AEA Papers and Proceedings 2026, 116: 568–572
https://doi.org/10.1257/pandp.20261063

Lack of Uniform Prices or Lack of Uniform Retailers?[†]

By Seula Kim and Michael A. Navarrete*

Standard models assume uniform pricing across stores (DellaVigna and Gentzkow 2019). We show that uniform pricing varies across products within food categories. Even when product-chain prices are nearly uniform, cross-market differences in retailer and product composition generate spatial dispersion in effective price levels. Poorer metropolitan statistical areas (MSAs) are served by fewer chains, have a higher share of large national retailers, and exhibit lower product variety across and within retailers. Ignoring this heterogeneity understates price-level gaps between poor and rich areas. These results complement Kim and Navarrete (2025), who identify retail market structure as a key driver of spatial inflation heterogeneity.

I. Heterogeneity in Prices within Food Chains across MSAs

First, we document differences in price levels across MSAs, following DellaVigna and Gentzkow (2019). We use the NielsenIQ Retail Scanner data, which provide rich information on prices and quantities at the store-week-product level.[1] DellaVigna and Gentzkow (2019) study 40 product modules sold in food stores, of which 31 fall into food and beverages.[2] From these 31 modules, we select three: ready-to-eat cereal, ground and whole bean coffee, and fresh eggs. We focus on food stores, use the same sample period, 2006–2014, as DellaVigna and Gentzkow (2019), and impose similar data restrictions.[3] In addition, we use MSA-level income per capita to characterize spatial markets.[4]

We follow DellaVigna and Gentzkow (2019) and run the following regression for cereal, coffee, and eggs:

$$\ln(p_{ksmt}) = \beta_0 + \beta_1 Income_m + \delta_k + \delta_c + \varepsilon_{ksmt}, \tag{1}$$

where $\ln(p_{ksmt})$ denotes the log price of product k in store s in MSA m at week t.[5] $Income_m$ denotes the average income per capita for MSA m between 2006 and 2014. δ_k corresponds to product fixed effects, δ_c corresponds to chain fixed effects, and ε_{ksmt} is the error term.

* Kim: Pennsylvania State University (email: seulakim@psu.edu); Navarrete: Federal Reserve Bank of Atlanta (email: michael.navarrete@atl.frb.org). This research is funded by the Washington Center for Equitable Growth. This paper was developed under the RESET project with the support of the Alfred P. Sloan Foundation. Researchers' 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 researchers 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. The views expressed here are those of the authors and do not necessarily reflect the views of the Federal Reserve System, the Board of Governors, nor their staff. Navarrete worked on this paper while a PhD student at the University of Maryland, College Park. All errors are our own.

[†] Go to https://doi.org/10.1257/pandp.20261063 to visit the article page for additional materials and author disclosure statement(s).

[1] See Ehrlich et al. (2023) for details.

[2] This classification is based on the entry-level-item system, under which product modules such as batteries are excluded from food and beverages.

[3] Following DellaVigna and Gentzkow (2019), we drop stores without a chain retailer code and restrict the sample to chains present in at least eight of the nine years in our sample.

[4] Alternatively, store-level income per capita could be constructed using the NielsenIQ Consumer Panel, as in DellaVigna and Gentzkow (2019). However, this approach has limitations: Panelist income is right censored, and panelists are not representative at the store level. Representativeness holds only at the national level with projection factors, or for a limited set of MSAs.

[5] Note that Table 1 closely follows the online Appendix Table 4 in DellaVigna and Gentzkow (2019).

Table 1—Price versus Income, within Chain and between Chain, by Product Module

	Dependent variable: average log price					
	Within-chain specification			Between-chain specification		
	(1)	(2)	(3)	(4)	(5)	(6)
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
R^2	0.6859	0.6468	0.3144	0.6791	0.3871	0.3508
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
R^2	0.8210	0.8066	0.3497	0.8686	0.3916	0.3402
Panel C. Eggs						
Income per capita	0.0225	0.0256	0.0475	0.0383	0.0477	0.0201
(in $10,000s)	(0.0107)	(0.0107)	(0.0099)	(0.0086)	(0.0096)	(0.0050)
Observations	62,693,739	62,694,095	4,010,940	3,886,614	202,443	202,443
R^2	0.8326	0.8070	0.3678	0.7728	0.3994	0.3200
FE	Chain × UPC	Chain, UPC	Chain	UPC	Chain	Chain
Observation level	Store-UPC	Store-UPC	Store	Chain-UPC-MSA	Chain-MSA	Chain-MSA

Notes: Each column reports the coefficient on MSA-level income per capita (in $10,000s) from a separate regression following equation (1). All specifications include the fixed effects indicated in the bottom row and cluster standard errors by *parent_code*. Columns 1–3 report within-chain specifications at the store-UPC or store level, while columns 4–6 report between-chain specifications at the chain-UPC-MSA or chain-MSA level. All specifications are unweighted except column 5, which weights observations by the number of stores within each MSA-chain pair. The sample consists of weekly observations from 2006 to 2014. Standard errors are reported in parentheses.

Table 1 reports the results for cereal in panel A, coffee in panel B, and eggs in panel C. We find similar results to DellaVigna and Gentzkow (2019), where we find close to uniform pricing within a chain-UPC pair. At the same time, we find heterogeneity in the degree of uniform prices across these products. For coffee (panel B), we obtain null estimates across all specifications, consistent with uniform pricing. In contrast, for eggs (panel C), the estimates are positive and statistically significant across all specifications. In our most restrictive specification (column 1, panel C), which includes chain-UPC fixed effects, a $10,000 increase in MSA income per capita is associated with a 2.3 percent higher price for the same egg product sold by the same chain. For cereal (panel A), the estimates are insignificant in the two most restrictive specifications. However, once we allow for variation in products (columns 3, 5, and 6) or in chain composition (column 4) across regions, the estimated coefficients become positive and statistically significant. This increase in the coefficient on MSA income per capita suggests that differences in retail or product composition can amplify price-level differences across MSAs.

II. Heterogeneity in Retailers and Product Varieties across MSAs

Motivated by the results in Table 1, we next investigate heterogeneity in retailer characteristics across areas. We measure retailer characteristics using sales, market shares, and the number of UPCs sold within an MSA, as well as indicators for large retailers defined as chains in the top decile of the national sales distribution. Based on these measures, we pool MSAs into income-per-capita deciles, following Kim and Navarrete (2025), and report average retailer characteristics for deciles 1 (poorest), 5, and 10 (richest) in Figure 1. We find that richer MSAs have more retailers (panel A), larger

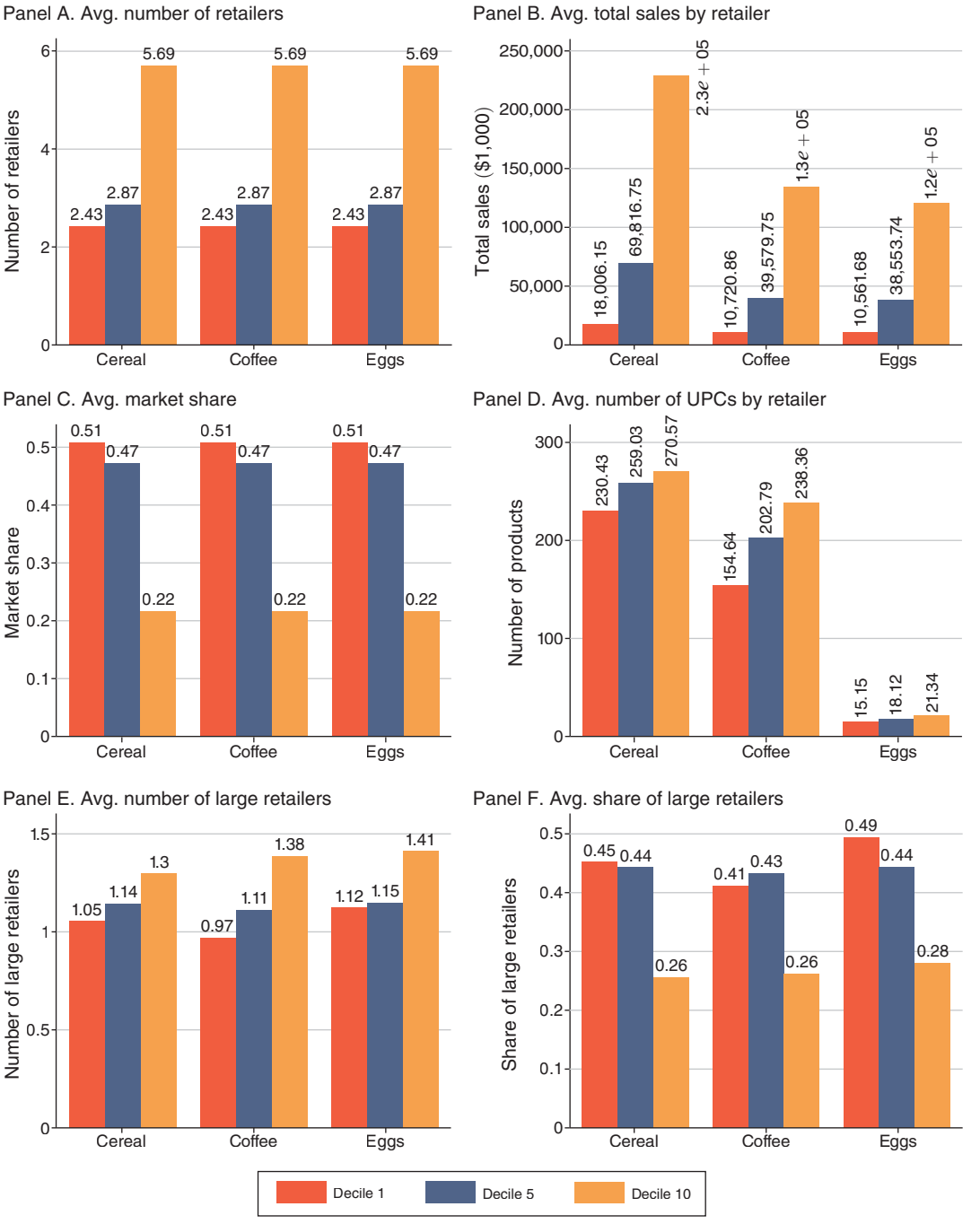

FIGURE 1. RETAILER HETEROGENEITY ACROSS REGIONS BY PRODUCT MODULE

Notes: Each panel reports a statistic for a given product module (eggs, coffee, and cereal) across income-per-capita deciles 1, 5, and 10. Panel A reports the average number of retailers per MSA; panel B reports the average total sales of retailers per MSA; panel C reports the average retailer-level market share within an MSA; panel D reports the average number of UPCs per retailer within an MSA; panel E reports the average number of large retailers per MSA; and panel F reports the average sales share of large retailers within an MSA. Large retailers are defined as the top decile of the national sales distribution.

Table 2—Effect of Retailer Heterogeneity on Price Dispersion, by Product Module

	Dependent variable: average log price					
	Cereal		Coffee		Eggs	
	(1)	(2)	(3)	(4)	(5)	(6)
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: Each column reports the coefficient on MSA-level income per capita (in $10,000s) from a separate regression following equation (2), which controls for time-varying retailer characteristics (log sales and local market share within MSAs). Columns 1 and 2 report results for cereal, columns 3 and 4 for coffee, and columns 5 and 6 for eggs. For each product, the first column includes product fixed effects only, while the second column includes both product and chain fixed effects. The unit of observation is the weekly UPC-MSA-chain level over 2006–2014. Standard errors are reported in parentheses and are clustered by *parent_code*.

retailers by sales volume (panel B), and greater product variety (panel D). However, each retailer in richer MSAs has lower sales shares (panel C) on average in these areas. Moreover, richer MSAs have a larger number of large retailers (panel E)—defined by the top decile of the national sales distribution—yet these retailers account for a smaller share of local sales (panel F). These patterns are consistent across cereal, coffee, and eggs. These results align with Kim and Navarrete (2025), who document higher retailer sales concentration in poorer deciles for overall food and beverages.

To assess how heterogeneity in retail chain characteristics affects price dispersion across regions, we augment the specification in columns 2 and 4 of Table 1 with retailer-level controls as follows:

$$\ln(p_{ksmt}) = \beta_0 + \beta_1 Income_m + X'_{cmt}\gamma + \delta_k + \delta_c + \varepsilon_{ksmt}, \tag{2}$$

where the notation remains the same as before except for adding X'_{cmt}, the set of retailer c's characteristics in MSA m at time t. Specifically, we control for a retail chain's log sales and its local market share within an MSA.

Table 2 reports the results. For coffee and eggs, we find a positive association between prices and retailer log sales and a negative association between prices and retailer market share. This implies that retailers with larger sales volumes or lower local market shares are associated with higher prices. This pattern reflects heterogeneity in retailer market structure across regions with different income levels: Richer areas exhibit higher total sales but lower local retailer concentration, and these markets are associated with higher price levels. This suggests that a nontrivial share of regional price dispersion is systematically related to differences in local retailer composition and characteristics, and indeed, including these controls reverses the sign of the income-per-capita coefficient or attenuates its statistical significance. These relationships hold in specifications that include only product fixed effects as well as those that include both product and chain fixed effects. The latter indicates that even the same retailer can exhibit different local characteristics and price differently across regions. Taken together, these results provide suggestive evidence that retailer composition and local market characteristics are an important source of pricing differences in retail food markets.[6] For

[6] As a robustness check, we also estimate specifications that control only for log sales or only for market share. While coefficient magnitudes change, the coefficient on log sales remains positive and the coefficient on market share remains negative.

Table 3—Income and Product Variety by Product Module

	Dependent variable: log product count					
	Cereal		Coffee		Eggs	
	(1)	(2)	(3)	(4)	(5)	(6)
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: Each column reports the coefficient on MSA-level income per capita (in $10,000s) from a separate regression following equation (3). Columns 1 and 2 correspond to results for cereal, columns 3 and 4 correspond to results for coffee, and columns 5 and 6 correspond to results for eggs. All observations are at the weekly MSA-chain frequency from 2006 to 2014. Standard errors are in parentheses and are clustered by *parent_code*.

cereal, the estimates are statistically insignificant, indicating that the effects vary across product categories. For a deeper analysis of how retailer market structure affects relative price changes, see Kim and Navarrete (2025).

Finally, one may incorrectly infer from the uniform pricing literature that consumers in poorer MSAs would face the same product variety as those in richer MSAs if the same retail chains operated in both markets. To investigate this, we examine how product variety varies across MSAs, both across chains and within chains. We regress the log number of products offered by a chain in an MSA on income per capita as follows:

$$\ln(N_{cmt}) = \beta_0 + \beta_1 Income_m + \delta_k + \delta_c + \varepsilon_{cmt}, \tag{3}$$

where N_{cmt} is the number of product varieties offered by chain c in MSA m at time t, and all other notation is defined as above.

Table 3 reports results for two specifications—without fixed effects and with chain fixed effects—for cereal, coffee, and eggs. Without fixed effects, a $10,000 increase in income per capita is associated with a 6 to 15 percent increase in product variety across the three product modules. Once we include chain fixed effects, the magnitude of the coefficients declines but still remains economically meaningful. For example, column 4 indicates that a $10,000 increase in MSA income per capita is associated with a chain offering 10 percent more coffee products.

Our results indicate near-uniform pricing at the retailer-product level, consistent with DellaVigna and Gentzkow (2019). However, focusing exclusively on retailer-product comparisons risks missing the broader picture. We document large and systematic cross-region differences not only in retailers and products but also in local retailer characteristics and products available within chains. These systematic differences help explain the 8.8 percentage point gap in food inflation between the bottom and top income-per-capita deciles from 2006 to 2020 documented by Kim and Navarrete (2025).

REFERENCES

DellaVigna, Stefano, and Matthew Gentzkow. 2019. "Uniform Pricing in US Retail Chains." *Quarterly Journal of Economics* 134 (4): 2011–84.

Ehrlich, Gabriel, John C. Haltiwanger, Ron S. Jarmin, David Johnson, Ed Olivares, Luke W. Pardue, Matthew D. Shapiro, and Laura Zhao. 2023. "Quality Adjustment at Scale: Hedonic versus Exact Demand-Based Price Indices." NBER Working Paper 31309.

Kim, Seula, and Michael A. Navarrete. 2025. "Geospatial Heterogeneity in Inflation: A Market Concentration Story." Federal Reserve Bank of Atlanta Working Paper 2025-15.