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.

\[ \log(q_{s,t,w}) = -e_{m,t,l} \log(p_{s,t,w}) + \text{store}_s + \text{product}_p + \text{week}_w + \varepsilon_{s,t,w} \]

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.

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).

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

<table>
<thead>
<tr>
<th>explanatory variables (ln)</th>
<th>dependent variable: elasticity</th>
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<tbody>
<tr>
<td>real GDP per capita</td>
<td>0.02*** (0.15)</td>
</tr>
<tr>
<td>unemployment rate</td>
<td>1.49 (1.00)</td>
</tr>
<tr>
<td>economic dependency ratio</td>
<td>0.31 (0.23)</td>
</tr>
<tr>
<td>cumulative change in real housing price</td>
<td>0.36*** (0.11)</td>
</tr>
<tr>
<td>population</td>
<td>-1.11*** (-0.74)</td>
</tr>
<tr>
<td>No. of UPCs per category (scanner data)</td>
<td>0.10 (0.02)</td>
</tr>
<tr>
<td>No. of grocery establishments per 10K residents</td>
<td>-0.05 (-0.13)</td>
</tr>
<tr>
<td>No. of employees per grocery establishments</td>
<td>-0.00 (0.01)</td>
</tr>
<tr>
<td>fixed effects of year and market/market-category</td>
<td>YES</td>
</tr>
</tbody>
</table>

Note: Standard errors, clustered at the market level, are in parentheses.

References


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