Driving Factors of Retail Price Variation

Chenguang Li *
University College Dublin

Richard Volpe
ERS, United States Department of Agriculture


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Abstract

This study explores the strategic pricing behaviors across retail chains for produce products. We adopt a Panel-VAR model to identify the driving factors of retail price variation and find that retail price history, competition, product cost are among the key drivers of retail price change. Forecast Error Variance Decomposition (FEVD) is used to quantify the relative impact of driving factors to retail price changes and show how they affect prices differently across retail chains. We also find that higher responsiveness to competition may indicate superior management ability in price setting that associates with better profitability in practice.

Research Questions

What are the driving factors behind retail price change? How do they influence retail price variation across different chains?

Literature Reviews

The intertemporal discrimination model views retail price variation as mean of retailer price discrimination (Conlisk, Gerstner and Sobel, 1984; Sobel, 1991; Banks and Moorhuy, 1999; Pesendorfer, 2003).

The static model of retailer competition (Varian, 1988) argued the informed consumers purchase from the retailer offering the lowest price, but the uninformed consumers do not compare prices when doing their shopping. Varian shows that in equilibrium, all retailers randomly choose prices every period.

The multi-product retailer model emphasizes the multiproduct characteristics of grocery retailers, and show that goods with independent demand may have interrelated price by the same retailer (Lal and Matutes, 1994; Hooken and Reiffen, 2001; Braido, 2006). The decision of sales may be affected by product popularity, inventory capacity, or time periods since last sale (Warren and Barsky, 1995; Aguirregabiria, 1999; Pesendorfer, 2000; Chevalier, Kashyap, & Rossi, 2000).

Menu cost may form a barrier of price changes at the micro level (Levy et al., 1997).

Marketing literature (Nagle and Holden, 1994; Levy, et al. 1997; Nij, Srinivasan, & Pauwels, 2007) offer some practical insights on the determination of price change at retail level. The price decision in practice is based on information such as: wholesale price changes, promotions, latest store information on product, which may include last week’s sale and prices; competitors’ prices and promotions; and menu costs.

Characterization of Retail Pricing Behaviors

- **Markup pricing**: Retailers who utilize markup pricing strategy set the markup fixed or fixed proportional to the acquisition costs.
- **Fixed pricing**: The retail price is fixed at a certain level regardless the fluctuation of farm price.
- **Periodic sale**: The retail price stays at a certain level for extended periods, interrupted by temporary price discounts, after which the price returns to its original level.
- **High-low pricing**: Price fluctuates frequently among different high and low levels. The mean of the prices may be relatively higher than fixed price, but the actual price varies constantly.

Four Steps of Estimation:

- Panel unit root test using method developed by Levin, / Lin and Chu (2002) to rule out non-stationary time series problem.
- Panel-VAR identifies the driving factors of retail price variation. (The specified estimation is system GMM.)
- Impulse response functions and forecast error variance decomposition (FEVD) are used to quantify the relative impact of driving factors on price change (Lütkepohl, 2005; Love, 2006).
- Link retailers’ different pricing behaviors to their relative market share and profitability to draw implication on marketing performance.

Results

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<thead>
<tr>
<th>Relative Market Share vs. Relative Profit</th>
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<tbody>
<tr>
<td>Chain_1</td>
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<td>Chain_8</td>
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<td>Chain_12</td>
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<td>Chain_14</td>
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Table 4: Relative Market Share vs. Relative Profit

Conclusion

- High level of price dispersion found at retail market for produce products.
- Chains exhibit different types of retail pricing strategies.
- Panel-VAR model used to identify the driving factors of retail price variation, including retail price history, competition, and farm price.
- Driving factors have different impacts to different types of retailers. Pricing decisions reflect different marketing emphasis and management considerations.
- Higher responsiveness to competition may indicate superior management ability that translates into higher profitability.