Private Label and National Brand Pricing and Promotional Strategies in Health Differentiated Product Categories: Canadian Evidence

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Introduction

A significant amount of literature has discussed different issues relating to the rapid and successful emergence of private labels (PL) brands in grocery retailing. Staring with the influential and heavily cited empirical work on national brand (NB) and private label (PL) price margin by Connor and Peterson (1992), PL have created new and increasingly stiff competition for many established manufacturers of national grocery brands over the past decades. Apart from the significant market share of PLs in many staple food categories, retailers have successfully used new and more diversified PL products to enter many higher quality product segments (Soberman and Parker, 2004). In the Canadian and U.S. market PLs account for a 25% and 20% retail market share, respectively. Moreover, with growing consumer attention to and importance of a variety health and lifestyle attributes in food choice decisions; health has emerged as a new competitive factor in retail product differentiation and market segmentation.

According to Agriculture and Agri-Food Canada (2009) 32% of PLs and NB products carry at least one health related feature. The economic literature has taken great interest in retailer's strategic use of PLs to counter the prior dominance of NB manufacturers (Berge`s-Sennou et al., 2004). The question to what extent increasing health-attribute driven product differentiation has affected the PL-NB competitive relationship and this question has not been addressed to date. Health and nutrition concerns in food demand and related lifestyle changes have made many consumers more selective in their retail product choices, pushing sales of a rapidly growing selection of healthier product options (Schroeter and Foster, 2004). According to the 2009 *Healthy Eating Trends* more than 90% of U.S. consumers stated that eating healthily is important to them (Nielsen 2010). In response several large retail chains have developed differentiated PL "good for you" product lines and labelling schemes around their healthy product option. For example Canadian Loblaws "President Choice Blue Menu" or Safeway's "Eating Right" lines of products. Focused reductions in levels or removal of unfavourable ingredients (e.g. fat, sodium, sugar, etc.) (Anders and Moeser, 2010). According to Agriculture and Agri-Food Canada (2009) 32% of PLs and NBs available in Canadian retail stores carry at least one health related product attribute.

The objective of this paper is to quantify the competitive interaction of private labels and their national brand product counterparts in selected food product categories where health attributes are present. More specifically this study will a) test whether the presence of a labeled health attribute (e.g. regular and low salt bacon) affects the private label-national brand competitive interaction; b) quantify retailer private label price setting, frequency of price changes, promotional strategies and frequencies relative to national brand counterparts. The analysis in this paper is based a unique set of proprietary scanner data made available through the SIEPR-Giannini Data Center covering 2004-2007 product-level sales information for 200 grocery UPC product categories across stores for a major retailer with stores in Canada and the U.S.

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affected the PL-NB competitive relationship has not been addressed to date. Moreover, despite the significant increase in the market share of private label products in the Canadian retail sector very little empirical evidence exists on the nature of the competitive pricing and/or promotional interactions between PLs NBs in the Canadian retail market.

Background

For several past decades, manufacturers have been considered the main producers of branded consumer packaged products at the retail level. This leadership position has diminished over time as major grocery retail chains themselves have started to introduce their own branded products - private label brands (Wu and Wang, 2005). The history of PLs is older than often assumed dating back almost 100 years ago in product lines such as tea (Raju et al. 1995). PLs were developed as generic and cheaper products meant to undercut the prices of their NB substitutes. Formerly considered to be of lower quality, and limited to product categories such as canned foods targeted at low income consumers, modern PL brands are available almost every universal product code (UPC) category in major retail markets, including Canada. With the exception of some fresh produce categories the share of PLs in total grocery sales ranks 3rd or 4th in across North American and European markets (Raju et al., 1995; Grier, 2003). In 1992, PLs accounted for roughly 18% of all retail level product sales and 14% of total superstore sales volume (Jafri et al., 1993). PLs have grown particularly rapidly in grocery superstores where the top 3 PL brands accounted for 70% of sales in all product categories in 1998 (Wu and Wang, 2005). Sales of PLs in Canada were $11.4 billion in 2010, accounting for 18.3% of total consumer expenditure on consumer packaged goods. Similar PL market shares are found in many European markets where PLs account for significant portions of grocery retail sales. In 2009, market shares in Switzerland, the UK and Germany were 46%, 43% and 32%, respectively (Nielsen, 2010).

Literature

A growing economic literature based on the greater availability of retail scanner data suggests that PL products play an important role both in intra- and inter-store retail competition. Despite being prized below their NB counterparts PL, on average, yield higher retail margins making PLs an important source of retailer profit (Hoch and Banerji, 1993). Narasimhan and Wilcox (1998) and other found that PLs are often used as strategic weapons against NB manufacturers in pricing and promotional competitive interactions. The complex nature of the competitive interactions between PLs and NBs has become a concern and research focus of marketing managers and industrial organization economists' alike (Cotterill et al. 2000). In today`s retail market environment PLs are considered to be a serious threat to NB manufacturers (Abe, 1995). As part of their competitive interactions, both private labels and national brands use different product marketing strategies. A shift in and increase in the product quality of many private label products over time has intensified the competitive interactions specifically at the brand level (Volpe, 2010). Moreover, evidence suggests that retailers

are using PL product lines to exert market power against many NB manufacturers (Narasimhan and Wilcox, 1998; Sayman, et al. 2002; Meza and Sudhir, 2010).

Apart from higher retail product margins, PL product lines can increase store traffic as consumer choose a specific retail chain for its PL products. Over time this may lead to greater store (retail chain) customer loyalty at the expense of other retailer and overall NB sales (Ailawadi et al. 2008). Increasing customer loyalty also helps retailers to grow their long-run profitability (Meza and Sudhir, 2010). Behind this development stands the observation that consumers in many markets increasingly recognize PL brands as quality signals and have developed preferences for many PL product lines and the growing selection they tend to offer (e.g. President's Choice). Loyal Pl shoppers positively affect retailer's market share in individual product categories and allow retailers to effectively use PL in (often aggressive) retail promotion, advertising and sales events to attract additional consumers to their stores and increase the overall demand for their product lines. New and increasingly differentiated PL product lines, especially those targeted at specific consumer demands (e.g. health, convenience, environmental and other attributes), may also be used to attract additional consumer demand and stifle competition pressure against NB major manufacturers.

Previous economic literature has addressed various issues and dimensions related to the competitive impact of PL including their economic significance to retail chains (Chintagunta et al., 2002), growth and development of PL product markets (Hoch and Banerji, 1993), competitive interactions between PLs and NBs (Raju et al. 1995; Narasimhan and Wilcox, 1998; Cotterill et al. 2000; Sayman et al. 2002; Huang et al. 2003; Wu and Wang, 2005; Bontemps et al. 2005; Bontemps et al. 2008; Karray and Herran, 2009; Volpe, 2010) and the use of private labels in exerting retail market power (Narasimhan and Wilcox, 1998; Meza and Sudhir, 2010). Despite the increasing attention and devoted to PLs by industrial organization economics, the recent study by Volpe (2010) seems to be one of the few empirical papers that presents a comparative analysis of the specific strategic competitive interactions between PLs and NBs across individual product categories. Despite the increasing availability of retail scanner data and individual consumer purchase records, empirical studies on retailer's strategic pricing and promotional behaviour are still scare. This lack of reliable evidence can yet be attributed to the lack of detailed enough store-level scanner panel data that would allow researchers to identity and model more complex competitive games played between retail PLs and NBs at the national retail market level; instead of isolated metropolitan or regional retail markets. To our knowledge no empirical evidence exists on the impact of increasing product differentiation in health and other (much researched) food attributes on the competition interactions between PLs and NB manufacturers in mature retail market, Canada.

Data and Analysis

The analysis in this paper is based on a set of proprietary scanner panel data made available through the SIEPR-Giannini Data Center. The data provides retail sales information for 200 UPC product categories across stores for a major North American retail chain with stores in Canada and U.S. Aggregate weekly store level sales randomly

selected from all retailer operational regions across both markets include information at the individual UPC level: price, applicable discounts, sales quantity, retail gross and net margin (wholesale cost) for the period week 1-2004 to week 27-2007. For the purpose of the analysis in this paper selected exemplary product categories and product pairings are selected, where direct comparisons close substitutes of regular and healthy PL and NB could be matched The matching criterion is based on the fact that products are direct, close substitutes within the same product category and both products (PL, NB) carry close to identical characteristics as identified from product name descriptions and product pictures.

To empirically analyze pricing and promotional competitive interactions between PLs and NBs in retail categories where product differentiation includes consumer health attributes, three product categories were selected. These are a) packaged, sliced side bacon, a popular North American cured meat product commonly used in breakfast dishes; b) sandwich bread or toast; and c) soda crackers, a popular side to soups and snack item. A first analytical step involved the identification of the leading brand manufacturers and their respective leading products. The next step as then focused on matching corresponding regular and healthy NB product options with their substitute PL counterparts. For the category of sliced bacon the most common health attribute is `low sodium`. The health attribute selected for sandwich breads is `whole wheat, and healthy soda crackers are differentiated by the absence of added salt.

Table 1 shows the descriptive statistics of private label and national brand product at Canadian retail level. Promotional price is the price accounting the promotional discounts, coupons and saving through membership card and shelf price is defined as the price printed on the shelf of the product in retail store. So when the product is not on promotion then shelf price and promotion price would be same. First and second column of table shows the difference between average shelf and promotional prices national brand and private label products. The last two columns in table 1 show the retailer margin (difference between shelf price and wholesale price) of private label and national brand products.

Table 1: Shelf price, Discounts and Retail Margin for Selected NB and PL Products

Product	Shelf Price	Discount Price	Retailer Margin PL	Retailer Margin NB
Regular Bacon	3.40	2.55	1.51	3.30
Healthy Bacon	1.13	0.64	2.98	3.35
Regular Bread	0.83	0.78	1.00	1.23
Healthy Bread	0.55	0.44	1.11	1.23
Regular Cracker	-0.19	-0.27	1.49	0.93
Healthy Cracker	0.23	-0.04	1.48	1.01

Differences between NB and PL shelf prices vary considerably across different healthy and regular products. Positive values indicate that the NB is more expensive than the respective PL product. The highest price difference exists for regular bacon at $3.40. The shelf price of NB regular bacon exceeds that of the substitute PL for about 99% of available observations. In the case of sliced bacon the shelf price of the NB product is about 19% higher than its PL counterpart. The PL-NB shelf price difference is $1.13. Previous literature concluded that the price of a NB can be expected to be higher than its NB counterpart (Dhar and Hoch, 1997; Ailawadi et al. 2001; Volpe, 2010). The negative PL-NB shelf price difference for regular soda crackers is unexpected and contradicts previous findings.

The difference between promotional price of national brand and private label product shows that the promotional price difference in highest in regular bacon category as it is $ 2.55 and lowest for regular cracker. The negative promotional price of regular cracker shows that the promotional price of private label product is higher than the promotional price of national brand product. The pricing gap of shelf price of regular bacon is higher than the promotional price gap of regular bacon. It shows that the national brand producers are offering more discounts on their products than private label. Retailer margin for private label and national brand varies significantly as shown in table 1. Hoch and Banerji (1993) and Steiner (2004) stated that private label products can be expected to be less expensive than their national brand substitutes and yield higher retail margins. Steiner (1993) concluded that leading advertised NBs have a lower retail margin than PLs. The data shows that for some products the actual value ($) retail margin for PLs is higher than for NBs in the healthy cracker category, but this relationship is reversed for sliced bacon and sandwich bread. The reason for higher dollar retail margin for NBs could be their higher shelf price compared to the PL product, consistent with the findings published by Ailawadi and Harlam (2004).

The comparison of retail margins is also insightful. For regular sliced bacon the shelf price margin is 99%, while it is only 19% for the healthy bacon option. The study by Volpe (2010) found an 18% percent shelf price margin for meat and seafood at the same retail chain in the U.S. market. The reason for a higher shelf price margin for regular sliced bacon could lie in the considerable brand equity of the NB manufacturer (the market leader in Canada) and it focus on higher income retail consumers. The overall shelf price margin across for all three selected products and categories stand at 31%. This is compared a total average shelf price margin across multiple store outlets of the retailer in the U.S. of 23% (Volpe, 2010). The study by Dhar and Hoch (1997) found an overall shelf price margin of 40% for multiple retailers in a regional U.S. market area.

Rao (1991) stated that promotional decisions in grocery retailing have two dimensions, promotional depth and promotional frequency. Table 2 presents percentage differences between PL and NB promotional activities for the three selected product categories. Promotional frequency measures the percentage difference between NBs and PLs in terms of the time each product was on promotion over the range of available data, and promotional depth measures the percentage difference between the shelf price and promotional discount price between NBs and PLs as defined by (Rao, 1991).

Table 2: PL and NB Promotional Frequency and Promotional Depth in Selected Product Categories

Product	Promotional Frequency	Promotional Depth
Regular Bacon	18.54	10.79
Healthy Bacon	-9.94	5.55
Regular Bread	-61.80	-1.81
Healthy Bread	-37.64	3.03
Regular Cracker	2.25	3.15
Healthy Cracker	1.69	7.92

Promotional frequency varies considerably among different product categories. Positive values show that NBs are performing more promotional activities and negative value indicate that PLs are more frequently promoted relative to their NB counterpart. In case of regular sliced bread the promotional frequency is -61.80 percent, indicating that the PL product is on promotion about 61.80% more often than NB regular sandwich bread. The highest positive promotional frequency value is found for regular sliced bacon. The value suggests that the NB remains on promotion about 18.5% more of time compared to PL regular bacon. Promotional frequency for healthy options in two of the three categories show a negative sign meaning that PL healthy product options are promoted more intensively than their national brand counterparts. Overall, these findings are largely consistent with the findings reported by Volpe (2010) and Rao (1991) for other product categories and retail markets in North America.

Promotional depth is another important parameter of importance to retail consumer product demand or sales. Anderson and Simester (2004) stated that increases in the promotional depth of a product can be expected to result in a positive long-run effect on prospective consumer loyalty. Our data reveals that highest promotional depth can be found in the sliced bacon category where the difference stands at 10.79. The NB manufacturer tends to offer higher degrees of promotional depth than the substitute PL product. Rao (1991), obtaining similar results, concluded that NBs are offering more promotional depth than can be found for PLs, thus forgiving profits to ensure that the PL refrains from conducting more frequent promotions. We identify a negative promotional depth for regular sandwich bread, standing for a higher promotional depth of the PL relative to the relevant competing NB. Volpe (2010) also identified negative promotional depths for selected retail departments: merchandise, frozen foods, salad dressing.

As another analytical step Table 3 presents the direct comparison of NB promotional prices with their corresponding PL shelf prices. Especially column three indicates a considerable pricing gap between NB promotional prices and PL shelf prices. Positive values show that promotional prices of NBs still exceed regular shelf prices of PLs, and negative sign vice versa. For regular sliced bacon the difference is largest at 41.5%. The promotional price of the NB product is 41.5% more expensive than the regular shelf price of PL regular sliced bacon. This difference almost disappears for corresponding health differentiated sliced bacon products (1.69%, table 3).

Table 3: Statistical Comparison of National Brand and Private Label Product Prices

Product	Promotional price NB	Shelf price of PL	% difference between NB promotional price and PL shelf price
Regular Bacon	5.87	3.43	41.57
Healthy Bacon	5.87	5.77	1.69
Regular Bread	2.29	1.70	25.93
Healthy Bread	2.29	1.97	13.73
Regular Cracker	2.70	3.09	-14.17
Healthy Cracker	2.89	3.04	-5.27

In the case of healthy and regular sandwich breads the NB promotional price is still higher than PL shelf price, while for regular and healthy soda crackers the pricing difference is negative. We again can confirm the previous results reported by Volpe (2010) who also found a considerable variation in the percentage differences between NB promotional price and PL shelf price. Positive values for beverages, dairy products, and general merchandise, meat and seafood, and packed breads. Negative differences for baking and cooking supplies, candy, canned goods, coffee and tea, pasta, rice and beans, and snack items. However, Volpe did not investigate pricing of individual direct NB-Pl substitutes; instead his analysis was based on UPC category averages only.

The following tables 4 to 9 address the issue of overall promotional activity by competing, substitutive PLs and NBs as well as their promotional interactions using contingency tables. The contingency tables cover all possible promotional outcomes for PLs and NBs independent and joint promotional activities (only PL (NB) on promotion, both PL (NB) on promotion or are not on promotion). To conduct this analysis only those combinations of PL and NB products were considered where a close matching of substitutive PLs and NBs was possible, imposing the implicit assumption that promotional interaction are limited to within each category and relevant close substitutes and excluding other alternative products options (e.g. promotional interactions between regular and health differentiated products). In other words, only pairings of leading NBs were matched with the retailer`s corresponding PL product.

Table 4: Contingency Table of Healthy Bacon

		Private Label		
	Healthy Bacon	Promotion	No promotion	Total
National Brand	Promotion	38.51	17.39	55.90
	No Promotion	27.33	16.77	44.10

	Total	65.84	34.16	100

The contingency table for healthy differentiated sliced bacon shows that the NB remains on promotion about 55.9% of time and the competing PL remains on promotion 65.84% of time. 38.51% of time both NB and PL remains on promotion, while 16.77% of time none of the two competing products is sold at a discount at any of the retailer`s stores in Canada. In only 27.33% of time the PL was on promotion but not the NB. Moreover, chi-square statistics[1] reveal a significant relationship between NB-PL promotional activities. A χ^2 test statistic is 26.17 and significant at 1% level.

In the regular sliced bacon category the NB remains on promotion 61.80%, compared to 43.26% for the PL product. Table 4 and 5 show that the NB regular bacon products are more frequently promoted compared to healthy sliced bacon and compared to PL. A plausible reason behind these differences could lie in that retailers are earning higher margins on healthy sliced bacon products relative to PL regular bacon therefore shifting promotional focus to maximize category returns.

Table 5: Contingency Table for Regular Bacon

		Private Label		
	Regular Bacon	Promotion	No promotion	Total
National Brand	Promotion	26.97	34.83	61.80
	No Promotion	16.29	21.91	38.20
	Total	43.26	56.74	100

Table 6 presents the same analysis for healthy sandwich bread characterized by a 100% whole wheat content. Here PL products remain on promotion about 69.10% of time while the corresponding NB products remain on promotion only 31.46% of time. 23.60% of time both NBs PLs are jointly promoted and 45.51% of time only PL healthy sandwich brads were on promotion. Chi-square test statistics again confirm a significant interdependence of promotional activities indicating a significant impact of NB promotions of healthy sandwich bread options corresponding PL promotional activities.

Table 6: Contingency Table of Healthy Bread

[1] For calculating χ^2 statistic we used following formula:

$$\chi^2 = \sum \frac{(Observed\ \ value - \exp ected\ \ value)^2}{\exp ected\ \ value}$$

		Private Label		
	Healthy Bread	Promotion	No promotion	Total
National Brand	Promotion	23.60	7.87	31.46
	No Promotion	45.51	23.03	68.54
	Total	69.10	30.90	100

PL regular sandwich bread is offered at discount prices 94.38%, while the corresponding NB substitute is only promoted 32.58% of time. The χ^2 statistic for regular sandwich bread is 45.53. Table 6 and 7 reveal that in both sandwich bread categories, PL products remain on promotion more often than their NB counterparts. Volpe (2010) confirms the evidence that PL brands remains on promotion more often than their NB counterpart across a wide range of consumer packaged goods categories. Anecdotal evidence also suggests that PL products are heavily used in weekly household flyers across regional Canadian retail markets and retail chains. The same holds with regards to a recent increase in television commercial for selected Canadian PL brands.

Table 7: Contingency Table of Regular Bread

		Private Label		
	Regular Bread	Promotion	No promotion	Total
National Brand	Promotion	32.02	0.56	32.58
	No Promotion	62.36	5.056	67.42
	Total	94.38	5.62	100

For the third selected category Table 8 presents the results of the contingency analysis for soda cracker products. The results show that NB products remains on promotion about 81.46% of time, while the corresponding PL products were promoted about 79.78% of time. 65.73% of time both NB and PL label health differentiated crackers (no salt) remained on promotion. In the regular cracker (salted) category, the promotional frequency for NBs stands at 82.02%. Tables 8 and 9 confirm that for both product options the NB exerts a higher degree of promotional activities compared to their PL rivals.

Table 8: Contingency Table of Healthy Cracker

		Private Label		
	Healthy Cracker	Promotion	No promotion	Total

National Brand	Promotion	65.73	15.73	81.46
	No Promotion	14.04	4.49	18.54
	Total	79.78	20.2247191	100

One plausible reason good be the overall lower promotional price of NB crackers compared to the regular shelf price for PL cracker products. Chi-square tests confirm a significant response of the PL to the promotional activities of the relevant leading NB cracker manufacturers. The χ^2 value for healthy and regular crackers are 22.70 and 21.53, respectively, significant at the 1% level. Volpe (2010) limited his analysis of promotional activity to the aggregate of snack items. The analysis concluded that PL products remain on promotion more often than the relevant NB counterparts within the same category.

Table 9: Contingency Table of Regular Cracker

		Private Label		
	Regular Cracker	Promotion	No promotion	Total
National Brand	Promotion	65.73	16.29	82.02
	No Promotion	14.04	3.93	17.98
	Total	79.78	20.22	100

Conclusion

For a long time food manufacturers were considered to be the main producer of branded retail consumer packaged products. The rapid emergence of retailer PL brands beyond their initial focus on cheap and generic product options has changed this situation with the introduction of PL in many differentiated higher quality food product categories. Moreover, PLs themselves have undergone a transformation towards higher quality and continuous differentiation to meet retail customer demands for convenience health and other attributes at often lower retail prices. Both these developments have supported retailer`s objectives to use PLs to exert market power and as a strategic weapon against formerly powerful brand manufacturers at the same time creating sustainable levels of store loyalty among customers. The objective of this paper was to use descriptive statistics techniques to quantify the competitive interactions and pricing strategies of PLs and their NB product counterparts in selected food product categories where health attributes are present. The study benefitted from available proprietary store level scanner made available through the SIEPR-Giannini Data Center covering 2004-2007 product-

level sales information for 200 grocery UPC product categories across stores for a major retailer with stores in Canada and the U.S.

Findings of this analysis reveals that shelf price, promotional price and retail margin varies significantly in different product categories and even in healthy and regular products. For some products the shelf price NB was found to be higher than the respective PL products (e.g. regular and health differentiated sliced bacon (low salt), regular and health differentiated sandwich bread (1005 whole wheat) and health differentiated soda crackers (no salt). The results presented here are largely consistent with previous studies in the economic literature that have explored and compared pricing and promotional strategies between PLs and NBs in major consumer packaged goods categories (Hoch and Banerji, 1993; Steiner, 2004; Volpe, 2010). However, the category of PL regular soda crackers was found to be more expensive than their NB counterparts proposing an inconsistency with the recent study by Volpe (2010) based on similar data. The reasons for lower NB prices for some product could be multiple, but may be closely related to NB`s potential economies of scale as they may be jointly producing PL and branded products. Moreover, absolute ($)retailer margins for selected PL NB also varied considerably and were found to be higher for some NBs. Ailawadi and Harlam (2004) found the similar results and concluded that the reason for higher absolute NB margins is closely related to their often absolute higher shelf price level. However, higher margins for NB products are in violation of industrial organization theory regarding the relative performance of PLs and NBs. Our findings form the comparative analyses of promotional frequencies revealed that PL product generally remain on promotion more often than their NB counterparts. These results are overall consistent with the studies published by Rao (1991) and Volpe (2010). However, we found that promotional frequency and promotional depth varied significantly across regular and health differentiated products and selected categories. Also, the differences between absolute promotional price levels between NBs and PLs were non-negligible. For some NB products we found their promotional price level yet to be higher than the corresponding regular PL price (valid for regular and health differentiated bacon, sandwich bread). While this relationship did not hold for the category of soda crackers. The soda cracker category (healthy and regular) also revealed a high degree of promotional activity for both PLs and NBs at 65.73% of time while overall. The data showed that promotional depth is higher for the selected NB products compared to PLs. Rao (1991) stated that NBs promote more frequently to preempt PL promotional activities. However, results from contingency table analyses and pricing differences across labels showed that PL producers are generally conducting higher degrees of promotional activities in the product categories in which the price of PL products is lower than their NB counterparts. The exception is regular sliced bacon in the Canadian market, characterized by a small number of NBs and equal number of retail labels. Volpe (2010) only derived the conclusion that PL products remain on promotion more often than their NB substitute products without discussing reasons behind this pattern. Overall, several Chi-square tests confirmed significant bilateral associations between the promotional activities of NBs and PLs in the selected packaged food product categories in the competitive Canadian retail market. Next steps for this research are to apply new empirical industrial organization quantitative methods to estimate retail price cost margins across product categories following Kadiyali et al`s (1996) brand competition framework.

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