Food Inflation and Household Responses Across Income Groups in the UK

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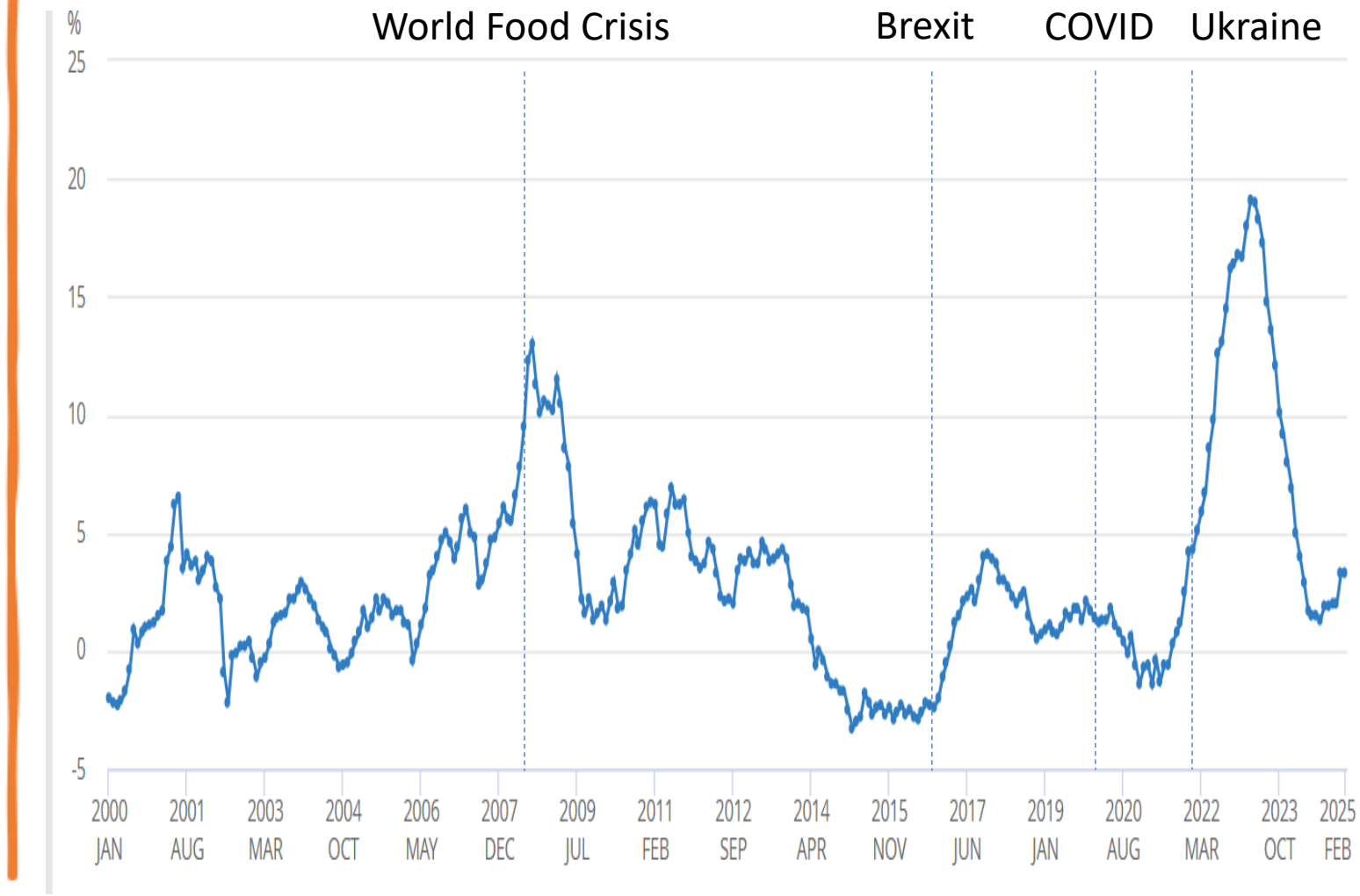
Context

25 Years of Food Inflation in the UK



Why Does Food Price Inflation Matter?

"If inflation is the most regressive of taxes. . .
. . . . food inflation is its most regressive component"

(Kenneth Rogoff, former IMF Chief Economist)

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Why Does Food Price Inflation Matter?

- Food Poverty
  - The poorest consumers are affected disproportionately by rising food prices (Engel's Law)
    - Poorest (richest) quintile spend 14% (9%) on food
    - Fewer options for 'trading down' in low income groups
- Inflationary expectations
  - Food prices shape perceptions and expectations more so than other shocks (BoE 2024)

Hao Lan, Tim Lloyd, Steve McCorriston, Cesar Revoredo-Giha

Cost of Living Inequality

- Extends beyond expenditure shares
- Prices paid in income groups differ since shopping baskets differ
- Experience of inflation also reflects the response to changing prices in different income groups

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In this paper

- Measure the cost-of-living in UK over time and socio-economic groups
- Document how different income groups adjust to changing prices, stressing role of
  - product substitution
  - the entry and exit of products
  - changing consumer preferences
- Provide decomposition of inflation experience that accounts for these factors
- Contrast with the Consumer Prices Index

To address these issues we draw upon . . .

- Recent **developments in the theory of price indices** that allow for:
  - **Entry and exit of products** Feenstra (*AER*, 1994); Broda and Weinstein (*QJE* 2006, *AER* 2010)
  - **Changes in tastes** Redding and Weinstein (*QJE*, 2020)
  - Both these innovations build on the Exact Price Indices (Diewert, 1976; Sato 1976, Vartia (1976) derived from CES demand system that allow for **product substitution**.
- Access to **household scanner data** (*Kantar WorldPanel* data)

Why does accommodating these factors matter?

Product Substitution

- Product substitution is a fundamental to the consumer's response to price changes, a key part of which is entry (exit) of products.

- Having data at the product level allows us to identify the extent to which households substitute when prices change

Why might these factors matter for measuring the cost of living?

Shopping behaviour

- Another way of limiting exposure is to price rises to ‘shop around’

- ‘Promiscuous shoppers’ adjust the prices they pay by changing outlet, purchasing the same products rather than buying substitutes

Why might these factors matter for measuring the cost of living?

Entry and exit of products

- Entry and exit of products is a key mechanism by which consumers reflect their preferences with implications for prices they pay.
- High and low income households likely to have very different substitution possibilities in the face of changing prices
- Particularly pertinent in food and drink

Why might these factors matter for measuring the cost of living?

Changing Tastes

- Preferences change over time reflecting changing consumer incomes, desire for healthier or ethical products, etc. particularly at the barcode level.

- A preference shift towards a product is equivalent to a reduction in its price.

- Akin to, but distinct from, adjusting prices for quality (e.g. technology)

- Redding and Weinstein (2020) show how to back-out **‘taste adjusted prices’** from observed product prices in CES demand system.

Why might these factors matter for measuring the cost of living?

Changes in tastes

- Treating consumer preferences as constant is likely to give a misleading measurement of the welfare effects of price changes

What exotic convenience food looked like in the past

And today

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Data

- *Kantar WorldPanel* data
  - Individual products purchased by 30,000 households in Great Britain; evaluated weekly, aggregated to quarterly 2013-2023
  - Thousands products in all categories of food and non-alcoholic drinks
  - Provides range of household characteristics (income)
    - Low: <£25k Middle: £25-50k High: >£50k

- We can identify what households buy, from where, at what cost.

- From this, we can derive a price indices across all households and income groups

Decomposing the price index

- We can express Redding and Weinstein's (2020) inflation measure as:

$$\mathrm{Ln}\left[\frac{P_t}{P_{t-1}}\right]^{I}_{gt} = \underbrace{\sum_{k\in\Omega^{*I}_{gt}} s^{*I}_{kgt-1} \ln\left(\frac{\bar{p}_{kgt}}{\bar{p}_{kgt-1}}\right)}_{Change\ in\ product\ prices} + \underbrace{\sum_{k\in\Omega^{*I}_{gt}} \left(\omega^{*I}_{kgt} - s^{*I}_{kgt-1}\right) \ln\left(\frac{\bar{p}_{kgt}}{\bar{p}_{kgt-1}}\right)}_{Product\ substitution} +$$

$$+ \underbrace{\sum_{k\in\Omega^{*I}_{gt}} \omega^{*I}_{kgt} \ln\left(\frac{\theta^{I}_{kgt}}{\theta^{I}_{kgt-1}}\right)}_{Change\ in\ shopping\ behaviour} + \underbrace{\frac{1}{\sigma^{I}_{g}-1} \ln\left(\frac{\lambda^{I}_{gt}}{\lambda^{I}_{gt-1}}\right)}_{Entry\ and\ Exit} - \underbrace{\sum_{k\in\Omega^{*I}_{gt}} \omega^{*I}_{kgt} \ln\left(\frac{\varphi^{I}_{kgt}}{\varphi^{I}_{kgt-1}}\right)}_{Changing\ tastes}$$

- Applied to purchases of 30,000 UK households over 2013Q1-2023Q4

Results

Experience of food inflation by household income

Average annual inflation (%) 2013-2023

	Low	Middle	High
Price changes	3.0	2.9	2.8

Similar price inflation for a fixed basket

Switching lowers prices in all income groups

In the main, we are creatures of habit

Product entry and exit is a key mechanism particularly among low-income households

Changing preferences most pronounced among low households

Markedly different experience of price changes

Experience of food inflation by household income

Average annual inflation (%) 2013-2023

	Low	Middle	High
Price changes	3.0	2.9	2.8
Substitution	-0.90	-0.93	-0.88
Shopping Behaviour	-0.01	0.01	0.01
Entry and exit	-0.30	-0.26	-0.22
Constant taste inflation rate	**1.81**	**1.71**	**0.8**
Tastes	-1.99	-1.41	-0.91
Taste adjusted rate of inflation	**-0.22**	**0.34**	**0.82**

Similar price inflation for a fixed basket

Switching lowers prices in all income groups

In the main, we are creatures of habit

Product entry and exit is a key mechanism particularly among low-income households

Low income consumers experience higher rates of inflation

Changing preferences most pronounced among low households

Markedly different experience of price changes

How well does the CPI do?

Experience of Food inflation by household income

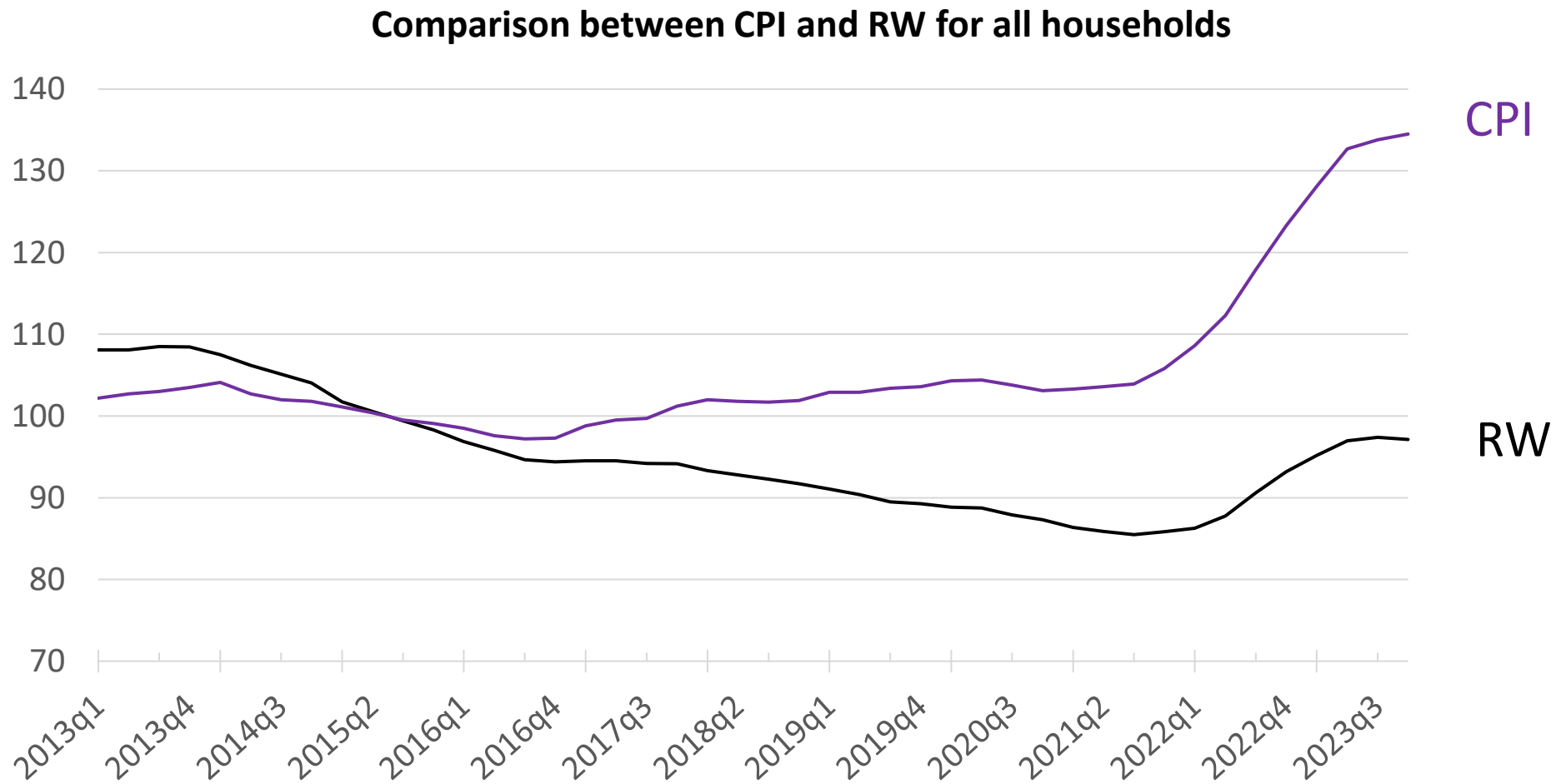
Average annual inflation (%) 2013-2023

	Low	Middle	High	**CPI**
Price changes	3.0	2.9	2.8	**2.7**
Substitution	-0.90	-0.93	-0.88	
Shopping Behaviour	-0.01	0.01	0.01	
Entry and exit	**-0.30**	**-0.26**	**-0.22**	
Tastes	**-1.99**	**-1.41**	**-0.91**	
Overall	**-0.22**	**0.34**	**0.82**	**2.7**

Good measure of prices in a fixed basket

Poor measure of the cost of living

As a measure of the cost of living, CPI over-estimates the effects of price changes by almost 40%



Headline Results

- Substitution, product innovation, and taste changes matter for the experience of inflation at the household level
- High and low income households have a different experience of inflation
- CPI overstates experience of inflation at the household level as it fails to take into account these factors

Thank you!

Ongoing work investigates

- Magnitude and patterns in large taste effect identified
- Explaining the gap between inflationary experiences of rich and poor households
- How different income groups adjusted their behaviour during the COVID and recent cost-of-living crises
- Did these shocks lead to unhealthy purchases