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The Short- and Medium-Term Impacts of the Recession on the UK Income Distribution*

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Abstract

We study the short- and medium-term impacts of the recent recession on the distribution of net household income in the UK. We document trends in the distribution of income during and immediately after the economy's 6.3 per cent contraction between 2008Q1 and 2009Q2. We then use a tax and benefit microsimulation model combined with macroeconomic and

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demographic forecasts to project 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 until 2010–11 and beyond. We find that the major difference between income groups is in the timing of the reductions in income, rather than in their magnitude. For those in the middle and upper parts of the distribution, dependent mainly on labour market income, falls in real income happened largely between 2009–10 and 2011–12. For those towards the bottom, dependent more on benefit incomes, falls in real income will happen largely as a result of the post-recession fiscal tightening between 2010–11 and 2015–16. We explore the sensitivity of the results to different scenarios for employment and earnings: the central and qualitative conclusions prove robust.

Policy points

- We project that the reductions in household income between 2007–08 and 2015–16 will be spread quite evenly across the income distribution.
- The timing of the recession's impact is very different across income groups. Those on middle and higher incomes, largely dependent on labour market incomes, were hit immediately after the recession as real earnings fell sharply. Lower-income families, and in particular those with children, tended to fare less badly than others over that period, but are being hit relatively hard by the tax and benefit measures during the post-recession fiscal consolidation.
- The large planned net 'takeaway' from households during the fiscal consolidation is a major driver of the pattern of income changes that we expect to see up to 2015–16. Qualitatively, our conclusions are therefore robust to the direct impacts of quite large deviations in employment and earnings from their forecast levels in the medium term.

I. Introduction

The UK recently experienced its deepest recession since the Second World War, during which GDP fell by over 6 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 for 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.[1] We separately identify the likely impact on the distribution of income of the 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 are 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 exists.

Of course, we are not the first to consider this important issue. Ozdemir, Sanoussi and Ward (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. (2012) provide a comprehensive survey of changes in the labour market and the income distribution for six countries (Germany, Ireland, Italy, Sweden, the UK and the US) during and immediately after the recession, from 2007–08 to 2010–11.[2] They include an analysis of actual household income data, but also the use of microsimulation techniques to 'nowcast' the present income distribution.[3] Their work 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, this paper extends the work for the UK in Jenkins et al. (2012). Muriel and Sibieta (2009) use household income data to study the actual evolution of living standards, inequality and poverty during previous UK recessions. Avram et al. (2013) simulate the distributional impacts of fiscal consolidation measures that had been implemented by 2012 in Estonia, Greece, Italy, Latvia, Lithuania, Portugal, Romania, Spain and the UK. They suggest that these early elements of fiscal consolidation packages reduced incomes on average, but by widely varying amounts across countries; and they hit higher-income groups hardest for six out of the nine countries studied. Matsaganis and Leventi (2013) study the effects of the Greek recession and associated austerity package between 2009 and 2010. They find that these immediate effects, comprising a combination of falls in labour market incomes and austerity measures, were spread widely across income groups – overall income inequality was quite stable, and relative income

[1]The December 2012 Economic and Fiscal Outlook (Office for Budget Responsibility, 2012).

[2]The UK contribution to Jenkins et al. (2012) was produced by some of the current authors, and we draw on it in the analysis in this paper.

[3]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.

poverty rose slightly but by far less than absolute income poverty. Browne, Hood and Joyce (2013) project median income and poverty rates in the UK (against a moving and fixed poverty line) in the post-recession period from 2010–11 to 2016–17, and in 2020–21.

This paper studies the UK case in detail. It updates work in Jenkins et al. (2012) and combines this with the simulations underlying Browne, Hood and Joyce (2013), in order to study the short-term and likely medium-term implications of the recession for the income distribution as a whole. Section II describes our methods. Section III analyses trends across the income distribution between 2007–08 and 2011–12. This includes a 'nowcast' for 2011–12. Section IV presents our central estimates of how the income distribution will evolve up to 2015–16. Section V presents counterfactuals and sensitivity tests. We conclude in Section VI.

II. 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. The most recent data available at the time of writing (February 2013) are for 2010–11.[4] The micro-data include a set of weights, which are intended to correct for non-random non-response and to gross up to known population aggregates.[5]

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

- we analyse actual micro-data on the household income distribution between 2007–08 and 2010–11 (inclusive);
- we nowcast the household income distribution in 2011–12;
- we project the household income distribution in 2012–13 to 2015–16, given stated plans for personal taxes and benefits and external macroeconomic forecasts.

To implement the nowcasting and forecasting, we use microsimulation 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:

[4]See Department for Work and Pensions (2012).
[5]See Department for Work and Pensions (2005).

1. Begin with base micro-data (the 2010–11 FRS) on the distribution of private incomes and household characteristics.
2. Uprate financial variables in the data (for example, earnings) in line with observed or forecast changes.
3. Adjust certain characteristics of households to reflect major policy changes due between 2010–11 and 2015–16.[6]
4. Reweight 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 actual and expected future tax and benefit systems, taking into account pre-announced changes for future years. This is done using the Institute for Fiscal Studies (IFS) static tax and benefit microsimulation model, TAXBEN.[7] This does not allow for behavioural responses to tax and benefit changes at the micro level, although we 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 use (see footnote 6).
6. Adjust simulated benefit and tax credit entitlements to account for the facts that not everyone who is entitled to such payments actually claims them and that 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

[6]We do this only for 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 for women of any other age, nor for their partners. See appendix section D.3 of Browne, Hood and Joyce (2013) for a full description of the methods used. The fact that we do not make similar adjustments 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.

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

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.[8]

We account for actual and pre-announced policy changes and macroeconomic forecasts up to and including the December 2012 Autumn Statement and Economic and Fiscal Outlook. The policy changes accounted for in step 5 above include numerous 'takeaways' from households in the form of tax rises and welfare cuts designed to reduce the structural budget deficit.[9] They also include the phased introduction of universal credit – a major structural change to the welfare system, which will see six means-tested benefits and tax credits replaced with a single integrated payment. The take-up assumption (step 6 above) underlying the modelling of universal credit is that, if a household reported receiving any of the six means-tested payments that universal credit will replace in the 2010–11 survey data, then it will take up universal credit if it is entitled to it (and will report such take-up in future surveys).

Below, we elaborate on the incorporation of macroeconomic forecasts into our microsimulation model (steps 2 and 4). Full details of the modelling approach are described in Browne, Hood and Joyce (2013).

Up to 2011–12 (the last complete financial year at the time of writing), 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 by industry using figures from Oxford Economics. We account for the change in total employment using employment growth in 2011–12 as reported by the Office for Budget Responsibility (OBR), and again incorporate heterogeneity, allowing for differential employment changes by region and industry according to Oxford Economics figures.

When looking beyond 2011–12, we use forecasts of employment and average earnings growth from the OBR, the government's independent fiscal forecaster. The forecasts that we make use of were published on 5 December 2012[10] and are reproduced in Table 1. Within the OBR forecasts for total employment and average earnings, we allow for heterogeneity in the same way as in 2011–12. Future earnings growth is allowed to vary by industry,

[8]Further details on the measure of income used can be found in appendices 1 and 2 of Department for Work and Pensions (2012).

[9]There are three welfare cuts that we do not model, because we do not have the data or modelling capacity necessary to do so. These are changes to the way that tax credit entitlements respond to within-year income fluctuations; reductions in the age of youngest child at which a lone parent can claim income support rather than jobseeker's allowance; and changes to council tax support from April 2013, which vary at the English local authority level. See appendix section D.2 of Browne, Hood and Joyce (2013) for further details and discussion.

[10]Office for Budget Responsibility, 2012.

TABLE 1

UK macroeconomic forecasts used in projections

	2010–11	*2011–12*	*2012–13*	*2013–14*	*2014–15*	*2015–16*
Annual CPI inflation to September	3.1%	5.2%	2.2%	2.6%	2.2%	2.0%
Annual RPI inflation to September	4.6%	5.6%	2.6%	3.1%	2.7%	3.1%
Annual RPI inflation, whole year	5.0%	4.8%	3.1%	2.9%	2.8%	3.2%
Annual Rossi inflation to September[a]	4.8%	6.8%	2.8%	3.6%	3.1%	3.3%
Employment (millions)	29.1	29.2	29.6	29.6	29.8	30.0
Average earnings growth	0.6%	2.6%	2.6%	2.2%	3.0%	3.9%
Nominal GDP growth	4.6%	3.3%	2.3%	3.6%	4.2%	4.4%

[a]Rossi inflation forecasts (see sources below) are available only quarterly. Rossi inflation figures in September from 2013 onwards are therefore assumed to equal the rate of inflation to quarter 3 of the relevant year.

Source: Office for Budget Responsibility (2012) – table 2.1 from main document and economy supplementary tables 1.4 and 1.5.

and changes in employment to vary by industry and region, all according to forecasts from Oxford Economics. In Section V, we examine the sensitivities of our results to variation in the OBR's forecasts and under 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

TABLE 2

Characteristics controlled for in simulations by reweighting the data

Dimension	*Categories*
Total population	Constituent nation and English region
Households	Household type, constituent nation and English region
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+
Employment	Industry, constituent nation and English region
Ethnicity	Asian (Great Britain only)

Note: The sources of the population and household control totals we use for future years are Northern Ireland Statistics and Research Agency (2010), General Register Office for Scotland (2010), Welsh Assembly Government (2011), Office for National Statistics (2011b and 2012) and Department for Communities and Local Government (2012). We control for changes in total employment using forecasts from the Office for Budget Responsibility (2012). Within that total, changes in employment are allowed to vary by constituent nation and English region, and by industry, according to forecasts provided by Oxford Economics.

characteristics that we incorporate when reweighting the data is given in Table 2).

We take a relatively simple approach to forecasting the incomes of elderly households. For such groups, a sophisticated projection would use dynamic microsimulation 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 that are heavily dependent on the incomes of such households (for example, rates of pensioner poverty), 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 therefore do not report statistics that are highly sensitive to such trends (for example, mean income and the Gini coefficient). This also means that we do not need to rely on assumptions about behavioural changes among the very highest-income individuals – who have been affected by the considerable changes to the income tax system for those with incomes exceeding £100,000 per year – over which there is huge uncertainty (particularly over the extent to which those people are engaging in temporary income shifting or permanent responses). But note that we will therefore not pick up the substantial hit to this small group at the very top of the income distribution arising from measures announced as part of the fiscal tightening.[11]

Note that throughout our analysis we use the retail price index (RPI) as our measure of inflation to compare real incomes in different years. This is consistent with the UK government's official household income statistics, but is likely to understate the true growth in household incomes because the RPI is widely thought to overstate the true measure of inflation experienced by households. Furthermore, this problem is thought to have worsened following a change to the way in which clothing prices were sampled in 2010.[12] In our projections of future income trends, we therefore examine a variant in which we use the consumer price index (CPI) as our measure of inflation.

[11]See Joyce and Phillips (2013) for distributional analysis of all tax and benefit measures announced as part of the fiscal consolidation that does include the impacts of measures affecting the very richest.

[12]For more on the different measures of inflation in the UK, see Levell (2012).

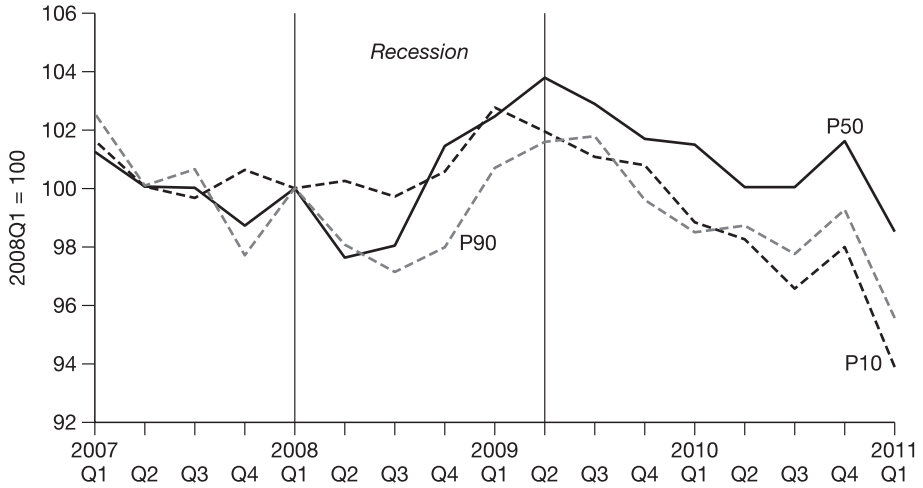
III. Household incomes since the start of the recession

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.[13] Between 2007–08 and 2009–10, average annual real-terms growth was 1.2 per cent at the mean and 0.6 per cent at the median, the latter of which is statistically significant from zero at the 5 per cent level.[14] 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.[15] This experience of continued household income growth despite the onset of recession mirrors that of other developed countries such as Sweden, the US and even Ireland.[16]

Figure 1 suggests that changes in real earnings over this period did not vary widely across the earnings distribution, although the median (P50), if anything, seems to have performed slightly better than earnings at either end.

FIGURE 1

Percentile points of full-time weekly earnings



Note: Real-terms index calculated using RPI all-items quarterly index.
Source: Office for National Statistics, series CHAW for RPI. Authors' calculations using the Labour Force Survey.

[13]All references to historical trends or levels of income in this paper are derived from the Institute for Fiscal Studies (IFS) time series of the income distribution, for which key summary statistics are available online at http://www.ifs.org.uk/fiscalFacts/povertyStats (accessed 1 March 2013).

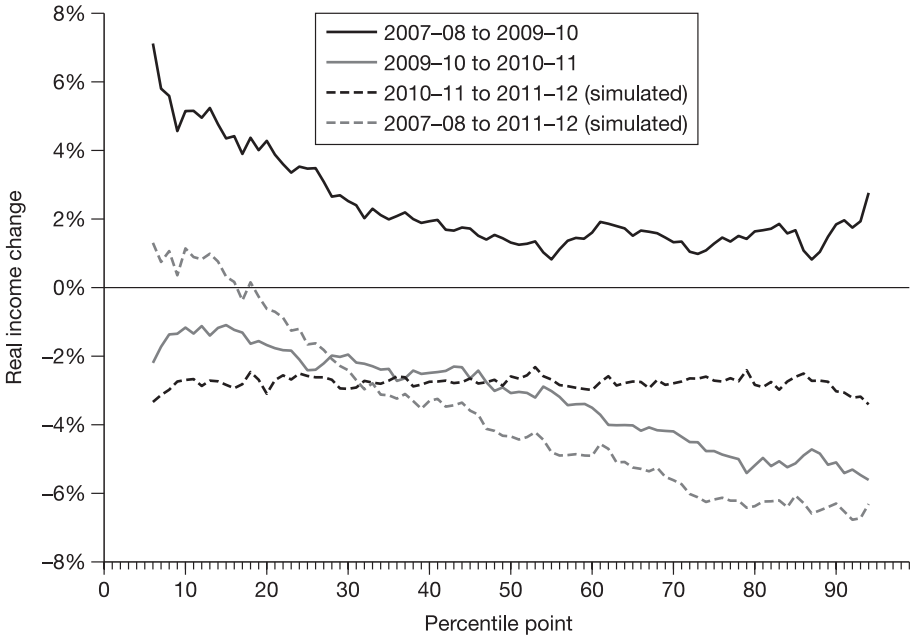
[14]See Cribb, Joyce and Phillips (2012).

[15]See Office for National Statistics (2011a) and discussion below.

[16]See Jenkins et al. (2012).

FIGURE 2

Real income growth incidence curves, 2007–08 to 2011–12



Note: Income growth at the top and bottom five percentile points is not shown due to uncertainty from sampling and measurement error.
Source: Authors' calculations based on Family Resources Survey, 2007–08, 2009–10 and 2010–11, using TAXBEN and assumptions specified in the text.

However, the growth incidence curves for net household income, shown in Figure 2, indicate that income growth was clearly most robust towards the bottom. Cribb, Joyce and Phillips (2012) 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 reduce the standard rate of VAT temporarily, inflation fell markedly from 5.0 per cent in the year to September 2008 to just 0.5 per cent, on average, in 2009–10, resulting in substantial real annual increases in benefit and tax credit amounts in that year.

The growth incidence curve for 2010–11, however, shows that the surprisingly benign initial trends in net incomes after the recession hit were reversed in 2010–11, when real incomes fell right across the distribution. The reductions in income were large by historical standards: for example, the 3.1 per cent real fall at the median was the largest single-year decline since 1981. There was also a clear distributional pattern, with larger proportionate reductions seen at higher points in the income distribution. As discussed in Cribb, Joyce and Phillips (2012), the key explanation for this pattern is the fact that falls in real earnings were larger than falls in the real

value of benefits. Furthermore, this picture of larger proportionate reductions towards the top of the income distribution repeats the patterns of income growth seen during previous UK recessions.[17]

Figure 2 also shows our simulated income growth incidence curve for 2011–12. We simulate further real year-on-year falls in household incomes, but much more evenly distributed across income groups. This largely reflects the convergence of the growth rates in the two major household income sources in 2011–12. Benefit and tax credit rates (which are relatively important for lower-income households) and average earnings (which are relatively important for middle- and higher-income households) both grew by about 3 per cent in cash terms. Overall, then, the patterns of income growth we simulate in 2011–12 barely change our impression of the distributional impact of the recession to date.

Putting this together, the magnitude of the simulated income losses over the period 2007–08 to 2011–12 is clearly increasing with income, particularly within the bottom half of the distribution. This is reflected in the

TABLE 3

Income statistics (actual and simulated)

	Annual median income change (%), real terms, relative to:		Child poverty		Poverty among working-age adults without children		Inequality ratios		
	RPI	*CPI*	*Relative low income (%)*	*Absolute low income (%)*	*Relative low income (%)*	*Absolute low income (%)*	*90:10*	*90:50*	*50:10*
2007–08 (actual)	+0.1	+2.0	22.5	21.3	14.0	13.5	4.22	2.05	2.05
2008–09 (actual)	+0.6	–0.2	21.8	20.2	14.7	14.1	4.20	2.07	2.02
2009–10 (actual)	+0.7	–1.0	19.7	17.5	15.0	14.0	4.08	2.06	1.98
2010–11 (actual)	–3.1	–1.7	17.5	17.5	14.6	14.6	3.92	2.02	1.94
2011–12	–2.6	–2.1	17.5	19.3	15.1	15.8	3.90	2.01	1.94
2012–13	–0.1	+0.4	19.0	20.9	15.1	15.9	3.96	2.01	1.97
2013–14	–0.7	–0.3	20.5	23.1	15.7	16.6	4.02	2.00	2.01
2014–15	–0.6	+0.1	20.9	23.8	16.0	17.0	4.08	2.03	2.01
2015–16	+0.4	+1.5	21.4	23.8	16.0	17.2	4.12	2.05	2.01

Note: Relative low income line is 60 per cent of contemporary median income. Absolute low income line is 60 per cent of the 2010–11 median in real terms (deflated using the RPI).
Source: Authors' calculations based on Family Resources Survey, 2010–11, using TAXBEN and assumptions specified in the text. 'Actual' relative low income figures from Department for Work and Pensions (2012); 'actual' absolute low income figures are authors' calculations using Family Resources Survey, 2007–08 to 2010–11.

[17]See Muriel and Sibieta (2009).

movements of inequality ratios (see Table 3): the 90:10 ratio fell by 8 per cent; the 50:10 ratio fell by 6 per cent; and the 90:50 ratio fell by 2 per cent.

Given the progressivity of changes in the income distribution between 2007–08 and 2011–12, we would generally expect declines in rates of relative income poverty. Using a poverty line of 60 per cent of the contemporary median, Table 3 shows that this was indeed the case for families with children, but not for working-age adults without children.[18] Tax and benefit policy seems very likely to be key to the explanation.[19] Low-income families with children are on average entitled to significantly more state support than those of working age without children, and so benefited disproportionately from the relative stability of benefit and tax credit entitlements in 2009–10 and 2010–11. There were also specific discretionary increases to child tax credit in 2008–09, 2009–10 and 2010–11. By contrast, those of working age without children would not have benefited 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.

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 3 shows that between 2007–08 and 2011–12 the proportion of children falling below the absolute low income threshold fell by about 2 percentage points, but the proportion of such working-age adults without children rose by about 2 percentage points. Again, there is a clear difference between the fortunes of families with and without children.

IV. Household incomes up to 2015–16

There are reasons to expect that much of the impact on the income distribution associated with the recession is happening only now or is still to come. First, the government has embarked on a large fiscal tightening intended to restore the cyclically-adjusted current budget balance to surplus by 2017–18. This includes a large number of specific pre-announced changes to taxes and benefits up to 2015–16, which together amount to a net takeaway from households of 2.6 per cent of national income in that year,

[18]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 projections). 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.

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

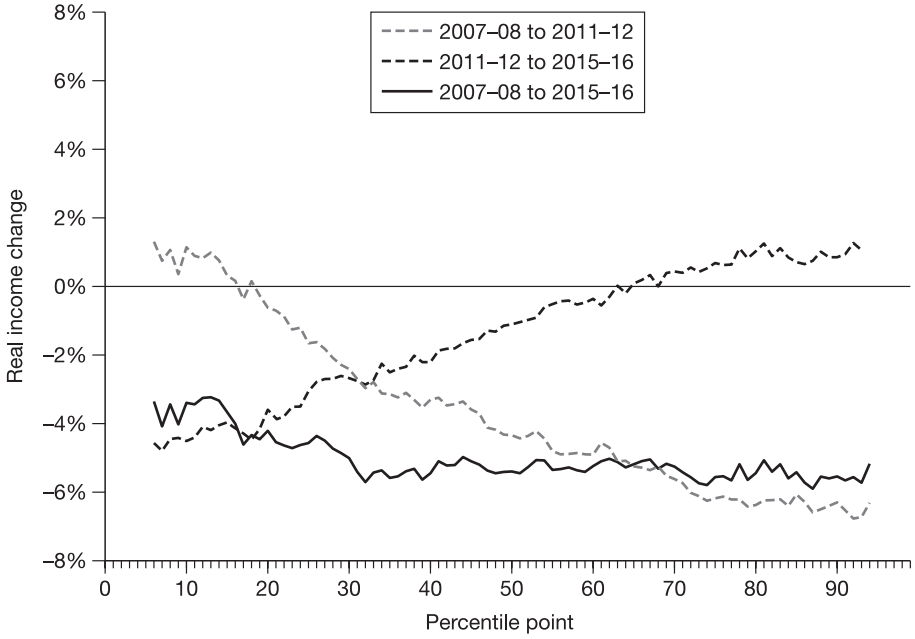
comprised roughly equally of net tax rises and net benefit cuts.[20] Second, as set out in Table 1, real earnings are still falling and are expected to continue to do so in the near term.

Figure 3 shows the simulated income growth incidence curve for the period between 2011–12 and 2015–16. It also combines this with the analysis shown in Figure 2 to give an estimate of the total growth incidence curve from 2007–08 (before the recession) to 2015–16. Table 3 presents median incomes, poverty rates and inequality ratios from our simulated net household income distributions for each year up to 2015–16.

The results suggest that, if macroeconomic forecasts are correct, the large falls in real incomes in the middle and upper parts of the distribution have already happened (although we do not look at what happens at the very top of the distribution because of the large uncertainty due to sampling and measurement error). This mostly reflects the forecasted relative stability of earnings (compared with RPI inflation) from 2012–13. But there is to be no

FIGURE 3

Simulated real income growth incidence curves, 2007–08 to 2015–16



Note: Income growth at the top and bottom five percentile points is not shown due to uncertainty from sampling and measurement error.
Source: Authors' calculations based on Family Resources Survey, 2007–08 and 2010–11, using TAXBEN and assumptions specified in the text.

[20]Emmerson, Keynes and Tetlow, 2013.

strong recovery in incomes either: for example, according to the official measure, we project a 1.1 per cent fall in real median income between 2011–12 and 2015–16 (although this measure uses the RPI to deflate incomes and, as already mentioned, this is generally considered to somewhat overstate the true rate of inflation facing households; under the variant where we use the CPI to deflate incomes, real median income increases by 1.7 per cent between 2011–12 and 2015–16).

In contrast, our simulations suggest that lower-income groups will fare considerably worse over the post-recession period (between 2011–12 and 2015–16) than they did during and shortly after the recession itself (between 2007–08 and 2011–12). The key explanation, as we show in the next section, is that those on lower incomes are the most affected by the substantial cuts to the welfare budget that form part of the post-recession fiscal tightening. The resulting pattern of income changes across the distribution between 2011–12 and 2015–16 is therefore inequality-increasing and is essentially the converse of what happened over the previous four years since the onset of recession. The net effect is that, between 2007–08 and 2015–16, we simulate quite evenly spread proportionate reductions in incomes across the distribution. If anything, income falls in the bottom third of the distribution over this period are expected to be slightly smaller than those for other groups, on average. But the major difference between income groups is in the timing of the reductions in real income, rather than in their magnitude.

The simulated poverty statistics shown in Table 3 show that we expect increases in poverty up to 2015–16 using both relative and absolute poverty lines. Again, there is variation by family type: child poverty rates are simulated to rise more steeply than poverty rates among the working-age childless. This represents a reversal in relative fortunes compared with the period between 2007–08 and 2011–12. Overall, we simulate that relative child poverty will still be slightly lower in 2015–16 than it was before the recession, in 2007–08. This is the net effect of quite volatile trends over the period, with sharp falls in relative child poverty over the four years after 2007–08 and sharp rises over the subsequent four years. In contrast, the relative position of low-income working-age adults without children will be worse in 2015–16 than it was in 2007–08, and this reflects relatively steady increases in relative poverty among the group, continuing a trend that began almost three decades ago.[21]

Our central projections suggest that the 90:10, 50:10 and 90:50 ratio measures of inequality will increase between 2011–12 and 2015–16. However, because of the very 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 expected to have remained stable over the same period. This reflects

[21]Cribb, Joyce and Phillips, 2012.

the fact that, as Figure 3 makes clear, projected cumulative income losses between 2007–08 and 2015–16 are generally increasing with income within the bottom third of the income distribution, but relatively flat in the top two-thirds.

V. 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 twofold. First, we redo our simulations under the counterfactual scenario in which direct tax and benefit policy had not been changed since April 2010. 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 overall impact of the recession on that distribution. Second, we redo our simulations under different macroeconomic scenarios – specifically for employment and earnings – from 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 exercise like 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 tax rises and benefit cuts have (positive or negative) impacts on macroeconomic variables such as employment and earnings, then these will also affect 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 macroeconomic sensitivity analysis is

[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 was 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 per cent 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.

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 400,000 higher or lower and average earnings 4 per cent higher or lower in 2015–16 than currently forecast by the OBR. The deviations from the OBR forecasts of earnings growth and employment that these scenarios represent are at least as large as the revisions to those OBR forecasts between November 2010 and December 2012.[23] In other words, in the 'optimistic' scenario the 2015–16 economy is where the OBR expected it to be in November 2010, and in the 'pessimistic' scenario the deterioration of the macroeconomic outlook since the November 2010 forecast is twice as bad as the OBR currently expects.

We also consider what would happen if the rate of average earnings growth were as the OBR expects, but earnings inequality changed. In other words, we assume that earnings in 2015–16 are lower in some earnings decile groups, and higher in others, than they would be under our central scenario (which does allow for variation in earnings growth by industry, but not within industries). We consider both progressive and regressive patterns of earnings growth, fixing average earnings at their level under the central scenario. Our 'progressive' earnings growth scenario assumes that average earnings relative to the first earnings decile group fall by 1 per cent for the second earnings decile group, 2 per cent for the third, and so on up to 9 per cent 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 9 percentage points. 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 4 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 4 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 tightening from April 2011 onwards are, unsurprisingly, set to reduce household incomes across most of the income distribution.

[23]See Office for Budget Responsibility (2010 and 2012).

- 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 substantial welfare cuts amounting to a planned 1.3 per cent of national income by 2015–16.[24] The cuts to social security almost entirely explain the projected reductions in incomes within the bottom half of the distribution in the post-recession period of fiscal consolidation.

TABLE 4

Income statistics from counterfactual simulated income distributions, 2015–16

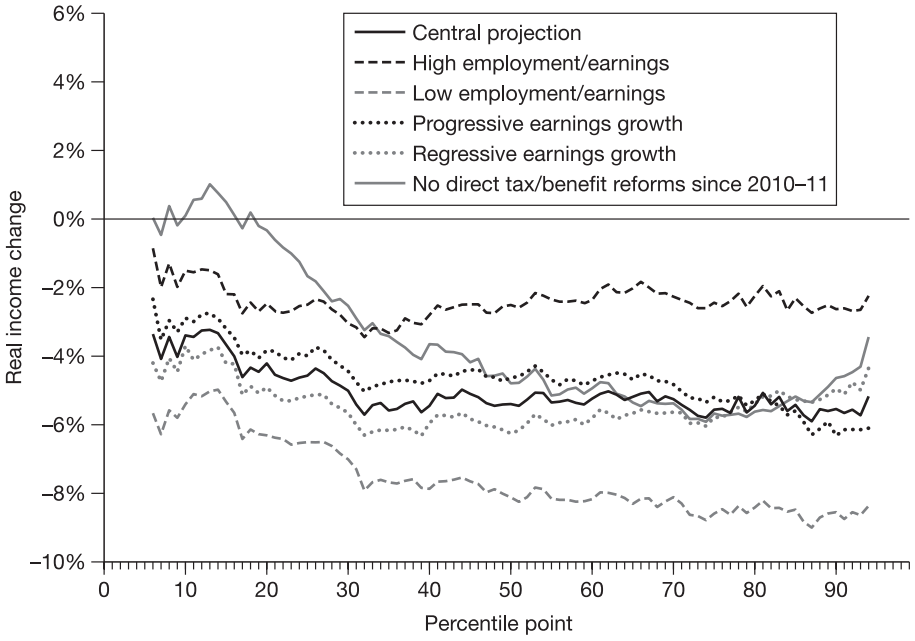
Scenario	*Median income, £ per week (2013–14 prices)*	Child poverty		Poverty among working-age adults without children		Inequality ratios		
		Relative low income (%)	*Absolute low income (%)*	*Relative low income (%)*	*Absolute low income (%)*	*90:10*	*90:50*	*50:10*
Memo: 2015–16 central projection	449	21.4	23.8	16.0	17.2	4.12	2.05	2.01
No tax and benefit reforms after 2010–11	451	16.6	18.5	15.2	16.1	4.02	2.06	1.95
Higher employment and earnings	462	22.2	22.8	15.9	16.2	4.16	2.05	2.03
Lower employment and earnings	436	20.4	25.0	16.1	18.3	4.07	2.04	1.99
Progressive earnings growth	452	21.7	23.6	16.0	16.8	4.06	2.02	2.02
Regressive earnings growth	444	21.1	24.1	16.1	17.6	4.17	2.08	2.00

Note: 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 per cent of contemporary median income. Absolute low income line is 60 per cent of the 2010–11 median in real terms (deflated using the RPI). See text for description of the scenarios.
Source: Authors' calculations based on Family Resources Survey, 2010–11, using TAXBEN and assumptions specified in the text.

[24]Emmerson, Keynes and Tetlow, 2013. 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 (Avram et al., 2013).

FIGURE 4

Sensitivity analysis, 2007–08 to 2015–16



Note: Income growth at the top and bottom five percentile points is not shown due to uncertainty from sampling and measurement error.
Source: Authors' calculations based on Family Resources Survey, 2007–08 and 2010–11, using TAXBEN and assumptions specified in the text.

- The seventh and eighth income decile groups are exceptions to the rule. The net effect of the direct tax and benefit changes on their incomes is close to zero, on average. This is because these groups are the biggest gainers from a substantial tax cut over the period: namely, the discretionary increases to the income tax personal allowance (the amount of income exempt from income tax). Nearer to the top of the distribution, households tend to be net losers from the changes. Contributing factors include real reductions to the higher-rate income tax threshold, rises in National Insurance contributions, and the withdrawal of child benefit from higher-income families.[25]
- There is important variation in the simulated effects of the fiscal tightening by family type as well as by income. Our simulations suggest that the direct tax and benefit reforms increase relative and absolute low income poverty among children by about 5 percentage points by 2015–

[25]As explained earlier, other tax rises aimed specifically at the very highest-income individuals have also been very significant right at the top end of the distribution, but these are not fully captured here – we exclude the top five percentile groups from the analysis, as the methods used here cannot be used to project their incomes robustly.

16, but have an effect of only about 1 percentage point on the same poverty rates among working-age adults without children. The qualitative pattern is not surprising, as low-income families with children tend to get a relatively large share of their income from the state.

- Different macroeconomic out-turns would have little direct impact on the bottom third of the distribution, where employment income tends to be relatively unimportant. Within the top two-thirds, more benign out-turns would tend to increase income inequality (and vice versa), since labour market income accounts for a larger average share of income as one moves further up the distribution.
- Under the 'optimistic' scenario, the cumulative income reductions between 2007–08 and 2015–16 peak in the fourth income decile (whereas under the central scenario the proportionate reductions are essentially the same for the top two-thirds of the distribution). This is because those further up the distribution gain most from the more benign labour market outcomes. Under the 'pessimistic' scenario, the cumulative income reductions are even more clearly progressive than those under the central scenario, with inequality declining within the top half of the distribution as well as the bottom half. Under either of the alternative scenarios, the proportionate reductions in income between 2007–08 and 2015–16 for those towards the bottom of the distribution are among the smallest.[26]
- Even the very marked deviations from uniformity in earnings growth rates across the earnings distribution that we consider change the results relatively little. For example, the simulated level of median income in 2015–16 is affected by no more than 1 per cent. This is mainly due to two factors: the fact that there is not a very strong correlation between being a low-earning individual and being in a low-income household; and the progressive tax and benefit system.
- It is also clear that progressive patterns of earnings growth are not well targeted at reducing relative poverty. This is primarily 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[27]). The 'progressive' earnings growth scenario actually increases relative child poverty, because some working

[26]We have made the neutral assumption here of uniform changes in earnings and no change in the composition of the employed population relative to the central scenario. 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.

[27]See Brewer, May and Phillips (2009).

individuals towards the bottom of the earnings distribution are situated around the middle of the household income distribution (for example, because they live with another earner), and hence this scenario raises the relative poverty line by raising median income.

VI. Conclusions

Given the severity of the recession, substantial reductions in household incomes were surely inevitable. But the timing, mechanisms and distribution of the shock to national income are important and more complicated issues. This paper has used microsimulation techniques in an effort to understand the likely medium-term implications of the recent recession for the distribution of income in the UK.

Our simulations suggest that, if macroeconomic forecasts are correct, the large falls in real incomes in the middle and upper parts of the distribution[28] – driven primarily by the failure of the earnings of those in work to keep pace with inflation – have already occurred. In contrast, much of the pain for lower-income groups is happening now or is still to come. This is because those on lower incomes are the most affected by the substantial cuts to the welfare budget. Hence, they have been hit much harder by the post-recession fiscal tightening – an inevitable policy response given that the recession permanently reduced the productive (and tax-generating) capacity of the economy – than by the direct macroeconomic effects of the recession itself.

The major difference between income groups is in the timing of the reductions in real income, rather than in their magnitude. For those in the middle and upper parts of the distribution, dependent mainly on labour market income, falls in income happened largely between 2009–10 and 2011–12. For those towards the bottom, dependent more on benefit incomes, falls in income will happen largely between 2010–11 and 2015–16. The net effect is that, between 2007–08 and 2015–16, we simulate quite evenly spread proportionate reductions in incomes across the distribution. If anything, income falls in the bottom third of the distribution over this period are expected to be slightly smaller than those for other groups, on average.

Our simulation results, and hence conclusions, make use of 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

[28]Although we do not look at what happens at the very top of the distribution because of the large uncertainty due to sampling and measurement error.

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 regarding the medium-term distributional implications of the recession 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 was 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 period for spending on public services since the 1940s. But the UK has been experiencing a period of weak growth in living standards for all but the very top of the distribution since the early part of the previous decade, both compared with past years and compared with 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.[29] 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 economic growth and the living standards of most households, as well as the highly uncertain path for future economic growth.

References

Avram, S., Figari, F., Leventi, C., Levy, H., Navicke, J., Matsaganis, M., Militaru, E., Paulus, A., Rastringina, O. and Sutherland H. (2013), 'The distributional effects of fiscal consolidation in nine countries', EUROMOD Working Paper no. EM 2/13 (https://www.iser.essex.ac.uk/publications/working-papers/euromod/em2-13.pdf).

Brewer, M., Browne, J., Joyce, R. and Sibieta, L. (2010), 'Child poverty in the UK since 1998–99: lessons from the past decade', Institute for Fiscal Studies (IFS), Working Paper no. 10/23 (http://www.ifs.org.uk/publications/5303).

—, May, R. and Phillips, D. (2009), *Taxes, Benefits and the National Minimum Wage*, London: Low Pay Commission (http://www.lowpay.gov.uk/lowpay/research/pdf/FromLPC_Document_Feb.pdf).

Browne, J., Hood, A. and Joyce, R. (2013), *Child and Working-Age Poverty in Northern Ireland from 2010 to 2020*, Report no. 78, London: Institute for Fiscal Studies (http://www.ifs.org.uk/comms/r78.pdf).

Cribb, J., Joyce, R. and Phillips, D. (2012), *Living Standards, Poverty and Inequality in the UK: 2012*, Commentary no. 124, London: Institute for Fiscal Studies (http://www.ifs.org.uk/publications/6196).

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

Department for Communities and Local Government (2012), *Household Projections* (https://www.gov.uk/government/statistical-data-sets/detailed-data-for-modelling-and-analytical-purposes).
Department for Work and Pensions (2005), 'The New Family Resources Survey grossing regime' (http://research.dwp.gov.uk/asd/frs/reports/new_grossing_regime.pdf).
— (2012), *Households Below Average Income: An Analysis of the Income Distribution 1994/95–2010/11* (http://research.dwp.gov.uk/asd/hbai/hbai2011/index.php?page=contents).
Emmerson, C., Keynes, S. and Tetlow, G. (2013), 'Public finances: outlook and risks', in C. Emmerson, P. Johnson and H. Miller (eds), *The IFS Green Budget: February 2013*, London: Institute for Fiscal Studies (http://www.ifs.org.uk/budgets/gb2013/GB2013_Ch5.pdf).
General Register Office for Scotland (2010), *Household Projections for Scotland 2008-Based* (http://www.gro-scotland.gov.uk/files2/stats/household-projections/2008-projections/household-projections-2008-based.pdf).
Giles, C. and McCrae, J. (1995), 'TAXBEN: the IFS microsimulation tax and benefit model', Institute for Fiscal Studies (IFS), Working Paper no. 95/19 (http://www.ifs.org.uk/publications/572).
Gomulka, J. (1992), 'Grossing-up revisited', in R. Hancock and H. Sutherland (eds), *Microsimulation Models for Public Policy Analysis: New Frontiers*, STICERD Occasional Paper no. 17, London: London School of Economics.
Jenkins, S., Brandolini, A., Micklewright, J. and Nolan, B. (eds) (2012), *The Great Recession and the Distribution of Household Income*, Oxford: Oxford University Press.
Joyce, R. and Phillips, D. (2013), 'Tax and welfare reforms planned for 2013–14', in C. Emmerson, P. Johnson and H. Miller (eds), *The IFS Green Budget: February 2013*, London: Institute for Fiscal Studies (http://www.ifs.org.uk/budgets/gb2013/GB2013_Ch7.pdf).
Levell, P. (2012), 'A winning formula? Elementary indices in the retail prices index', Institute for Fiscal Studies (IFS), Working Paper no. 12/22 (http://www.ifs.org.uk/publications/6456).
Matsaganis, M. and Leventi, C. (2013), 'The distributional impact of the Greek crisis in 2010', *Fiscal Studies*, vol. 34, pp. 83–108.
Muriel, A. and Sibieta, L. (2009), 'Living standards during previous recessions', Institute for Fiscal Studies (IFS), Briefing Note no. 85 (http://www.ifs.org.uk/publications/4525).
Northern Ireland Statistics and Research Agency (2010), *2008-Based Household Projections for Northern Ireland* (http://www.nisra.gov.uk/demography/default.asp21.htm).
Office for Budget Responsibility (2010), *Economic and Fiscal Outlook, November 2010*, Cm 7979, London: The Stationery Office (http://budgetresponsibility.independent.gov.uk/economic-and-fiscal-outlook-november-2010/).
— (2012), *Economic and Fiscal Outlook, December 2012*, Cm 8481, London: The Stationery Office (http://budgetresponsibility.independent.gov.uk/economic-and-fiscal-outlook-december-2012/).
Office for National Statistics (2011a), *The Impact of the Recession on Household Income, Expenditure and Saving, Q2 2011* (http://www.ons.gov.uk/ons/dcp171766_240249.pdf).
— (2011b), *National Population Projections, 2010-Based Projections* (http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2010-based-projections/index.html).
— (2012), *2010-Based Subnational Population Projections for England* (http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2010-based-projections/index.html).
Ozdemir, E., Sanoussi, F. and Ward, T. (2010), 'The potential effects of the recession on the risk of poverty: nowcasting', Social Situation Observatory – Income Distribution and

Living Conditions, Research Note no. 6/2010 (http://www.socialsituation.eu/research-notes/RN06_2010_Nowcasting.pdf).

Welsh Assembly Government (2011), *Household Projections for Wales (2008-Based)*, (http://wales.gov.uk/docs/statistics/2010/100929hseholdproj2008en.pdf).

Whittaker, M. and Savage, L. (2011), *Missing Out: Why Ordinary Workers Are Experiencing Growth without Gain* (http://www.resolutionfoundation.org/media/media/downloads/Missing_Out.pdf).