Secular Rise and Pro-cyclical Variation in Markups: Evidence from US Grocery Stores.

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Abstract

This paper documents substantial time variations in price elasticities of demand and implied markups for the US food retail sector. First, we employ a Hausman-type IV to estimate store-level own-price elasticities at the market-good-year level, using scanner data of US grocery stores from 2001 to 2020. Then, we efficiently aggregate these data annually to estimate a common trend and cyclical variation in elasticities. Finally, we impute nationwide store-level price-cost markups from annual elasticities under a monopolistic pricing rule. **We find (i) a long-run increase in US grocery store markups of 3.9% per year in the past two decades and (ii) a short-term decrease of 13.6% per year during aggregate demand contractions. We show the underlying elasticities are largely driven by economic and market factors, such as real GDP, housing prices, population, and product differentiation.**

Introduction

- Supply-side evidence on the rising firm-level price-cost markups across sectors in the United States: De Loecker et al. (QJE, 2020)
- Lack of demand-side narratives.
- We provide demand-side evidence on the long-run upward trend in store-level price-cost markups for the US food retail sector.
- We find sizable and significant pro-cyclical variations in these store-level price-cost markups at times of aggregate demand contractions.
- We develop a panel-IV approach to reliably and precisely estimate the underlying own-price elasticities of demand for many goods.
- We identify economic and market factors that drive changes in elasticities, such as real GDP, housing prices, population, and product differentiation.

Data and Method for Elasticity Estimation

- **Scanner Data**: (i) IRI, 2001-2012 (Bronnenberg et al., 2008); (ii) NielsenIQ, 2006-2020 (the Kilts Center for Marketing at the University of Chicago).
- **Elasticity Estimation Sample**: Weekly food product sales at each food store in 26 markets (defined by IRI, see Figure 1 below). Data show that close markets are much more likely to sell the same set of food products. NielsenIQ has 60 food categories while IRI has 16.
- **Estimate Average Store-level Elasticities by Market-category-year**: panel-IV.

$$log(q_{s,v,w}) = -e_{m,c.t}\, log(p_{s,v,w}) + store_s + product_v + week_w + \varepsilon_{s,v,w},$$

where the log weekly store-product price is instrumented by the quantity-weighted average of log weekly prices of the same product sold in the paired market(s); and standard errors are clustered at store and week levels in two ways.

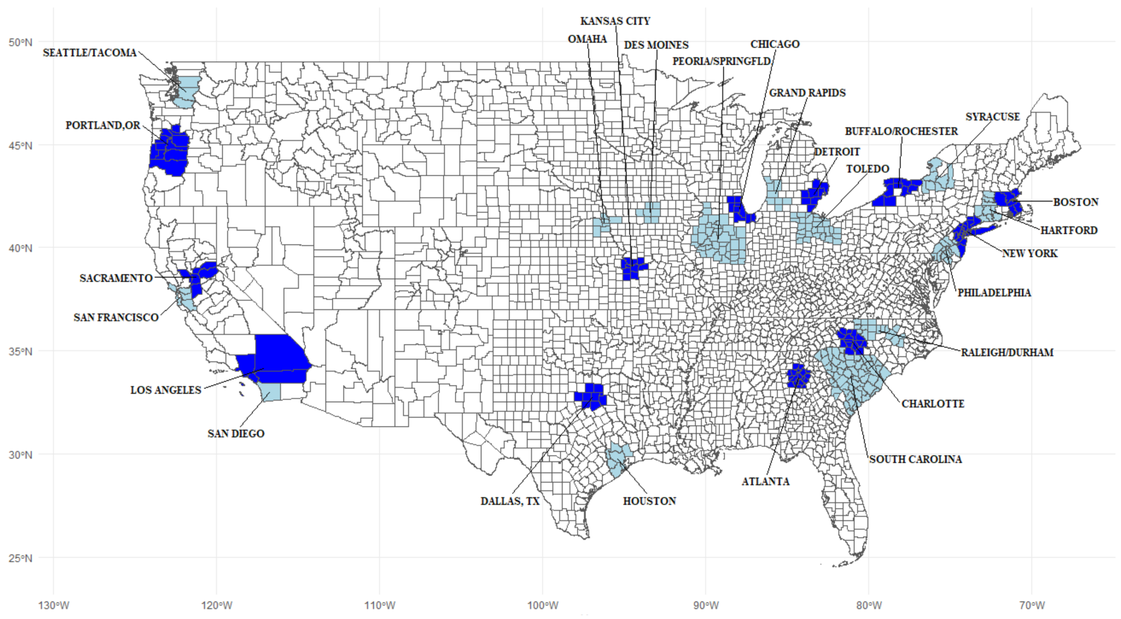

Figure 1. 26 Paired Neighboring Markets across Major US Regions.

Results

- Time Variation in Own-price Elasticity: Figure 2, cleaned (91% out of raw).
- Time Variation in Implied Price-cost Markup: Figure 3, monopolistic pricing.
- Economic and Market Factors that Drive Elasticity Changes: Table 1, see data and descriptions about the proposed factors in our paper (available at SSRN).

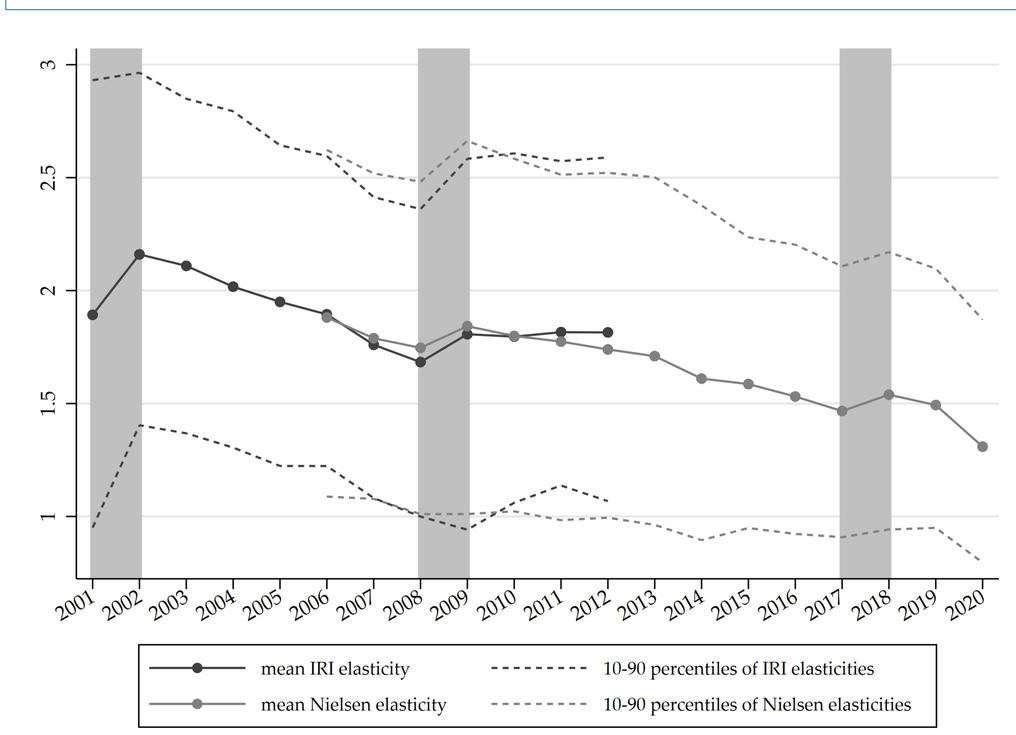

Figure 2. Time Variation in Average Store-level Own-price Elasticity Estimates.

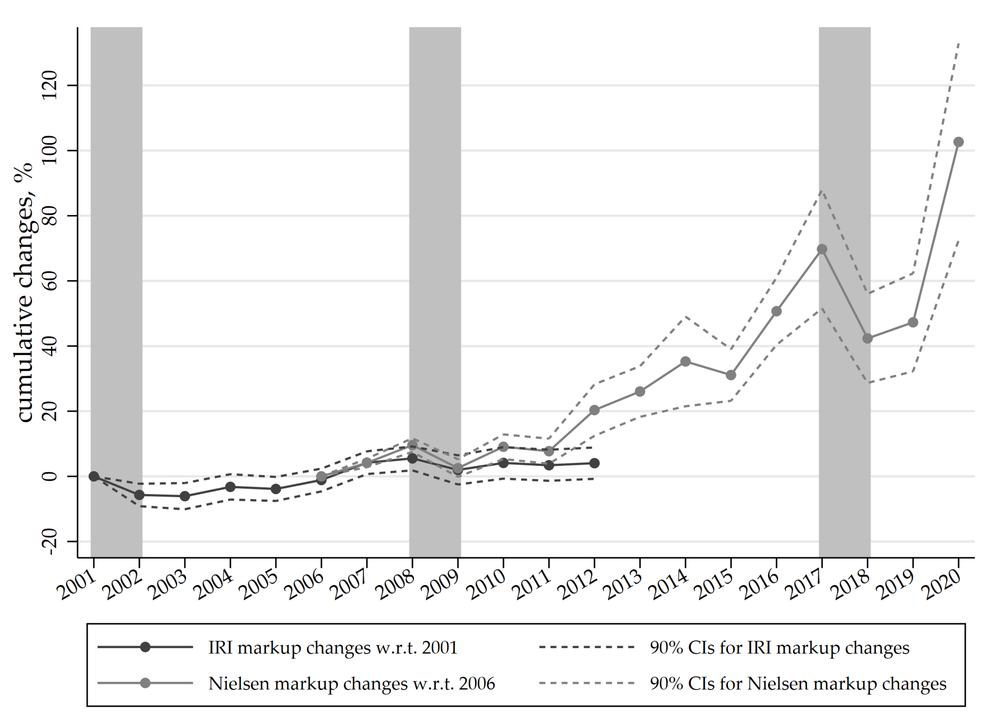

Figure 3. Time Variation in Nationwide Store-level Price-cost Markup Rates.

Table 1. Market-year Factors and Market-category-year Elasticities.

	dependent variable: *elasticity*	
explanatory variables (*ln*)	main	balanced
real GDP per capita	-0.82***	-0.90***
	(0.15)	(0.14)
unemployment rate	1.49	1.49
	(1.22)	(1.00)
economic dependency ratio	0.31	-0.02
	(0.33)	(0.25)
cumulative change in real housing price	0.38***	0.30***
	(0.11)	(0.09)
population	-1.11***	-0.74***
	(0.42)	(0.26)
No. of UPCs per category (scanner data)	0.10	0.02***
	(0.12)	(0.00)
No. of grocery establishments per 10k residents	-0.05	-0.13
	(0.14)	(0.10)
No. of employees per grocery establishments	-0.00	0.01
	(0.02)	(0.02)
fixed effects of year and market/market-category	YES	YES
$adj.R^2$	0.340	0.407
N	25,062	19,746

Note: Standard errors, clustered at the market level, are in parentheses. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

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2. Bronnenberg, B.J., Kruger, M.W. and Mela, C.F., 2008. Database paper—The IRI marketing data set. Marketing science, 27(4), pp.745-748.