EFFECTS OF RETAIL CONCENTRATION ON RETAIL PRICE: THE US DAIRY MARKET

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Introduction

The US food marketing system has undergone structural changes recently such as the rising retail concentration. In the food retailing sector alone, the four largest grocery chains have seen their market shares increase from 16% in 1982 to 36% in 2005 (Hovhannisyan and Bozic, 2013). Rising retail concentration has the potential to reshape the horizontal competitive landscape among food retailers, which carries important welfare implications for the US farmers, processors, consumers.

This study provides an empirical investigation of the relationship between grocery retail concentration and retail dairy prices in the US. Results from a reduced-form empirical framework estimated via panel data techniques indicate that grocery retail concentration has a positive impact on dairy retail prices.

Objective

We employ panel data econometric methods to empirically evaluate the relationship between retail concentration and prices. This rather powerful technique allows us to account for market, retail, and product-level unobserved heterogeneity, which is of great practical value given that lack of information is an intrinsic characteristic of economic environments. Specifically, this approach obviates the need for imposing non-testable assumptions concerning the behavioral aspects of economic agents and market competition.

Data

We use a large store-level panel data provided by the Information Resources Inc. Infoscan data from 2008 through 2011. These are product-level, weekly store panel data. We confine our analysis to dairy retailing in the US.

Methodology

We adopt a reduced-form framework to empirically evaluate the effects of retail market concentration on retail prices. Market concentration is quantified via a Herfindahl–Hirschman Index (HHI) using two alternative ways, namely retail store-level turnover and selling space. We obtain the HHI estimates for the city/metropolitan areas in the US, which represent our catchment areas.

Denote $p_{i,j}^{y,m}$ - price of product i in store j in month m of year y,
$\theta(i)$ - product type (national brand or store brand),
$\varphi(i)$ - type of store (supermarket, convenience etc.),
$c(j)$ - denotes the city where store j is located.

We adopt the following reduced-form price equation as our base specification:

$$(1) \quad p_{i,j}^{y,m} = \delta^y HHI_{c(j)}^y + \lambda^y X_{c(j)}^y + \alpha_i^{y,m} + \beta_{\theta(i)}^y + \gamma_{\varphi(i)}^y + \varepsilon_{i,j}^{y,m}$$

where
$HHI_{c(j)}^y$ - index of market concentration,
$X_{c(j)}^y$ - market-specific characteristics other than concentration (e.g., population and income),
$\alpha_i^{y,m}$ - product x year x month dummies,

$\beta_{\theta(i)}^y, \gamma_{\varphi(i)}^y$ - product and store-type effects, respectively.

We compute HHI based on store sales area using Nielsen TDLinx data. This is done to avoid potential endogeneity associated with turnover-based HHI.

We also estimate a more conservative within estimator via inclusion of store fixed effects, which account for time-invariant unobserved store characteristics such as quality of management, network effects, and location). We also include dummy variables accounting for interaction effects among product and store types. This recognizes the fact that certain items may be priced differently depending on store type (e.g., convenience store vs. discount store).

Results

Our findings indicate that retail concentration affects dairy retail prices positively. As regards the magnitude of the effect, 1% rise in retail concentration is found to result in 0.04% price increase in 2008 with the effect diminishing across years to only 0.014% in 2011.

Figure 1. Cross-Section and Within Estimates Using Store Space-Based HHI Index for Concentration

Controls	Cross-section				Within			
	2008	2009	2010	2011	2008	2009	2010	2011
Convenience	0.337	0.425	0.419	0.402	Ref.	0.093	0.078	0.059
	0.002	0.002	0.002	0.002		0.002	0.002	0.002
Dollar	0.094	0.129	0.134	0.136	Ref.	0.033	0.031	0.033
	0.002	0.002	0.002	0.002		0.002	0.002	0.002
Drug	0.061	0.100	0.092	0.088	Ref.	0.049	0.039	0.032
	0.002	0.002	0.002	0.002		0.002	0.002	0.002
Grocery	0.072	0.063	0.049	0.070	Ref.	0.001	-0.019	0.003
	0.002	0.002	0.002	0.002		0.002	0.002	0.002
Mass merchandiser	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
HHI	0.040	0.021	0.020	0.014	0.042	0.034	0.032	0.031
	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Population	0.015	0.018	0.020	0.019	Ref.	-0.001	-0.002	0.001
	0.003	0.004	0.004	0.004		0.001	0.001	0.001
Income	0.081	0.083	0.092	0.090	Ref.	0.004	0.012	0.017
	0.002	0.002	0.002	0.002		0.001	0.001	0.001
Additional controls	(Product x year x month)				(Product x year, year x month, product x store type, store effect)			
No. observations	281,623	297,306	300,172	311,757	281,623	297,306	300,172	311,757

Conclusions

Results from a reduced-from empirical framework estimated via panel data techniques indicate that grocery retail concentration affects dairy retail prices favorably. This central result is robust to the way that retail concentration is measured and is consistent with the empirical evidence from both the US and oversees.