by the OBR. In practice, the incidence of indirect tax will not be uniform, but income distributions are typically measured by applying economy-wide deflators to nominal incomes, so this reflects a limitation of real income measurement that goes well beyond our own analysis. Note also that the higher inflation caused by the VAT rise could lead to higher benefit rates in 2012 than would otherwise have been the case, because the uprating of most benefits in April 2012 is based on CPI inflation in September 2011. We might also expect increases in the prices of goods to be accompanied by increases in nominal earnings. On the other hand, the Bank of England has a 2% CPI inflation target: isolating the effect of the VAT rise on benefit rates and earnings levels would involve isolating the monetary policy response. All these issues are abstracted from here.

macroeconomic sensitivity analysis is designed precisely to give the reader an idea of how important these kinds of factors might be.

We consider scenarios in which the labour market performs better or worse than currently expected, with employment 200,000 higher or lower and average earnings 2% higher or lower in 2015-16 than currently forecast.

We also consider scenarios in which average earnings evolve as currently forecast, but earnings inequality changes. Our 'progressive' earnings growth scenario assumes that average earnings relative to the first earnings decile group falls by one per cent for the second earnings decile group, two percent for the third, and so on up to nine percent for the tenth decile group. Our 'regressive' earnings growth scenario assumes the reverse: for example, the average earnings ratio between the tenth and first earnings decile groups rises by nine per cent. One could of course extrapolate from changes in earnings inequality over some previous period but, given the macroeconomic shocks that have occurred recently, it is not clear how informative this would be, so it seems to us preferable to document the sensitivity comprehensively by considering very markedly progressive and regressive scenarios.

Table 6 presents median incomes, poverty rates and inequality ratios from our counterfactual 2015-16 income distributions, and compares these with our baseline 2015-16 forecasts from the previous section. Figure 3 shows the growth incidence curves between 2007-08 and 2015-16 under the baseline and counterfactual assumptions. Together, they highlight the following key points:

- The direct tax and benefit reforms implemented as part of the fiscal contraction from April 2011 onwards are, unsurprisingly, set to reduce household incomes across the income distribution.

- The pattern of losses from those reforms is set to be inequality-increasing within the bottom half of the income distribution, as we might expect given the £19 billion per year of planned annual welfare cuts by 2014-15.[23]

- There is important variation in the simulated effects of the fiscal consolidation by family type as well as income, with low-income families with children set to lose the most from direct tax and benefit reforms. This is not surprising, given numerous planned cuts to child-contingent benefits and tax credits. Our simulations suggest that the reforms increase relative and absolute low income poverty among children by about one and half percentage points by 2015-16, but have virtually no effects on the same poverty rates among working-age adults without children.

- Higher total employment and/or average earnings than currently expected would, of course, increase incomes. But the sensitivity analysis suggests that even quite substantial deviations in these variables from their expected levels will not drastically alter the qualitative conclusions. In particular, even with 200,000 more people employed and average earnings 2% higher in 2015-16 than currently forecast, real incomes would still be lower across the distribution in 2015-16 than before the onset of the recession (in particular, it would remain the only period of more than 5 years in which real median income has not increased, since consistent records began in 1961).

- If anything, more benign macroeconomic outturns are most likely to increase inequalities still further, as those further up the income distribution (who tend to rely relatively more on labour market income) benefit more than those lower down.[24]

- Even the very marked deviations from uniformity in earnings growth rates across the earnings distribution that we consider change the simulated level of median income

[23] Early comparative evidence from the EU (looking at reforms implemented by summer 2011) suggests that this is by no means a feature of all post-recession austerity packages (Callan et al. 2011).

[24] We have made the neutral assumption here of uniform changes in earnings and no change in the composition of the employed population. Of course, one could in principle come up with any number of possible scenarios for the distribution of earnings growth or employment growth around the average/total, and this would affect the impact on the distribution of net household income.

in 2015-16 by less than one per cent. This is mainly due to two factors: the progressive tax and benefit system in the UK, and that fact that there is only a weak correlation between being a low earner and being in a low income household, due to the way individuals sort themselves into households.

- It is also clear that progressive patterns of earnings growth are not well targeted at reducing relative poverty. This is due to the mismatch between people's ranking in the individual pre-tax earnings distribution and the net household income distribution (for example, about one quarter of minimum wage workers are in the top half of the net household income distribution – see Brewer, May and Phillips, 2009). The 'progressive' earnings growth scenario actually increases relative poverty, which suggests that some working individuals towards the bottom of the earnings distribution are situated around the middle of the household income distribution, and hence this scenario raises the relative poverty line by raising median income.

6. Conclusions

This paper has used micro-simulation techniques in an effort to understand the likely longer-term consequences of the recent recession for the distribution of income in the UK. This complements our existing (but, due to the lags with which household income data become available, quite out-of-date) knowledge about the rather surprising income trends during the recession itself.

Although immediate impacts of the recession on net household incomes have been remarkably hard to detect, our simulations suggest that this respite was temporary and that the bump will be hard. From peak to trough (2009-10 to 2012-13), we expect the largest 3-year fall in real median income in the UK for 35 years, and we expect the median to still be 4.5% below its 2009-10 level in 2015-16 - a collapse in average incomes unprecedented since consistent records began in 1961. Had real median income continued to grow at its historical average annual rate of 1.7% since 2002-03, its 2015-16 level would be about 25% higher than our forecasted 2015-16 level. We also forecast rises in poverty against both a fixed and moving poverty line in the post-

recession period, particularly among children, despite the relative stability of these indicators during the recession itself; and we have shown that the planned fiscal consolidation in the recession's aftermath – most notably, the £19 billion of annual welfare cuts by 2014–15 – is an important reason for this.

Our simulation results, and hence conclusions, depend in large part on the official macroeconomic forecasts of employment and earnings. Producing such forecasts at the moment must be exceedingly challenging. There is significant uncertainty over the extent to which the recession has led to a permanent reduction in productive capacity, and whether the sustainable rate of growth is now lower than previously thought (either because the recession's impact might itself have lowered the long run growth rate, or because events associated with the recession revealed information about that growth rate). Clearly, there is a wider and very challenging research agenda to be made out of these big macroeconomic questions. However, our sensitivity analysis does suggest that the central and qualitative conclusions of this paper are unlikely to be drastically altered under realistic alternative scenarios.

Why, then, is the recent recession set to have such a long-lasting effect on household living standards in the UK? Mostly, it is because this was a deep recession that is being followed by a sharp fiscal contraction: the drop in UK GDP from peak-to-trough being larger even than that seen during the Great Depression, and the fiscal consolidation, required to address what were unsustainable levels of borrowing, is leading to the tightest seven-year period for spending on public services since the 1940s. But the UK has been experiencing a period of weak growth in living standards since the early part of the previous decade, both compared with past years and GDP growth at the time. A mechanical explanation for the disconnect with GDP growth is increased wage inequality, a decline in labour's share of national income and an increased fraction of total employee remuneration being made in the form of social contributions.[25] Although the impact of the recession on household living standards in the UK will be long-lasting, future research must not neglect the underlying causes of the past disconnect between

[25] For an argument along these lines, see Whittaker and Savage (2011).

economic growth and the median households' living standards, as well as the highly uncertain path for future economic growth.

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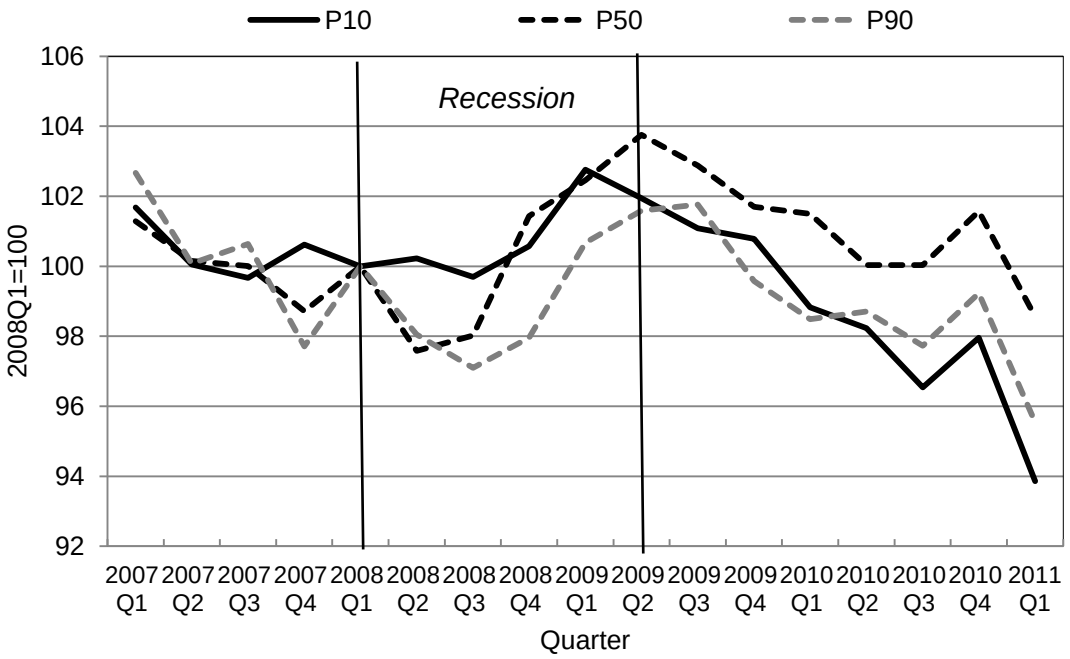
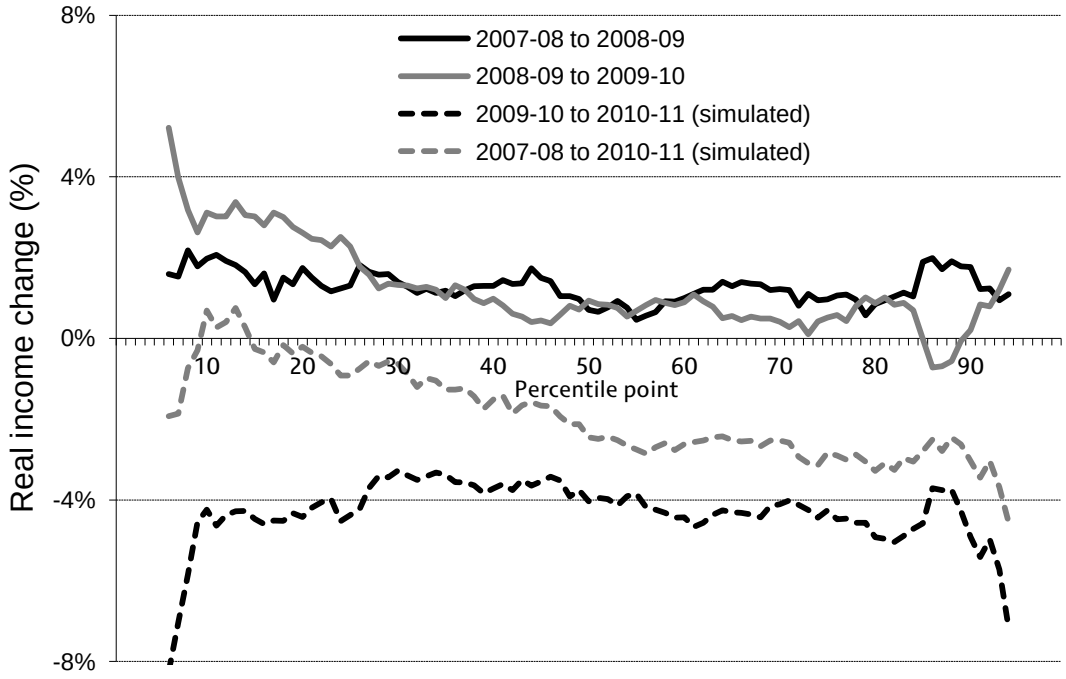
Figure 1. Percentile Points of Full-Time Weekly Earnings, 2007 Q1 to 2011 Q1



Source: Office for National Statistics, series CHAW for RPI. Authors' calculations using the Labour Force Survey.

Notes: Real-terms index calculated using RPI All-Items quarterly index.

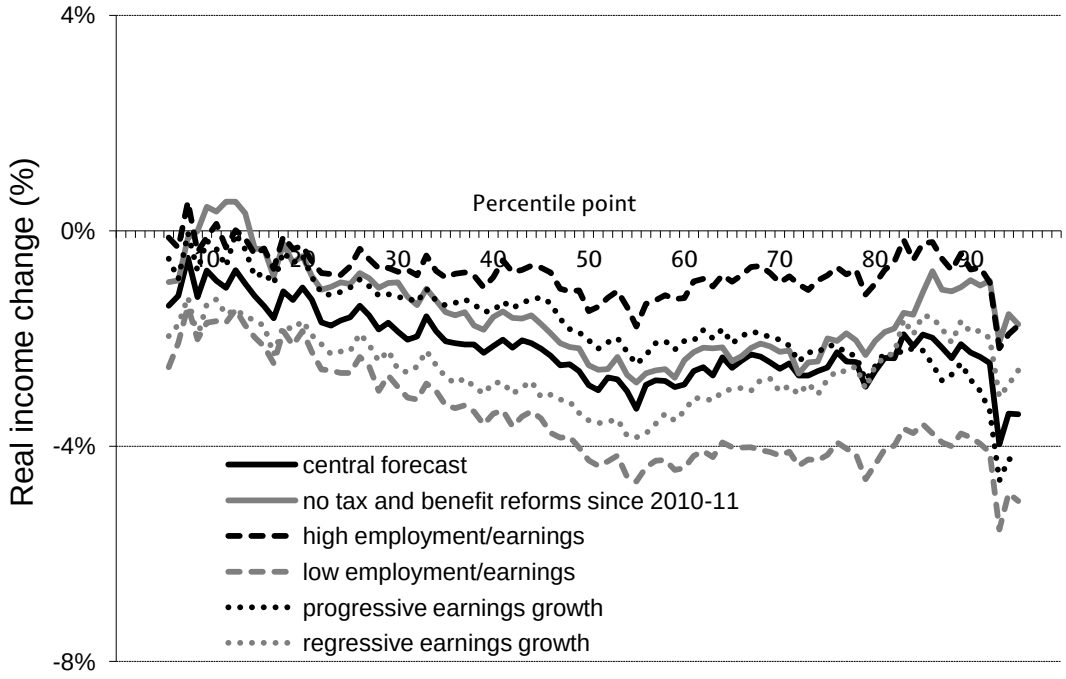
Figure 2. Real income growth incidence curves, 2007–08 to 2010-11



Source: Jin et al. (2011); authors' calculations using Family Resources Survey, 2007–08 and 2008–09, TAXBEN, and assumptions specified in the text.

Note: Income growth at the top and bottom 5 percentile points is not shown due to uncertainty from sampling and measurement error.

Figure 3. Simulated real income growth incidence curves, 2007–08 to 2015-16



Source: Authors' calculations using Family Resources Survey, 2007–08 and 2008–09, TAXBEN, and assumptions specified in the text.

Note: Income growth at the top and bottom 5 percentile points is not shown due to uncertainty from sampling and measurement error.

Table 1. Changes in numbers employed by subgroup, 2008-09 to 2010-11

	Change in number employed (%)
Gender and age	
Male, aged 16-29	-7.8
Male, aged 30-49	-4.6
Male, aged 40-64	-2.4
Male, aged 65+	+11.8
Female, aged 16-29	-8.1
Female, aged 30-49	-5.0
Female, aged 40-64	+0.7
Female, aged 65+	+7.8
Gender, family type and work status	
Male, couple, full-time	-4.6
Male, couple, part-time	+7.2
Male, single, full-time	-8.3
Male, single, part-time	+20.2
Female, couple, full-time	-4.0
Female, couple, part-time	-0.2
Female, single, full-time	-9.4
Female, single, part-time	+10.2

Source: Authors' calculations using Labour Force Survey.

Table 2. Average nominal earnings growth (%) by subgroup, 2008-09 to 2010-11

	Male full-time	Male part-time	Female full-time	Female part-time
Earnings quintile 1	4.4	-2.2	5.9	0.0
2	3.6	3.0	6.3	6.9
3	3.1	4.0	6.5	4.9
4	2.9	4.1	6.3	7.1
Earnings quintile 5	3.3	6.6	6.3	10.5

Note: Average earnings in each quintile are assumed to grow at the rate of earnings at the midpoint of that quintile.

Source: Statistics from Annual Survey of Hours and Earnings: 'Table 1 – All employees' at http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-238620 (accessed 06/01/2012).

Table 3. UK macroeconomic forecasts from Office for Budget Responsibility

	2010	2011	2012	2013	2014	2015
Annual CPI inflation to September	3.1%	5.2%	2.5%	2.1%	2.0%	2.0%
Annual RPI inflation to September	4.6%	5.6%	3.1%	2.9%	3.1%	3.6%
Annual RPI inflation (whole year)	4.6%	5.2%	3.3%	2.9%	3.1%	3.6%
Annual Rossi inflation to September	4.8%	6.8%	3.1%	3.0%	3.1%	3.1%
Employment (millions)	29.0	29.2	29.1	29.2	29.4	29.7
Average earnings growth	2.1%	0.9%	2.0%	3.1%	4.3%	4.5%
Nominal GDP growth	4.6%	3.4%	3.5%	4.6%	5.3%	5.6%

Note: Rossi inflation forecasts (see sources below) are available only quarterly. Rossi inflation figures in September from 2012 onwards are therefore assumed to equal the rate of inflation to quarter 3 of the relevant year.

Source: Office for Budget Responsibility (2011). Rossi forecast published separately at authors' request; see http://budgetresponsibility.independent.gov.uk/wordpress/docs/ROSSIDec2011.pdf (accessed 06/01/2012).

Table 4. Characteristics controlled for in simulations by reweighting the data

Dimension	*Categories*
Total population	n/a
Number of individuals by region	12 standard regions of Great Britain
Number of households by region	Scotland, London, whole of UK
Household size	One person
Age and gender (jointly)	Males and females split into the following age categories: 0–9, 10–15, 16–19 (dependent child), 16–19 (non-dependent), 20–24, 25–29, 30–44, 45–59, 60+
Number employed	Males and females split into the following age categories: 16-29, 30-49, 50-State Pension Age, State Pension Age + Males and females also split according to family type (single or cohabiting) and part-time or full-time status (jointly, i.e. a total of 2*2*2=8 cells)
Ethnicity	Asian (Great Britain only)
Lone-parent families	n/a
Two-parent families by country	England, Scotland, Wales, whole of UK
Housing tenure	Owner, tenant (social), tenant (private)

Note: The population forecasts of the number of individuals or households with such characteristics are obtained from the Office for National Statistics (2009, 2010), Northern Ireland Statistics and Research Agency (2010), Department for Communities and Local Government (2009), Welsh Assembly Government (2009), General Register Office for Scotland (2008), and internal Department for Work and Pensions projections of the number of lone parents and couples with children in Great Britain, which was kindly made available to us.

Table 5. Income statistics (actual and simulated), 2007-08 to 2015-16

	Real annual median income change (%)	***Child poverty***		***Poverty among working-age adults without children***		***Inequality ratios***		
		Relative low income (%)	*Absolute low income (%)*	*Relative low income (%)*	*Absolute low income (%)*	*90/10*	*90/50*	*50/10*
2007 (actual)	+0.1	22.5	20.8	14.0	13.3	4.22	2.05	2.05
2008 (actual)	+0.7	21.8	19.7	14.7	13.8	4.21	2.07	2.03
2009 (actual)	+0.9	19.7	17.2	15.0	13.7	4.09	2.06	1.99
2010	–4.0	19.2	19.2	15.3	15.3	4.06	2.04	1.99
2011	–2.8	19.0	20.8	15.3	16.0	4.00	2.02	1.98
2012	–0.5	19.8	22.0	15.4	16.3	4.04	2.03	1.99
2013	+0.2	21.0	22.8	15.8	16.6	4.09	2.04	2.01
2014	+1.5	21.7	22.6	15.5	16.2	4.11	2.05	2.01
2015	+1.1	22.2	22.6	15.5	15.7	4.15	2.06	2.01

Notes: Relative low income line is 60% of contemporary median income. Absolute low income line is 60% of the 2010-11 median in real terms (deflated using Retail Prices Index). Years refer to financial years.
Source: Authors' calculations based on Family Resources Survey, 2008–09, using TAXBEN and assumptions specified in the text. 'Actual' relative low income figures from Department for Work and Pensions (2011); 'actual' absolute low income figures are authors' calculations using HBAI 2007-08 to 2009-10 and simulated 2010-11 median income.

Table 6. Income statistics from counterfactual simulated income distributions, 2015-16

Scenario	*Median income, £ per week (2011-12 prices)*	*Child poverty*		*Poverty among working-age adults without children*		*Inequality ratios*		
		Relative low income (%)	*Absolute low income (%)*	*Relative low income (%)*	*Absolute low income (%)*	*90/10*	*90/50*	*50/10*
Memo: 2015 central forecast	435	22.2	22.6	15.5	15.7	4.15	2.06	2.01
No tax and benefit reforms after 2010-11	437	20.6	20.6	15.7	15.8	4.16	2.09	1.99
Higher employment and earnings	442	22.7	22.2	15.5	15.2	4.19	2.07	2.03
Lower employment and earnings	429	21.6	23.1	15.5	16.0	4.12	2.06	2.00
Progressive earnings growth	439	22.6	22.3	15.5	15.2	4.11	2.04	2.02
Regressive earnings growth	432	22.0	22.9	15.6	16.0	4.19	2.09	2.01

Notes: Median income amounts are expressed as equivalent amounts for a couple with no children, using the modified OECD equivalence scale. Relative low income line is 60% of contemporary median income. Absolute low income line is 60% of the 2010-11 median in real terms (deflated using Retail Prices Index). Years refer to financial years. See text for description of the scenarios.

Source: Authors' calculations based on Family Resources Survey, 2008–09, using TAXBEN and assumptions specified in the text.