Income-specific Price Indices

NASEM/BLS CPI Meeting

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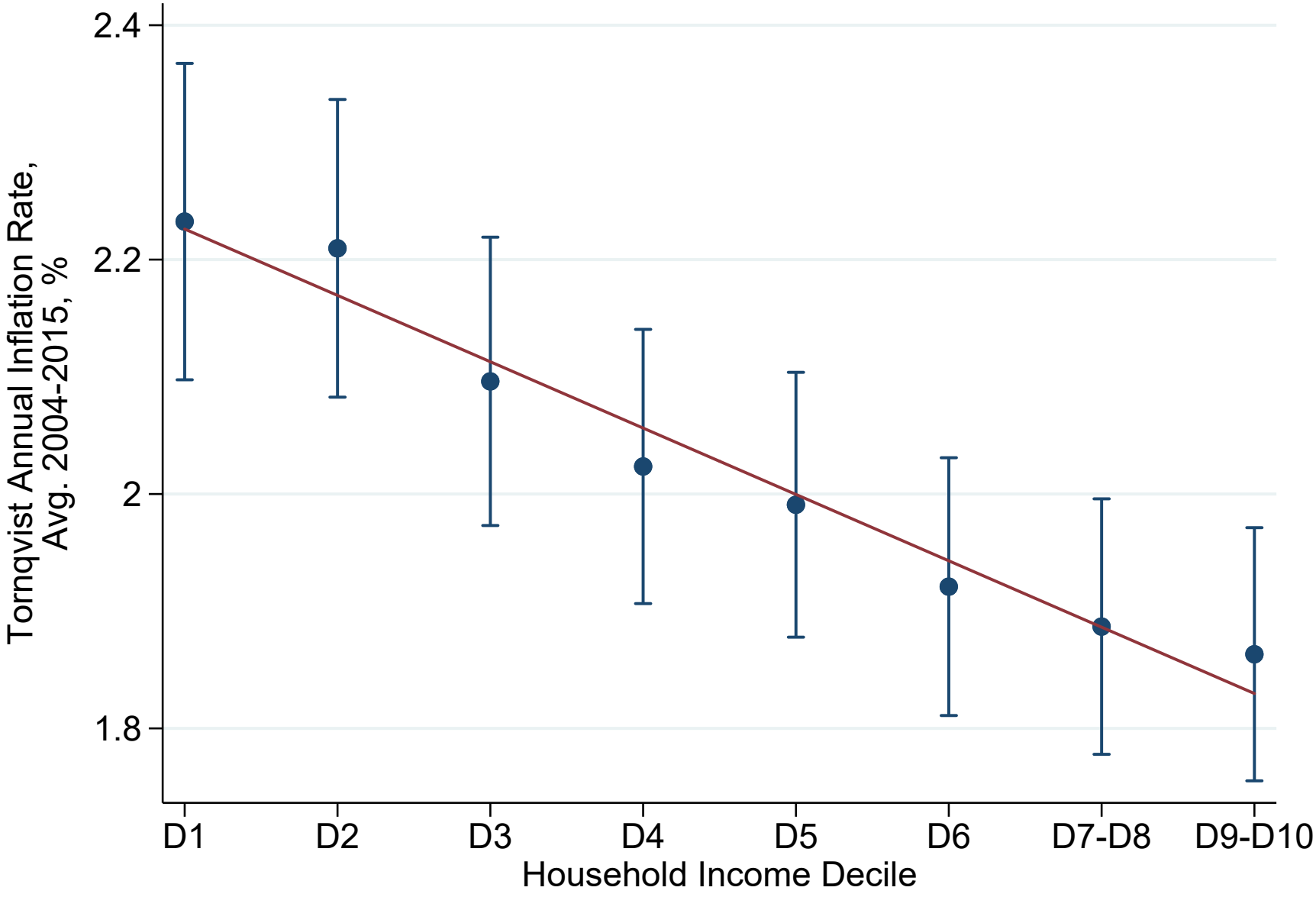
Introduction

- Does inflation vary across the income distribution?
  - Granular data from various sources suggest that inflation rates decline with household income in the United States (in recent years)
    - ⋆ accurate masurement requires granular (income-group specific) price and expenditure data, because of aggregation bias (e.g., scanner, claims datasets)
    - ⋆ earlier work found limited inflation inequality but used more aggregate data (e.g., Amble and Stewart 1994, Garner et al. 1996, Hobijn and Lagakos 2005, and McGranahan and Paulson 2006)
  - Recent advances in price index theory could facilitate the study of inflation inequality across the income distribution (e.g., Comin-Lashkari-Mestieri 2020)

Inflation Inequality & Aggregation Bias

- Jaravel (QJE 2019) document inflation inequality in the United States from 2004-2015
  - Linked CEX-CPI data (256 ELIs)
  - Fast-moving consumer goods: Nielsen data, barcode-level
  - Large aggregation bias

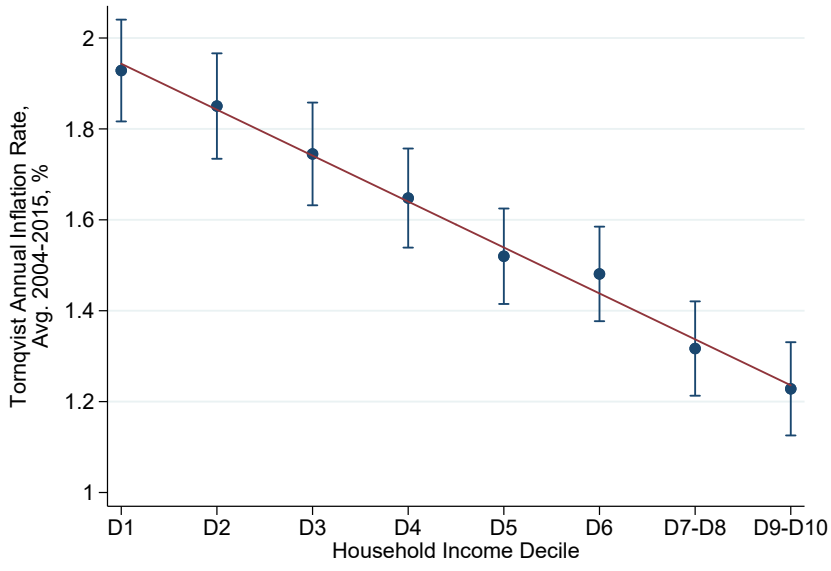
Full Consumption Basket (CEX-CPI data)



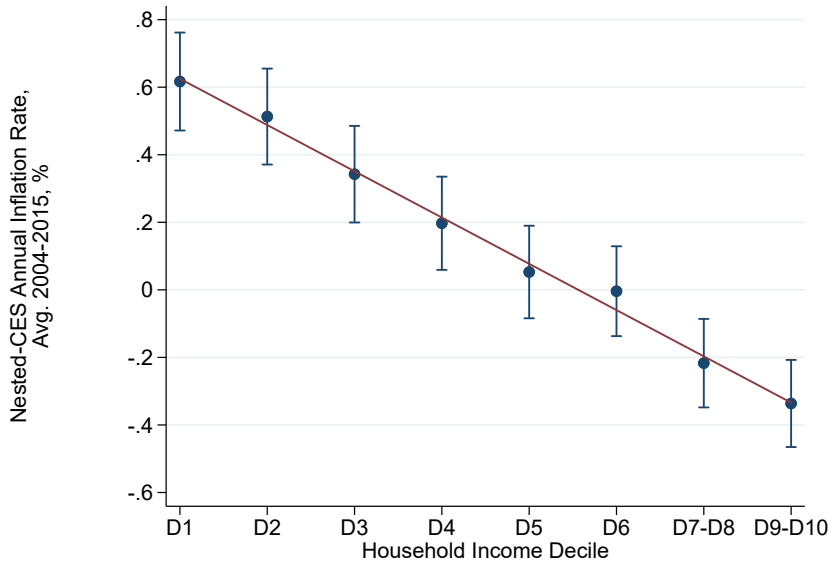
Aggregation Bias: Top vs. Bottom Quintiles
Full Consumption Basket (CEX-CPI data)

	Δ Inflation Rates	
Aggregation Level	pp	*% Explained*
Detailed Categories $N = 256$	0.3464	*100*
Sub-categories $N = 22$	0.0739	*21.3*
Main categories $N = 11$	0.0965	*27.8*

Fast-Moving Consumer Goods (Nielsen data)



(a) Törnqvist for continued products



(b) Nested CES with entry-exit

Aggregation Bias: Top vs. Bottom Quintiles
Fast-Moving Consumer Goods (Nielsen data)

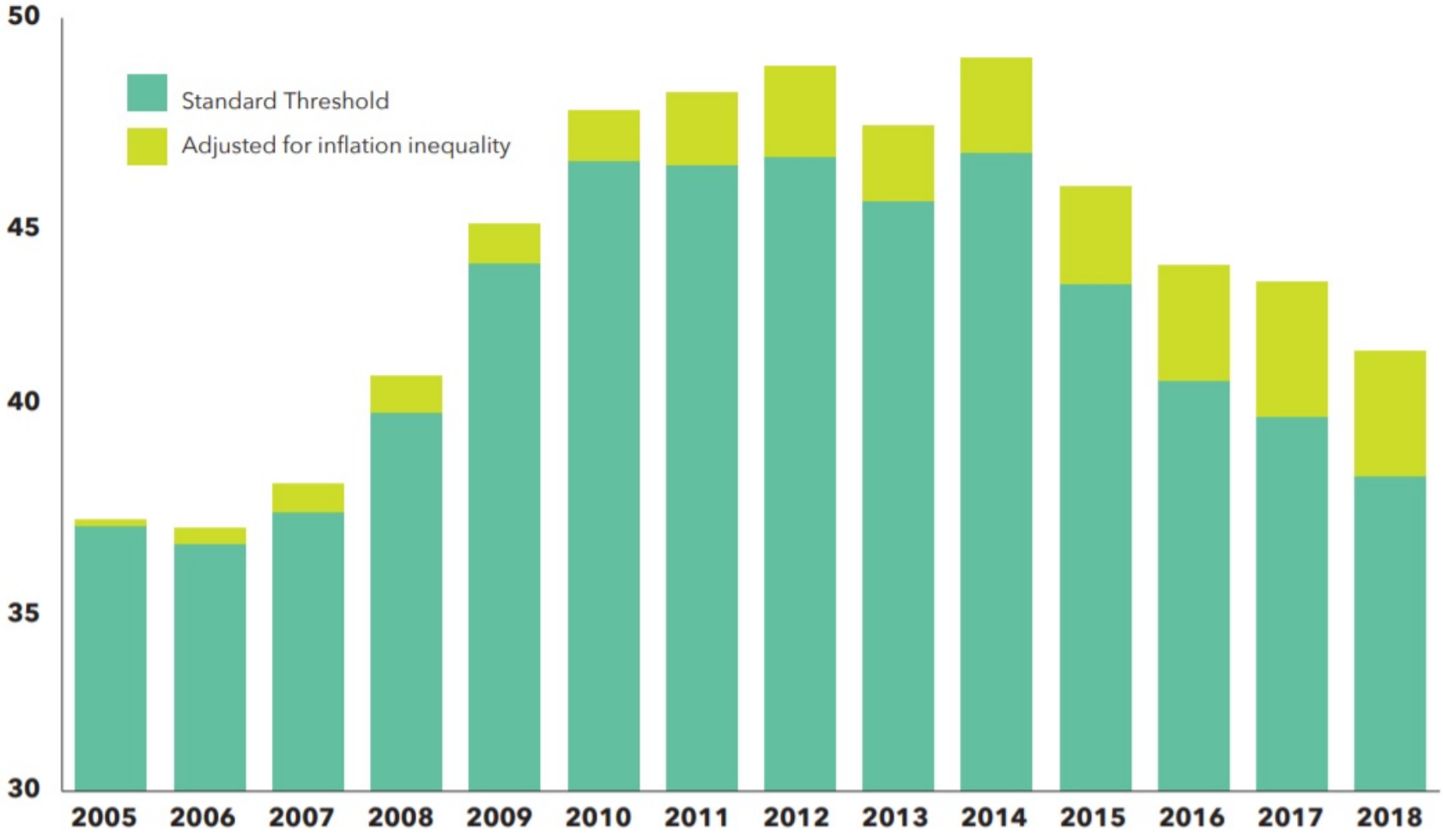
	Δ Inflation Rates, Continuing Products		Δ Log Feenstra Variety Adj.	
	pp	*% Explained*	pp	*% Explained*
Aggregation Level	(1)	(2)	(3)	(4)
Barcodes $N = 2,240,278$	0.541	*100*	1.487	*100*
Product Modules $N = 1,042$	0.358	*66.2*	0.578	*38.9*
Departments $N = 10$	0.071	*13*	-0.048	*-3.3*

Potential Policy Relevance?

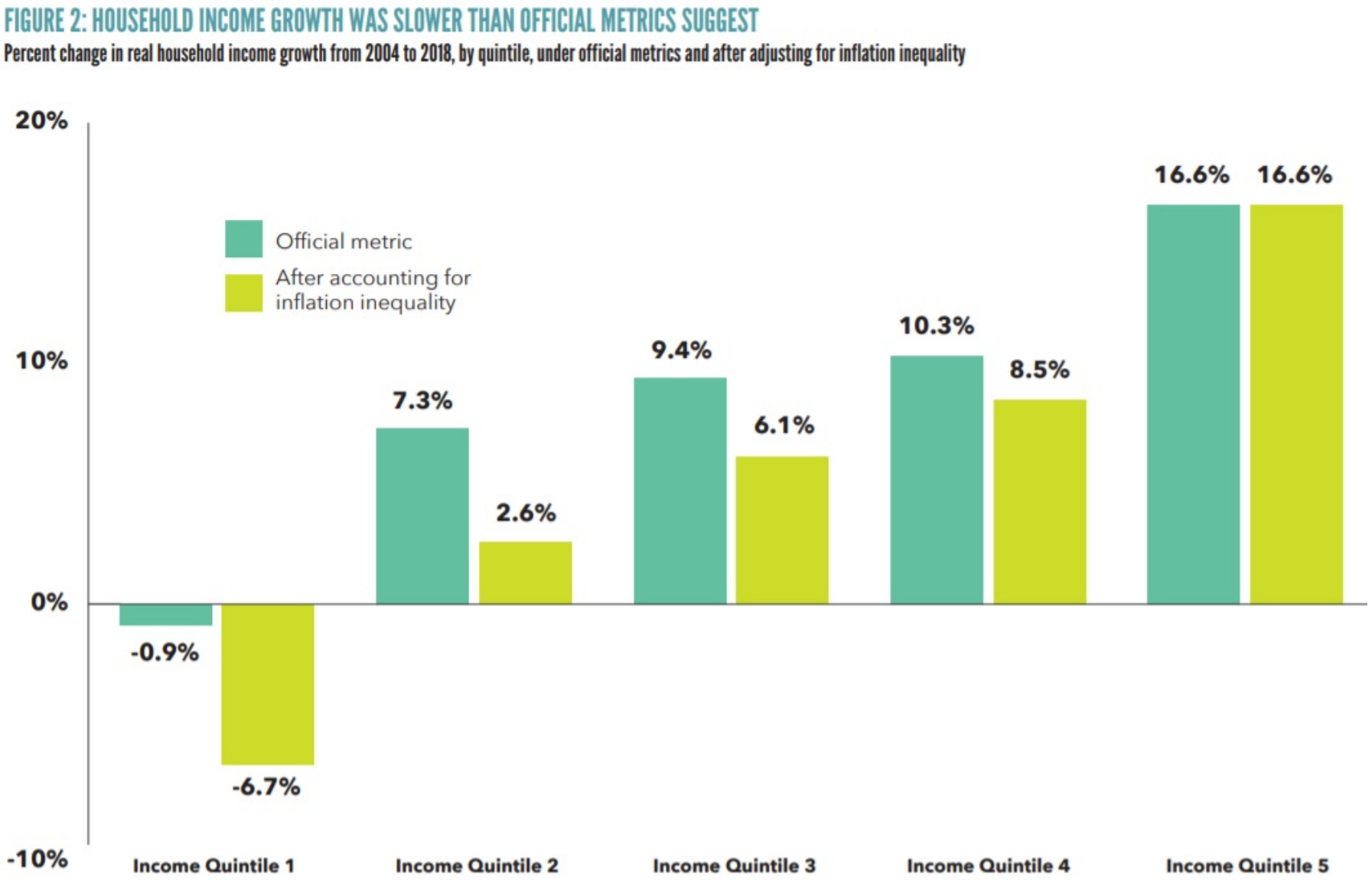
- Wimer, Collyer and Jaravel (2019, Groundwork Collaborative Policy Brief) use the estimates from the linked CEX-CPI sample and Nielsen data and re-estimate recent trends in poverty and income inequality from 2004 to 2018
- Adjusted inflation index indicates that
  - 3.2 million more people are classified as living in poverty in 2018
  - real household income for the bottom 20 percent of the income distribution actually declined by nearly 7 percent since 2004
- Suggests that inflation inequality may significantly accentuate both the incidence of poverty and income inequality
  - Only suggestive, much more work required (e.g., obtaining micro data in most sectors of the economy)

Individuals in Poverty

FIGURE 1: INDIVIDUALS IN POVERTY UNDER THE OFFICIAL THRESHOLD AND INEQUALITY INFLATION ADJUSTED THRESHOLD, IN MILLIONS, 2005-2018



Household Income Growth



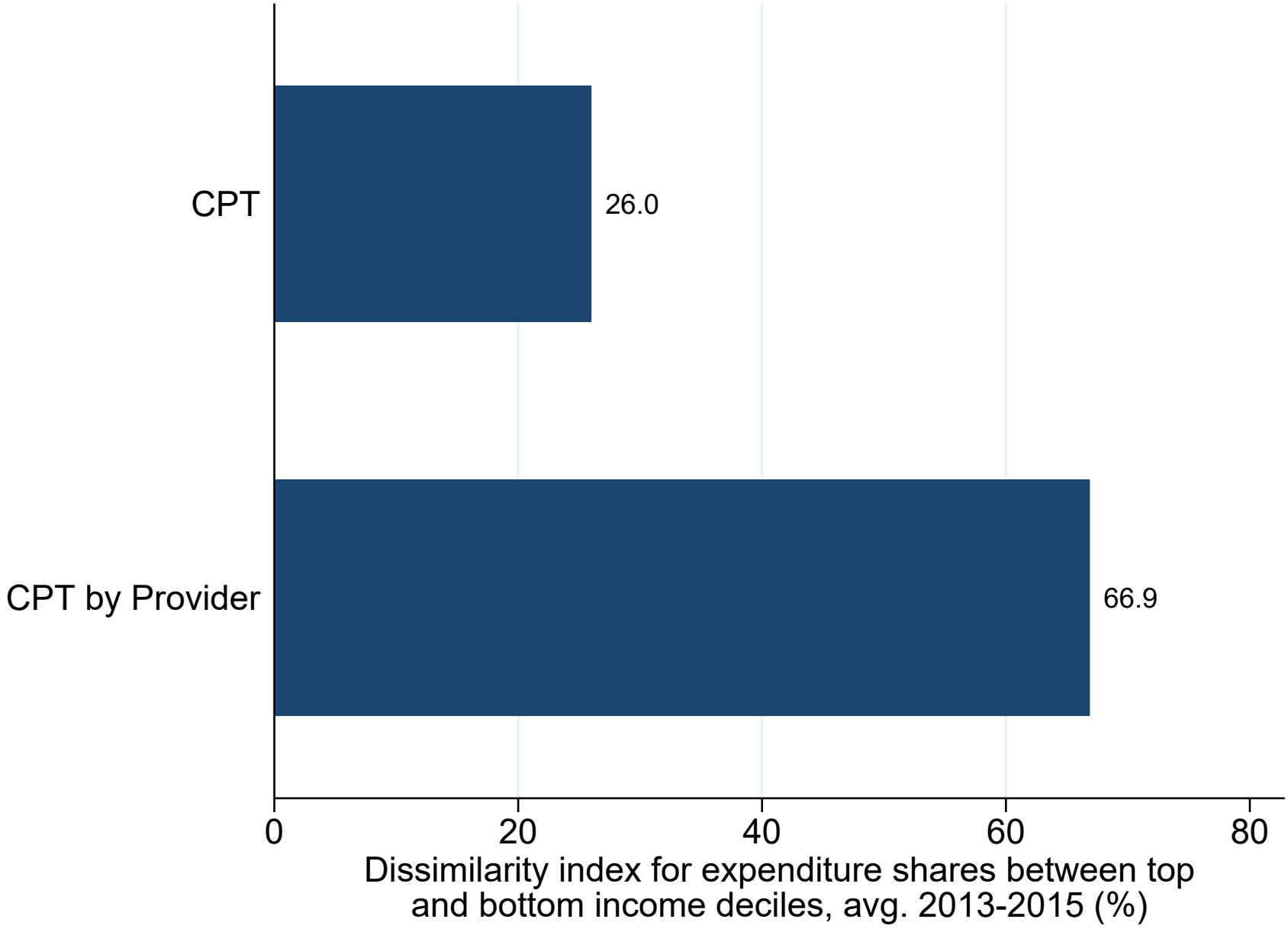
Recent Work on Inflation Inequality

- Ongoing/recent work explores other datasets
  - Inflation inequality in health care, using claims data and linked employer-employee datasets (Jaravel, Kolstad, Lavetti, Nguyen-Mason 2020)
  - Real-time inflation inequality during Covid 19: Cavallo (2020), Jaravel and O'Connell (2020, JpubE)
  - Shelter inflation inequality

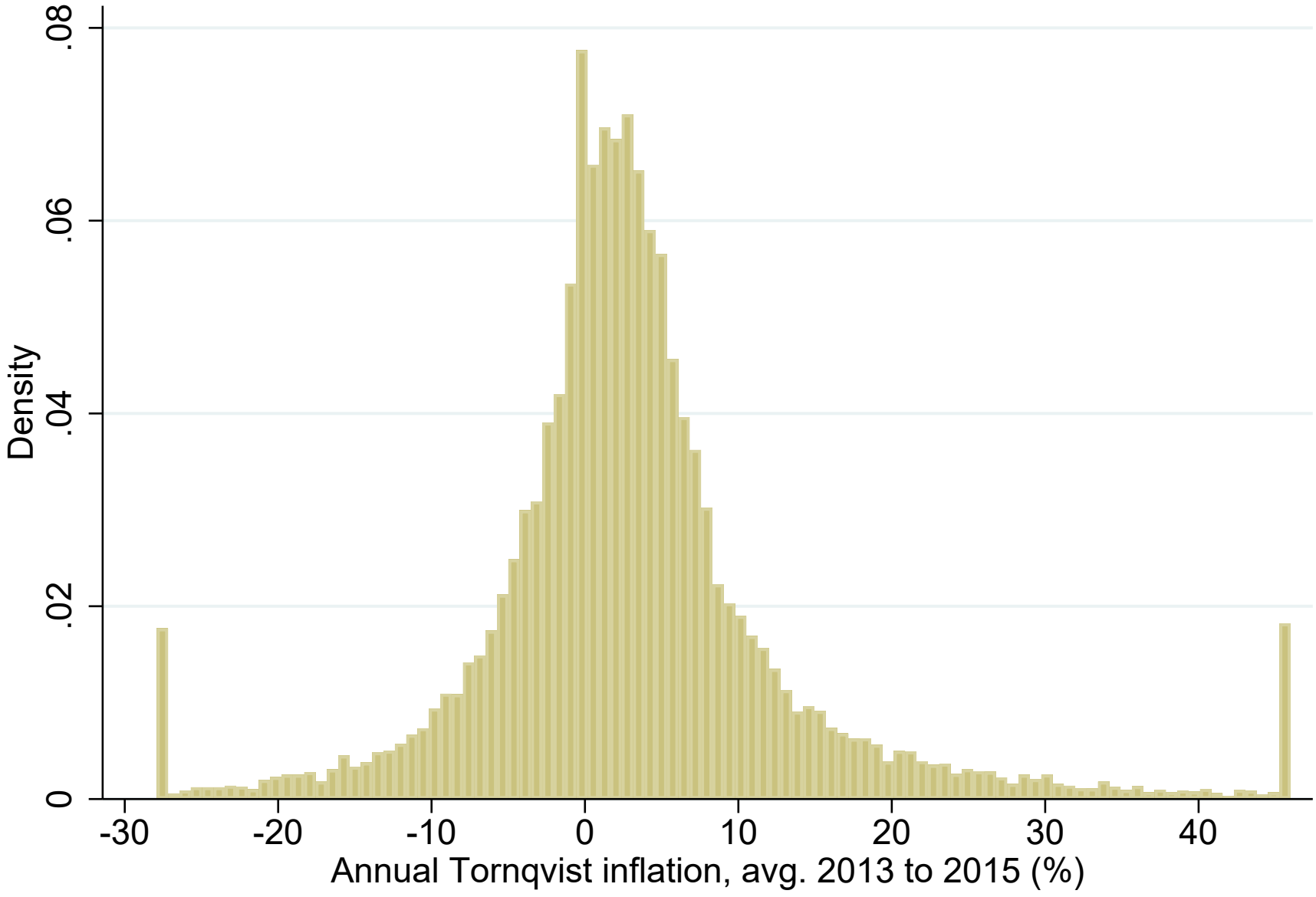
Inflation Inequality in Health Care & Firm-level Incidence

- Who pays for increased health care costs?
  - Two socio-demographic groups may have different medical conditions / use procedures with different inflation rates, but cost increase may be shared through common insurer
  - Incidence is key for measurement of health care inflation inequality
- Jaravel, Kolstad, Lavetti, Nguyen-Mason (2020) study incidence through private employer-based insurance (55% of total spending)
  - Inflation risk is shared within the firm, but potentially not across income groups due to segregated labor market
  - Estimate heterogeneity in inflation rates across firms, then project back to households across income distribution
  - Claims data for Utah (2013-2015), linked employer-employee dataset

Dissimilarity b/w Top and Bottom Income Deciles

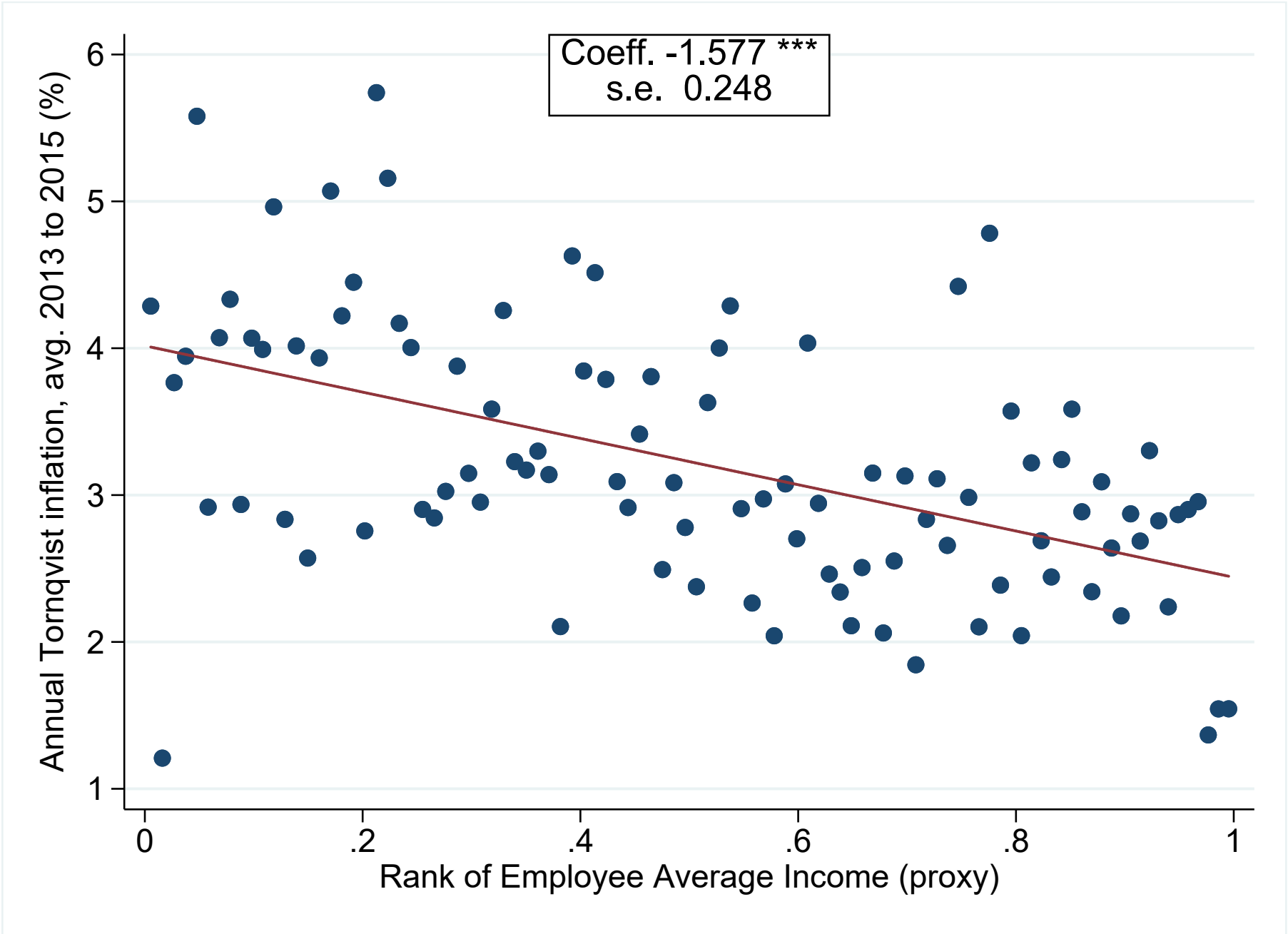


Inflation Heterogeneity across Firms



Data winsorized at 1% level

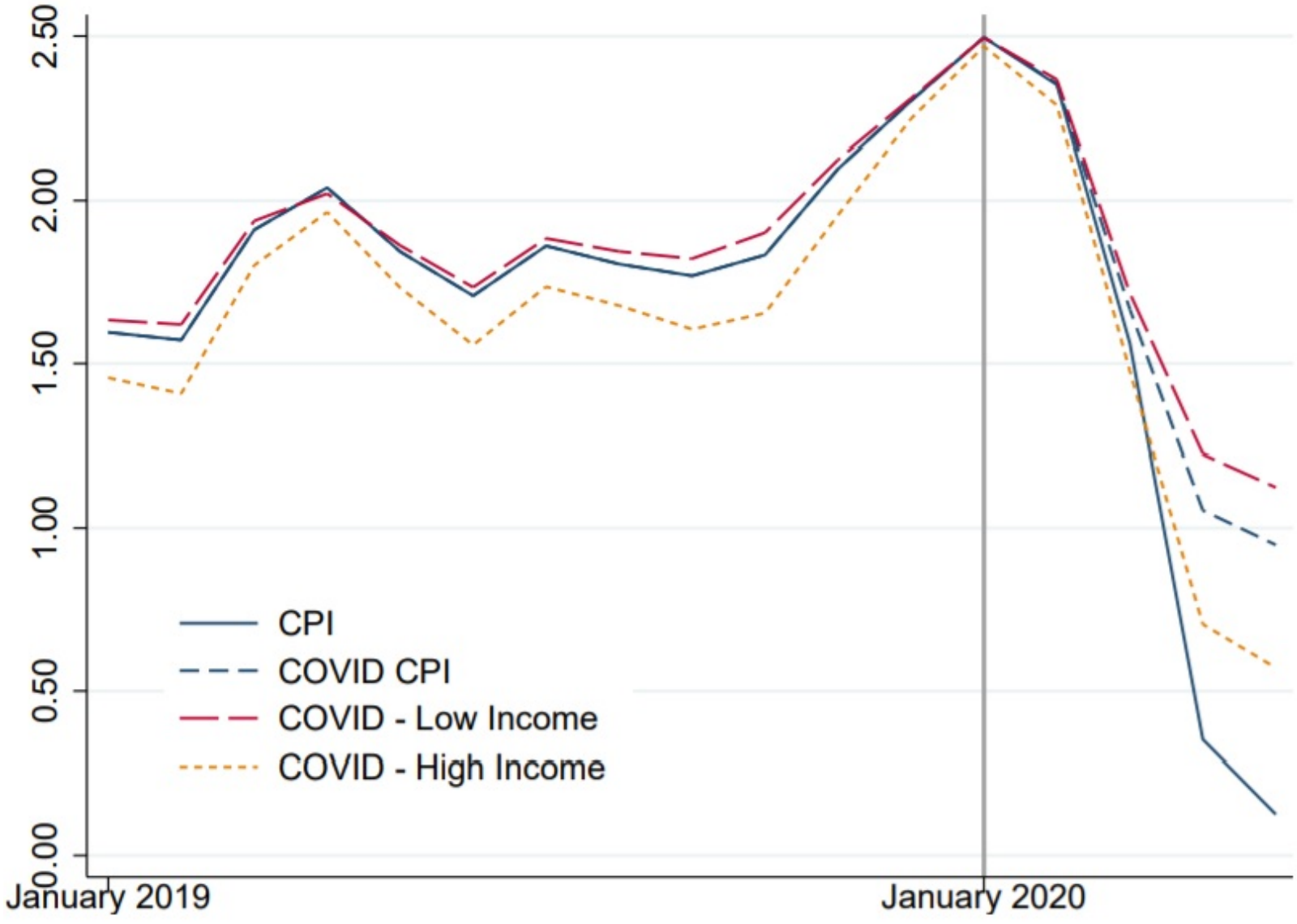
Inflation Inequality & Firm-level Incidence



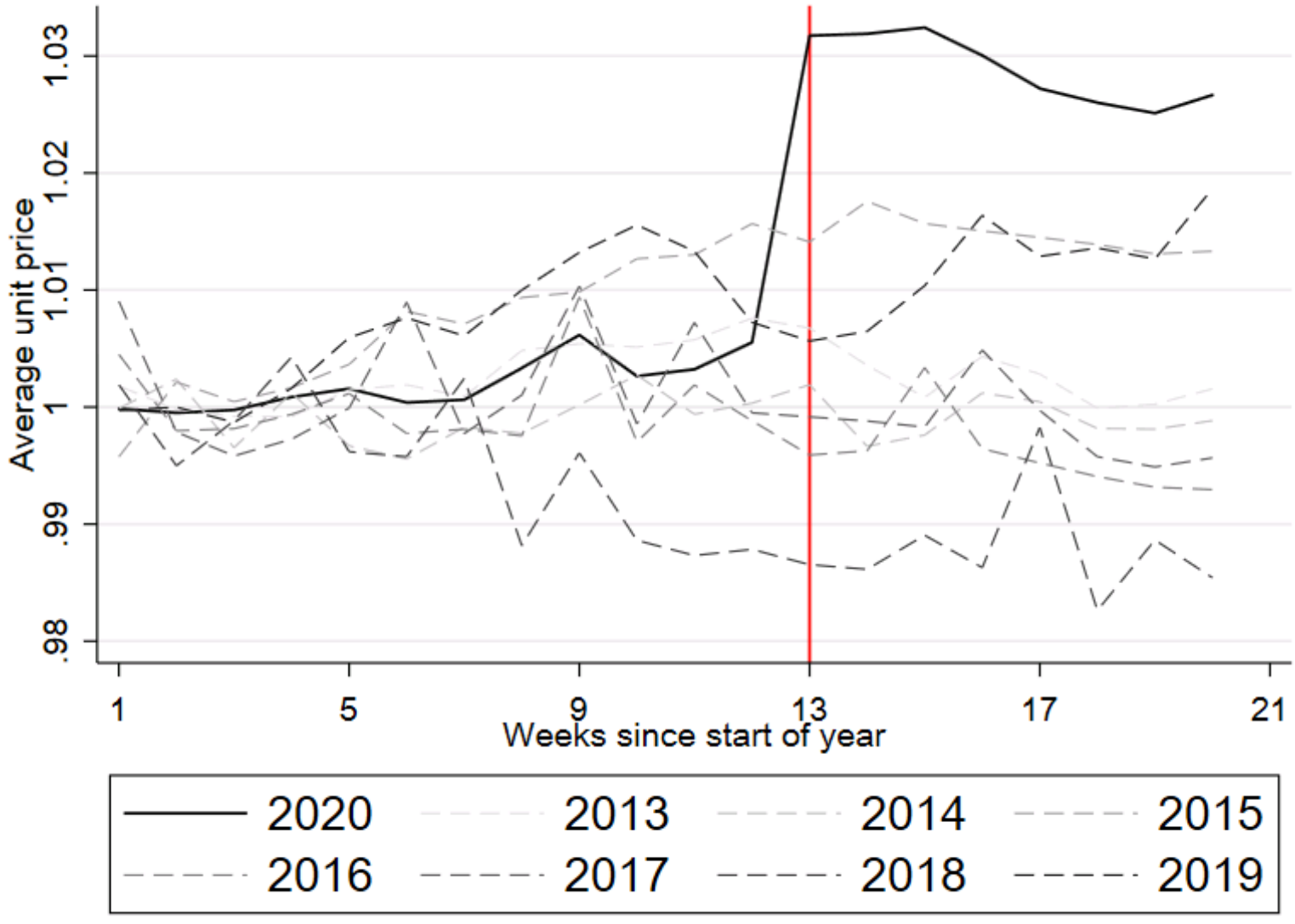
Real-time Inflation Inequality

- Recent work leverages private sector data to measure inflation inequality in real time
  - Cavallo (2020, WP): updating expenditure shares on broad sectors based on real-time credit card data
    - ⋆ Finds sizable inflation inequality (low-income groups buy relatively more food, with higher inflation during lockdown)
  - Jaravel and O'Connell (2020, JPubE): use real-time scanner data on fast-moving consumer goods in the UK
    - ⋆ Find a sharp upturn in inflation and a significant fall in product variety at the beginning of lockdown
    - ⋆ But not much inflation inequality

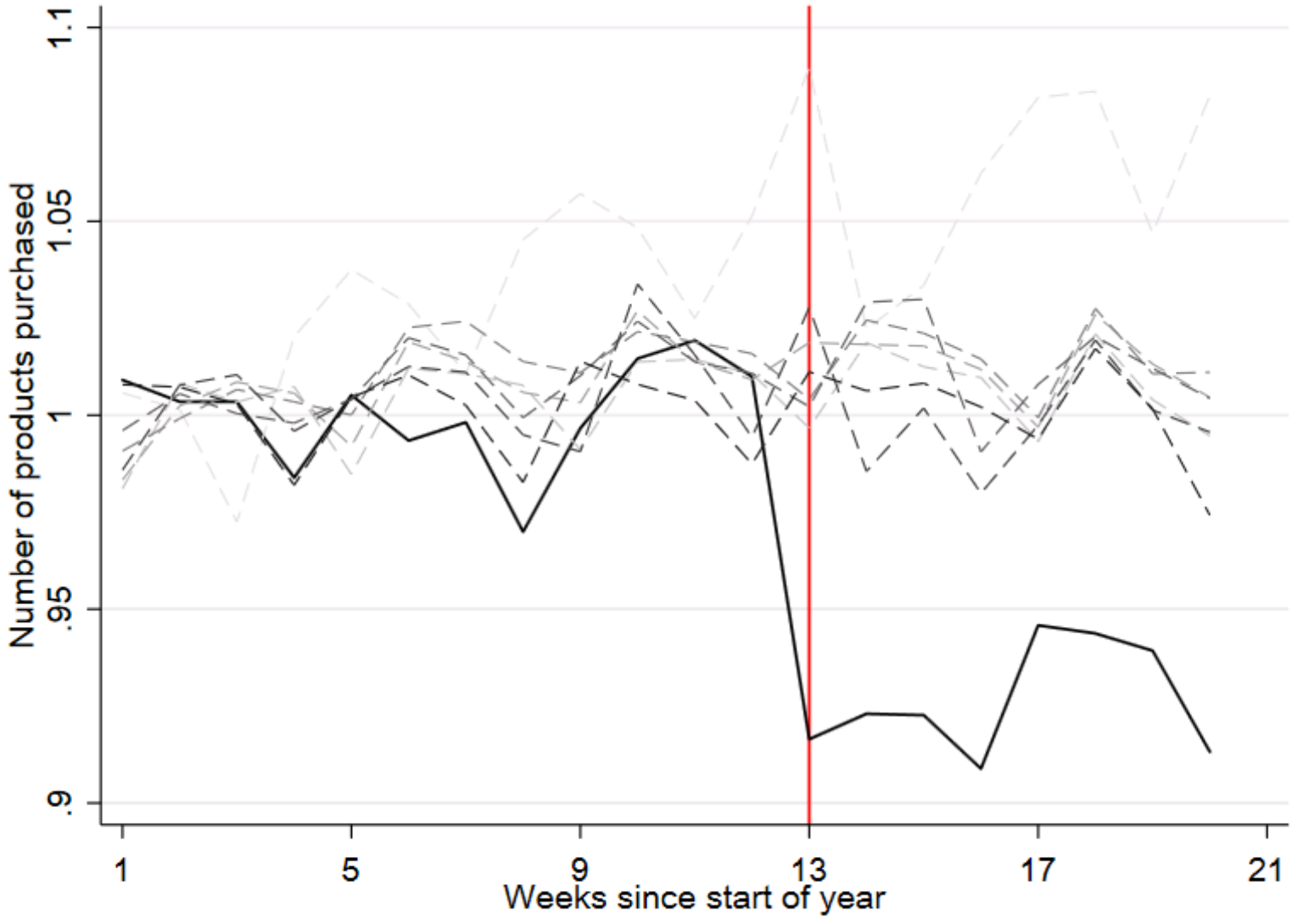
Evidence from Sectoral Data in the United States



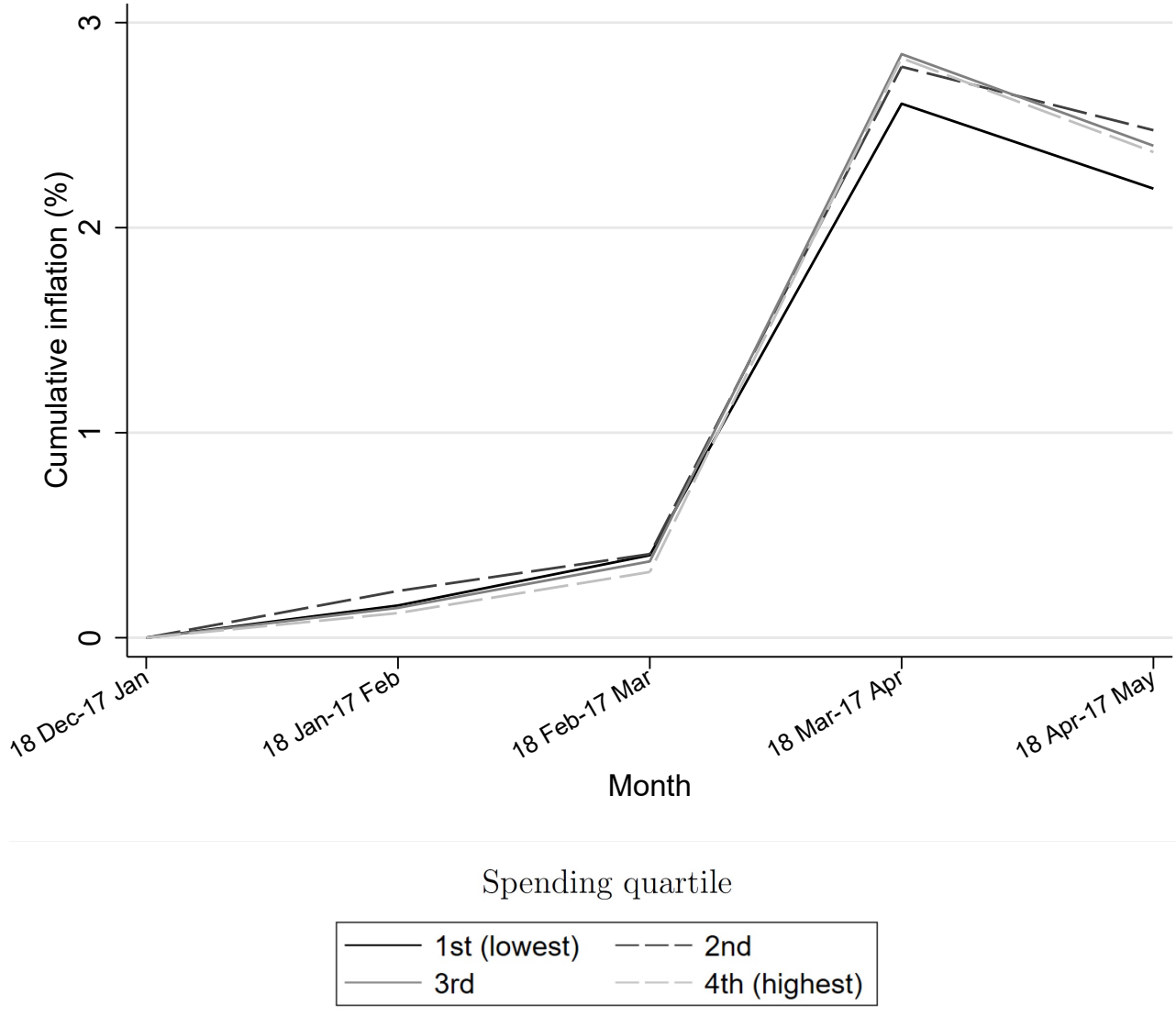
Evidence from Fast-Moving Consumer Goods in the United Kingdom: Increase in Average Price



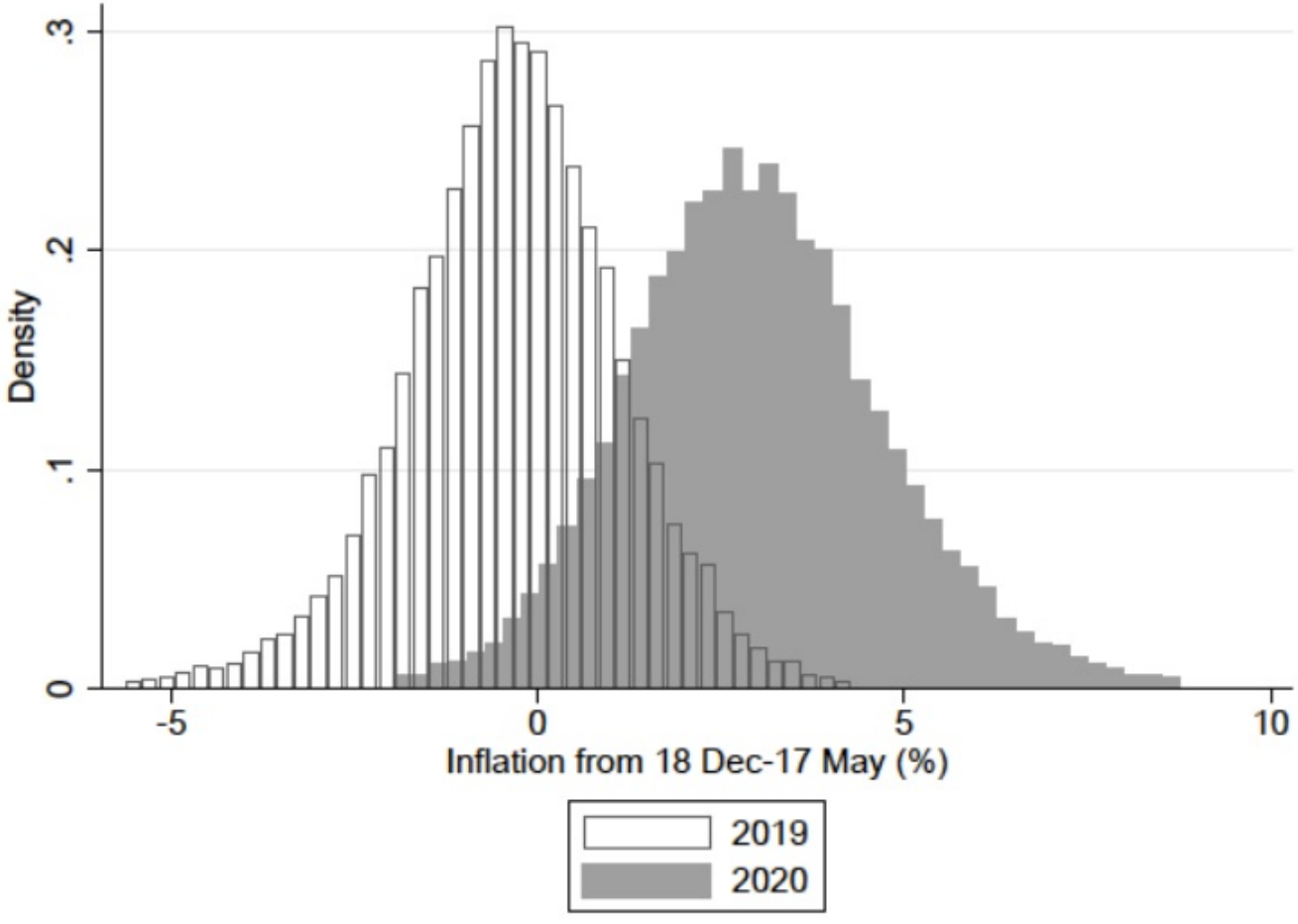
Fast-Moving Consumer Goods in the United Kingdom: Drop in Product Variety



Fast-Moving Consumer Goods in the United Kingdom: Inflation Inequality



Fast-Moving Consumer Goods in the United Kingdom: Household-Specific Inflation Rates



Notes: Distribution of household-specific inflation rates computed with a fixed base Fisher price index using Kantar FMCG Purchase Panel..

Shelter Inflation Inequality

- Shelter large component of CPI
- Debate on impact of shelter inflation
  - Moretti (AEJ 2013) $\Rightarrow$ higher shelter inflation for college-educated (b/c shelter inflation varies across cities)
  - Diamond (AER 2016) $\Rightarrow$ lower shelter inflation for college-educated after adjusting for changes in amenities
  - Glaeser and Jaravel (WP, ongoing) $\Rightarrow$ heterogeneity between renters & homeowners, and depending on when home was purchased

Challenges

- Recent work suggests that it is useful to take seriously the idea that inflation is heterogeneous, notably across the income distribution
- But many open questions
  - How to alleviate aggregation bias in all sectors of the economy
    - ★ New data: scanner data, claims data; could get more: cars, housing, slow-moving consumer goods, services?
    - ★ Collecting more granular price data (e.g., UCC-level, rather than ELI-level)?
    - ★ Could make assumptions related to price level/quality ladder (as in Cravino-Levchenko AER 2017)
  - What dimensions of inflation inequality to consider
    - ★ income deciles vs. households-level heterogeneity; renters vs. homeowners; age groups; race; gender
    - ★ Useful to choose methods consistent with "distributional national accounts"?