Look Within

Demographic Grouping Masks Inflation Inequality

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Researcher's own analyses and calculations based in part on NielsenIQ Retail Measurement Service and Consumer Panel Service data for the Total US. The conclusions drawn from the NielsenIQ data are those of the researcher and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was was not involved in analyzing and preparing the results reported herein or in developing, reviewing, or confirming the research approaches used in connection with this report.

Overview

Households' inflation experiences much more disparate than captured by comparing demographic groups

- most heterogeneity occurs *within demographic group*

Heterogeneity strongly correlated with average inflation

- not driven by changing gaps across demographics

Implications for measuring inflation distribution

Did Inflation Disparities Grow in 2021-2022?

Evidence from the Consumer Expenditure Survey: **no**

- Jaravel (2024)
  - Inflation gap between high- and low-income shrank from 2020 to 2022
- Klick and Stockburger (2024), Gindelsky and Martin (2025)

Evidence from detailed household panels in grocery sector: **yes**

- O'Flaherty (2025)
  - Rising price change heterogeneity within product categories made inflation outcomes much more disparate in 2022
- Chen, Levell, and O'Connell (2024); Kostyshyna and Ouellet (2025)

Grocery inflation: data and method

The NielsenIQ Consumer Panel Data contains detailed grocery purchases for about 50-60,000 households annually.

Used to compute Tornqvist grocery inflation at a household level:

$$\Psi_{h,t-j,t} = \prod_{k \in \left\{\Omega_{h,t-j} \cup \Omega_{h,t}\right\}} \left(\frac{p_{k,t}}{p_{k,t-1}}\right)^{\frac{1}{2}(s_{h,k,t}+s_{h,k,t-j})} \quad (1)$$

where $s_{h,k,t} = p_{k,h,t}q_{k,h,t} / \sum_{\Omega_{h,t}} p_{k,h,t}q_{k,h,t}$ is the expenditure share for household h among goods purchased in t, denoted $\Omega_{h,t}$.

Methodology: the matched goods problem

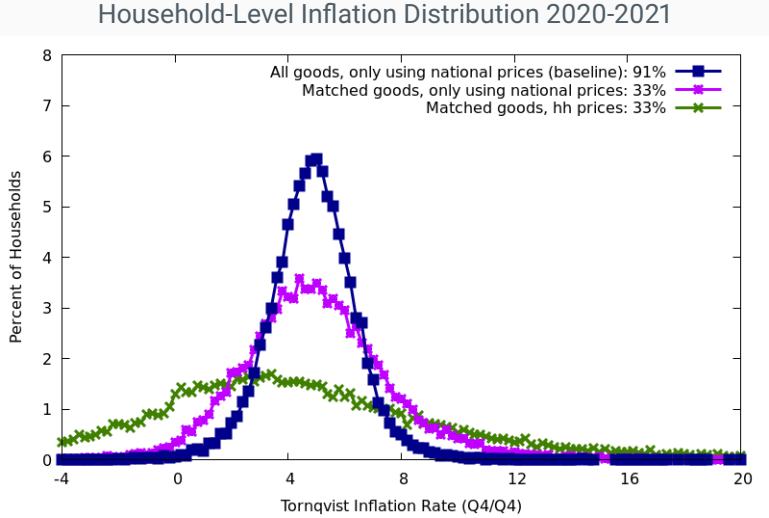
Important difference from seminal approach for computing household-level inflation laid out by Kaplan & Schulhofer-Wohl (2017)

$$\Psi_{h,t-j,t}^{KSW} = \prod_{k \in \left\{\Omega_{h,t-j} \cap \Omega_{h,t}\right\}} \left(\frac{p_{h,k,t}}{p_{h,k,t-1}} \right)^{\frac{1}{2}(s_{h,k,t}+s_{h,k,t-j})} \tag{2}$$

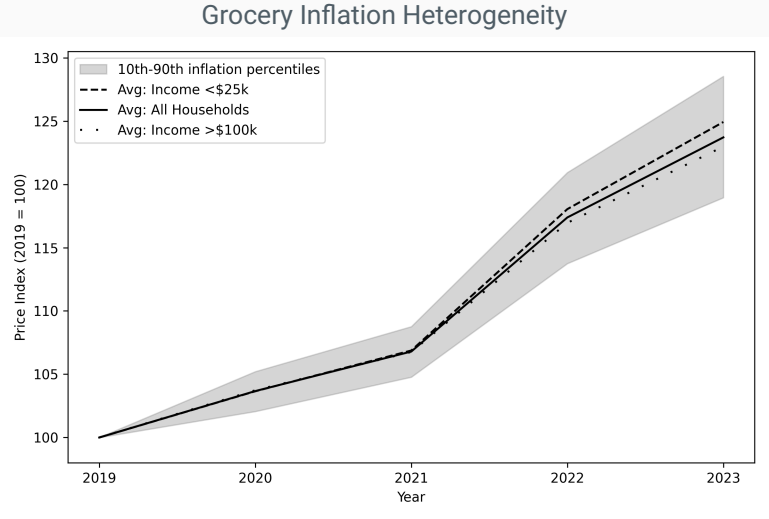
Applying household-specific prices

1. restricts attention to matched goods
   - dramatically reduces sample and eliminates substitution
   - inflation from 2019-2023 would use 78 goods, drop 900+
2. incorporates variation due to temporary promotions
   - interesting, but not driving persistent cost of living gaps

Methodology: the matched goods problem



NielsenIQ data: need to look within groups



Demographics miss most heterogeneity

Define the *residual* variance not explained by grouping G as

$$\tilde{\sigma}^2_{G,t} = \sum_h d_{h,t}(\Psi_{h,t-1,t} - \bar{\Psi}^g_{t-1,t})^2$$

where $\bar{\Psi}^g_{t-1,t}$ is average inflation among households in group g.

Percent of Cross-Sectional Variance Explained by Demographics

Income	Age	Size	Race	ZIP Density	All
0.9%	0.4%	0.7%	0.6%	1.5%	10.6%

Note: Variance computed across one-year annual average inflation rates from 2013-2023. Values average 100 (1 - $\tilde{\sigma}^2_{G,t}/\sigma^2_t$) across all years.

Demographics miss *dynamics* of heterogeneity

The variance of inflation σ_t^2 strongly correlates with average inflation $\bar{\Psi}_t$. That correlation almost entirely driven by the residual portion.

Percent of Corr($\bar{\Psi}_t$, σ_t^2) Explained by Demographics

Income	Age	Size	Race	ZIP Density	All
0.5%	0.0%	0.0%	0.4%	0.0%	0.6%

Note: Variance computed across one-year annual average inflation rates from 2013-2023. Values average 100 (1 - $Corr(\bar{\Psi}_{t-1,t}, \bar{\sigma}^2_{6,t}) / Corr(\bar{\Psi}_{t-1,t}, \sigma^2_t)$) across all years.

Implications for tracking inflation inequality

Highly granular data needed to effectively detect heterogeneity

- Not just about paying different prices for sampled goods
- Diversity of goods households buy contribute significantly

Conditional on having detailed data, statistics by demographic group do not effectively convey available distribution

- Important to track systematic disparities; households likely also care about idiosyncratic ones

Thank you

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