Nowcasting household income in the UK

Richard Tonkin
Meeting of Providers of OECD Income Distribution Data, February 2016

Email: richard.tonkin@ons.gsi.gov.uk
Twitter: @richt2

Introduction

- In assessing economic well-being / material living standards, it's important to look at experience of "typical" household and distribution of income
    - (see e.g. OECD, 2013; ONS, 2014; Stiglitz et al.,2009)
    - Median equivalised disposable income and S80/S20 ratio among ONS headline indicators of economic well-being

- However…
    - In the UK, statistics on income distribution have historically been published 15 months or more after reference period
    - Macroeconomic measures such as RHDI are timely, but do not reflect distribution

Nowcasting household income

- In response to considerable user feedback, ONS investigating 'nowcasting' techniques to provide early estimates of key indicators:
  - Median equivalised disposable income
  - Measures of inequality (e.g. Gini, S80/S20)
  - At Risk of Poverty rate (based on EC indicator)

- What is nowcasting?
  - Uses data already available for the period of study – earnings, employment, inflation, tax/benefit policies
  - Potential to provide distributional indicators within a few months of income reference period

Nowcasting household income

Key milestones		
Initial methodological article	1 Jul 2015	• Variety of approaches tested • Included 'nowcasts' for 2013/14 assessed against survey-based estimates • Feedback from external experts
2014/15 nowcasts published	28 Oct 2015	• Estimates for 2014/15 published (t + 7 months), based on revised methodology • Published as 'Experimental Statistics'
2014/15 survey based estimates published	23 Feb 2016	• Will allow assessment of 2014/15 nowcasts • Methodology / future plans reviewed as appropriate
2015/16 nowcasts published	July 2016 (TBC)	• Early/provisional estimates potentially available by t+4 months

Data sources

- Nowcast data built upon the UK **Inter Governmental Tax and Benefit Model (IGOTM)**
  - Uses data from the Living Costs & Food Survey (LCFS) conducted by ONS
- Input dataset for 2014/15 nowcasts – LCFS data from 2010/11 to 2012/13
- Different data source to OECD IDD
  - Data collection largely comparable
  - Definitions aligned with Canberra Handbook
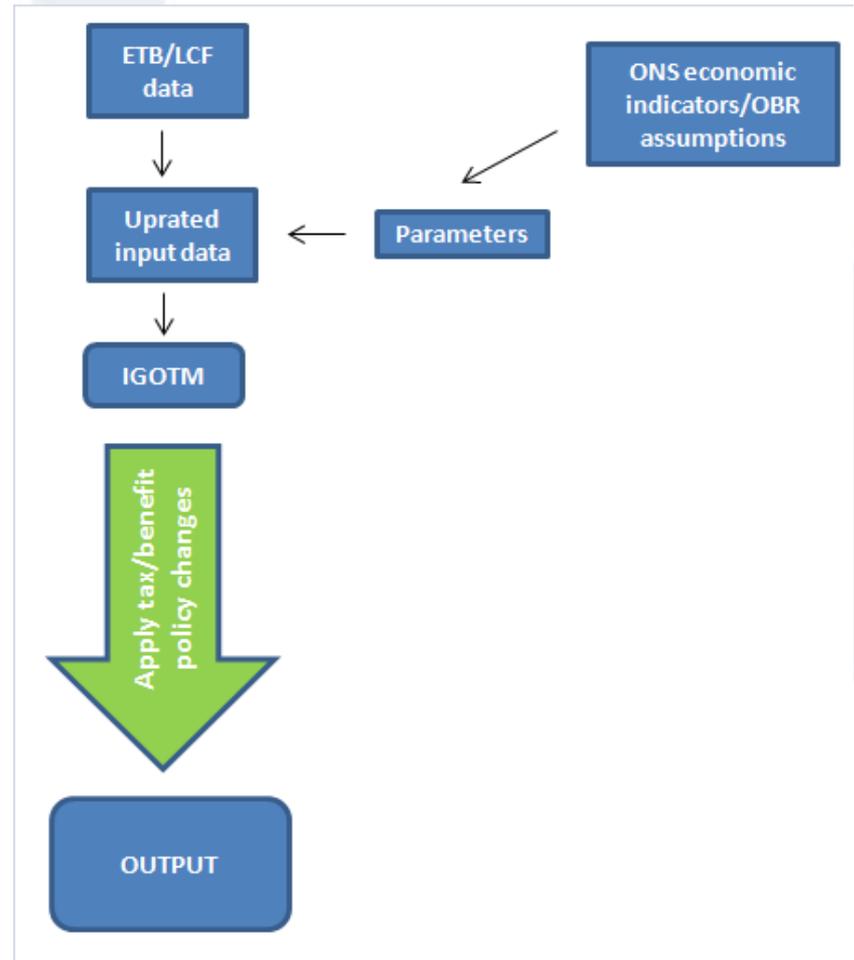
Methodology: Uprating financial variables

- First step is to uprate income microdata to year for which nowcast estimates are being produced
  - Use published series produced by ONS & others for periods where actual data avilable
  - IGOTM uses OBR forecasts for later periods

- Earnings uprating based on Annual Survey of Hours & Earnings (ASHE) for earnings growth across distribution, plus latest average earnings estimates from National Accounts

- Other financial variables:
  - Income from self-employment & odd jobs uprated in line with average earnings
  - Income from private pensions & annuities uprated by RPI
  - Income from main government benefits uprated by CPI or other values as appropriate

Methodology: Policy changes

- Data run through IGOTM
  - Rules of tax & benefit system for relevant year applied
  - Model calculates how much direct and indirect taxes due & level of benefits would be received
  - Rules applied at individual, benefit unit or household level as appropriate
- Tax & benefit changes in 2014/15 included:
  - Tax free personal allowance increased from £9,440 to £10,000
  - Benefits to working age people – Jobseekers' Allowance, Income Support, etc. increased by 1%
  - State Pension increased by 2.7% (in line with HICP)
  - Introduction of new disability benefit – Personal Independence Payment (replacing Disability Living Allowance for some people)
  - Rates of local taxation (Council tax – based on property values) frozen in some areas but increased in others

Methodology:
Labour market & demographic changes

- Recalibrate original ETB weights to account for shifts in labour market participation and demographic characteristics of population

- Number of different calibrations tested
  - Tempting to introduce many constraints, but this can lead to extreme weights

- Calibration variables used:
  - Region / country (12 categories)
  - Age/sex (22 categories)
  - Economic status (12 categories)
    - Employee (FT/PT & with/without children)
    - Self-employed (with/without children)
    - Unemployed/inactive (with/without children)
    - Retired (with/without children)
    - Women aged 60-64 in employment
    - Under 16

- Totals for economic status from Annual Population Survey

Results: Median income

Median equivalised household disposable income (GBP) - comparison between LCFS and EU-SILC
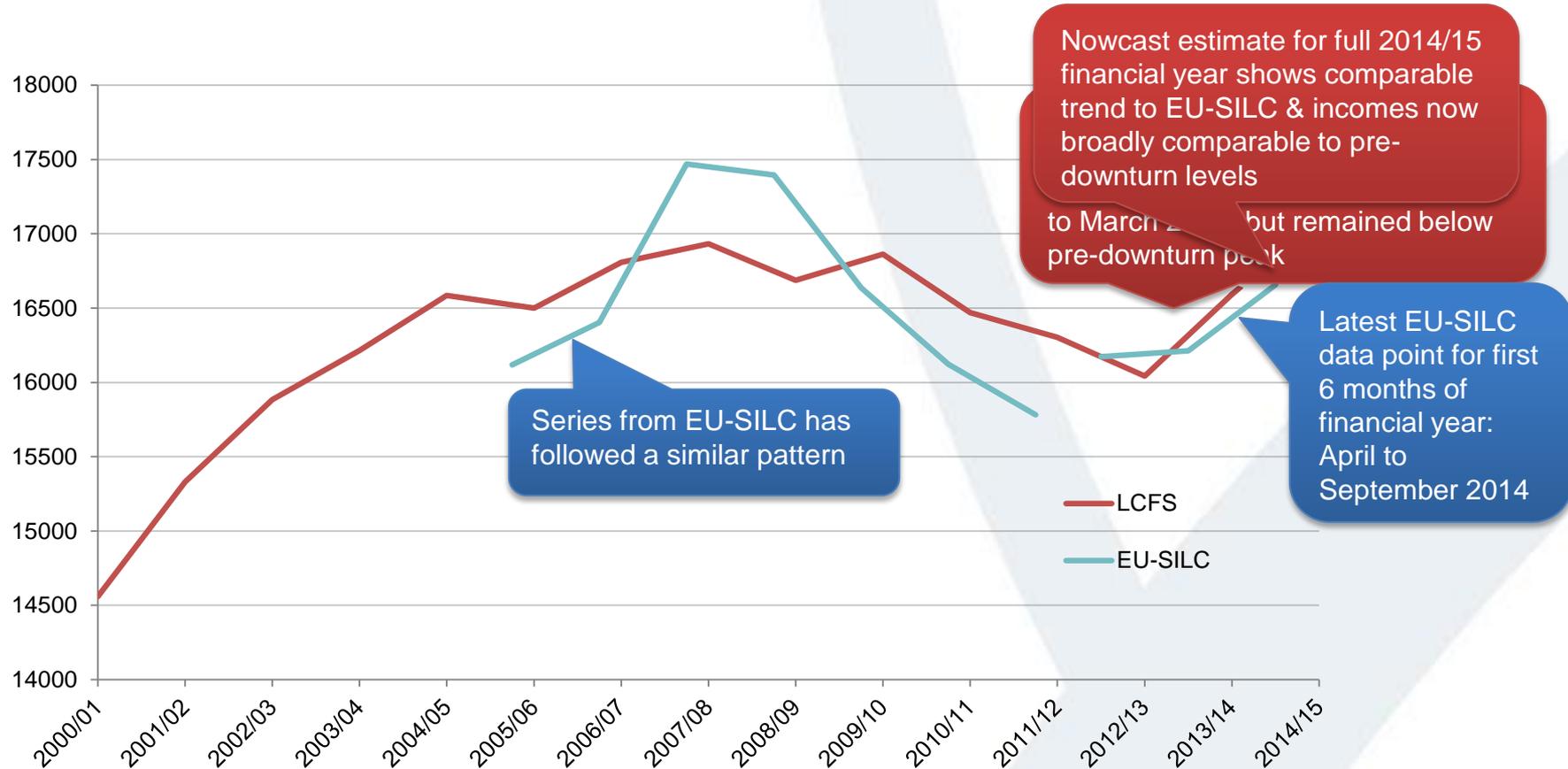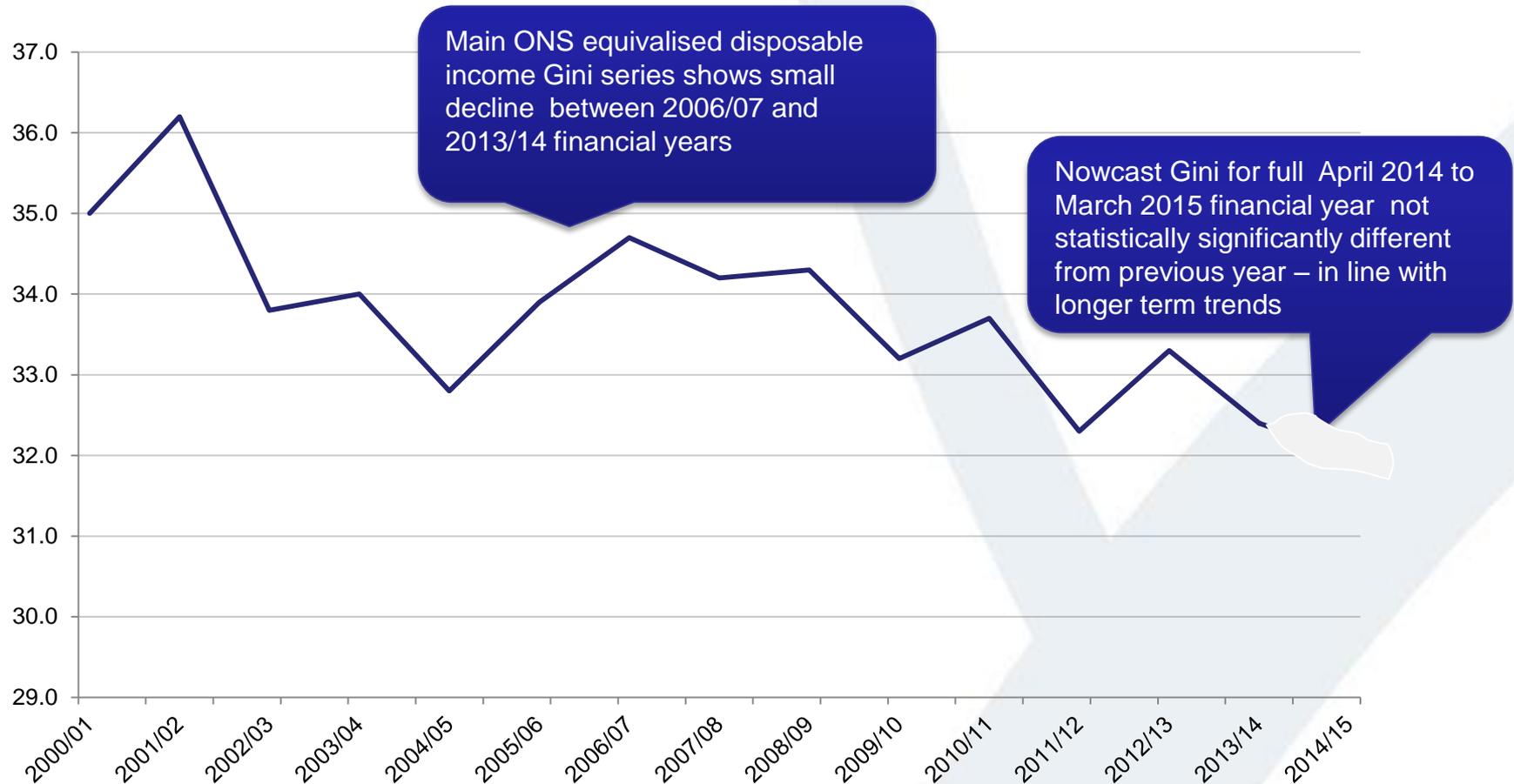

Source: Office for National Statistics & Department for Work and Pensions, UK

- Real growth rates– incomes deflated to 2014/15 prices
- EU-SILC 2013 refers to Apr 2013 to Sept 2013

Results: Gini Coefficient

Gini coefficients- LCFS

Main ONS equivalised disposable income Gini series shows small decline between 2006/07 and 2013/14 financial years

Nowcast Gini for full April 2014 to March 2015 financial year not statistically significantly different from previous year – in line with longer term trends
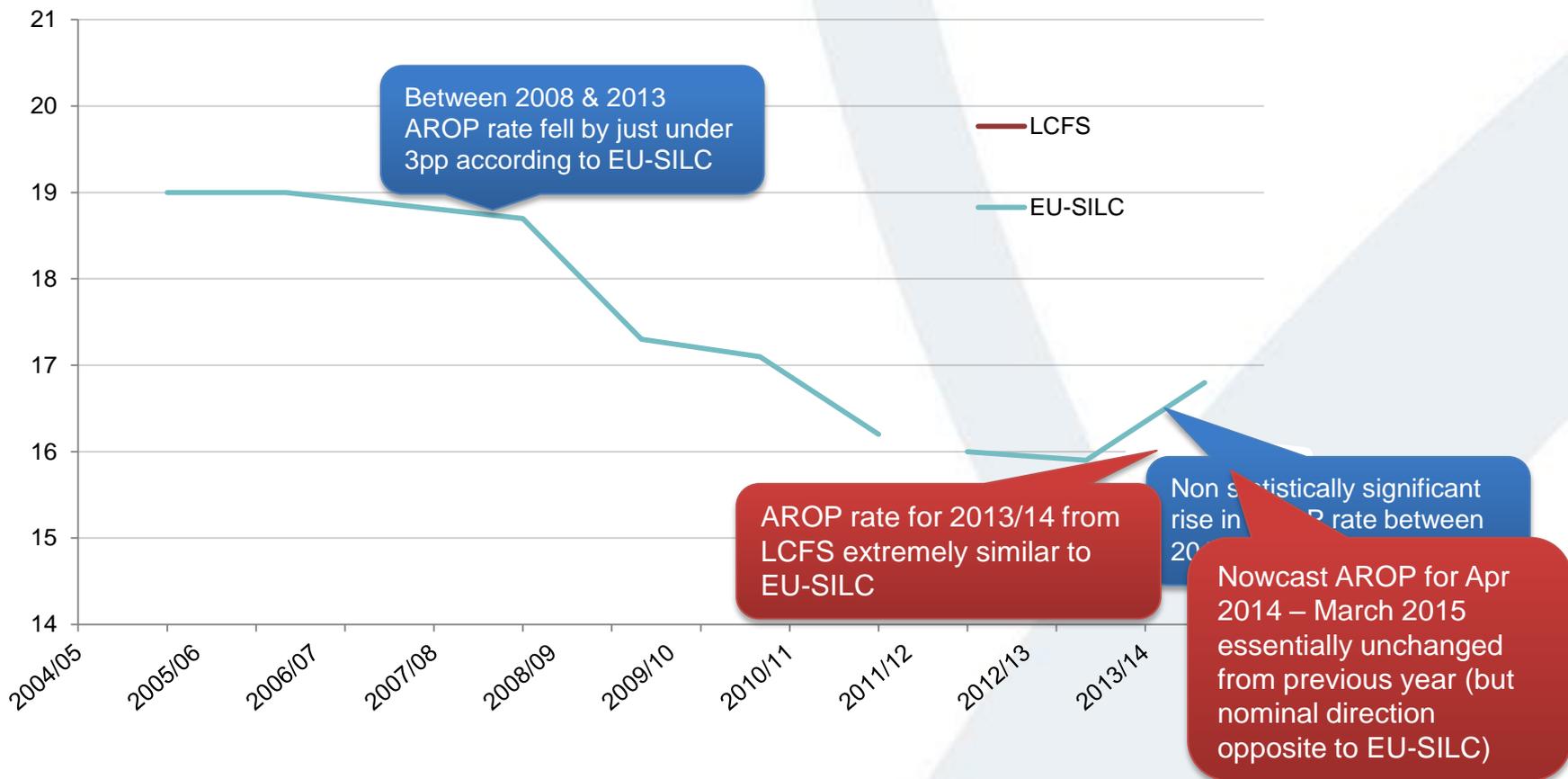
Source: Office for National Statistics & Department for Work and Pensions, UK

Results: AROP

AROP indicators - comparison between LCFS and EU-SILC

Between 2008 & 2013 AROP rate fell by just under 3pp according to EU-SILC

LCFS

EU-SILC

AROP rate for 2013/14 from LCFS extremely similar to EU-SILC

Non statistically significant rise in AROP rate between 20...

Nowcast AROP for Apr 2014 – March 2015 essentially unchanged from previous year (but nominal direction opposite to EU-SILC)

Source: Office for National Statistics & Department for Work and Pensions, UK

Dissemination of results

- Experimental Statistical Bulletin published October 2015
 - Response from users overwhelmingly positive:

Torsten Bell @TorstenBell · 6h
Very welcome to see ONS providing more timely indications of income trends. New 'nowcast' out this morning: ons.gov.uk/ons/rel/househ…

RETWEETS	FAVORITES
9	3

2:42 AM - 28 Oct 2015 · Details

Reply to @TorstenBell

Nice work on the now-casting. Really pleased to see ONS doing new things. I think it will prove to be a really valuable resource! – **New Policy Institute**
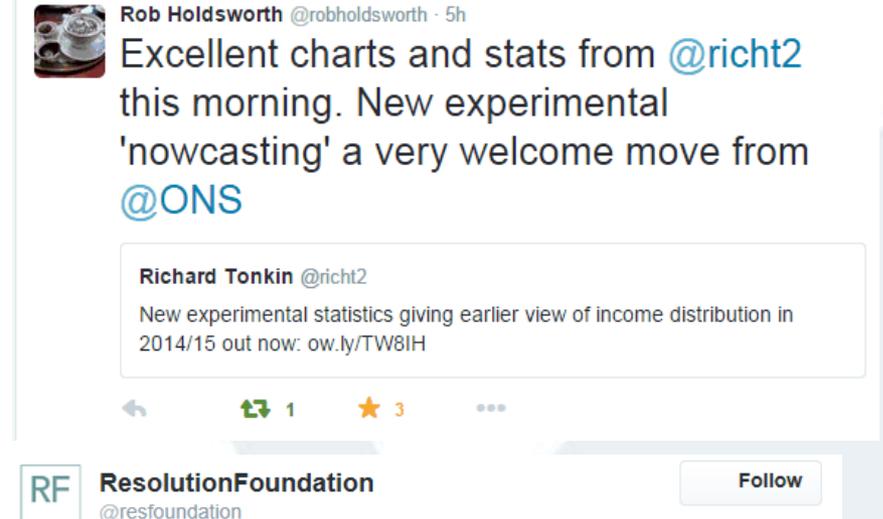
Rob Holdsworth @robholdsworth · 5h
Excellent charts and stats from @richt2 this morning. New experimental 'nowcasting' a very welcome move from @ONS

Richard Tonkin @richt2
New experimental statistics giving earlier view of income distribution in 2014/15 out now: ow.ly/TW8IH

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RF **ResolutionFoundation**
@resfoundation   Follow

Very welcome move by @ONS to experiment with 'nowcasting' household income. Important for living standards debate ons.gov.uk/ons/dcp171778_…

- Some concern that new figures may cause confusion, particularly as people may be unused to preliminary estimates/ scheduled revisions in income microstatistics

Dissemination of results

- Conscious of need to minimise communication risks:
  - Aimed to ensure preliminary & experimental nature of estimates clear, something that was reflected in media reporting

The ONS said for the first time it had used so-called nowcasting techniques to provide quicker estimates of trends in household incomes.

Jonathan Athow, the ONS director general for economic statistics, said: "Today's release shows how ONS is exploiting existing data sources to provide key information on the economy and living standards much more quickly than before.

Source: The Guardian

The ONS produced its estimates employing a new "nowcasting" technique, using evidence on earnings, employment, inflation and changes to taxes and benefits. These data have allowed the UK national statisticians to offer preliminary calculations on disposable incomes before receiving full survey evidence, which will not be available until 2016.

Source: Financial Times

Conclusions

- Considerable user demand for more timely data

- Key issue: Can nowcasting provide sufficiently robust early/provisional estimates? Potentially, yes…
  - More complete assessment possible after 23rd February (next Tuesday!)
  - Results from initial methodological work, plus comparison with EU-SILC promising
  - Despite some limitations, nowcast estimates for median income and inequality measures very close to published estimates

- …but some caution is needed:
  - Accuracy of any nowcast dependent on choices made (uprating indices, control totals in weighting, etc.)
  - Nowcast based estimates cannot perfectly reflect changes in distribution, particularly for small population subgroups
    - Behavioural responses to policy changes not necessarily fully reflected
    - Certain income sources may follow different trends during periods of crisis / across regions
  - Estimating AROP / relative low income particularly challenging
  - As with any statistics, need to take into account limitations / sources of error[14]