Lack of Uniform Prices or Lack of Uniform Retailers?

Seula Kim
Penn State

Michael Navarrete
Federal Reserve Bank of Atlanta

ASSA 2026 Annual Meeting

Measuring Inflation: It's All About Minding Your P's and Q's Session

January 3, 2026

Acknowledgements and Disclaimers

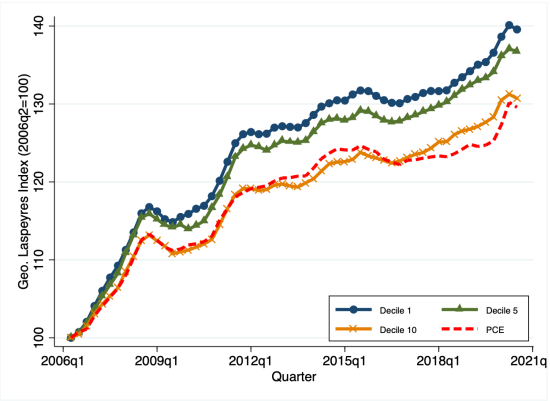
This research is supported by the Washington Center for Equitable Growth. Researcher(s)' own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researcher(s) and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein. Any opinions and conclusions expressed herein are solely the responsibility of the authors and do not necessarily represent the views of the Board of Governors of the Federal Reserve System or any other person associated with the Federal Reserve System. Michael Navarrete worked on this paper while a PhD student at the University of Maryland, College Park. We thank the RESET team, without whom this project would not have been feasible, for providing the infrastructure to address our research project.

Motivation

DG Table

- A common assumption in economics is "uniform" pricing across areas (DellaVigna and Gentzkow 2019)
  - DellaVigna and Gentzkow 2019 find that food stores in poorer areas face lower prices
  - However, this is quantitatively small, which leads to the conclusion of uniform prices
  - For a $10,000 increase in the income of an area, the price for a UPC at the same chain is 0.5% higher.
- Based on this information one may (incorrectly) conclude that consumers pay the same price for goods across areas
- However, imposing chain-UPC restriction may be a strong restriction given that areas face different products and different chains (in a systematic manner)
  - Specifically, poorer areas face fewer products and fewer chains relative to richer areas

Spatial Heterogeneity in Inflation: Aggregate Food



- Food price has been growing **faster** in **poorer** areas
- Heterogeneous food inflation across areas may at first glance seem at odds with uniform pricing

Research Questions

1. Is there heterogeneity in uniform prices at the chain-UPC level across food product modules?

2. How do differences in retail and product composition across areas affect local price levels?

This Paper

- Uses NielsenIQ Retail Scanner dataset

This Paper

- Uses NielsenIQ Retail Scanner dataset
- Finds the following stylized facts on:
  1. Heterogeneity in the degree of uniform prices across product modules
  2. Large differences in both the number of chains and products present across MSAs
  3. Specifically, there are fewer but larger retailers and fewer products (even within the same chain) in poorer MSAs

This Paper

- Uses NielsenIQ Retail Scanner dataset
- Finds the following stylized facts on:
  1. Heterogeneity in the degree of uniform prices across product modules
  2. Large differences in both the number of chains and products present across MSAs
  3. Specifically, there are fewer but larger retailers and fewer products (even within the same chain) in poorer MSAs
- Differences in local retail market structure may be accounting for some of these differences in pricing

Data and Definitions

NielsenIQ Retail Scanner (RMS)

- NielsenIQ contains detailed information for retail chains across U.S. markets
  - Covers 100 chains and over 40,000 individual stores
  - Weekly pricing, volume, store location, and merchandising conditions, etc.
  - Total sales worth over $200 billion/yr; 50% of total sales in grocery stores; 55% in drug stores; 32% in mass merchandisers; and 2% in convenience stores
  - Over 2.6 million 12-digit universal product codes (UPCs), aggregated to product modules and groups

NielsenIQ Retail Scanner (RMS)

- NielsenIQ contains detailed information for retail chains across U.S. markets
  - Covers 100 chains and over 40,000 individual stores
  - Weekly pricing, volume, store location, and merchandising conditions, etc.
  - Total sales worth over $200 billion/yr; 50% of total sales in grocery stores; 55% in drug stores; 32% in mass merchandisers; and 2% in convenience stores
  - Over 2.6 million 12-digit universal product codes (UPCs), aggregated to product modules and groups
- We make several data restrictions to match the sample from DellaVigna and Gentzkow (2019)
  - Focus on 3 product modules from 2006 to 2014
- Map MSAs into income deciles based on the BEA income per capita
- Define large retailers by the national-level sales distribution

MSA Deciles

- We sort MSAs into one of 10 deciles based the average income per capita
- MSAs in the top 10% of income per capita are assigned to decile 10

Examples of MSA Deciles

Decile 1	El Paso (TX), Albany (GA), Yuma (AZ), Terre Haute (IN), etc.
Decile 5	Knoxville (TN), Panama City (FL), Binghamton (NY), Wilmington (NC), etc.
Decile 10	New York (NY), Washington (DC), Boston (MA), San Francisco (CA), etc.

Main Findings

Testing Uniform Pricing

$$\ln(p_{ksmt}) = \beta_0 + \beta_1 \text{Income}_m + \delta_k + \delta_c + \varepsilon_{ksmt}$$

- $\ln(p_{ksmt})$ is the log price of product k in store s in MSA m at week t
- Income_m denotes the average income per capita for MSA m between 2006 and 2014
- δ_k: product fixed effects
- δ_c: chain fixed effects

	Within-chain specification			Between-chain specification		
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Average Log Price					
Panel A. Cereal						
Income per capita	0.0066	0.0070	0.0129***	0.0133*	0.0133***	0.0098***
(in $10,000s)	(0.0047)	(0.0045)	(0.0040)	(0.0078)	(0.0038)	(0.0017)
Observations	795,488,691	795,489,672	4,012,347	52,928,281	202,443	202,443
Panel B. Coffee						
Income per capita	0.0023	0.0027	0.0104	0.0040	0.0100	0.0057
(in $10,000s)	(0.0024)	(0.0023)	(0.0080)	(0.0029)	(0.0092)	(0.0058)
Observations	508,519,099	508,520,454	4,012,302	43,562,746	202,443	202,443
Panel C. Eggs						
Income per capita	0.0225**	0.0256**	0.0475***	0.0383***	0.0477***	0.0201***
Observations	62,693,739	62,694,095	4,010,940	3,886,614	202,443	202,443
Fixed effects	Chain×UPC	Chain, UPC	Chain	UPC	Chain	Chain
Observation level	Store–UPC	Store–UPC	Store	Chain–UPC–MSA	Chain–MSA	Chain–MSA

Notes: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Retailer Heterogeneity on Price Dispersion

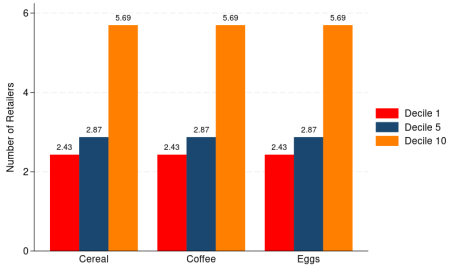
$$\ln(p_{ksmt}) = \beta_0 + \beta_1 \text{Income}_m + X'_{cmt}\gamma + \delta_k + \delta_c + \varepsilon_{ksmt},$$

- X'_{cmt}: controls for a retail chain's local log sales and market share (all else the same)
- See how the local retailer market structure is affecting pricing decisions across/within retail chains

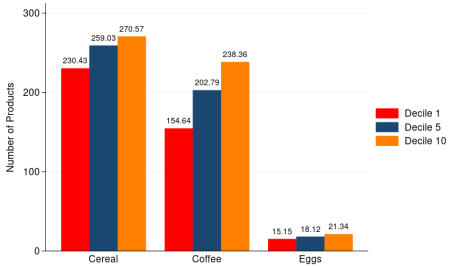
	Cereal		Coffee		Eggs	
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Average Log Price					
Income per Capita	0.009	0.004**	-0.007**	-0.006***	0.010	-0.013***
	(0.006)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)
Log Sales	0.001	0.001	0.011***	0.010***	0.028***	0.024***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.004)	(0.004)
Market Share	-0.032*	0.001	-0.030***	-0.013**	-0.091***	-0.052***
	(0.017)	(0.006)	(0.006)	(0.005)	(0.024)	(0.016)
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Chain FE	No	Yes	No	Yes	No	Yes
Observations	52,928,281	52,928,281	43,562,746	43,562,746	3,886,614	3,886,614
Observation level	Chain–UPC –MSA	Chain–UPC –MSA	Chain–UPC –MSA	Chain–UPC –MSA	Chain–UPC –MSA	Chain–UPC –MSA

Notes: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Composition Differences



Avg. Number of Retailers

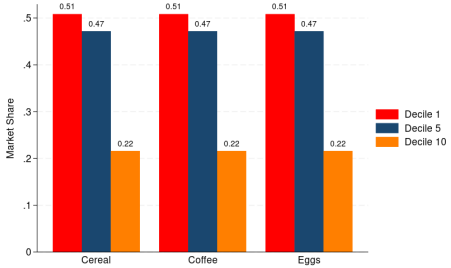


Avg. Number of UPCs by Retailer

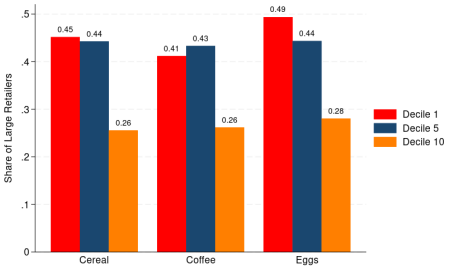
- There are substantial differences in the composition of retailers and products across areas
- Specifically, there are more retailers and products available in poorer MSAs
- This holds across all three product modules

Composition Differences

Regressions



Avg. Market Share



Avg. Share of Large Retailers

- Also, the average market share is higher in poorer MSAs
- Especially for nationally large chains
- This holds across all three product modules

Product Availability Across Chains

$$\ln(N_{cmt}) = \beta_0 + \beta_1 \text{Income}_m + \delta_k + \delta_c + \varepsilon_{cmt},$$

- $\ln(N_{cmt})$: log of the number of products of available in chain c in MSA m at week t
- Thought experiment: would we have the same products if we had the same chains across areas?

Income and Product Variety by Product Module

	Cereal		Coffee		Eggs	
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Log Product Count					
Income per Capita	0.061***	0.051***	0.145***	0.103***	0.108***	0.064***
	(0.017)	(0.011)	(0.041)	(0.019)	(0.029)	(0.012)
Chain FE	No	Yes	No	Yes	No	Yes
Observations	202,443	202,443	202,443	202,443	202,443	202,443
Observation level	Chain–MSA	Chain–MSA	Chain–MSA	Chain–MSA	Chain–MSA	Chain–MSA

Notes: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Conclusion

- Find that the dispersion of prices (how much uniform pricing holds) varies across product modules
- The poorest decile of MSAs faces (than the richest)
  1. fewer chains
  2. fewer products
  3. and higher average market share of retailers (esp. for large retailers)
- We find suggestive evidence that local retailer market structure could be playing a role in pricing (consistent with Kim and Navarrete 2024)
  - Specifically the log sales and the local market share seem to influence pricing decisions
- Even if all MSAs had the same retailers, we would still fewer products in poorer MSAs

THANK YOU! ☺

seulakim@psu.edu / mnavarrete.econ@gmail.com

Appendix

Motivation

Main

ONLINE APPENDIX TABLE 4

PRICE VS. INCOME, WITHIN CHAIN AND BETWEEN CHAIN

Specification:	Within-Chain Specification					Zone Pricing Sp.	Between-Chain Specification			
Dependent Variable:	Log Price					Average Log Price	Average Log Price			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A. Food Stores										
Income Per Capita	0.0048***	0.0047***	0.0047***	0.0047***	0.0038***	0.0124**	0.0431***	0.0419***	0.0442***	0.0376***
(in $10,000s)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0003)	(0.0050)	(0.0055)	(0.0094)	(0.0056)	(0.0115)
Fixed Effects	Chain x UPC	Chain, UPC	Chain, UPC	Chain	Chain x State	Chain	UPC			
Weighted by number of stores						X	X	X		X
Includes Only Store-UPCs with Elasticities			X							
Drop Two Outlier Chains										X
Observation Level	Store-UPC	Store-UPC	Store-UPC	Store	Store	Chain-State	Chain-UPC	Chain	Chain	Chain
Observations	12,027,499	12,027,499	6,593,513	9,415	9,415	171	84,480	64	64	62
R-squared	0.823	0.256	0.315	0.931	0.960	0.962	0.208	0.280	0.481	0.190

Source: DellaVigna and Gentzkow (2019) Online Appendix Table 4 Panel A