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Natural or Organic: An Empirical Analysis of Ready-To-Eat Cereal Market

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INTRODUCTION

As negative effects of the intensive use of synthetic chemicals in our industrial agriculture come to the public's attention, food demand began to shift toward organic products. While the organic products are taking market share from conventional products, their own market is undermined by the category called "natural".

- Organic label is regulated by the United States Department of Agriculture (USDA).
- No legal requirements are imposed for using the term "natural" except for meat and poultry, which means "bad" ingredients prohibited from organic products is allowed in "natural" foods.

Consumers' misperception and lack of regulation on "natural" labeling provide an opportunity for firms to cash in on consumers who desire for healthy and ecological sustainability by claiming their conventional products as "natural", and consumers' welfare might be consequentially lessened.

OBJECTIVE

This study focuses on the U.S. ready-to-eat (RTE) cereal market. Specifically, I seek to examine:

- U.S. consumers' preferences for natural and organic RTE cereals.
- Manufacturers' price-cost margins for natural and organic cereals.

Organic label and "natural" claim



METHOD

Data:

- Obtained from Nielsen
- Market level data including 3 Designated Market Areas (DMAs): New York, Boston, and Hartford
- Sales of 9 organic cereal brands and 8 natural brands between 2008 and 2012

Demand: Random Coefficient Logit Model

The utility of consumer i from purchasing product j in market t is given by:

$$U_{ijt} = X_{jt}\beta_i + \xi_{jt} + \varepsilon_{ijt}$$

where X_{jt} is a vector of observed product characteristics, β_i represents individual-specific parameter, ξ_{jt} is the unobserved product characteristics, and ε_{ijt} is a type I extreme value distributed error term. The random coefficient is given by:

$$\beta_i = \beta + \sigma v_i$$

where β is the mean preference, v_i represents heterogeneity across consumers, and σ is a parameter to be estimated.

			Summary Statistics						
	Firm	Brand	Calories (/oz)	Sugar (g/oz)	Saturated Fat (g/oz)	Sodium (mg/oz)	Fiber (g/oz)	Price (\$/oz)	Market Share (%)
Organic	GENERAL MILLS	CASCADIAN FARM HONEY NUT O'S	103	7	0	160	3	0.3855063	0.08
	GENERAL MILLS	CASCADIAN FARM KDS CINAMON CRN	110	8	0	105	3	0.379474	0.10
	GENERAL MILLS	CASCADIAN FARM RAISIN BRAN	100	8	0	140	3	0.289858	0.07
	KELLOGG COMPANY	KASHI CINNAMON HARVEST	95	5	0	0	3	0.2133207	0.46
	KELLOGG COMPANY	KASHI ORGANIC PROMISE ATMN WHT	100	4	0	0	3	0.2151259	0.36
	KELLOGG COMPANY	KASHI ORGANIC PROMISE STBY FLD	110	8	0	180	1	0.3598466	0.20
	NATURE S PATH FOODS INC.	NATURE'S PATH FLAX PLUS	104	4	0	128	5	0.2826583	0.10
	NATURE S PATH FOODS INC.	NATURE'S PATH HERITAGE MLTGN	113	3	0	108	3	0.3208525	0.05
	BRIGHT FOOD GROUP CO LTD	WEETABIX	96	2	0	0	3	0.3668026	0.06
Natural	KELLOGG COMPANY	KASHI GO LEAN	80	3	0	50	6	0.2410579	0.65
	KELLOGG COMPANY	KASHI GO LEAN CRISP!	100	6	0	70	4	0.2359869	0.52
	KELLOGG COMPANY	KASHI GO LEAN CRUNCH!	102	8	0	50	4	0.2288534	1.39
	BRIGHT FOOD GROUP CO LTD	BARBARA'S MG SHREDDED SPOONFUL	113	1	0	190	4	0.2765279	0.10
	BRIGHT FOOD GROUP CO LTD	BARBARA'S PUFFINS	85	5	0	180	5	0.4039078	0.19
	BRIGHT FOOD GROUP CO LTD	BARBARA'S PUFFINS CRUNCHY CORN	113	7	0	75	3	0.3448912	0.28
	BRIGHT FOOD GROUP CO LTD	BARBARA'S SHREDDED OATS	108	6	1	130	2	0.2981075	0.05

Supply side:

By assuming a pure-strategy Bertrand-Nash equilibrium, the price-cost margins can be calculated from a set of first order conditions:

$$S_j(p) + \sum_{r \in \psi_f} (p_r - mc_r) \frac{\partial S_r(p)}{\partial p_j} = 0$$

where $S_j(p)$ is the market share of product j , p_r is the price of product r , mc_r represents the marginal cost of product r , and ψ_f is the set of products produced by firm f .

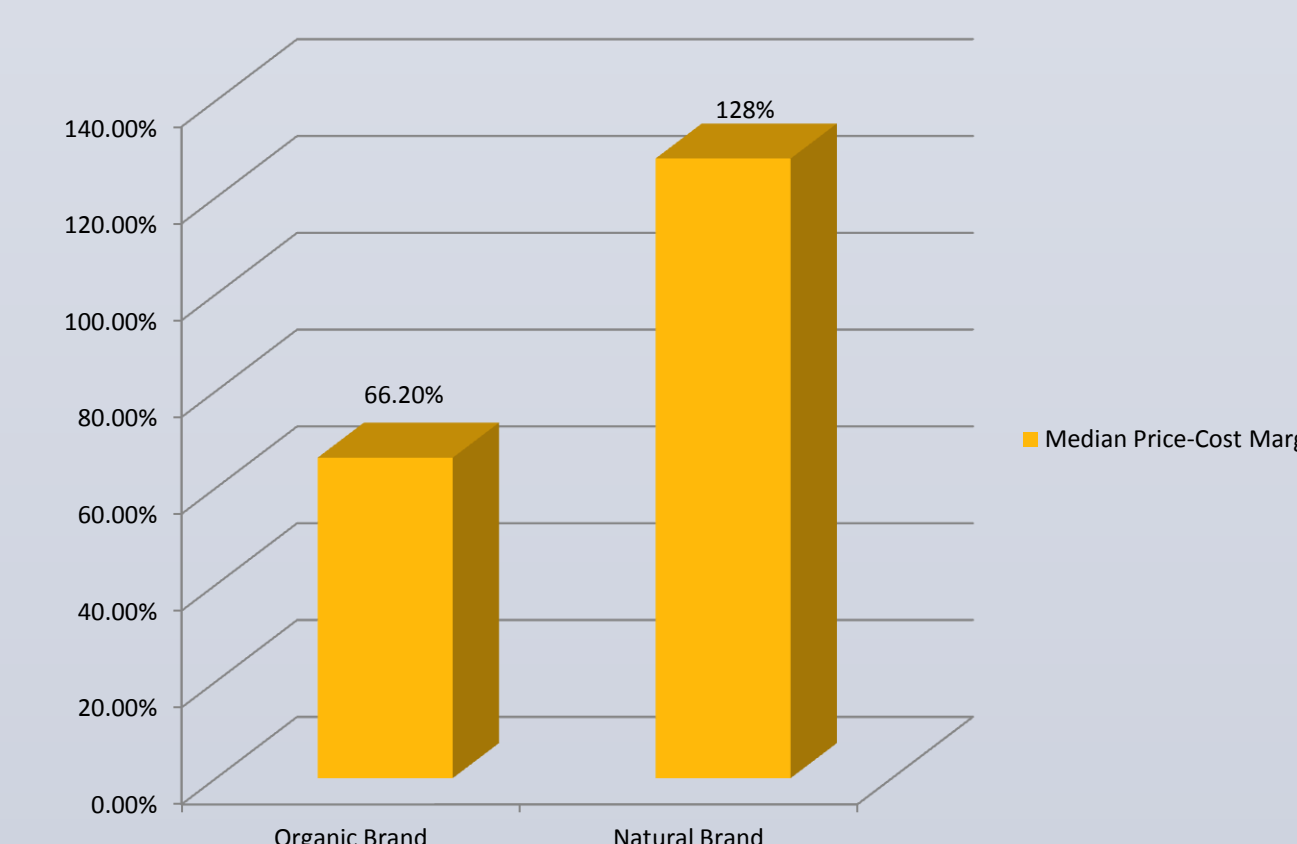
RESULTS

Vairable	Demand Parameters	
	Mean	Deviation
Price	-3.194* (0.072)	0.904* (0.145)
Organic	-0.560* (0.044)	1.926* (0.092)
Calories	5.564* (0.109)	2.389* (0.016)

Sugar	3.403* (0.028)	1.408* (0.036)
Fat	-1.023* (0.167)	1.038* (0.399)
Sodium	-2.573* (0.085)	2.531* (0.058)
Fiber	-3.660* (0.083)	2.640* (0.029)
Constant	-14.863* (0.223)	1.021* (0.020)
DMA Fixed Effects		Yes
Season Fixed Effects		Yes

Standard errors in parentheses. * significant at 0.05 level

Median Price-Cost Margins



CONCLUSIONS

- Consumers' preferences toward RTE cereal characteristics are heterogeneous.
- Consumers are willing to pay more for natural cereals than organic cereals conditional on other characteristics.
- Median price-cost margin for natural cereals (128%) is much larger than for organic cereals (66.2%).

Firms make huge profit from their "natural" claim products, and consumers prefer natural products which may not be as healthful as organic products.

REFERENCES

- Berry, S., J. Levinsohn, and A. Pakes. 1995. "Automobile Prices In Market Equilibrium." *Econometrica* 63(1995):841-889.
- Dube, Jean-Pierre, Jeremy Fox, and Che-Lin Su. 2011. "Improving the Numerical Performance of BLP Static and Dynamic Discrete Choice Random Coefficients Demand Estimation," University of Michigan, Department of Economics working paper.
- Nevo, A. 2000. "A Practitioner's Guide to Estimation of Random-Coefficients Logit Models of Demand," *Journal of Economics & Management Strategy*, 9(4), 513-548.
- Nevo, A. 2001. "Measuring market power in the ready-to-eat cereal industry," *Econometrica*, 69(2), 307-342.
- The Cornucopia Institute. 2011. Retrieved from <http://www.cornucopia.org/2011/10/natural-vs-organic-cereal/> on 01.10.2013.

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