The Impact of Store Brands on Overall Product Category Performance

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A comprehensive store-level data set of 9 dairy product categories across 149 stores of a supermarket retailer chain over 32 weeks in 2021 was used to examine the impact of store brands on overall category performance as measured by net margin dollars. The study examines results on both the overall dairy department and category specific performance. The results for the overall dairy department indicate there is not a significant positive relationship between a change in overall store brand sales penetration and profitability. There is, however, a significant positive relationship between overall store brand net margin dollar penetration and category profitability.

Keywords: store brands, private brands, category profitability, category management, supermarkets

INTRODUCTION

Store brands, also called private label brands, are defined by PLMA (2023) as products that carry the retailer's name. Survey results indicate that nearly all shoppers buy store brands on a regular basis with a high degree of volume (PLMA, 2023). The market for store brands has been increasing with decisions and applications made in this market becoming important for retailers and consumers (Sarimehmet & Aydin, 2021).

In 2022, sales of store brands increased 11.3% in the United States setting an annual record of $228.6 billion and dollar share penetration increased .7 points to 18.9%. Refrigerated, the largest department for store brands with $47.4 billion in sales, increased 17.1%. A major reason for the significant increases for store brands were their acceptance by consumers as a dependable ally against tenacious inflation and other personal financial difficulties (PLMA, 2023).

Today, when considered holistically, store brands are the largest brand in the world. Store brands are being developed to respond to consumer needs and no longer compete on price alone (Lincoln & Thomassen, 2008).

The acceptance of store brands is often related to product categories in the literature (e.g., Anselmsson et al., 2007; Zielke & Dobbelstein, 2007). Specifically, store brands perform better in large categories offering high margins (Hoch & Banerji, 1993). Retailers use their store brands as strategic tools to increase market share and profitability and because they return higher profit margins than national brands. Store brands are also used by retailers to create a competitive advantage over other retail chains (Sethuraman & Gielens, 2014).

The significant growth of store brands has resulted in the reduction of retail space for national brands. Store brands have evolved into strong competitive threats to national brands (Bao et al., 2011) and have the ability to push them off retailer shelves if they are not leaders in their product categories (Lambin et al., 2007).

CATEGORY MANAGEMENT

Retailers such as supermarkets provide two types of brands, store brands and national brands. Retail profit margins in the packaged goods industry have been a major discussion and research topic in the past decade. Extensive research has focused on the increasing power of retailers and their tendency to negotiate lower wholesale prices and higher trade allowances from manufacturers. The growth of store brands has become a major topic at the center of much of the discussion about retailer power and profitability relative to that of manufacturers (Ailawadi & Harlam, 2004).

National brands are brands owned and marketed by producers while store brands are brands owned and sold by retailers under their store brand name or a new brand name. Retailers expect their category managers to make assortment and pricing decisions to maximize category profitability (Basuroy et al. 2001). Many retailers believe store brands are a key component of a successful category strategy and often use store brand performance as one of the metrics to evaluate overall category performance (ACNielsen, 2006).

STORE BRANDS AND CATEGORY PERFORMANCE

The primary objective of business is to seek profit or maximize profit. Only after profit seeking can other goals be achieved (Endang, 2021). Store brands are an attractive option from a retailer's perspective as they provide higher margins on each product and greater profitability. Store brands have a strong visual identity and brand message in addition to higher margins and are increasingly being used to retain customers (Diallo et al., 2013). Store brands are available in nine of every ten consumer packaged goods categories (SymphonyIRI Group, 2011) and numerous retailers are making a focused effort to grow their store brand offering even further, mainly because of high retail margins (Braak et al, 2013).

There have been mixed results from previous studies on the effectiveness of store brands. A primary motivation for retailers to offer store brands is that they are more profitable for the retailer than national brands (Ailawadi & Harlam, 2004; Ailawadi et al, 2008). Some studies question the assertion that store brands enhance profitability of categories (Glemet & Mira, 1993; Corstjens & Lal, 2000). As store brands result in delivering higher retailer margins than national brands, it is in the retailers' interest that consumers choose their store brands over national brands. However, national brands build store traffic due to their marketing campaigns and provide context for store brands when consumers evaluate their value propositions. There is a significant chance when consumers do not find a desired national brand that they will switch to a different brand, delay purchase, or switch to a different store (Mantrala et al., 2009).

The purpose of this study is to empirically investigate the impact of store brands on category performance and is organized around the following research questions:

RQ1: What is the impact of store brands on overall category performance?

RQ2: Does the extensive focus of retailers in promoting their store brands conflict with the premise of category management that seeks to maximize the sales and profits of the entire category and not any individual brand?

This study has important implications for retailers and academics as the results of this study can provide guidance by simultaneously monitoring store brand sales impact on overall category profitability. This study contributes to the current knowledge and literature of store brands and manufacturer brands. Unlike

many prior research findings, this study provides meaningful insights to category managers of both store brands and national brands.

Based upon the literature review and research questions, the following hypotheses will be tested in this study:

H₁: There is a significant positive relationship between overall store brand sales penetration and category profitability

H₂: There is a significant positive relationship between overall store brand net margin dollar penetration and category profitability

H₃: There is a significant positive relationship between category specific store brand sales penetration and profitability

H₄: There is a significant positive relationship between category specific store brand gross margin dollar penetration and profitability

METHODOLOGY

Point-of-sale (POS) scanner data was obtained from a major supermarket retailer operating in the northeastern part of the United States. The retailer has over 140 stores distributed across six states with annual sales exceeding $4 billion and places a major emphasis on the growth of their store brand products. Category management is implemented at this supermarket and scanner data was obtained from the dairy (refrigerated) department, consisting of nine product categories, to analyze the impact of store brands on category profitability. Segmentation of the categories are based on consumer purchase patterns of similarities among products and the key objectives of each category manager is to increase sales or profits of each category along with store brand sales penetration.

Measurement of Variables

The point of sale scanner data from nine refrigerated dairy product categories purchased during a thirty-two week period in 2021 was analyzed. The first part of our research analyzed the performance of the overall dairy department. Table 1 lists Total Category sales as calculated as the 32-week sales total of the nine product categories. Total category sales consists of total store brand sales and total national brand sales. Total store brand sales penetration percentage is calculated as total category store brand sales divided by total category sales (composed of national brand and store brand).

TABLE 1
TOTAL CATEGORY SALES

	TOTAL CATEGORY SALES	**TOTAL STORE BRAND SALES**	**TOTAL NATIONAL BRAND SALES**	**TOTAL- STORE BRAND SALES Penetration**
TOTALS- 32 Weeks	165,784,722	85,531,435	80,253,287	51.59%
AVERAGE- 32 Weeks	5,180,773	2,672,857	2,507,915	51.59%

Table 2 lists Total Category net margin dollars as calculated by the 32-week sales total of the nine product categories. Total category net margin dollars consists of total store brand net margin dollars and total national brand net margin dollars. Total store brand net margin dollar penetration percentage is

calculated as total category store brand sales divided by total category sales (composed of national brands and store brands).

TABLE 2
TOTAL CATEGORY NET MARGIN DOLLARS

Week #	Total CATEGORY Net Margin $	Total STORE BRAND Net Margin $	Total NATIONAL BRAND Net Margin $	TOTAL STORE BRAND NET MARGIN $ Penetration %
TOTALS- 32 Weeks	50,603,511	26,337,600	24,265,911	52.05%
AVERAGE- 32 Weeks	1,581,360	823,050	758,310	52.05%

The second portion of our study analyzes the performance of each product category. Table 3 lists each product category along with the corresponding 32-week total category sales. Total category sales are itemized by total store brand sales and total national brand sales. Total store brand sales penetration percentage is calculated as total category store brand sales divided by total category sales (composed of national brand and store brand). Ailawadi and Harlam (2004) demonstrate that although a retailer's percentage margins on store brands are high on average, these margins vary considerably across categories and high standard store brand shares lower store profitability as they primarily serve price sensitive consumers.

TABLE 3
TOTAL CATEGORY SALES SPLIT BY PRODUCT

CATEGORY	32 Week TOTAL CATEGORY SALES	32 Week TOTAL STORE BRAND SALES	32 Week TOTAL NATIONAL BRAND SALES	TOTAL STORE BRAND SALES PENETRATION %
BUTTER	8,902,544	6,033,522	2,869,022	67.77%
CHEESE	43,071,841	23,595,850	19,475,991	54.78%
COTTAGE CHEESE	4,402,816	2,070,190	2,332,626	47.02%
CREAM	12,826,998	5,621,711	7,205,287	43.83%
DESSERT/ TOPPING	4,281,901	925,811	3,356,090	21.62%
EGGS	15,225,604	12,166,694	3,058,910	79.91%
MILK	39,107,915	28,371,836	10,736,079	72.55%
REFRIGERATED JUICES	18,603,577	4,741,071	13,862,506	25.48%
YOGURT	19,361,525	2,004,750	17,356,775	10.35%

Table 4 lists each category along with the 32-week total category net margin dollars. Total category net margin dollars are itemized by total store brand net margin dollars and national brand net margin dollars. Total store brand margin dollar penetration percentage is calculated as total category store brand net margin dollars divided by total category net margin dollars (composed of national brand and store brands).

Consistent with the study of Ailawadi and Harlam (2004), we define net margin as the difference between the realized retail price (i.e., net of discounts and promotions) and the wholesale price (the price the retailer pays to acquire the product from the supplier).

TABLE 4
TOTAL CATEGORY NET MARGIN DOLLARS SPLIT BY PRODUCT

CATEGORY	Total CATEGORY Net Margin $	Total STORE BRAND Net Margin $	NATIONAL BRAND Net Margin $	TOTAL STORE BRAND MARGIN $ PENETRATION %
BUTTER	1,798,770	889,148	909,622	49.43%
CHEESE	13,389,717	7,512,359	5,877,358	56.11%
COTTAGE CHEESE	1,575,180	787,123	788,057	49.97%
CREAM	4,833,431	2,428,160	2,405,271	50.24%
DESSERT/ TOPPING	1,509,528	376,521	1,133,007	24.94%
EGGS	5,305,821	4,159,022	1,146,800	78.39%
MILK	11,697,946	8,216,804	3,481,142	70.24%
REFRIGERATED JUICES	4,474,407	1,388,061	3,086,346	31.02%
YOGURT	6,018,710	580,403	5,438,307	9.64%

RESULTS

For each hypothesis, a linear regression analysis was generated. Reliability of the results was ensured by examining the normality of the sample via Shapiro-Wilk and by running the Durbin Watson test for autocorrelation of the residuals (test of independence). After the dataset was checked using the above techniques as guides we are able to conclude below. Table 5 lists the results of the regression analysis for hypothesis 1 and hypothesis 2. Table 6 and 7 respectively lists the results of the regression analysis for hypothesis 3 and 4.

TABLE 5
RESULTS OF THE REGRESSION ANALYSIS FOR HYPOTHESIS 1 (H1) AND 2 (H2)

	Hypothesis	
Statistic	H1	H2
R	0.052	0.351
t-stat	0.278	2.051
P-value	0.783	0.049
Lower 95% for population slope	(9.74)	11,312.70
Upper 95% for population slope	12.79	4,995,378.00

H₁: *There is a significant positive relationship between overall store brand sales penetration and category profitability*

The results indicate that H1 is not supported with a t-value of 0.278 and an associated p-value of 0.783. The standard regression weight was 0.052. Therefore, there is not a significant positive relationship between a change in overall store brand sales penetration and category profitability.

One of the major objectives of category management is focusing on increasing overall category profitability. Category managers must manage all brands in each respective category to determine which have the greatest impact on increasing profits. This study showed no significant relationship between overall store brand sales penetration and category profitability.

The overall product assortment mix needs to be managed by category managers to provide the optimal selection to meet consumers' needs. Store brands are an integral part of a product offering to consumers but other brands need to be focused on also in order to meet consumer needs and enhance overall category profits. Although store brands represent a unique, differentiated product offering, almost four out of five items purchased in U.S. supermarkets are national branded items.

H₂: *There is a significant positive relationship between overall store brand net margin dollar penetration and category profitability*

Using a conventional 5% level of significance, the results indicate that H2 is supported with a t-value of 2.051 and with an associated p-value of 0.049. The standard regression weight was 0.351. Therefore, there is a significant positive relationship between a change in overall store brand sales penetration and profitability at this standard level of significance.

The 95% confidence interval for the true population slope is bounded between 0.113 and 49.95. This means with high confidence we can state that an increase of a 1% store brand net margin penetration will increase the total category net margin between $11,312.70 and $4,995,378.

H₃: *There is a significant positive relationship between category specific store brand sales penetration and profitability.*

Using a conventional 5% level of significance (LOS), we tested nine categories for the H3 hypothesis. Table 6 presents the regression analysis, including R, R^2, t-stat value, p-value, results of the test at a 5% LOS, and results of the Durbin Watson test for independence in the residuals. Excluded from the discussion are the categories of Cottage Cheese (PAC = positive autocorrelation) and Eggs (IC = inconclusive) due to their potential failure of the independence test among the residuals. Further analysis is warranted and presents an excellent avenue for future research.

The discussion of the remaining seven categories is divided into those that reject H3 and those that do not reject H3 at a 5% LOS. Notably, the categories of butter, cheese, and dessert do not support H3. Consequently, there is no significant positive relationship between changes in category-specific store brand sales penetration and profitability for these three categories. This could be attributed to the promotional strategy of the retailer in this study, which uses these categories as traffic drivers through highly discounted retail prices, suppressing overall profitability. This area will be the focus of future research.

TABLE 6
RESULTS OF THE REGRESSION ANALYSIS FOR HYPOTHESIS 3 (H3)

Hypothesis Tests for IV = Sales Penetration and DV = Net Margin (Per Category)							
						At 5% LOS	Ind Check
Category	n	R	R^2	t-stat	P-value	Conclusion	DW Test
Butter	32	-0.16	2.56	-0.91	0.37	DNR	passed
Cheese	32	-0.21	4.41	-1.18	0.25	DNR	passed
Cottage Cheese	32	-0.15	2.25	-0.08	0.93	DNR	PAC (1.23)
Cream	32	-0.49	24.01	-3.10	0.004	Reject	passed
Dessert	32	-0.2	4.00	-1.11	0.28	DNR	passed
Eggs	32	0.13	1.69	0.70	0.49	DNR	IC (1.37)
Milk	32	-0.26	6.76	-1.47	0.15	DNR	passed
Refrigeration Juice	32	0.48	23.04	3.03	0.005	Reject	passed
Yogurt	32	-0.54	29.16	-3.50	0.002	Reject	passed

A significant positive relationship is observed between changes in refrigerated juice store brand sales penetration and profitability, as indicated in Table 6 and the t-statistic of t = 3.30 (p-value = 0.005). The 95% confidence interval for the true population slope falls between $41,390 and $211,950. This means we can confidently state that a 1% increase in store brand net sales penetration for this category will boost the specific category net margin within this range.

Conversely, a strong negative relationship is found for the categories of cream (t = -3.10, p-value = 0.004) and yogurt (t = -3.50, p-value = 0.002) when analyzing the relationship between store brand sales penetration and profitability. We can assert with high confidence that a 1% increase in store brand net sales penetration for the cream category will decrease its net margin between $109,197 and $541,897. Likewise, for yogurt, it is evident that a 1% increase in store brand net sales penetration will reduce the net margin between $320,744 and $772,811. Notably, an increase in yogurt's store brand net sales penetration has a larger potential impact on net margin reduction compared to cream. Once again, an examination of the retailer's promotional strategy will be a subject for future research to explore the idiosyncrasies of each product category.

Furthermore, the results indicate that cream, refrigerated juices, and yogurt, as shown in Table 6, have coefficients of variation ranging from 20% to 30%. It can be concluded that at least 20% of the variation in the profitability of these respective categories is attributable to changes in store brand sales penetration values.

H₄: There is a significant positive relationship between category specific store brand gross margin dollar penetration and profitability.

A conventional 5% level of significance (LOS) was utilized for testing the nine categories for the H4 hypothesis. Table 7 provides the regression analysis, which includes R, R^2, t-statistic, p-value, the results

of the test at a 5% LOS, and the results of the Durbin Watson test for independence in the residuals. Excluded from the discussion are the categories of Cottage Cheese (PAC = positive autocorrelation) and Mike and Yogurt (IC = inconclusive) due to the potential failure of the independence test among the residuals. Further analysis is warranted, presenting an excellent avenue for future research.

TABLE 7
RESULTS OF THE REGRESSION ANALYSIS FOR HYPOTHESIS 4 (H4)

Hypothesis Tests for IV = Gross Margin Penetration and DV = Net Margin (Per Category)							
						At 5% LOS	Ind Check
Category	n	R	R^2	t-stat	P-value	Conclusion	DW Test
Butter	32	0.425	18.069	2.572	0.015	Reject	passed
Cheese	32	0.285	8.120	1.628	0.114	DNR	passed
Cottage Cheese	32	0.224	5.039	1.262	0.217	DNR	PAC (1.36)
Cream	32	-0.345	11.887	-2.012	0.053	DNR	passed
Dessert	32	-0.141	1.982	-0.779	0.442	DNR	passed
Eggs	32	0.548	30.073	3.592	0.001	Reject	passed
Milk	32	0.190	3.597	1.058	0.299	DNR	IC (1.47)
Refrigeration Juice	32	0.099	0.971	0.542	0.592	DNR	passed
Yogurt	32	-0.227	5.164	-1.278	0.211	DNR	IC (1.38)

The discussion of the remaining six categories is categorized into those that reject H4 and those that do not reject it at a 5% LOS. In this hypothesis, the four categories of cheese, cream, dessert, and refrigerated juices do not support H4. Consequently, there is no significant positive relationship between changes in category-specific store brand gross margin dollar penetration and profitability for these four categories. This, once again, could be attributed to the retailer's promotional strategy in this study, which employs these categories as traffic drivers through highly discounted retail prices, suppressing overall profitability.

A significant positive relationship is observed between changes in butter store brand gross margin dollar penetration and profitability, as indicated in Table 7 and the t-statistic of t = 2.57 (p-value = 0.015). The 95% confidence interval for the true population slope falls between $12,961 and $112,866. Results indicate that a 1% increase in store brand net sales penetration for this category will boost the specific category's net margin within this range.

Additionally, a significant positive relationship is observed between changes in eggs store brand gross margin dollar penetration and profitability, as indicated in Table 7 and the t-statistic of t = 3.59 (p-value = 0.001). The 95% confidence interval for the true population slope falls between $257,431 and $935,965. It can be asserted that a 1% increase in store brand net sales penetration for this category will boost the specific category's net margin within this range. Furthermore, the results indicate that butter and eggs, as shown in Table 7, have coefficients of variation of 18% and 30%, respectively. Looking at the coefficient of variation and the 95% confidence interval for eggs allows us to understand the impact of changing the store brand

gross margin dollar penetration for this product. It is highly likely that even a small change in penetration for store brand eggs could have a significant effect, close to $1 million dollars, on the net margin.

DISCUSSION AND MANAGERIAL IMPLICATIONS

The purpose of this study was to empirically investigate the impact of store brands on category performance. The study generated results according to each research question:

RQ1: What is the impact of store brands on overall category performance?

RQ2: Does the extensive focus of retailers in promoting their store brands conflict with the premise of category management that seeks to maximize the sales and profits of the entire category and not any individual brand?

It is vital for category managers to focus on all brands within their respective categories and not overemphasize store brands. Category management emphasizes finding the optimal mix of all brands in a product category from the perspective of consumers, and retailers need to assess what this optimal level is for both store brands and national brands in each product category. Improved performance of the entire product category and not just private-label brands is the underlying principle of category-management practices. The contribution of each brand toward overall category sales and profits needs to be evaluated to determine 'over performing' or 'underperforming' product lines.

LIMITATIONS AND FUTURE RESEARCH

A limitation of this research was the collection of data from one supermarket chain that utilizes a promotional pricing strategy (high-low strategy) and the results may differ from other retailers that utilize an everyday low price strategy. There is also variability between different regions of the United Stated in sales penetration and consumer perceptions of store brands limiting the inferences obtained from this study to other supermarket chains throughout the country. The supermarket retailer used in this study has a store brand program that is maturely developed and conclusions may not be consistent with a supermarket store brand program that has not reached a mature level or is underdeveloped compared to competition.

A recommendation for future research is to focus on other types of food retailers as store brand impact may potentially vary across food-retail formats due to varying buying volumes and influence of national-brand manufacturers. To further validate the findings of this study, additional research should be conducted on other product categories. Future studies should also focus on the promotional strategies of retailers for all brands in a product category, consisting of both store brands and national brands.

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