Naughty noughties in the UK: Decomposing income changes in the 2000's

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Background

From 2001-11, in the UK:

- **People's characteristics:**
  Increase in n tertiary students; part-time workers; ethnic groups (FRS)
- **Earnings:**
  Decline in real full-time weekly earnings between 2007-13; narrowing of the gender gap for full-time employees and increasing gender gap for part-time employees; slight increase in 90th/10th ratio in full-time earnings (ONS)
- **Tax-benefit policies:**
  Real increase in National Minimum Wage; reforms to tax credits; cuts in benefits; increase in top marginal tax rate
- **Household disposable income:**
  Inequality stable (Gini); decline in relative poverty (HBAI 2013)

Literature

- Growing literature on income decomposition, focus on the UK and on the effect of *policy changes* vs *'other'* things (see Bargain, 2011; Brewer et al., 2012; Bargain et al., 2013; Paulus et al., 2014)
- Policy changes have reduced poverty and inequality, while 'other' things lead to the opposite
- **But what is the effect of 'other' things a result of?**

- Literature focusing on changes in wages and employment (see Dolton et al., 2010; Lindley&Machin, 2013; Gregg et al., 2014)
- **But how do these translate into changes in hh disposable income (automatic stabilisation of tax-benefit system)?**

What and how

- Isolate and quantify changes in the *entire* distribution of hh disposable income in the UK due to changes in:
  - the tax-benefit system
  - benefit take-up
  - hh characteristics and the returns to these characteristics
- Examine pre-recession (2001-07) and recession (2007-11) periods separately
- Decomposition of income changes through counterfactual distributions
  - Microsimulation techniques (EUROMOD) (see BargainCallan, 2010)
  - Parametric and non-parametric methods (see Bourguignon et al., 2008)

Methodology

- The real change in hh disposable income (DPI) between two periods can be attributed to changes in:
  1. benefit entitlements and tax liabilities –> (direct) **policy effect**
  2. benefit take-up (changes in assumptions) –> **take-up effect**
  3. hh and individual characteristics and the returns to these characteristics –> **non-policy effect**
- We decompose changes in the entire distribution of DPI:
  - Step 1: Start from the actual income distribution in period 1.
  - Step 2: Create a counterfactual scenario in which one of the factors from period 1 is modified to mimic the one in period 0.
  - Step 3: Repeat this cumulatively for all attributes until we arrive at the actual income distribution in period 0.

1. Policy effect and take-up effect

- Use the tax-benefit microsimulation model EUROMOD
- The model operates on hh survey data *(Family Resources Survey)*
- Calculates benefit entitlements and tax and social insurance liabilities
- Calculates hh DPI
- Direct **Policy effect**
  - Keep data on market incomes and population characteristics **the same** (as of period 1) and apply in turn policies from **different** years
- **Take-up effect**
  - Keep data on market incomes, population characteristics and policies **the same** and apply in turn **different** benefit take-up rates

2. Non-policy effect - components

- wages (w/o returns to uni degree)
- returns to university degree
- self-employment income
- other market income
- employment pattern (hours bands, self-employed, unemployed)
- n children (1, 2, 3+)
- level of education (secondary, college, undergrads, masters, PhD)
- region (n=12)
- ethnicity (n=10)
- demography (sex, age, n adults in the hh)
- **We use parametric (log-linear regressions and mlogit models) and non-parametric (re-weighting) methods** (see Bourguignon et al., 2008)

2. Non-policy effect: example

What would DPI be in period 0 for the period 1 population?

Table : Log-wage regression

	2001 males	2007 males
Constant	1.956***	1.988***
	(.053)	(.060)
Head of hh	.375***	.396***
	(.015)	(.017)
In a couple	.133***	.123***
	(.024)	(.021)
Employee-working hours 1-29	.025	.072**
	(.036)	(.035)
Employee-working hours 30-39	.321***	.253***
	(.014)	(.020)
Employee-working hours 40-49	.165***	.129***
	(.014)	(.019)
Other controls	yes	yes
R-squared	.378	.327
N	10430	9019

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

2. Non-policy effect: example

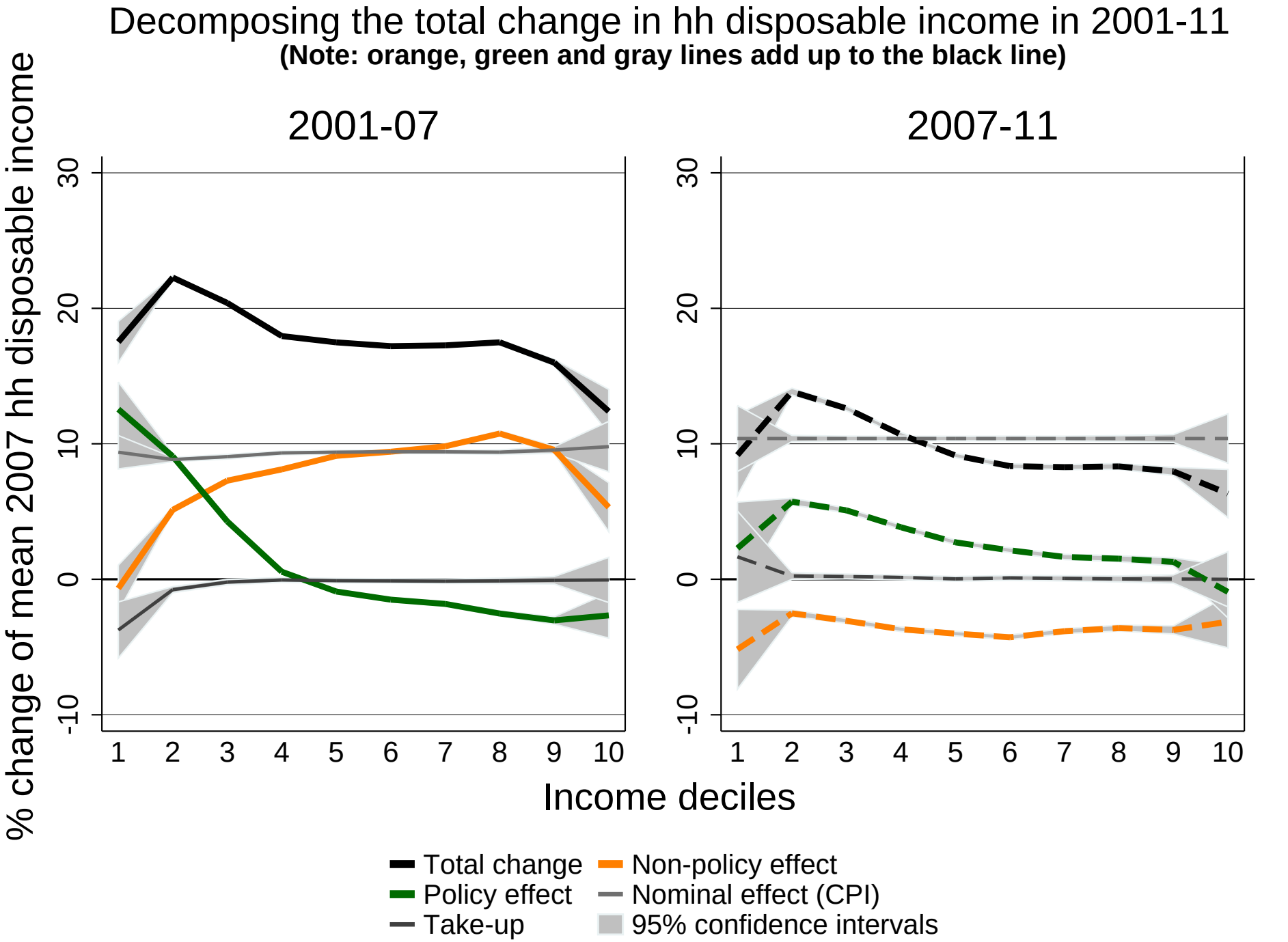
What would DPI be in period 0 for the period 1 population?

- Replace the estimated coefficients from period 1 with the ones from period 0
- Residuals - scale up the variance of the residual terms by the ratio of the estimated variance in period 0 to that of period 1
- Predict wages given population characteristics in period 1
- *Result:* an estimate of wages of the period 1 population if they were renumerated according to the returns prevailing in period 0
- Keep tax and benefit policy rules as of period 0
- Calculate (in EUROMOD) new hh DPI based on newly predicted wages
- *Result:* effect of changes to wages and the automatic stabilisation effect of the tax-benefit system

Data

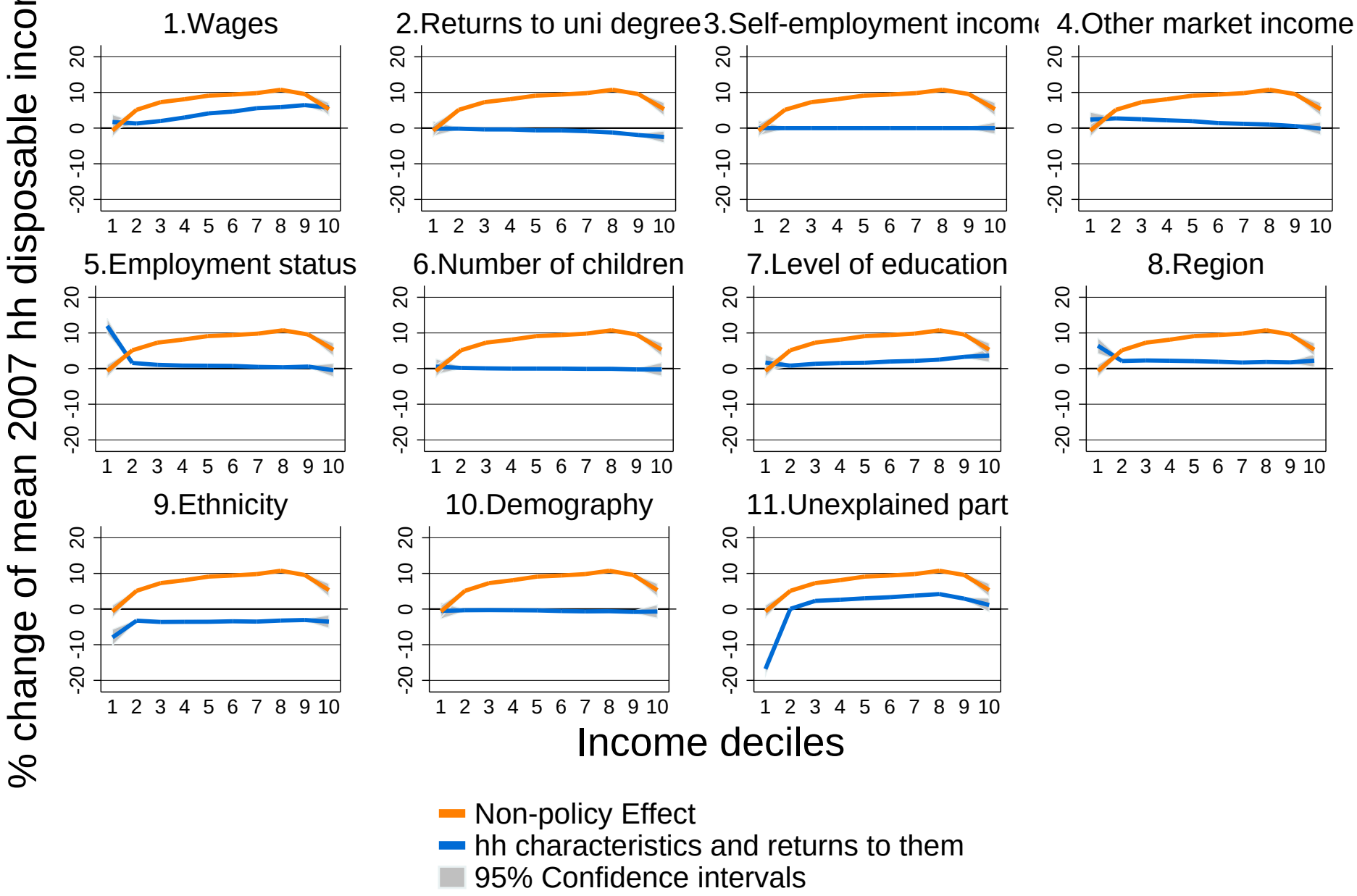
Table : Data - Family Resources Survey (FRS)

Input dataset	N households	N individuals
FRS 2001/02	25,320	59,499
FRS 2007/08	24,977	56,926
FRS 2011/12	20,759	47,744


Decomposing the total change in hh disposable income in 2001-11
(Note: orange, green and gray lines add up to the black line)
2001-07
2007-11
% change of mean 2007 hh disposable income
30
20
10
0
-10
1
2
3
4
5
6
7
8
9
10
Income deciles
Total change
Non-policy effect
Policy effect
Nominal effect (CPI)
Take-up
95% confidence intervals

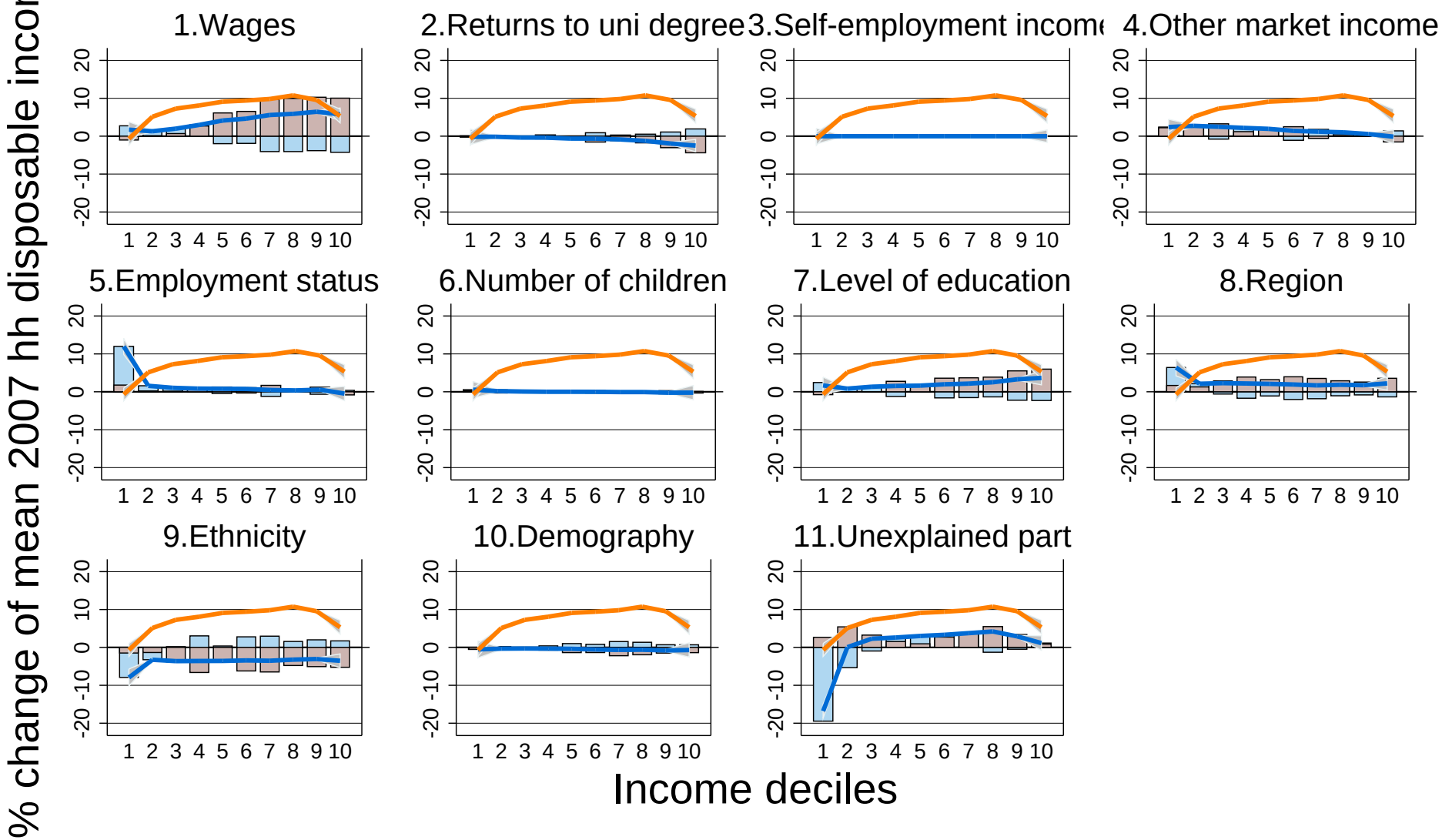
Decomposing the non-policy effect on hh disposable income in 2001-07

(Note: blue lines add up to the orange line)



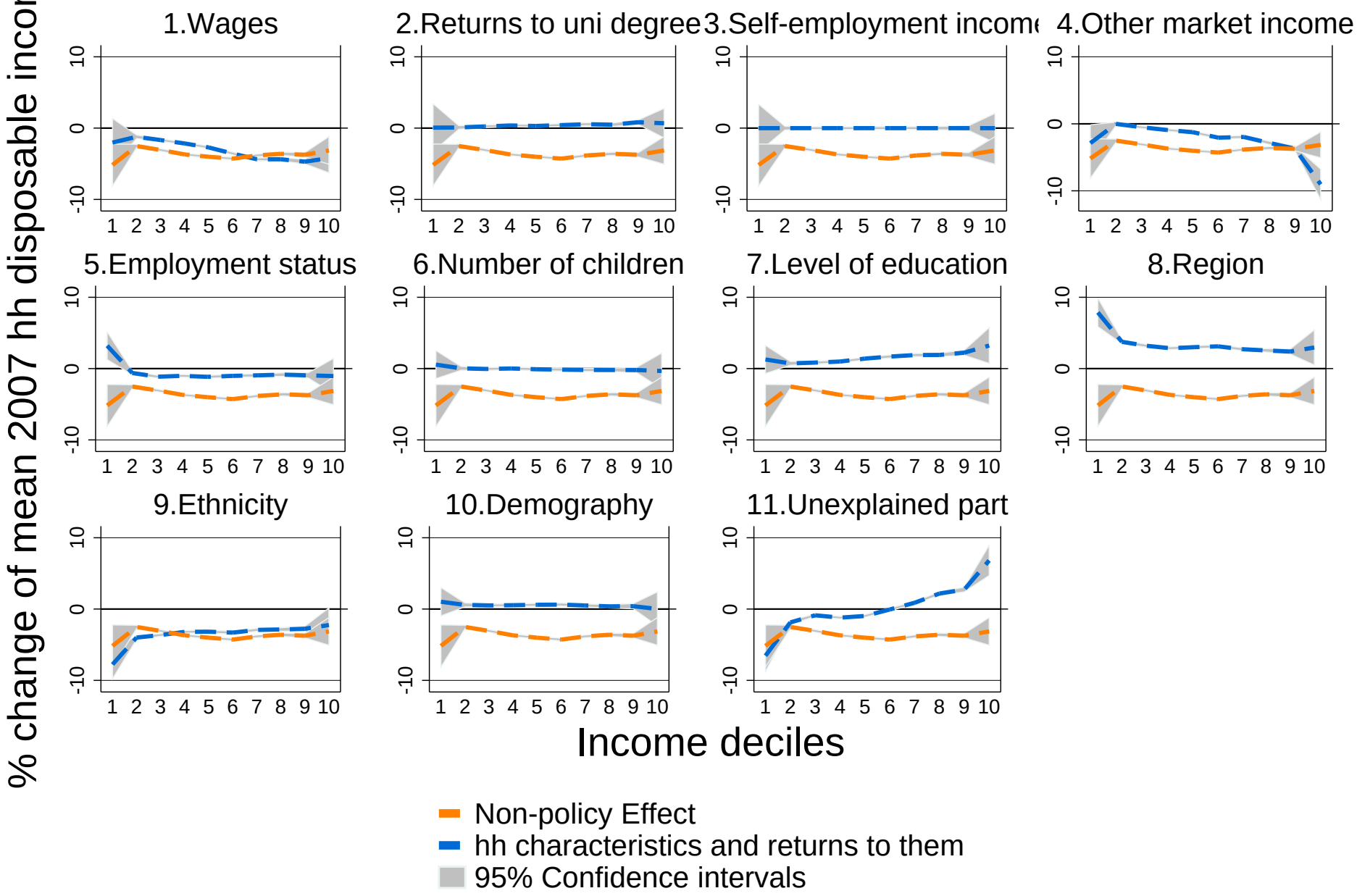
Decomposing the non-policy effect on hh disposable income in 2001-07

(Note: blue lines add up to the orange line; bars add up to the blue lines)



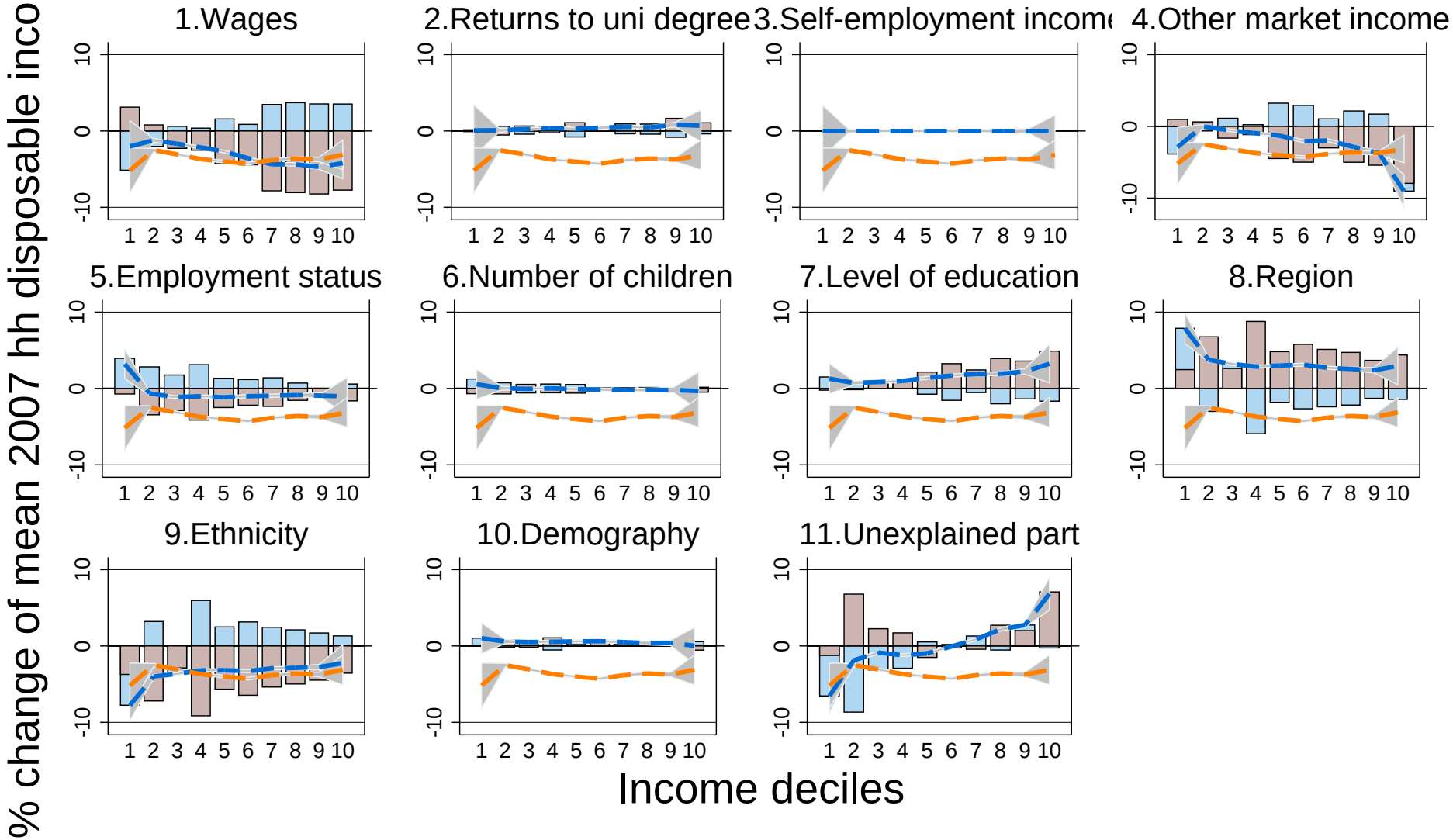
Decomposing the non-policy effect on hh disposable income in 2007-11

(Note: blue lines add up to the orange line)



Decomposing the non-policy effect on hh disposable income in 2007-11

(Note: blue lines add up to the orange line; bars add up to the blue lines)



Summary

- Detailed picture of the changes in the UK distribution of hh DPI in the 2000s
- The role of the tax-benefit system
  - more important than previously thought
  - direct policy effect and automatic stabilisation effect
- Non-policy effect
  - **Expansion of higher education in both periods** - benefited the top, increased inequality
  - **Returns to higher education** - negative at the top between 2001-07 and constant in 2007-11
  - **Migration story** - internal vs external migration
- Next steps - pensions

Thank you!