Promotion Pass-Through and Consumer Search: An Empirical Analysis

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Background & Motivation

Retail price pass-through is one of the most important issues facing manufacturers of consumer packaged goods. Manufacturers would prefer retailers to completely pass-through trade deals to consumers. At the same time, they would rather retailers not pass-through wholesale price increases to consumers. Asymmetric pass-through between rising and falling wholesale prices (e.g. "rockets and feathers") is commonly thought to result from retailers exercise of market power, while recent theoretical work argues that this conventional phenomenon may instead be due to consumer search behaviors and retailers rational responses.

Most empirical literature consider retailer response to negative wholesale price change (i.e. trade promotions) and not upward movements in wholesale prices as well. In this study, we offer a treatment of pass-through that is relevant to both wholesale price discounts and price increases.

Objectives

Our objective is to explain why the pass-through rate for trade promotions and increased wholesale prices tend to be generally less than complete.

We test whether incomplete pass-through is due to consumer search behavior or market power

We apply our test to wholesale and retail breakfast cereal price data for five retailers in the Los Angeles MSA market over a 156 weeks.

Modeling Approach

We follow Hansen's (1999) Panel Threshold Error Correction Model (TECM):

$$\Delta p_{i,t}^{r} = \begin{cases} \alpha_{0,i} + \theta^{(1)}(N_t^r, \eta_t^r)\cdot ECT_{i,t-1}^{r} + \alpha_1 \Delta p_{i,t-1}^{r} + \alpha_2 \Delta w_{i,t}^{r} + \alpha_3 \Delta w_{i,t-1}^{r} + \varepsilon_{i,t}, \\ \quad (ECT_{i,t-1}^{r} \le \gamma_1) \\ \alpha_{0,i} + \theta^{(2)}(N_t^r, \eta_t^r)\cdot ECT_{i,t-1}^{r} + \alpha_1 \Delta p_{i,t-1}^{r} + \alpha_2 \Delta w_{i,t}^{r} + \alpha_3 \Delta w_{i,t-1}^{r} + \varepsilon_{i,t}, \\ \quad (\gamma_1 < ECT_{i,t-1}^{r} \le \gamma_2) \\ \alpha_{0,i} + \theta^{(3)}(N_t^r, \eta_t^r)\cdot ECT_{i,t-1}^{r} + \alpha_1 \Delta p_{i,t-1}^{r} + \alpha_2 \Delta w_{i,t}^{r} + \alpha_3 \Delta w_{i,t-1}^{r} + \varepsilon_{i,t}, \\ \quad (ECT_{i,t-1}^{r} > \gamma_2) \end{cases}$$

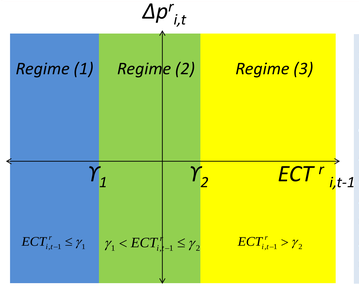
where $\theta^{(1)} = \phi_{11} N_t^r + \phi_{12}\eta_{i,t}^r$, $\theta^{(2)} = \phi_{21} N_t^r + \phi_{22}\eta_{i,t}^r$, $\theta^{(3)} = \phi_{31} N_t^r + \phi_{32}\eta_{i,t}^r$

- i: brand, t: week, and r: retailer
- p: retail price, w : wholesale price
- N: number of stock-keeping units (SKUs) of ready-to-eat breakfast cereal (Consumer Search Costs)
- η: the absolute value of the own-price elasticity of demand (Market Power)
- Υ_1 & Υ_2: the threshold parameters

Short-run asymmetries can be incorporated as follows

$$\ldots \alpha_2^{+}\Delta^{+} w_{i,t}^{r} + \alpha_2^{-}\Delta^{-} w_{i,t}^{r} + \alpha_3^{+}\Delta^{+} w_{i,t-1}^{r} + \alpha_3^{-}\Delta^{-} w_{i,t-1}^{r}$$

Regime-dependant Pass-through Rates



From the co-integration relationship

$$ECT_{i,t}^{r} = e_{i,t}^{r} = p_{i,t}^{r} - \beta_0 - \beta_1 w_{i,t}^{r}$$

Therefore,

Regime (1) : retail prices are relatively low

Regime (3) : retail prices are relatively high

Regime (2) : no-adjustment range

Data and Time Series Properties

- Weekly price data (03/01/2007-03/31/2010)
- Five retail companies in LA
- Retail prices from INFOSCAN
- Wholesale prices from PROMODATA
- Ten primary brands
- **Hadri (2000)'s Panel Unit-Root Test**

⟹ For the variables in levels, some panels contain unit roots; For the variables in first difference, all panels follow an *I(0)* process

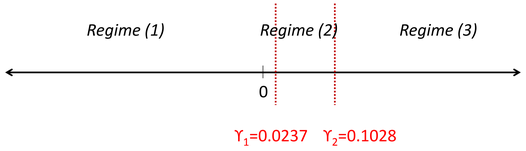
- **Pedroni (2000)'s Panel Co-integration Test**

⟹ There is a long-run relationship between retail and wholesale prices for each brand and retailers

- **Wholesale prices are weakly exogenous**

Threshold Estimates and Hypothesis Tests

# of Thresholds	Estimated Thresholds	LR Statistic	Bootstrap P-Value
1	0.1028	23.39	0.023
2	0.0237 0.1028	23.40	0.047
3	0.0237 0.0354 0.1028	4.59	0.767



Symmetric & Asymmetric TECM Estimates

	TECM	ATECM
$ECT^{(1)}_{t-1}$	1.3112**	1.3113**
$ECT^{(2)}_{t-1}$	-3.4576**	-3.4586**
$ECT^{(3)}_{t-1}$	-3.4087**	-3.4079**
$N^r_t \cdot ECT^{(1)}_{t-1}$	-1.3145**	-1.3132**
$N^r_t \cdot ECT^{(2)}_{t-1}$	0.7244**	0.7230**
$N^r_t \cdot ECT^{(3)}_{t-1}$	1.7040	1.7002
$\eta^r_t \cdot ECT^{(1)}_{t-1}$	-1.1344**	-1.1345**
$\eta^r_t \cdot ECT^{(2)}_{t-1}$	1.4851**	1.4856**
$\eta^r_t \cdot ECT^{(3)}_{t-1}$	1.1031**	1.1033**
$d\Delta p^r_{t-1}/dECT^{(1)}_{t-1}$	-0.8376	-0.8375
$d\Delta p^r_{t-1}/dECT^{(2)}_{t-1}$	-0.8923	-0.8927
$d\Delta p^r_{t-1}/dECT^{(3)}_{t-1}$	-0.9131	-0.9130
LLF	16,336.89	16,337.07
R^2	0.65	0.65

Conclusions

1. Our results that are contrary to the conventional wisdom.
   - *Market power cause retail prices to fall quickly and rise slowly*
   - *Consumer search costs cause retail prices to rise quickly and fall slowly precisely the "rockets and feathers" phenomenon*
2. Deal pass-through can be expected to be higher among more powerful retailers, and those that offer a low search-cost environment.
3. Manufacturers and wholesalers interested in improving pass-through performance would be well served to consider ways in which they can reduce consumer search costs.