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**Measuring Price Sensitivity Differences for Inner-City and Suburban Consumers: An
Analysis of Breakfast Cereals with Supermarket Scanner Data**

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Introduction

An extended period of slow growth in the U.S. economy has prompted many food manufacturers to adopt creative methods for marketing their products. Manufacturers, recognizing that consumers are becoming more and more cost-conscious, are offering supermarkets relatively stable prices through smaller or revised package sizes (Hirsch, 2008; Stock, 2011). Such marketing efforts at the retail level are communicated to consumers only through in-store inspection of products before purchase. Utility is therefore best maximized for a given purchase by exploring several products within a given product category. For example, purchasers of ready-to-eat (RTE) breakfast cereals are likely to find it advantageous to consider many brands of cereal as potential substitutes or complements to a specific brand. In essence, the relevant choice set of breakfast cereals for a shopper within a supermarket is the entire breakfast cereal category. Hence, this study examines the purchase behavior of shoppers for every brand of RTE breakfast cereals sold in four supermarkets.

Some recent breakfast cereal studies have emphasized the impacts of industry characteristics on product pricing and industry profitability (Price, 2000; Nevo, 2001). Factors such as high concentration, large price-cost margins, large advertising-to-sales ratios, rapid infusion of coupons and expanded product proliferation have been identified as key determinants of sales for RTE breakfast cereals (Price, 2000; Nevo, 2001). A more recent study has focused on the role that supermarkets play in the pricing and marketing of RTE breakfast cereals (Chidmi and Lopez, 2007). A key finding of this study is that consumers are highly price sensitive, but they display considerable brand and store loyalty. Building on this concept of store loyalty, this study examines the purchasing patterns of inner-city and suburban shoppers within specified stores for a single supermarket chain. This chain offers a total of 360 brands and/or product sizes

of cereals and a key objective of this study is to determine if inner-city shoppers, mainly lower-income shoppers, make purchase decisions that are significantly different from those of suburban shoppers, mainly higher-income shoppers.

Industry Characteristics and Consumer Demographics

Ready-to-eat breakfast cereals are relevant for this study because they are consumed by almost all U.S. households (93%) and they have a retail value of more than \$10.8 billion (Gallagher, 2009). Consumption of RTE cereals grew from 8.2 pounds per capita in 1970 to 14.8 pounds in 1994 (Price, 2000). Following this 1994 per capita consumption peak, consumption declined for a period, but has since rebounded for an annual growth rate of .3 percent during 2003-2008 (Euromonitor, 2009). Some of this growth has been sparked by private label cereals, brands that grew 12.8% during 2007-2009 and now represent 12.3% of RTE sales (Gallagher, 2009).

A recent study suggests that close to half of American consumers are fairly loyal to their favorite brand, while other consumers are willing to trade down to lower-priced national brands and private labels (Gallagher, 2009). As consumers trade down, it seems reasonable to hypothesize that they will attempt to select products with attributes that closely resemble those in their most preferred choice set. For this study, attributes and preferences are assumed to be highly correlated with product sales. That is, as preferred attributes among a product group increase, product sales for that group increase. Indeed product sales are assumed to represent revealed consumer preferences. To this end, this study groups brands of cereals into classes based on sales. Specifically, sales data are used to identify the top 24 national brands as well as the top 24 private label brands (national brands are listed in order of market share; private-labels

are not listed to avoid revealing the identity of the retailer).¹ National brands are identified from AC Nielsen data and private label brands are identified from a set of data provided to this researcher by the supermarket chain. These private-label data sales cover more than 140 stores over a three-state area: Ohio, Michigan and West Virginia. For estimation purposes, these 24 brands are then grouped as follows: top 6, second 6, third 6 and fourth 6 national brands; top 6, second 6, third 6 and fourth 6 private-label brands. Additional classes consist of all other cereals made by well-known manufacturers: General Mills; Kelloggs; Quaker Oats; Post; other national/regional brands; and other private-label brands. In summary, empirical estimates are derived for 14 classes of cereals.

Data and Model Specification

A 104-week data set covering calendar years 2006-2007 is used to empirically estimate price-sensitivity measures for inner-city and suburban consumers. These consumers patronize four supermarkets in the Columbus, Ohio, metropolitan area: two inner-city and two suburban stores. All of these stores are part of a single supermarket chain and geographically, they are within a single pricing zone -- meaning identical prices for cereals across all stores. As a general rule, residents surrounding the two inner-city stores have lower incomes and lower levels of education than those surrounding the two suburban stores. As previously mentioned, 360 brands and/or product sizes of cereals are sold in these supermarkets. Hence, to make the data manageable, cereals are grouped into the previously identified classes. For these classes, the following descriptive statistics, as shown in Table 1, are revealed: (1) suburban shoppers purchase larger shares of national brands from the top 6 and second 6 classes than inner-city

¹ Cheerios, Honey Bunches, Special K, Raisin Brans, Oat Life, Frosted Mini Wheats, Cinnamon Toast Crunch, Frosted Flakes, Lucky Charms, Cap'n Crunch, Rice Krispies, Fruity Pebbles, Fruit Loops, Fiber One, Apple Jacks, Corn Flakes, Shredded Wheat, Trix, Cocoa Puffs, Kix, Cookie Crisp, Golden Crisp, Cocoa Pebbles, Grape Nut Flakes.

shoppers (33.1% and 13.2% respectively vs. 30.7% and 12.7%); (2) inner-city shoppers purchase larger shares of private-label brands from all four classes: top 6, second 6, third 6 and fourth 6; (3) for inner-city shoppers, shares range from 6.7% for the top 6 to 2.0% for the fourth 6; (4) for suburban shoppers, these shares range from 4.4% to 1.8%; and (5) inner-city shoppers pay lower prices than suburban shoppers for all but two classes of cereals: class 4 national brands and all other national/regional brands. These outcomes could reflect differences in opportunity cost of time as well as differences in product preferences among classes.

Model Development

A double-log seemingly unrelated regression model is often used to estimate demand elasticities for food products involving supermarket scanner data (Capps, 1989). For this study, this approach would provide a unique set of own-price and cross-price elasticities for each store, making comparisons across four stores somewhat difficult. To minimize problems of comparison, this study uses a time series cross-section model (TSCS). Pindyck and Rubinfeld (1998) have shown that this approach is most appropriate for data involving time and space. Several model specifications are possible, but the error components model has been shown to be the most robust (Fuller and Battese, 1974). The general form of this model is:

$$(1) \quad Y_{qr} = \sum_{s=1}^v X_{qrs} \beta_s + \mu_{qr} \quad q = 1, 2, \dots, N; \quad r = 1, 2, \dots, T$$

where N is the number of cross-sections, and T is the length of a time-series for each cross-section.

Four cross-sections and 104 observations per cross-section are included in the specified model for this study. Fourteen equations are specified and estimated using the time series cross-

section regression (TSCSREG) procedure in SAS. The equations and included variables are specified as follows:

$$(2) \quad Q_{ikt} = f(p_{ikt}, p_{jkt}^s, p_{mkt}, SDUM_{kt}, TEXP_{kt}, TEXP_{kt}^s, PROM_{ikt}),$$

where Q_{ikt} is total ounces of class i for store k in week t ; $i = 1, \dots, 14$; $k = 1, \dots, 4$; $t = 1, \dots, 104$; p_{ikt} is a weighted-average price of class i for store k in week t ; p_{jkt}^s represents weighted-average prices for competing classes for store k in week t ; p_{mkt} is identical to p_{ikt} for inner-city stores 3 and 4, but 0 for all other stores (it is intended to capture price elasticity differences for inner-city and suburban shoppers); $SDUM_{kt}$ are zero-one dummy variables intended to capture store differences; $TEXP_{kt}$ represents total expenditures on cereals for store k in week t (intended as a proxy for consumer income); $TEXP_{kt}^s$ is identical to $TEXP_{kt}$ for inner-city stores 3 and 4, but 0 for all other stores (it is intended to capture differences in expenditure elasticities for suburban and inner-city shoppers); and $PROM_{ikt}$ is the number of products in class i within store k that are temporarily reduced in price by 10% or more during week t . Descriptive statistics for dependent and independent variables are provided in Table 2.

Prices are determined by expressing each cereal product as a ratio of all cereals within a given class. Specifically, weighted prices for class i in each time period is:

$$(3) \quad P_i = \sum_j W_{ij} P_{ij}, \text{ where } W_{ij} = (P_{ij} Q_{ij}) / (\sum_j P_{ij} Q_{ij})$$

and j denotes the cereal products in the same class. Because each class of cereals is a potential substitute for, or complement with, other classes of cereals, all classes are included in each equation.

Own-price, cross-price and expenditure elasticities are the primary coefficients of interest in this study. These factors are emphasized because they have the potential for revealing many

insights into consumer behavior. Own-price elasticities measure consumers' price sensitivity toward changes in product prices and these measures are critically important to retailers in the pricing and marketing of their products. For breakfast cereals, inner-city shoppers are hypothesized to show higher levels of price sensitivity for all brands of cereals. This hypothesis stems from the characteristics of inner-city shoppers (lower incomes, lower opportunity cost of time, etc.) and the relative weights they are likely to place on price relative to other factors such as brand and product attributes. Cross-price elasticities, estimated for price increases, are hypothesized to be smaller for inner-city shoppers than for suburban shoppers; this hypothesis stems from the differential impacts that price increases have on real incomes for the two groups. For the econometric model used in this study, differences in cross-price elasticities for inner-city and suburban shoppers cannot be captured, but what can be captured are differences in the magnitude of cross-price elasticities over product space. Specifically, it is hypothesized that cereal products that are closest in product space will have the largest cross-price elasticities (Berry, et al., 1995). For example, the cross-price elasticity between class 1 and class 2 national brands is hypothesized to be larger than the cross-price elasticity between class 1 and class 4 national brands.

Inner-city shoppers are hypothesized to have expenditure elasticities that are larger than those of suburban shoppers because income (expenditure) elasticities for food have been shown to decline with income (Tomek and Robinson, 2003). Temporary price reductions are expected to have positive impacts on sales and this effect is captured with a promotion variable that is hypothesized to be positive and statistically significant. A lagged dependent variable is included to capture habit persistence and this variable is expected to be positive and range between 0 and 1. Finally, the four stores have average weekly sales ranging from \$402,000 to \$751,000 and

these variations in sales are hypothesized to result in store differences. These differences are captured with zero-one dummy variables, with store 1 serving as the base store.

Empirical Results

Table 3 and 4 provide empirical results for the 14 classes of cereals listed in Tables 1 and 2. This discussion will focus mainly on estimated own- and cross-price (Table 4), but other estimated results are shown in Table 3. To give this discussion a proper focus, it is important to emphasize that all elasticities are derived from equations with fairly high R^2 's. One equation, all other national/regional brands, represents a small share (less than 1%) of all cereals and its R^2 is quite low, .45. Indeed this is the only equation for which the own-price elasticity is statistically insignificant for both inner-city and suburban shoppers. Other R^2 values range from .57 to .98, suggesting a high level of explanatory power for the explanatory variables. Sales at the four stores reflect store size as well as shoppers' purchasing behavior and shopping frequency. Dummy variables are included in the model to capture these store effects and most coefficients are statistically insignificant. Store 1 is the base store and most statistically significant coefficients have mathematical signs that are consistent with differences in purchases for inner-city and suburban shoppers.

As shown in Table 4, the top four classes of national brand cereals have fairly large own-price elasticities, confirming high degrees of price sensitivity. Further, inner-city shoppers, as compared to suburban shoppers, are shown to express even higher levels of price sensitivity for these cereals. These differences are smallest for the top 6 brands and largest for the fourth 6. Both suburban and inner-city shoppers show the highest level of price sensitivity for national brands that are designated as the third 6 (-1.78 and -2.36 respectively). Inner-city shoppers show roughly the same level of price sensitivity for the top 6 and fourth 6 classes of national brands (-

1.44 vs. -1.46). By contrast, suburban shoppers show much higher price sensitivity for the top 6 than for the fourth 6 (-1.22 vs. -.83). Among these national brands, both inner-city and suburban shoppers express the second highest level of price sensitivity for the second 6. In short, estimated own-price elasticities suggest that price reductions to stimulate sales are likely to be most effective for the second 6 and third 6, and less effective for the top 6 and fourth 6.

Private-label cereals, on average, are shown to have lower levels of price sensitivity than those estimated for national brands. For suburban shoppers, all of the estimated own-price elasticities for private label are inelastic, suggesting limited opportunities for retailers to use price to stimulate sales. For inner-city shoppers, three of the four own-price elasticities for private labels are close to unitary, while the value for the fourth 6 is elastic, but less elastic than any of the own-price elasticities for national brands. Interestingly, relative differences in own-price elasticities for private label cereals follow the same pattern as those for national brands. That is, differences in own-price elasticities for inner-city and suburban shoppers are smallest for the top 6 brands and largest for the fourth 6. These estimates support the view that highly preferred attributes, as associated with sales, tend to diminish the impact of price for all consumers.

Cereals not grouped in the top four national or private-label classes represent the third set of empirical results in Table 4. All classes of cereals produced by the major manufacturers (General Mills, Quaker, Kelloggs, and Post) are shown to have high levels of price sensitivity, with estimated own-price elasticities comparable in magnitude to those shown for the top four classes of national brands. These brands are not among the top sellers, but each class offers consumers a wider array of choices than the top four classes of national brands. As such, a high level of price sensitivity is reasonable for a larger number of choices. Inner-city shoppers show

much higher levels of price sensitivity for these four classes of cereals. For Quaker Oats cereals, inner-city shoppers express a level of price sensitivity that is more than twice that of suburban shoppers. An inelastic demand, as revealed for suburban shoppers, suggests the presence of some product attributes among this class of Quaker cereals that are highly preferred by these shoppers. By contrast, suburban shoppers express fairly elastic demands for cereals produced by the other three manufacturers. Higher elasticities for inner-city shoppers show the relative importance of price to product attributes for lower-income shoppers.

The final cereal classes are all other national/regional brands that are not produced by the top four cereal manufacturers and all other private label brands that are not included in the top four classes. As Table 1 shows, very few cereals fall into the national/regional class. Indeed the statistically insignificant own-price elasticity for this class of cereal is possibly due to insufficient price variation across a small number of products. By contrast, a large number of cereals fall into the catchall, private label class. Predictably, this class of private labels shows high price sensitivity for all consumers, but slightly higher price sensitivity for inner-city shoppers. Despite this high price sensitivity for both groups of shoppers, table 2 shows that inner-city shoppers pay a lower price per pound for this class of cereals. With private-labels being a supermarket brand, this high level of price sensitivity suggests that the supermarket could easily move products in this class with promotional efforts such as coupons, merchandising and temporary price reductions. Indeed temporary price reductions, as shown in table 3, are quite effective in stimulating sales of this product class.

Income is known to be a key determinant of demand and its proxy, total expenditures on cereals, is shown to be positive and statistically significant for all 14 classes of cereals. A dummy variable was included in the model to capture differences in expenditure elasticities for

inner-city and suburban shoppers, but this variable proved to be statistically insignificant for most classes of cereal. Consequently, the empirical results for this variable are not shown in Table 3. Inner-city shoppers are shown to have higher expenditure elasticities for the second 6 and fourth 6 classes of private label cereals, but lower expenditure elasticities for other national brands of cereals produced by General Mills, Quaker Oats and Post. These estimates suggest that breakfast cereals, as a single food category, command a share of consumers' total income that is too small to reveal significant expenditure differences for inner-city and suburban shoppers.

As expected, most cross-price elasticities show substitute relationships among cereal classes. Estimated elasticities for the leading classes of national and private label cereals tend to support the hypothesis that cereals closest in product space will have the largest cross-price elasticities. The second 6 class of national brands is a stronger substitute (.5413) for the top 6 class of national brands than the third 6 class (.5137) is for the top 6. Similarly, the top 6 class of private label cereals is a stronger substitute (.6381) for the top 6 national brands than they are for the second 6 class (.2246) of national brands. Other cross-price elasticities show that a particular Product A can be a substitute for another Product B without Product B being a substitute for Product A. Similarly, the elasticities show that a particular Product A is often a strong substitute for another Product B, while Product B is a weak substitute for Product A. As examples, the third 6 class of private label cereals is a substitute for the top 6 class of national brands, but the top 6 class of national brands is not a substitute for the third 6 class of private labels.

Additionally, the third 6 class of national brands is shown to be a strong substitute for the top 6 national brands, but the top 6 national brands is a weak substitute for the third 6 national brands. These results reflect differences in product prices and attributes.

Cross-price hypotheses were not advanced for many of the cereal classes because their product space relationships could not be determined. For example, is the all other class of Post cereals closer in product space to all other General Mills cereals or all other Quaker Oats cereals? One observation from the estimated cross-price elasticities is that the leading classes of national brands and private label cereals are more likely to serve as substitutes for other classes produced by major manufacturers. Several examples are provided: third 6 national brands is a substitute for other Quaker Oats cereals, but other Quaker Oats is not a substitute for third 6 national brands; top 6 private label brands is a substitute for other Kelloggs cereals, but other Kelloggs cereals is not a substitute for top 6 private label brands; top 6 private label brands is a substitute for other Post cereals, but other Post cereals is not a substitute for top 6 private label brands; and the second 6 private label cereals is a substitute for other Kelloggs cereals, but other Kelloggs cereals is not a substitute for the second 6 private label cereals.

Extending the discussion of the empirical estimates, it is clear that 12 of 14 estimated own-price elasticities show inner-city shoppers to have higher levels of price sensitivity, results that are consistent with specified hypotheses. Since these estimates are derived from data within a common pricing zone, it seems reasonable to posit that inner-city shoppers can serve to moderate price increases for breakfast cereals. That is, retailers perhaps recognize that across-the-board price increases for cereals would lead to larger reductions in sales in inner-city stores, as compared to suburban stores. Similarly, it seems reasonable to expect a temporary price reduction to give sales a larger boost in inner-city stores. For this study, temporary price reductions are limited to those that are 10% or larger and the impact of these reductions is captured by the number of products promoted during a given week. Results in table 3 show that a one-unit increase in the number of products promoted leads to an average increase of .016

ounces sold across the top four classes of national brands, with the largest effect (.045) realized for the fourth 6. For the top four classes of private label cereals, promotion is statistically insignificant for the first two classes, but, for the last two classes, a promotion effect comparable to that for national brands is realized. Specifically, a one-unit increase in the number of products promoted leads to an average increase of .014 ounces sold. A much larger promotion effect is realized for other national brands, with a unit increase in the number of products promoted leading to an average increase of .065 ounces sold across the four classes. By far, the largest (.185) impact is realized for Quaker Oats cereals.

Lower estimated own-price elasticities for private label cereals seem reasonable, given that private-label cereals are priced lower than national brands. As an illustration, it is plausible that a 10% price increase for private-label cereals will still leave them in a favorable price position as compared to national brands. Despite lower prices for private-label cereals, inner-city shoppers were hypothesized to show higher price sensitivity than suburban shoppers for these brands and this hypothesis is confirmed for all four classes. Further support for the higher price sensitivity of inner-city shoppers is revealed by descriptive statistics that show inner-city shoppers paying lower prices per pound for private-label cereals (table 2). These lower prices could reflect purchases of larger package sizes, a more optimal combination of flavors, more timely shopping, or a combination of these and other factors. Regardless of the factors involved, the descriptive statistics in Table 2 support the empirical estimates that show inner-city shoppers to be more price sensitive toward the purchase of private label cereals.

The estimated own-price elasticities for these cereals have implications for manufacturers and retailers. Instead of temporary price reductions to lower prices for all consumers, manufacturers could possibly increase their revenue by lowering prices in inner-city areas

through indirect promotional efforts, such as coupons. Retailers, in response to incentives from manufacturers to move product, could alter the mix of merchandising, advertising and temporary price reductions across inner-city and suburban stores to achieve both higher sales and higher profits.

Summary and Conclusions

Empirical results for this study show inner-city shoppers to be more price sensitive toward the purchase of most cereal products and these findings are consistent with specified hypotheses. Although price is shown to be an important determinant of price sensitivity, it should be noted that the top and fourth classes of national brands had relatively higher prices, but these classes did not have the highest level of price sensitivity. Indeed the highest level of price sensitivity was shown for the third class of national brands. What these results show is that consumers identify a set of desired characteristics within a product and that price is just one factor among a set of product characteristics that receives weight in a purchase decision.

Table 1. Shares of Purchased Cereals for Suburban and Inner-City Shoppers						
Suburban Stores						
	Store 1		Store 2		AVERAGE	
	Sales Share	Quantity Share	Sales Share	Quantity Share	Sales Share	Quantity Share
Product Class						
National Brands 1	32.97	30.23	33.21	30.54	33.09	30.39
National Brands 2	13.20	13.32	13.28	13.41	13.24	13.36
National Brands 3	6.84	6.67	6.41	6.29	6.63	6.48
National Brands 4	4.50	4.10	4.26	3.88	4.38	3.99
Private Label 1	4.53	7.22	4.35	6.92	4.44	7.07
Private Label 2	1.98	2.83	1.86	2.66	1.92	2.74
Private Label 3	2.29	3.21	2.26	3.16	2.27	3.18
Private Label 4	1.78	2.66	1.74	2.60	1.76	2.63
Other GM	9.10	6.80	9.75	7.36	9.43	7.08
Other Quaker	2.09	2.12	2.39	2.45	2.24	2.29
Other Kelloggs	9.41	7.37	9.54	7.50	9.48	7.43
Other Post	6.27	6.74	5.94	6.55	6.10	6.64
Other N/R Brands	0.65	0.63	0.66	0.60	0.65	0.62
Other Private Labels	4.39	6.10	4.34	6.08	4.36	6.09
Total	100.00	100.00	100.00	100.00	100.00	100.00
Inner-city Stores						
	Store 3		Store 4		AVERAGE	
	Sales Share	Quantity Share	Sales Share	Quantity Share	Sales Share	Quantity Share
Product Class						
National Brands 1	32.07	27.30	29.26	25.18	30.67	26.24
National Brands 2	11.06	11.01	14.36	14.86	12.71	12.93
National Brands 3	5.94	5.76	9.39	9.03	7.67	7.39
National Brands 4	3.50	2.71	5.08	4.05	4.29	3.38
Private Label 1	8.17	12.15	5.63	8.83	6.90	10.49
Private Label 2	3.46	4.81	3.66	5.29	3.56	5.05
Private Label 3	3.82	5.01	2.46	3.44	3.14	4.22
Private Label 4	2.52	3.55	1.91	2.77	2.21	3.16
Other GM	6.72	4.69	7.49	5.34	7.10	5.01
Other Quaker	1.91	1.85	1.48	1.45	1.69	1.65
Other Kelloggs	6.77	5.08	7.65	6.11	7.21	5.59
Other Post	5.36	5.52	6.18	6.65	5.77	6.08
Other N/R Brands	1.26	1.04	0.61	0.59	0.94	0.81
Other Private Labels	7.45	9.55	4.84	6.44	6.14	7.99
Total	100.00	100.00	100.00	100.00	100.00	100.00

Table 2. Weekly Mean Values for Classes of Breakfast Cereals

Quantity (Ounces)	Suburban Stores			Inner-City Stores		
	Store 1	Store 2	AVG.	Store 3	Store 4	AVG.
National Brands 1	11918	18165	15042	6337	13465	9901
National Brands 2	5250	7972	6611	2555	7946	5250
National Brands 3	2628	3738	3183	1336	4828	3082
National Brands 4	1618	2306	1962	628	2166	1397
Private Label 1	2848	4118	3483	2820	4722	3771
Private Label 2	1115	1582	1349	1117	2829	1973
Private Label 3	1267	1877	1572	1162	1838	1500
Private Label 4	1048	1547	1297	823	1481	1152
Other GM	2682	4377	3530	1088	2856	1972
Other Quaker	837	1460	1148	429	777	603
Other Kelloggs	2904	4460	3682	1178	3266	2222
Other Post	2656	3895	3276	1281	3554	2418
Other N/R Brands	250	357	303	241	313	277
Other Private Labels	2405	3618	3011	2217	3442	2829

Prices Paid (Per 16 oz Box)

National Brands 1	3.39	3.40	3.39	3.31	3.39	3.35
National Brands 2	3.03	3.04	3.03	2.80	2.77	2.79
National Brands 3	3.11	3.12	3.12	2.88	2.96	2.92
National Brands 4	3.44	3.45	3.45	3.71	3.72	3.72
Private Label 1	1.83	1.84	1.83	1.80	1.76	1.78
Private Label 2	2.02	2.05	2.04	1.92	1.90	1.91
Private Label 3	2.12	2.12	2.12	2.06	1.99	2.03
Private Label 4	1.97	1.98	1.98	1.91	1.97	1.94
Other GM	3.90	3.87	3.88	3.82	3.86	3.84
Other Quaker	2.96	2.85	2.90	2.79	2.87	2.83
Other Kelloggs	4.08	4.05	4.07	3.92	3.91	3.91
Other Post	2.82	2.77	2.80	2.70	2.67	2.68
Other N/R Brands	3.03	3.13	3.08	2.99	3.22	3.11
Other Private Labels	2.08	2.08	2.08	2.06	2.04	2.05

Table 2 (Cont). Weekly Mean Values for Classes of Breakfast Cereals

Sales (Dollars)	Suburban Stores			Inner-City Stores		
	Store 1	Store 2	AVG.	Store 3	Store 4	AVG.
National Brands 1	2269	3472	2871	1186	2571	1878
National Brands 2	908	1389	1148	409	1262	835
National Brands 3	471	670	571	220	825	522
National Brands 4	310	446	378	129	446	288
Private Label 1	312	455	383	302	494	398
Private Label 2	136	195	166	128	322	225
Private Label 3	158	236	197	141	216	179
Private Label 4	122	182	152	93	168	130
Other GM	626	1019	823	248	658	453
Other Quaker	144	250	197	70	130	100
Other Kelloggs	648	998	823	250	673	461
Other Post	431	621	526	198	543	371
Other N/R Brands	45	69	57	47	53	50
Other Private Labels	302	454	378	275	425	350
Promotion (Number)						
National Brands 1	4.30	4.16	4.23	4.00	4.19	4.10
National Brands 2	2.06	2.10	2.08	1.73	2.07	1.90
National Brands 3	1.54	1.38	1.46	1.35	1.62	1.48
National Brands 4	0.92	0.88	0.90	0.84	0.92	0.88
Private Label 1	1.49	1.47	1.48	1.30	1.82	1.56
Private Label 2	0.99	1.01	1.00	1.07	1.07	1.07
Private Label 3	0.83	0.72	0.77	0.77	0.88	0.83
Private Label 4	0.66	0.68	0.67	0.59	0.70	0.64
Other GM	1.61	1.62	1.61	1.49	1.73	1.61
Other GM	0.34	0.25	0.29	0.26	0.27	0.26
Other Kelloggs	2.48	2.63	2.56	2.07	2.57	2.32
Other Kelloggs	1.59	1.64	1.62	1.42	1.64	1.53
Other N/R Brands	0.37	0.37	0.37	0.33	0.42	0.38
Other Private Labels	2.25	2.53	2.39	1.93	2.32	2.13
Other Variables (Dollars)						
	579224.	750780.	665002.	402192.	581680.	491936.
Store Sales	9	5	7	8	7	8

Table 3. Empirical Results -- Excluding all Own-price and Cross-Price Elasticities

Variable	Dependent Variables ^a										
	National Brands 1		National Brands 2		National Brands 3		National Brands 4				
Constant	-1.5386	0.0012		-4.1311	0.0015		-0.5988	0.5495		-5.1707	<.0001
Promotion	0.0049	0.0038		-0.0004	0.9369		0.0120	0.0759		0.0368	0.0012
Expenditures	1.0737	0.0001		1.0430	0.0001		0.7527	0.0001		1.2211	0.0001
Store 2	-0.0250	0.1965		-0.0303	0.9827		0.0426	0.9321		-0.1546	0.7397
Store 3	0.1194	0.7564		-1.5669	0.3211		-2.4947	0.0106		-0.5014	0.6587
Store 4	0.0138	0.9721		-1.4678	0.3550		-1.9370	0.0496		-0.2990	0.7964
R ²	0.9845			0.7131			0.7041			0.5932	

Variable	Dependent Variables ^a										
	Private Label 1		Private Label 2		Private Label 3		Private Label 4				
Constant	0.8310	0.3431		2.7011	0.0214		-0.2983	0.7594		-0.1178	0.9176
Promotion	-0.0021	0.6044		0.0082	0.2087		0.0116	0.0843		0.0162	0.0715
Expenditures	0.8573	0.0001		0.6072	0.0001		0.8092	0.0001		0.6436	0.0001
Store 2	0.0169	0.9740		0.0932	0.0666		0.0640	0.1314		0.1114	0.0270
Store 3	0.7070	0.4593		-4.9920	<.0001		0.8120	0.4211		-2.8458	0.0153
Store 4	0.4692	0.6274		-5.1021	<.0001		0.5888	0.5687		-2.9384	0.0140
R ²	0.5871			0.8767			0.7855			0.7988	

^aFirst column for each variable contains estimated coefficients; second column, p-values.

Table 3 (Cont). Empirical Results -- Excluding all Own-price and Cross-Price Elasticities

Variable	Dependent Variables ^a							
	Other GM		Other Quaker		Other Kelloggs		Other Post	
Constant	-1.6082	0.1560	-5.1044	0.0022	-4.3369	<.0001	-4.6190	<.0001
Promotion	0.0149	0.0022	0.1860	<.0001	0.0192	<.0001	0.0345	5.1500
Expenditures	1.0329	0.0001	1.3473	0.0001	1.0909	0.0001	1.1887	0.0001
Store 2	0.0605	0.9482	-0.0151	0.9259	-0.0384	0.3550	-0.1482	0.0009
Store 3	0.7015	0.5769	5.0410	0.0009	-1.0931	0.1936	1.7372	0.0484
Store 4	0.4562	0.7138	5.1325	0.0009	-1.0512	0.2228	1.9981	0.0268
R ²	0.6379		0.5958		0.9561		0.9402	

Variable	Dependent Variables ^a			
	Other N/R Brands		Other Private Labels	
Constant	3.9986	0.4234	-0.6377	0.4829
Promotion	0.2042	<.0001	-0.0019	0.3357
Expenditures	0.8108	0.0686	0.7356	0.0001
Store 2	-0.1216	0.7148	0.0968	0.8733
Store 3	2.3213	0.5885	-0.2267	0.8364
Store 4	2.0458	0.6417	-0.4864	0.6620
R ²	0.4573		0.5704	

^aFirst column for each variable contains estimated coefficients; second column, p-values.

	Dependent Variables ^a									
	National Brands 1		National Brands 2		National Brands 3		National Brands 4		Private Label 1	
National Brands 1 ^b	-1.224	0.0001	-0.015	0.7981	0.2089	0.0007	-0.0406	0.4353	0.167	0.1571
National Brands 1 ^c	-0.2221	0.0476								
National Brands 2 ^b	0.5413	0.0007	-1.5549	0.0001	-0.0032	0.9762	-0.0249	0.7898	0.0674	0.7528
National Brands 2 ^c			-0.4088	0.0125						
National Brands 3 ^b	0.5137	0.0032	0.1554	0.2075	-1.7768	0.0001	-0.0486	0.6441	0.2843	0.2595
National Brands 3 ^c					-0.5848	0.0001				
National Brands 4 ^b	-0.3423	0.1242	0.1701	0.2898	-0.0174	0.9102	-0.8327	0.0001	0.3101	0.3225
National Brands 4 ^c							-0.6232	0.0023		
Private Label 1 ^b	0.6381	0.0001	-0.08	0.4289	0.2246	0.0242	0.0086	0.9207	-0.8055	0.0008
Private Label 1 ^c									-0.3456	0.0163
Private Label 2 ^b	0.2873	0.1518	0.0413	0.7768	0.2134	0.1233	0.2338	0.0661	-0.2518	0.4313
Private Label 2 ^c										
Private Label 3 ^b	0.4492	0.0066	0.0159	0.8949	0.0284	0.8028	0.0549	0.6002	-0.3446	0.1953
Private Label 3 ^c										
Private Label 4 ^b	-0.0853	0.6771	0.1128	0.4456	-0.0005	0.9969	0.0741	0.5604	-0.4551	0.1514
Private Label 4 ^c										
Other GM ^b	0.4528	0.0074	0.3357	0.0049	-0.0727	0.537	-0.0074	0.9423	-0.0276	0.9092
Other GM ^c										
Other Quaker ^b	1.0058	0.0016	-0.0021	0.9927	0.2646	0.2276	-0.0412	0.8289	0.0388	0.933
Other Quaker ^c										
Other Kelloggs ^b	-0.3673	0.0452	0.3639	0.0049	-0.283	0.0253	-0.0455	0.6812	0.2382	0.3647
Other Kelloggs ^c										
Other Post ^b	0.0046	0.9828	0.3694	0.0103	-0.3968	0.0065	0.2684	0.0297	-0.0723	0.7956
Other Post ^c										
Other N/R Brands ^b	-1.1138	0.226	-0.578	0.3689	1.2821	0.0435	0.1766	0.7489	0.8364	0.5097
Other N/R Brands ^c										
Other Private Label	0.3034	0.0302	0.0631	0.5378	0.0698	0.4703	0.0129	0.8891	-0.1751	0.4461
Other Private Labels ^c										

^aFirst column for each variable contains estimated elasticities; second column, p-values.

^bIndicates the price elasticity estimate for all consumers.

^cIndicates the price elasticity difference for suburban and inner-city consumers.

Table 4 (Cont). Own-Price and Cross-Price Elasticities for Time Series Cross-Section Regression Model

	Dependent Variables ^a									
	Private Label 2		Private Label 3		Private Label 4		Other GM		Other Quaker	
National Brands 1 ^b	0.0128	0.8865	0.0823	0.2391	-0.0109	0.8733	0.1224	0.0954	0.0551	0.1865
National Brands 1 ^c										
National Brands 2 ^b	-0.0882	0.5892	0.1778	0.155	-0.1833	0.1301	0.0393	0.7641	-0.221	0.0037
National Brands 2 ^c										
National Brands 3 ^b	-0.2458	0.1873	0.0361	0.8051	-0.0569	0.6941	0.1374	0.3266	0.1569	0.0689
National Brands 3 ^c										
National Brands 4 ^b	-0.1346	0.5682	0.1068	0.559	-0.106	0.5503	0.1754	0.3862	0.0772	0.4782
National Brands 4 ^c										
Private Label 1 ^b	-0.0791	0.6129	-0.2122	0.0777	-0.0566	0.6273	0.0632	0.5897	-0.146	0.0374
Private Label 1 ^c										
Private Label 2 ^b	-0.6987	0.0807	-0.5073	0.0064	0.3231	0.0772	0.3955	0.0146	-0.032	0.7602
Private Label 2 ^c	-0.3051	0.0235								
Private Label 3 ^b	0.0861	0.652	-0.6563	0.0168	-0.2563	0.0928	0.1669	0.2085	0.1352	0.1126
Private Label 3 ^c			-0.3431	0.0342						
Private Label 4 ^b	0.2534	0.2671	0.3548	0.0477	-0.6736	0.0053	0.1097	0.5061	-0.1	0.3328
Private Label 4 ^c					-0.6449	0.0167				
Other GM ^b	-0.3423	0.0572	0.2255	0.1108	-0.0368	0.7891	-1.3789	0.0001	-0.005	0.9493
Other GM ^c							-0.5192	0.0054		
Other Quaker ^b	-0.4099	0.227	0.8413	0.0016	0.3745	0.1501	0.6409	0.0124	-0.571	0.0074
Other Quaker ^c									-0.923	0.0001
Other Kelloggs ^b	0.221	0.2605	-0.0895	0.5611	0.0026	0.9858	0.3854	0.0105	-0.099	0.2731
Other Kelloggs ^c										
Other Post ^b	0.192	0.3624	0.3193	0.0508	0.2761	0.0805	0.0906	0.6035	-0.178	0.0708
Other Post ^c										
Other N/R Brands ^b	1.4868	0.1194	-0.9039	0.2235	-0.3951	0.5879	-0.1692	0.8225	0.4881	0.2727
Other N/R Brands ^c										
Other Private Labels ^b	0.2498	0.1212	0.1589	0.2215	0.2218	0.0861	0.3829	0.0007	0.0261	0.7182
Other Private Labels ^c										

^aFirst column for each variable contains estimated elasticities; second column, p-values.

^bIndicates the price elasticity estimate for all consumers.

^cIndicates the price elasticity difference for suburban and inner-city consumers.

	Dependent Variables ^a							
	Other Kelloggs		Other Post		Other N/R Brands		Other Private Labels	
National Brands 1 ^b	0.0699	0.1365	0.0396	0.5033	-0.0283	0.1102	0.077	0.5146
National Brands 1 ^c								
National Brands 2 ^b	0.036	0.6686	-0.0189	0.856	0.0426	0.1807	0.352	0.0984
National Brands 2 ^c								
National Brands 3 ^b	-0.2278	0.014	0.1467	0.1896	0.0701	0.0571	-0.0594	0.8071
National Brands 3 ^c								
National Brands 4 ^b	0.1152	0.342	-0.1809	0.2219	0.1589	0.0006	0.7061	0.0211
National Brands 4 ^c								
Private Label 1 ^b	0.1392	0.0792	0.3383	0.0004	0.0257	0.3927	0.3155	0.1291
Private Label 1 ^c								
Private Label 2 ^b	0.2023	0.086	-0.1398	0.2697	0.0184	0.684	-0.2597	0.4021
Private Label 2 ^c								
Private Label 3 ^b	0.0541	0.5786	0.0161	0.8772	-0.0264	0.4809	0.2944	0.2461
Private Label 3 ^c								
Private Label 4 ^b	0.1691	0.1508	0.1102	0.3999	-0.0169	0.7083	-0.2824	0.3519
Private Label 4 ^c								
Other GM ^b	0.3196	0.0007	0.2905	0.0081	-0.0083	0.8154	0.2662	0.258
Other GM ^c								
Other Quaker ^b	-0.0936	0.591	0.0445	0.8259	-0.0396	0.5722	-0.4501	0.3108
Other Quaker ^c								
Other Kelloggs ^b	-1.1989	0.0001	0.0983	0.4082	-0.0827	0.0323	-0.0037	0.9883
Other Kelloggs ^c	-0.3448	0.0364						
Other Post ^b	-0.0973	0.3767	-1.1324	0.0001	0.0871	0.0367	0.2602	0.3471
Other Post ^c			-0.5982	0.0002				
Other N/R Brands ^b	0.4388	0.3779	0.5101	0.402	-0.3914	0.2457	1.7331	0.1698
Other N/R Brands ^c					-0.1017	0.7663		
Other Private Labels ^b	0.0511	0.5366	0.1169	0.1855	-0.0052	0.8712	-2.0027	0.0001
Other Private Labels ^c							-0.2037	0.4363

^aFirst column for each variable contains estimated elasticities; second column, p-values.

^bIndicates the price elasticity estimate for all consumers.

^cIndicates the price elasticity difference for suburban and inner-city consumers.

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