Institute for Fiscal Studies

Simulating current and future changes to the distribution of income in the UK

Robert Joyce (IFS)

Joint work with Mike Brewer (ISER, IFS), James Browne (IFS), Luke Sibieta (IFS)

Introduction and motivation

- UK in aftermath of severe recession and in midst of slow recovery
- Interest in detailed 'real time' information about living standards
  - But data on household income distribution comes out with long lag
- Hence, the value of "nowcasting"
  - That is, estimating implications for household incomes of what we know is happening to labour market, tax and welfare policy, etc
- Same methods can be used to simulate future evolution of incomes, *given* planned policy, labour market forecasts, etc; and similarly for alternative policy or macroeconomic scenarios

The basic approach

- Start with latest available data on distribution of private income and household characteristics (2009/10 Family Resources Survey)

1. Up-rate financial variables in data, e.g. earnings
   - Use other data sources about what has happened to earnings since 2009/10 (for 'nowcasting'), and earnings forecasts (for forecasting)
2. 'Re-weight' data to reflect employment changes, and other relevant socio-demographic change (e.g. number of lone parents)
   - Increase weight given to types of people who have become more common since 2009/10
3. Simulate tax liabilities and benefit and tax credit entitlements, given current or expected future tax and benefit systems
   - Use tax and benefit micro-simulation model to do this (NB: ours is a static model, i.e. does not allow for behavioural responses)
4. Adjust incomes to reflect non-take-up (and non-reporting) of means-tested benefits and tax credits.

Data sources used

- Demographics:
  - For both nowcasting and forecasting, Office for National Statistics provide population by region, age and gender, and household types

- Earnings and employment:
  - for nowcasting, other large-scale surveys (LFS, Annual Survey of Hours and Earnings). Can disaggregate and use household-level information.
  - for forecasts, Office for Budget Responsibility (average/totals only); currently looking at adding industry/region-level forecasts from elsewhere

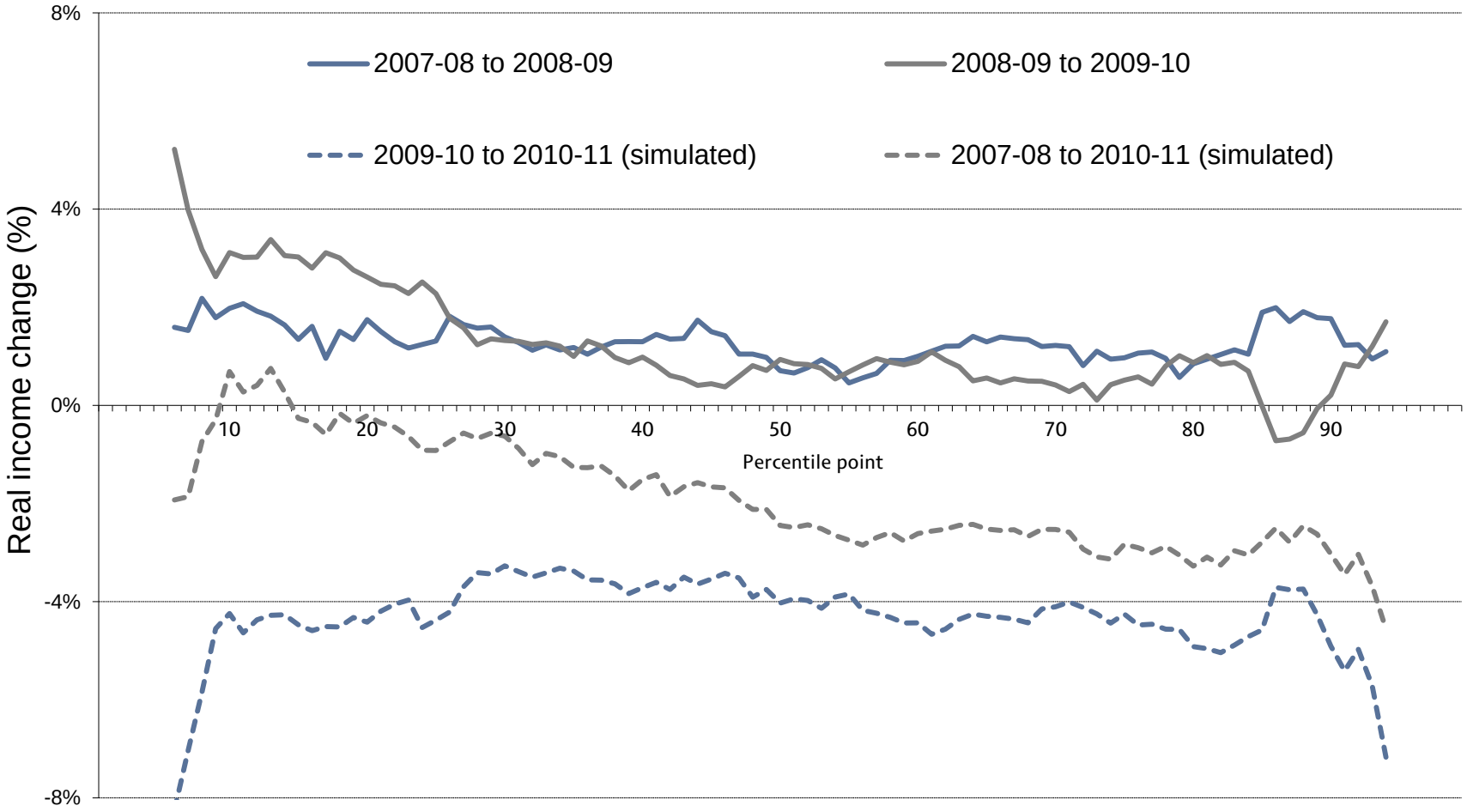
The result

- One ends up with a simulated current (for nowcasts) or future (for forecasts) income distribution
  - Can read off any summary statistic one likes from this, e.g. standard inequality measures, poverty rates, etc.

- In practice, one caveat is that the methods are not very appropriate at tails of the distribution
  - Due to (necessary) use of survey data, which is unreliable in the tails
  - So we don't report statistics that depend on the tails, e.g. Gini coefficients, mean income.

- More general limitations of the methods to come…

Simulated real income 'growth incidence curves', 07/08 – 10/11

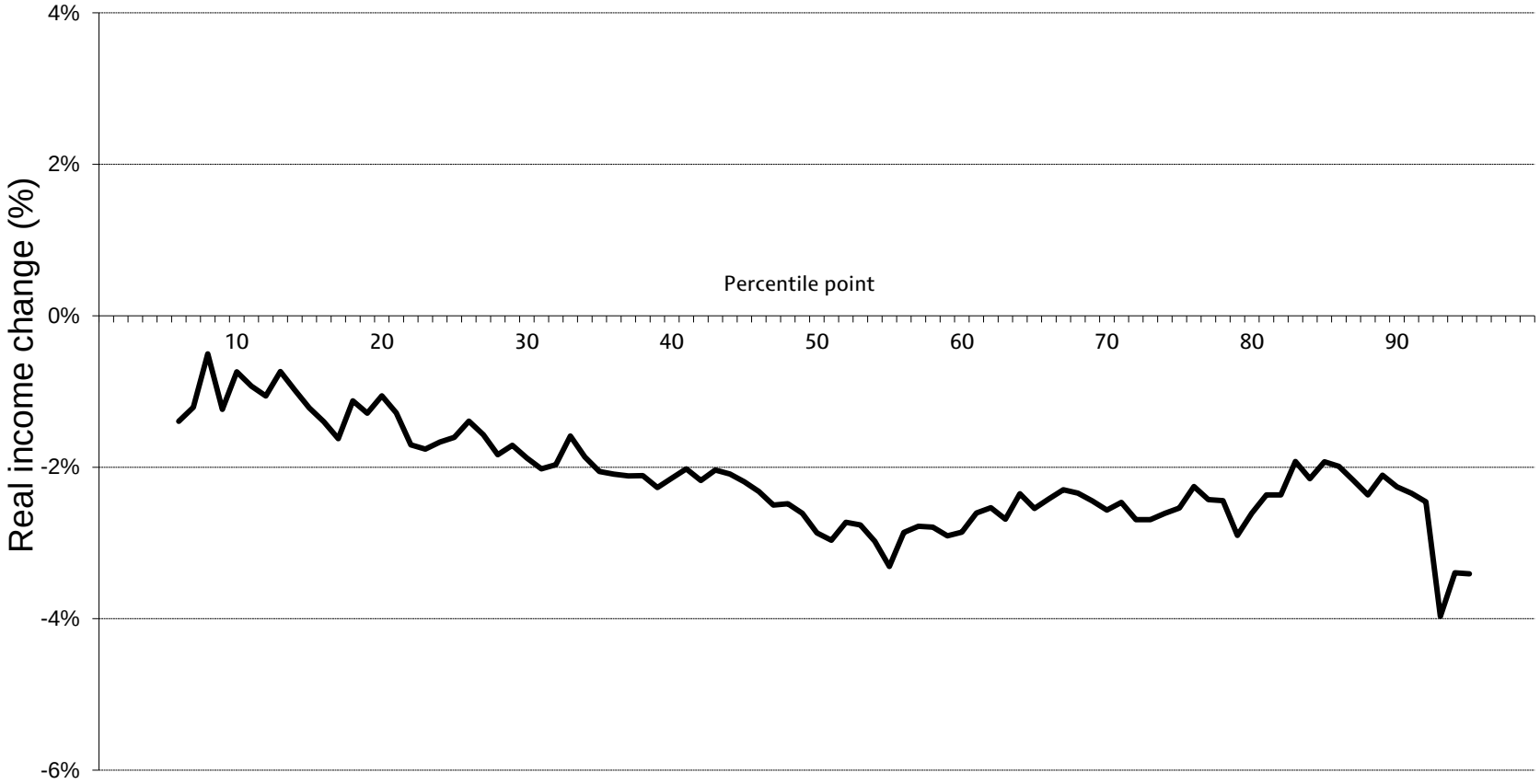


Source: Simulated data from authors' calculations using FRS 2009/10; other data from Cribb et al. (2012).

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

Institute for Fiscal Studies

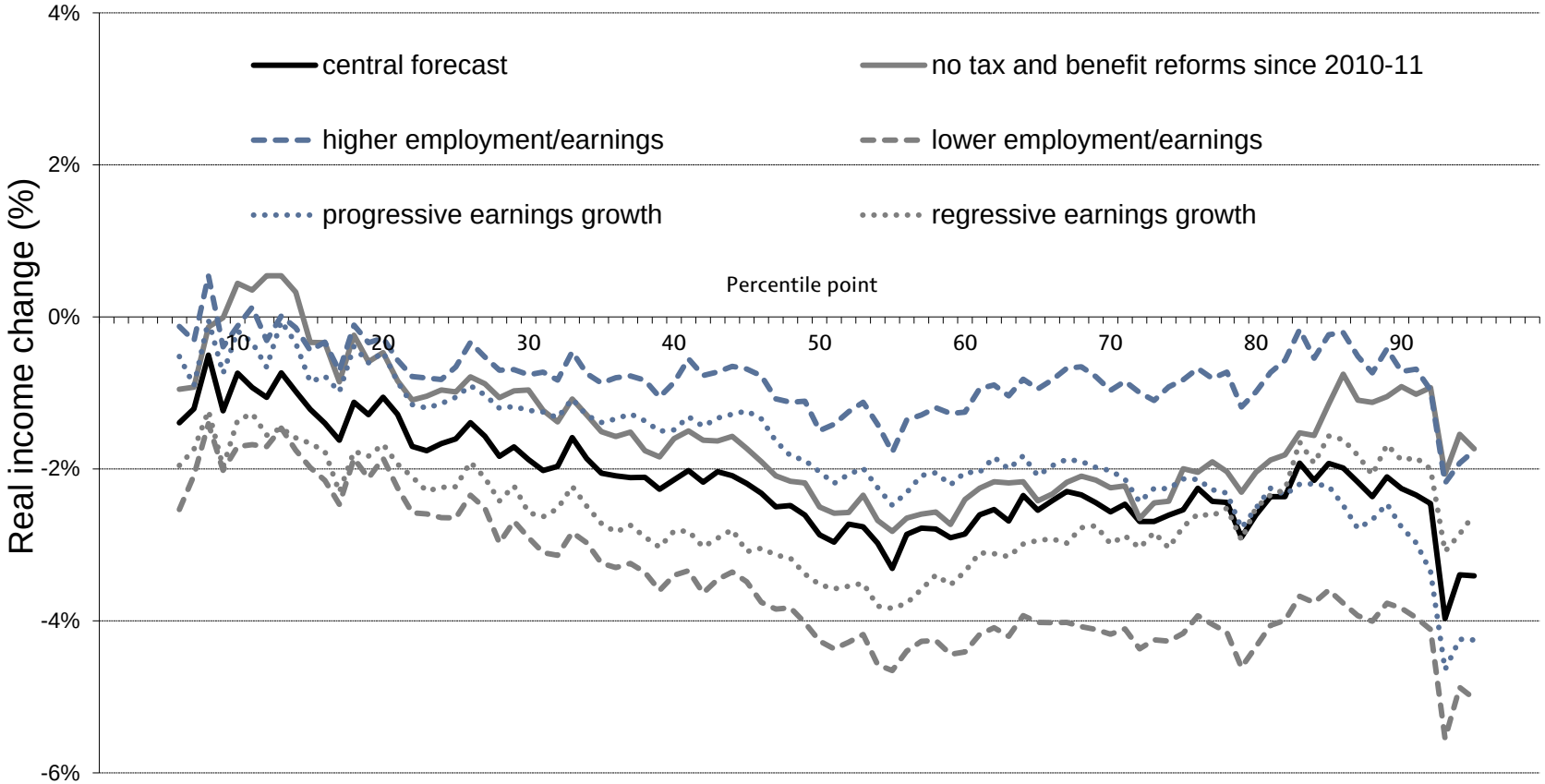
Incorporating projections for the post-recession years: 2007-08 to 2015-16…



Source: Authors' calculations using FRS 2009/10; and Cribb et al. (2012).

Note: Income growth at the top and bottom 5 percentile points is not shown due to uncertainty from sampling and measurement error. Macroeconomic forecasts from the OBR and policy assumptions underlying the simulations are from November 2011 (not quite the latest available).

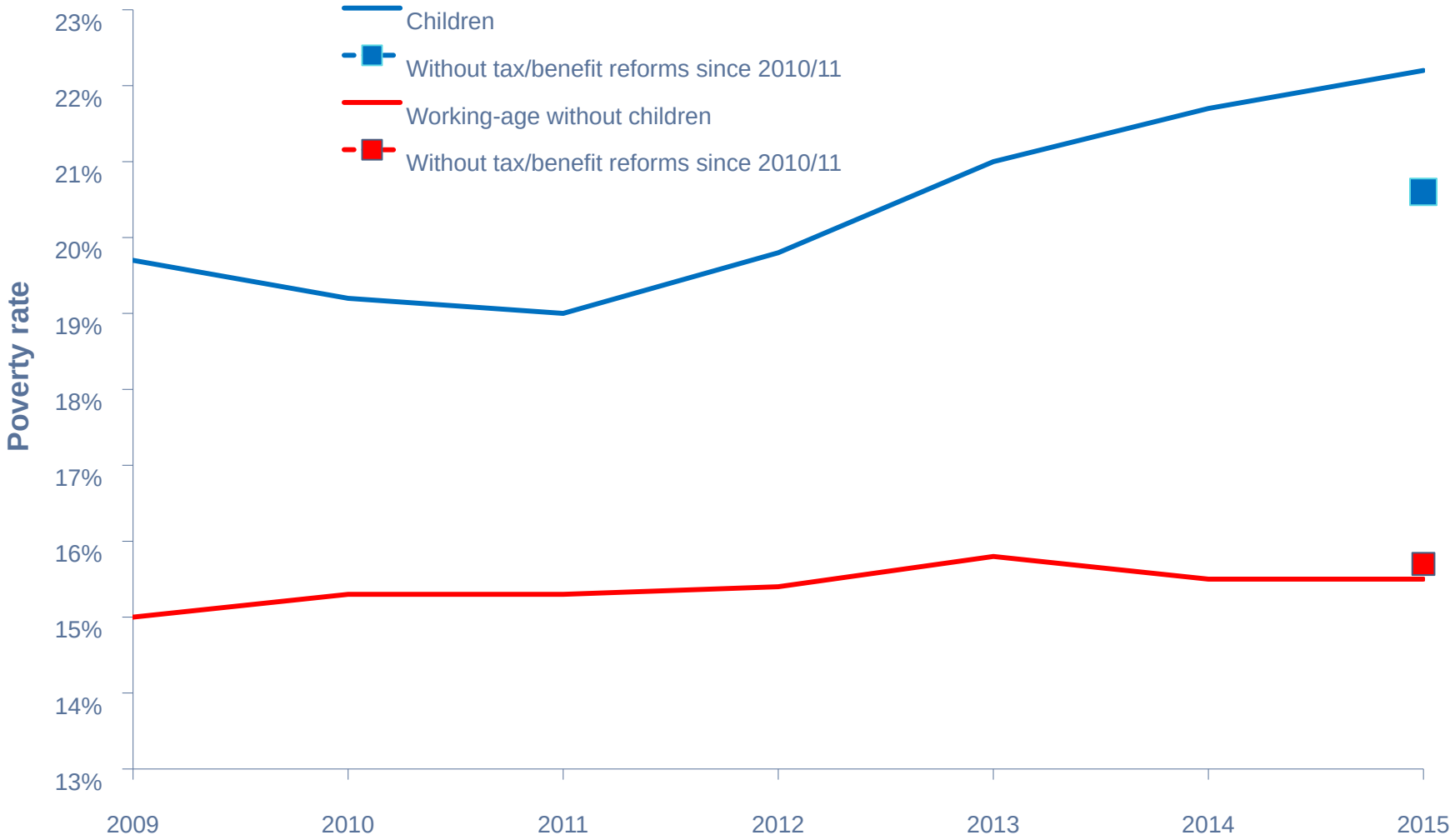
...and exploring alternative scenarios and counterfactuals



Source: Authors' calculations using FRS 2009/10; and Cribb et al. (2012).
Note: Income growth at the top and bottom 5 percentile points is not shown due to uncertainty from sampling and measurement error. Macroeconomic forecasts from the OBR and policy assumptions underlying the simulations are from November 2011 (not quite the latest available). Higher/lower employment and earnings scenarios add/subtract 2 percentage points to/from the employment rate and 2% to/from earnings levels. 'Progressive' and 'regressive' earnings growth scenarios involve each earnings decile group having 1% lower/higher earnings relative to the previous decile group than under central scenario.
.

Institute for Fiscal Studies

Relative poverty projections



Note: Poverty line is 60% of median income. Years refer to financial years.
Macroeconomic forecasts from the OBR and policy assumptions underlying the simulations are from November 2011 (not quite the latest available).

Institute for Fiscal Studies

Caveats and limitations

- Reweighting may not be appropriate for modelling radical demographic or labour market change (it 'clones' people)
  - And can't be sure to have captured all relevant dimensions of change
- Difficult or impossible to sensibly quantify all of the uncertainty around central estimates
  - The effect of sampling error in the data can be quantified, but it is unlikely to be the key source of uncertainty
- Nowcasting could be inaccurate at forecasting incomes *measured in future survey data* even if accurate at forecasting 'reality'
  - Because survey data can be inaccurate and subject to sampling error
  - So can be hard to retrospectively verify performance of the methods