

## **Why Private Labels Show Long-Term Market Share Evolution**

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### Abstract

Previous research has shown that most consumer packaged goods markets are in long-run competitive equilibrium. In most categories, a given brand's market share is stationary, showing remarkable stability over long time horizons (10 years). This empirical generalization has been attributed to consumer inertia and to competitive reaction elasticities that lead to offsetting marketing spending which nullify attempts by one brand to take unilateral action to increase share. We find a clear exception to this rule — during the period 1987-94 the retailer's private label consistently showed positive market share evolution. In 225 consumer packaged goods categories, private labels trended upward 86% of the time. The trend persisted even after controlling for marketing spending by both national and store brands. We consider the viability of alternative explanations including changes in consumer and national brand behavior and find that none of them can adequately account for the trend in private label share. We offer an analytical explanation and empirical support for why private labels can grow even though national brands shares are relatively stable. We argue that the retailer is in the best position to opportunistically appropriate different sources of category growth because not only does it control its own marketing spending, it also exerts some influence over the ultimate marketplace spending of their national brand competitors.

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A manager observes flat unit sales but a 2% decrease in market share for the quarter. Was it seasonality, bad luck, problems with a leading retailer, an aggressive competitor, or a systemic downward trend? An academic looks at the same numbers and then asks to see the prior seven quarters which show market share point changes of +2%, -0.5%, +0.5%, +1%, -1%, +0.5%, and -0.5%. The academic concludes that there is substantial noise in the system and that the market is stationary. The manager sees that share was up 3% in the prior year but down 3% over the last 12 months and opts for quick and decisive marketing action to reverse the negative trend.

It is not clear who is right. Small share changes may be nothing more than random error with no systematic drift, but 1-2% of a big number demands managerial attention and action. If nothing else, it is difficult to defend doing nothing, especially if competitors are spending more on promotion or lowering prices. We argue that both academic and manager are partially right but not looking at the problem in the same way. It may be because the manager reacts so quickly to small changes in performance that many consumer product goods (CPG) markets display the stationarity documented by all studies of long-term market share (Bass and Pilon 1980; Ehrenberg 1988; Lal and Padmanabhan 1995). The purpose of this paper, however, is neither to demonstrate once again that market shares are remarkably stable nor to provide evidence that the stability is due to consumer inertia and rapid competitive reactions. We find the nullifying competitive reaction story compelling. Instead, we show that while most brands in a category do show market share stationarity, there is one brand that does not, at least during the period of time we study. And it is the retailer's own brand, the private label.

We find that in 86% of 225 CPG categories the private label trended upward, on average about 1% per year during the period 1987-1994. The popular business press repeatedly noted the

rise of private labels in the early 90's, but previous academic studies have reported significantly smaller increases in private label shares — aggregate data from IRI and Nielsen indicated an increase of less than two market share points over the same time period (Hoch 1996). The trends we find are robust, persisting even after controlling for marketing spending by national brands (NB's) and the retailer. Cross-category analysis indicates that the uptrends are greater for health and beauty aids (HBC) categories and also greater in categories where the private label is of higher quality and is more extensively distributed. Private labels trends are independent of category growth rates or size. Although improved consumer attitudes towards private labels undoubtedly contributed to the PL uptrend, an improving economy during the time period casts doubt on a budget constraint explanation.

We argue that the anomalous behavior of the private label largely occurs because it is the only brand that controls not only its own marketing mix decisions, but also exerts a substantial measure of control over many of the marketing mix decisions made by its competitors. By virtue of making decisions after all the NB's have committed to a course of action, the retailer, if they so choose, is in a better position to blunt NB competitive reactions. We offer an analytic model and empirical support for how the retailer can use their private label to opportunistically appropriate many sources of category growth. We show how the retailer can unexpectedly turn demand generating of the NB's (e.g., price promotions) to their own advantage, essentially free-riding on marketing spending by NB competitors.

### **Consumer and Institutional Inertia**

A number of theoretical and empirical analyses suggest that a majority of CPG markets are more or less mature and long-run brand shares are approximately stationary. For example, Ehrenberg and colleagues (1988; Ehrenberg, Goodhardt, and Barwise 1990; Goodhardt,

Ehrenberg, and Chatfield 1984) have demonstrated the remarkable fit of the Dirichlet model to consumer repeat purchase data. Strictly, the model applies to markets that are stationary (no trends short or long run), not segmented (no homogeneous subgroups of consumers or brands), and where purchase behavior is zero-order (no learning or purchase feedback). On the surface these assumptions appear heroic, but in practice discrepancies from Dirichlet model predictions are not common (cf. Fader and Schmittlein 1993; Kahn, Kalwani, and Morrison 1986).

Although brand specific idiosyncracies exist and changes in marketing mix decisions cause short-term perturbations in performance, apparently they wash out in the long-run as market shares generally attain a long-run equilibrium (Bass and Pilon 1980). Dikempe and Hanssens (1995) in a meta-analysis of 400 prior analyses find that unit sales and marketing spending usually (68% of the time) evolve (i.e., move in one direction or another). In contrast, a similar analysis of market shares showed that 78% of the time series were stationary. Lal and Padmanabhan (1995) found that less than 1/3 of all brand level time series showed a statistically significant trend.

Although consumer inertia may explain some of the stationarity that characterizes consumer packaged goods markets, there is plenty of evidence that consumer tastes change over time and new brands and entirely new product categories that better satisfy consumer needs hit the market every year. And so it seems likely that some other forces are operating. Specifically, besides a healthy dose of consumer inertia, there is also plenty of institutional inertia. Let us go back to the brand manager mentioned earlier. He knows that when he increases promotional spending that his brand gets a significant short-term lift in sales performance. He probably believes that own-price elasticities are substantial. Chances are that he also believes that sales of competitive brands are influenced by his promotional spending. And the story suggests that he

believes that his brand has been adversely affected by competitive promotions, i.e., cross-price elasticities also are substantial. With these beliefs, what does he do? He reacts to the competition and his competitors react to his actions. Therefore, reaction elasticities also are substantial. If he and/or his competitors overestimate own and cross elasticities, then what may result is marketplace inertia due to aggressive reactions to competitors that essentially cancel each other out. This is the conjecture of Bass et al. (1984) — offsetting promotional activities contribute to the long-run equilibrium of market share.

Institutional inertia is probably of greater magnitude than consumer inertia since the firms have so much to lose if they get forced out of the market. The natural tendency is to do whatever it takes to ensure survival. Some firms may be willing to spend more than others but willingness to spend has to be closely linked to current market share since market share is a surrogate for what the firm potentially might lose by not matching. In support of this view, Lal and Padmanabhan (1995) found no trend in relative promotional expenditures over time. Even in categories that displayed non-stationary market shares, firms reacted quickly to changes in the promotional spending of their competitors. In essence these matching reactions nullify short-term changes in performance that might accompany a change in promotional spending by the competition. The result is long-term stationarity in shares.

### **The Study**

We analyze trends in the market share performance of private labels and compare them with trends observed for national brands. We also analyze which national brands are most likely to lose out to the private label. We show that even after controlling for changes in marketing spending by national and store brands, the trends in private labels persist. We are left concluding that it is the retailer who plays a dominant role in the evolution of private label market shares.

## Data Description

The data come from the Marketing Factbook published annually by Information Resources, Inc., a syndicated data provider to the CPG industry. The database contains most of the categories sold by U.S. supermarkets during 1987-1994<sup>1</sup>. The data represent an aggregation of the purchases of about 35,000 individual households, from 26 markets shopping in 180 different food stores. IRI states that the sample has demonstrated itself to be representative of national buyer behavior and overall consumer purchasing dynamics. The categories range from dry grocery (both food and non-food), frozen and refrigerated foods, health and beauty aids, and some general merchandise. There were 300 categories for which we had complete data for all 8 years. In 225 of these categories, there was a private label alternative available.<sup>2</sup>

At the category level, IRI provides the 13 variables in the Marketing Factbook as shown in Table 1 along with total volume expressed in units appropriate to the category (ounces, rolls, tablets). The same variables are reported for a number of manufacturers, brands, and the private label. Private label totals represent an aggregation across all retailers' store brand alternatives. Disaggregate brand detail varies greatly from category to category. To maintain consistency across categories, we aggregated up to the manufacturer level and formed five brand level aggregates: the leading national brand (NB<sub>1</sub>), the second largest national brand (NB<sub>2</sub>), the third largest national brand (NB<sub>3</sub>), the private label (PL), and all the rest of the brands (Other). National brand market share status was determined by a manufacturer's rank in 1987.

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<sup>1</sup> Although the Factbook goes back to 1982, we elected not to use the earlier years due to potential problems that could arise from a change in the sampling frame. During the first 5 years, the sample was largely composed of the small-town BehaviorScan markets, whereas in later years the data includes major metropolitan supermarket chains.

<sup>2</sup> This dataset is available through the Wharton Research Data Services. For more information see <http://wrds.wharton.upenn.edu>.

**Table 1: Description of the Database**

<b>Variable</b>	<b>Description</b>
Category Volume	Percent of total category volume in units
% Households Buying	Percent of households who made at least one purchase during the year
Volume/Purchase	Average volume of the item bought on a single shopping trip
Purchases/Buyer	Average number of times the item was purchased by buyers during the year
Purchase Cycle (Days)	Average number of days between consecutive purchases among repeat buyers of the item
Price/Volume	Average price paid per equivalent category-specific volume
Any Trade Deal	Percent of volume sold with any form of promotion
Print Ad Feature	Percent of volume sold with any newspaper or store flyer advertising
In-Store Display	Percent of volume sold with any off-shelf display
Shelf Price Reduction	Percent of volume sold with any short-term reduction in price of 5%
Store Coupon	Percent of volume sold with a coupon issued by the store. All coupons for private labels are store coupons.
Manufacturer Coupon	Percent of volume sold with a manufacturer's coupon
% Off Deal Prices	Average percent discounts on price deals

### **National Brand Stationarity and Private Label Evolution**

We estimated a simple linear time trend by regressing market share onto time for each of the five brand aggregates (NB<sub>1</sub>-NB<sub>3</sub>, PL and Other). A logistic transformation of the market share data produced identical results. We also conducted two nonparametric tests: a standard run test and the so-called *r* test. The *r* test compares the sum of squared deviations of successive observations to the sample variance; a trend is present when this quantity is small. The run test and the *r* test are omnibus tests that can detect more than simple linear trends; however, the



omnibus properties of these tests also result in lower statistical power against simple linear trends, and therefore provide more conservative criteria for declaring a trend.

The results are summarized in Tables 2a-2b. Across the five brand aggregates, 57% of the series displayed a significant trend, half positive and half negative.

**Table 2a: Overall Trends and Regression of Market Shares onto Time**

Brand	Overall Trends		Average Market Share Change/Year	Average Estimated Slope (S.E.)	Significant Trends (p<.05)	
	Positive	Negative			Positive	Negative
PL	86%	5%	+1.12	+ .92 (.08)	68%	5%
NB <sub>1</sub>	40	60	-.36	-.02 (.01)	20	37
NB <sub>2</sub>	41	59	-.12	-.01 (.02)	17	32
NB <sub>3</sub>	48	52	-.10	-.03 (.03)	28	24
Other	28	72	-.54	-.13 (.04)	14	43

**Table 2b: *r* Test and Run Test for Randomness**

Brand	<i>r</i> Test (p<.05)		Run Test (p<.05)	
	Positive	Negative	Positive	Negative
PL	61%	4%	44%	3%
NB <sub>1</sub>	17	32	12	24
NB <sub>2</sub>	16	26	9	20
NB <sub>3</sub>	23	22	14	19
Other	12	39	10	24

Using the same data source but a different time frame (1983-92) and brand aggregation scheme, Lal and Padmanabhan (1995) found that 33% of the categories showed significant trends (p<.05).<sup>3</sup>

<sup>3</sup> Lal and Padmanabhan do not report whether they included private labels in their analysis.

The most striking feature of the data is the overwhelming tendency for positive (86%) and statistically significant (68%) trends in private label shares. The average annual change in private label share is +1.12 share points. The average  $\beta$  coefficient of +0.92 for the time variable implies an estimated increase in private label share of 6.44 share points over the 1987-94 period. This does not strike us as evidence for stationarity. Instead store brands systematically gain ground at the expense of all NB competitors. For the four NB aggregates, about half of the time series display significant trends, somewhat more negative (34%) than positive (20%). There is more noise in the national brand trend data, however, as only the trends for NB<sub>1</sub> and Other are different from chance.

**Proportional Draw Analysis.** The previous analysis provides clear evidence that private labels are gaining share. The generally negative trends for each of the NBs in the category suggest that private label is gaining some share from all of its competitors. A more penetrating question, however, is whether the store brand is gaining at the expense of some brands more than others. To address this issue, we compare the empirically observed share losses to a proportional draw model which is consistent with a logit choice model formulation. Specifically, in the first year of the time series (1987), for each of the four brand aggregates (NB<sub>1</sub>, NB<sub>2</sub>, NB<sub>3</sub>, Other) we calculated each brand's share of the market exclusive of the private label. For example, let us say that the private label had 20% market share and NB<sub>1</sub> had 30%. Moreover, let us say that the PL gained 10 share points and rose to 30% market share in 1994. Then NB<sub>1</sub>'s expected share loss would be calculated as  $NB_1 / (100\% - PL) = 30/80 = 37.5\% \times (10\% \text{ PL share gain}) = -3.75\%$ .

Table 3 displays the results of the proportional draw analysis. Private labels gain some share from all their competitors, though they gain disproportionate market share from the smaller brands in a category. Share losses for the top three brands all are less than predicted by a

proportional draw. Only the Other category loses more than expected given its starting market position. There are a number of possible reasons for this. Consumers may perceive private labels as more similar to these smaller share brands. And as retailers make attempts to reduce supply chain costs through assortment reductions, they may be more likely to eliminate smaller regional brands who have less clout and with whom the retailer has a more limited relationship.

**Table 3: Loss of Share Analysis: Observed vs Expected Under Proportional Draw**

Brand	1987-1994 Market Share Loss		Observed-Predicted
	Observed	Proportional Draw	t-test
NB <sub>1</sub>	2.52	3.34	<-1
NB <sub>2</sub>	.84	1.38	<-1
NB <sub>3</sub>	.70	1.28	-1.50
Other	3.78	1.85	3.53

**The Impact of NB and PL Marketing Spending.** The previous analyses showed robust uptrends in PL market shares and weaker downward trends for the NB's. Private labels gain some market share from all of competitors, though the smallest brands in each category (Other) lose more than their fair share. In the next analysis we take advantage of both the time series and cross-sectional character of our data to better understand how the market mix decisions of both the national brands and the retailer influence trends in private label share. The basic structure of the analysis is as follows. First, the market shares were logit transformed to ensure that the dependent variable ranges over real values and avoids truncation effects of the untransformed values. Second, since we are interested in understanding trends in share across categories, the share data were mean-centered separately by category, equivalent to including category intercepts. We then estimated the following model:

$$PL_{t+1} = f[PL_t, \Delta_{(t+1)-1}(\text{NB and PL Marketing Mix Decisions}) + \Delta_{(t+1)-1}(\text{Category Buying Characteristics})] \quad (1)$$

We regress the logit transformed market shares onto the lagged market shares and changes in the marketing mix decisions of both the national brands in aggregate and the private label while controlling for contemporaneous changes in the buying characteristics of the category.<sup>4</sup>

Results are displayed in Table 4. The adjusted  $R^2$  of the model was 0.48. The statistically significant variables are shaded. Category buying characteristics explain little variance; only category penetration rate is significant, indicating that private labels grab more share in categories where fewer new consumers enter the category, a symptom of category maturity. Private labels may do better in mature categories because national brands introduce fewer new products, and so private label manufacturers more easily close the quality gap with NB's (Hoch and Banerji 1993).

Marketing mix decisions play a significant role in private label growth. Increases in NB feature advertising, in-store display, and coupons all retard private label growth, whereas when retailers display their own brands in their stores, private labels show greater increases in share. In terms of the competitive promotion equilibria that might lead to market share stationarity, it is interesting to think about who actually makes the spending decision for the four significant marketing mix variables. Two decisions seem straightforward. The retailer has complete control over displaying their own brands in their own stores, and NB's have control over their direct-to-consumer couponing activities. NB's, however, have only partial control (at best) of the feature advertising and display activities of the retailer. Witness the less than 50% pass-through of the trade-deals that they offer to the retailer. It is true that national brands sometimes can negotiate advertising and display guarantees as a precondition to providing the retailer with trade promotion

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<sup>4</sup> Although the resultant OLS estimates are consistent, with heteroskedasticity introduced through violations of across-category pooling assumptions, the standard errors tend to be biased downward. We therefore used White's

monies. But the retailer still has the final say and so can blunt the competitive reactions of the national brands to the performance and promotional spending for their own private labels.

**Table 4: Determinants of Trends in Private Label Market Share**

Variable	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>t-statistic</u>	<u>p value</u>
$PL_t$	.6352	.0356	17.83	0.000
$\Delta(\text{Category Volume})?$	$3.57 \times 10^{-6}$	$3.70 \times 10^{-6}$	0.96	0.336
$\Delta(\text{Category Penetration Rate})$	-.0093	.0046	-1.99	0.047
$\Delta(\text{Volume/Purchase})$	.0001	.0167	0.08	0.937
$\Delta(\text{Category Purchase Cycle})$	.0022	.0020	1.12	0.261
$\Delta(\text{NB Price})$	.0429	.0523	0.82	0.412
$\Delta(\text{NB Trade Deals})$	.0007	.0020	0.36	0.723
$\Delta(\text{NB Print Ad Feature})$	-.0073	.0034	-2.15	0.032
$\Delta(\text{NB In-Store Display})$	-.0082	.0027	-3.00	0.003
$\Delta(\text{NB Coupons})$	-.0091	0.0019	-4.69	0.000
$\Delta(\text{PL Price})$	-.0465	.0353	-1.32	0.188
$\Delta(\text{PL Trade Deals})$	.0006	.0018	0.31	0.757
$\Delta(\text{PL Print Ad Feature})$	.0033	.0024	1.38	0.167
$\Delta(\text{PL In-Store Display})$	.0058	.0022	2.61	0.009
$\Delta(\text{PL Coupons})$	.0089	.0106	0.84	0.404

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Asymptotic Covariance procedure to recompute corrected standard errors which are asymptotically consistent under these types of specifications.

Although changes in NB and PL marketing spending influences private label market shares, the large coefficient for the lagged PL share variable suggests a substantial upward trend even after controlling for marketing spending. We re-estimated the model in Eq. 1 without including the lagged PL share term and saved the residuals. We then re-estimated the time trends by regressing the residuals for each category onto the time variable. From this analysis we can determine whether the long-term trends persist even after controlling for NB and PL marketing spending. This analysis showed that 50% of the residual trends were positive and significant and 8% were negative and significant versus the 68% positive and 5% negative shown in Table 2a. Private label trends persist even after controlling for marketing spending. In the next section we evaluate the viability of some alternative explanations.

### **Determinants of Private Label Trends**

In light of all the prior research documenting long-term stationarity in CPG brand shares, we find the systematic uptrend in private label market shares noteworthy. Moreover, previous time series analyses have reported smaller changes in private label share (Hoch 1996). The more interesting issue, however, is why private labels have trended upward while other brands have displayed stationarity. In this section we consider a number of alternative factors that might contribute to the systematic trends in the private label during 1987-94.

**Changes in Consumer Attitudes.** One reason for the uptrend in store brands could be systematic changes in consumer attitudes and knowledge. Consumers could have become more sophisticated about NB-PL brand equivalence or become more value-conscious during the period of the study. In Table 5 we reproduce data from DDB Needham's annual Life Style Study that address attitudes toward store vs national brands and price consciousness.

**Table 5: Consumer Attitudes Toward NB's and Private Labels**

Statement	Year (1985-1995)											Trend
	85	86	87	88	89	90	91	92	93	94	95	
When I have a favorite brand I buy it-no matter what else is on sale.	59	60	59	61	58	58	59	58	54	56	59	-.33*
A national advertised brand is usually a better buy than a generic brand.	31	36	34	34	31	36	36	28	31	27	34	-.34
I try to stick to well-known brand names.	63	67	63	64	61	64	63	58	61	57	59	-.69*
A store's own brand is usually a better buy than a nationally advertised brand.	55	53	48	49	53	46	51	52	53	54	55	.20
I always check prices even on small items.	67	66	68	65	67	63	63	63	66	65	64	-.30

\* Denotes an estimate that is significant at the 5% level.

As can be seen, the evidence is mixed. During the relevant time period, consumers become less convinced of the superiority of national brands (the first 3 items), but there is no trend for either of the questions concerning whether the store brand is a better buy or consumers are more price consciousness. Previous research (Wells 1970) has shown that public opinion is remarkably stable even over long time horizons. Consumer attitudes may have become more favorable towards private labels, but it is difficult to believe that the relatively small changes could completely account for the sizable trends in private label market share that we observed, especially given the limits to attitudes predicting actual behavior.

**Budget Constraints.** Most practitioners and academics believe that private labels are income inferior goods due to their lower perceived quality. This implies that as income increases, consumers will shift consumption away from private labels towards higher quality national brands, whereas declines in income would result in gains for private labels. Previous research (Hoch and Banerji 1993) has shown that changes in private label share are inversely related to changes in personal disposable income. However, this conjecture conflicts with the steady observed growth

in both private label sales and real disposable income over the period of analysis. Real disposable income is plotted in Figure 1, the only decline occurred during the 1991 recession. If private labels are income inferior then their sales should have moved inversely with income. Budget constraints do not explain the uptrend in private label shares.

### **Cross-Category Analysis of Private Label Trends.**

In this section we consider a variety of category characteristics that might explain the uptrend in private label shares. These include:

1. **Improvements in Private Label Quality.** In the early days of private label development, many retailers and suppliers viewed private labels as a way of offering the consumer a low priced, lower quality alternative, i.e., an inferior good. Today, however, most retailers attempt to source store brand alternatives as close as possible to the quality of the leading NB's given cost and technology limitations. Although it is tough to pinpoint an exact point that retailers switched to a high quality strategy, it is clear that private label quality improved continuously over the 1987-94 period. Previous cross-category analyses have documented that quality is an important determinant of private label share (Hoch and Banerji 1993); consumers respond not only to price but also quality.
2. **Increases in Private Label Distribution.** It is possible that some or all of the market share growth for private labels comes from increases in the number of retailers offering a private label alternatives rather increases in share of the retailers who already carried a private label. Undoubtedly, increases in private label distribution, what the industry calls % ACV (All Commodity Volume), contributed to the robust uptrends. In our data set IRI reported no private label sales in 1987 for 19 out of 225 (8%) of the categories. By 1994, private labels in these categories had achieved a 10% share (compared to 7.6% growth for the remaining categories), which by definition must be due to increased distribution.
3. **Category Growth and Marketing Spending.** It is well known that during the late 1980's and early 1990's CPG firms shifted a significant percentage of their promotion budget from media advertising to trade promotion, in the range of 10% of their budgets according to the Donnelly Marketing Annual Survey of Promotional Spending. Much of the popular business press interpreted this trend as evidence of a shift in power to manufacturer to retailer, though Messinger and Narasimhan (1995) present strong evidence refuting this claim. It still is possible that this shift in spending patterns opened the door for private label. This seems more likely in categories that are not growing or mature, as NB's reduce spending due to lack of opportunity.
4. **Category Size.** Hoch and Banerji (1993) found that private labels had significantly higher share in large categories. They argued that this made sense from the retailer's perspective



since an investment in gaining share in a large category would bring larger rewards than in smaller categories. This suggests that there may be greater opportunity for private label growth in smaller categories where store brands are less developed.

We conducted a cross-category analysis of the private label trends to understand the influence of each of the factors just mentioned. The dependent variable was the change in share of the private label between 1987-94.<sup>5</sup> Each category was classified into one of four types: food, non-food, HBC, and refrigerated/frozen. As a surrogate for private label quality, we utilized the quality rating scores from Hoch and Banerji (1993) who surveyed 25 quality assurance experts in the late 1980's. In addition we used Hoch and Banerji's estimates of extent of distribution for the private label. For our measure of category growth, we estimated growth rates by regressing overall category unit volume onto time. The 225 categories were then divided into growing (coded +1) or declining (-1) categories depending on whether the trend coefficient was statistically significant ( $p < .05$ ), or flat otherwise (0). Category volume was obtained by multiplying unit volume times average unit price for the year 1987.

**Results.** Table 6 provides the results of this analysis. Three different models were estimated. Model 1 includes only category type indicator variables, with the refrigerated/frozen type serving as the base case. Significant differences in private label growth rates emerged; private labels grew much faster in HBC categories (13.1 share points) whereas refrigerated/frozen categories grew the slowest (4.5 share points). This improvement in HBC private labels is not totally unexpected and is probably at least partly driven by the strong push by supermarkets to develop the drug and pharmacy side of the business during this period. Model 2 includes only the category characteristics. Only the quality variable is significant.

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<sup>5</sup>An analysis using the estimated trend coefficients as the dependent variable yielded similar results.

Model 3 contains all the variables. The HBC indicator variable is still significant as is quality and extent of distribution. Private labels grew more in categories where they started off at a higher quality level, reinforcing the importance to consumers of high quality (Hoch and Banerji 1993). We had expected a negative quality coefficient might if across the board uptrends in private label were due predominately to improvements in quality, our rationale being that improvements in private label quality were more likely for categories that started off with lower quality and had more room to improve. Possibly lower quality categories faced technological barriers to improvements in quality which higher quality categories could (continue to) overcome. Higher levels of distribution also were associated with larger private label trends. Our thinking was that the coefficient for this variable would be negative if the uptrends in private labels were due more to increases in the number of retailers carrying a private label rather than increases in share within retailers already carrying private labels. The positive coefficient argues against that conjecture and suggests that higher levels of distribution were a necessary condition for future growth. Neither category growth nor category volume were statistically significant.

**Table 6: Cross Category Analysis of Private Label Trends**

<b>Variable</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Constant	4.5 (3.7)	-7.7 (-.8)	-29.8 (-3.0)
Non-Food	2.5 (1.4)	--	3.1 (1.7)
HBC	8.6 (5.1)	--	10.9 (5.9)
Food	1.1 (0.7)	--	1.0 (0.8)
Category Growth	--	0.35 (0.5)	1.1 (1.5)

Category Volume	--	-9.3 (-1.7)	-8.2 (-1.6)
Extent of Distribution	--	-5.7 (-1.4)	9.7 (2.1)
Quality	--	4.4 (2.0)	5.7 (2.7)
R <sup>2</sup>	.14	.05	.21

T-values of the estimates are provided in parentheses below the estimate.

These cross-category analyses show that private labels grew faster in some categories (HBC) than others. Moreover, private labels grew faster in categories with higher quality alternatives that were more widely distributed. We are by no means trying to suggest that across-the-board improvements in private label quality and distribution intensity did not contribute to the overall uptrend in private label share. We think it likely that private label quality and distribution continued to slowly improve during the time of the study. At the same time, this cross-category analysis suggests that additional forces were operating. Consumer attitudes toward private labels improved slightly over the relevant time period but hardly enough to explain the trends in share that we found, especially considering that attitudes usually are weak predictors of actual behavior. Budget constraints seem an unlikely factor since the economy generally trended upward during the relevant time frame. Although it has been well-documented that CPG firms shifted their marketing investments from advertising to trade promotion, we found that PL uptrends occurred independent of category growth, 7.6 share points in growing categories vs 6.6 and 6.9 share points in flat and declining categories. This casts doubt on the idea that the PL's benefited solely in cases where category maturity or decline led to decreased investment by NB's.

And so if these various explanations cannot adequately account for the private label, what does explain the fact that private labels have shown consistent long-term growth while national brands have been relatively stable? In the next section we sketch an analytic framework for the role of the retailer and provide some data consistent with the model.

### **An Analytic Framework to Understand Private Label Growth**

The average annual change in share for the top three national brands is -0.20%. In contrast, the average annual change for private labels is +1.12%. To illustrate the distribution of these changes we construct probability density estimates of the annual percentage changes for the national brands and private labels across the 225 product categories as shown in Figure 2. Notice that there is substantial variation in annual growth rate for all brands, but the distribution for private labels is shifted to the right which indicates an average tendency for private labels to grow at the expense of the national brands.

We offer a simple analytic framework to account for this pattern. We do not claim that it is the only explanation, but the model is simple, robust, and consistent with the data. It offers insight into why private labels may grow while other brands decline at a very slow rate. The key assumption is that retailers target private labels at the most successful brand(s) in a category (Sayman, Hoch, and Raju 2001). We presume that the targeted brand(s) is growing in relative and/or absolute terms; it is difficult to imagine a retailer allocating scarce resources toward targeting national brands with contracting shares. By selectively targeting pockets of category growth, the retailer can opportunistically appropriate some fraction of national brand growth for their own private label even if the overall marketplace is stagnant.

**Private Label Targeting of National Brands:** We take a broad view of private label targeting of national brands. The most direct way that private labels target national brands is

developing private labels that have similar product attributes and packaging. At the same time, there are less drastic and expensive ways that retailers can re-target that still may allow the retailer to appropriate some of the chosen national brand's growth. First, the retailer can change the shelf placement of the private label or alter the target of "compare and save" signage. Second, the retailer may introduce more than one private label. Sayman and Raju (2000) showed that in categories with two leading national brands (e.g., Miracle Whip and Hellman's Mayonnaise), a retailer is more likely to maintain multiple store brands. Premium store brands like President's Choice or Safeway Select are one way to accomplish this. Finally, there are numerous ways that the retailer can piggy-back onto the short-term demand generating activities of the fastest growing national brands. When NB's spend trade promotion dollars to secure in-store display space, retailers can display their store brands in close proximity. The retailer can use national brand advertising (both retailer-initiated feature advertising and national brand's own direct-to-consumer advertising) to build store traffic and then re-route that traffic toward its own brand once customers are inside the store. Some retailers engage in a practice called price shielding; whenever a leading national brand engages in a price promotion, the store brand also goes on deal in order to maintain its price advantage. Price shielding is not a game that NB's can play against each other. Retailers can also select which promotional offers to accept or reject (Hess and Armstrong 1997), giving them control over price levels and price variation.

**Private Label Growth in a Stagnant Market:** Suppose that a retailer sells two national brands and the absolute change in sales growth for each brand is denoted by  $\Delta q_i$ , where the subscript  $i=1$  or  $2$  denotes the index of the corresponding national brand and  $3$  corresponds with the private label. For simplicity let us assume that the  $\Delta q_i$ 's are independently and identically

distributed normal variates,  $\Delta q_i \sim N(0, \sigma^2)$  for  $i=1, 2$ . In other words the national brand market is stable, i.e.,  $E[\Delta q_i]=0$ . We assume that the retailer targets the national brand whose share is increasing the fastest and will attract  $g$  percent of the new market created by this leading national brand,  $\Delta q_3 = g \cdot \max(\Delta q_1, \Delta q_2)$ . The expected value<sup>6</sup> of private label growth is:

$$E[\Delta q_3] = g \cdot E[\max(\Delta q_1, \Delta q_2)] = g \cdot \sigma^2 \sqrt{2/\pi} > 0 \quad (2)$$

The key insight is that private labels grow faster as variability ( $\sigma^2$ ) in the growth rates of the NB's increases. Notice that private labels are expected to grow even though the individual brands have no expected growth. To illustrate this point we plot the probability density of the growth in Figure 3. Notice the qualitative similarities between Figure 2 and 3, namely the private labels have positive growth and show less variance than the national brands.

We realize that this framework is simplistic, but it is consistent with our findings, our intuition about how retailers operate, and represents a parsimonious argument about why private labels may exhibit growth while national brands are relatively stable. Moreover, this framework is robust, and does not require normality or specific distributional assumptions as we have used in our illustration. The only critical assumption is that the sales of the private label depends upon the sales of a targeted national brand. As long as a retailer has a better than average chance of targeting the leading national brand in its market, then private labels can exhibit positive growth. Changes to our assumptions may lessen the growth of the private label, but what we find most interesting is that the private label growth can occur in a stagnant market.

In essence PL targeting provides a means for the retailer to free-ride on any demand generating activity by an NB, long or short-term in nature, and there are limits on the actions that

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<sup>6</sup> If  $X$  and  $Y$  follow a bivariate normal distribution ( $E[X]=: x$ ,  $E[Y]=: y$ ,  $\text{Var}[X]=F_X^2$ ,  $\text{Var}[Y]=F_Y^2$ , and  $\text{Corr}[X,Y]=D$ ),

the NB can take to prevent it. Consider the specific case of price promotion by NB's<sup>7</sup>. Using the usual linear demand model, where  $q_i$  and  $p_i$  denoting the movement and price of brand  $i$  (1,2=NB's, 3=PL),

$$q_i = \mathbf{b}_{oi} + \mathbf{b}_{1i}p_1 + \mathbf{b}_{2i}p_2 + \mathbf{b}_{3i}p_3 + \mathbf{e}_i, \quad \mathbf{e}_i \sim N(0, \mathbf{s}_i^2) \quad (3)$$

Suppose that the retailer engages in price shielding and sets the price of the private label to always fall below the current national brand price by some small discount:

$$p_3 = \min(p_1, p_2) - \mathbf{d} \quad (4)$$

For simplicity we assume that the prices of the two national brands are identically and independently distributed normal variates,  $p_i \sim N(\bar{p}, \mathbf{n}^2)$ . The expected movement of the PL can be shown to be:

$$E[q_3] = \mathbf{b}_{03} - \mathbf{b}_{33} \left( \frac{\mathbf{n}}{\sqrt{\mathbf{p}}} \right) + (\mathbf{b}_{13} \mathbf{b}_{23} \mathbf{b}_{33}) \bar{p} \quad (5)$$

If demand is downward sloping, i.e.,  $\mathbf{b}_{33} < 0$ , it follows that  $\delta E[q_3] / \delta \mathbf{v} > 0$ . In other words when there is more variability in the price of NB's ( $<^2$ ), the PL can grow faster if the retailer targets the price promotion. We are not arguing that price shielding is necessarily profit maximizing, but when the retailer engages in such a practice, the model suggests that greater NB promotion can perversely increase PL sales, not decrease sales as would happen to other national brands. Intuitively retailers can enjoy the increased traffic drawn to the category and store by the national brand promotions without the promotional costs incurred by the national brands.

### Empirical Support for Opportunistic Targeting of National Brand Growth

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Clark (1961) showed that  $E[\max(X, Y)] = \frac{X M(X)}{L} + \frac{Y M(Y)}{L} + \frac{L N(L)}{L}$ , where  $\frac{X M(X)}{L} = \frac{Y M(Y)}{L}$  and  $L^2 = F_X^2 + F_Y^2 - 2DF_X F_Y$ .

<sup>7</sup> We use price only as an example to illustrate how retailers can target other brands. This model can easily be extended to incorporate other marketing mix variables like feature advertising, in-store display, packaging, and placement. If these other effects enter linearly then price can be reinterpreted in our model as a combination of these

Although we do not have data for a direct test of our analytic model, there is one implication which is testable. Specifically, our opportunistic targeting model implies that private labels should display greater market shares gains when there is greater variability in growth rates of the national brands. This is because higher variability implies that the growth rate of the fastest growing national brand (the extreme value) will be larger.

To test this proposition we used three years of retailer level data for 43 product categories to examine whether there is a systematic relation between within category variability in national brand growth rates and trends in private label market shares. The 1993-1995 data come AC Nielsen and have previously been analyzed by Dhar and Hoch (1997). For the top 120 U.S. supermarket retailers, we utilize yearly sales data for food categories ranging from coffee and cereal to dairy products. For each retailer, we identified the top three national brands and the retailer's private label. To compute a standardized measure of variability in national brand growth, for each year we first computed unit market share of the top national brands out of the top three. For example, market share of  $NB1 = NB1 / (NB1 + NB2 + NB3)$ . We utilize shares rather than unit sales to control for differences in sales volumes across retailers. Then we compute changes in shares for the three NB's from year 1 to year 2 and year 2 to year 3. Our measure of variability is simply the sum of these squared changes in shares. We also compute changes in private label shares from year 1 to year 2 and year 2 to year 3. Notice that because the NB shares are computed holding out the private label, there is no necessary mathematical relationship between NB variability and changes in private label share.

We then computed the correlation between NB variability and private label market share growth for each of the 43 categories. As predicted the correlation was positive, an average



correlation of 0.20, indicating that private labels tend to trend upward at a greater rate when there is greater variability in the growth rates of the top three national brands. Out of the 43 correlations, 38 were positive and for 26 categories the correlation was statistically significant at  $p < .05$ . This demonstration lends support to the notion that there is significant option value that accrues to the retailer through opportunistically targeting the fastest growing national brands. Moreover, the benefits to the private label systematically increase with increases in the variability (and the extreme value) of these national brand growth rates. We should point out that because these results rely on a within-category across-retailer analysis they cannot be explained by secular forces such as changes in consumer attitudes, private label quality, the economy, or increases in distribution.

### **Discussion**

Exogenous events may disturb the stability that characterizes most CPG markets. A product recall or health scare may lead to a shift in market power, e.g. the Tylenol tampering episode. And genuinely new product ideas can shake up an established category. For example, in 1984 when P&G introduced gel technology into its disposable diapers, Pampers gained 12 share points in one year (though because the technology was not patent protected competitors reformulated their products and regained much of the lost share within a couple of years).

What else might perturb the institutional inertia that keeps any one competitor in check? Any one brand controls its own spending but has little if any control over what its competitors do. In essence each firm is one player in an  $n$ -firm prisoner's dilemma where tit-for-tat rules the day. Every brand that is except for one—the retailer's own private label brand. This brand is much like any other brand to the consumer. It faces downward sloping demand with respect to price and upward sloping demand with respect to quality. But unlike other firms, the private label occupies

a special role because the firm that owns it and stands the most to gain and lose from its performance is the very same firm (the retailer) that ultimately has some measure of control over a variety of marketing mix decisions that get made for other brands in the category. For example, although the wholesale prices and trade promotion spending of the national brands have an undeniable influence on the ultimate price and promotion decisions made by the retailer, the retailer still has the final say and more control over the competition, at least relative to the control exerted by one national brand over another.

Therefore, unlike the national brand case, the substantial reaction elasticities that may keep NB shares relatively constant over time may not exert as strong an influence over the market share performance of private labels. Consider the case of price competition in a product category without a substantial private label presence. Generally when one national brand (NB) lowers its wholesale price, other national brand competitors follow suit quickly and the retailer passes those price changes onto the consumer. In contrast, when the retailer has a private label in the category, it is not clear how they will react to the NB's price decrease. Before passing the price decrease onto the consumer, the retailer must decide whether this is in their best interests (Hoch and Lodish 1998). Not only must they anticipate the change in demand for the NB, but also the secondary impact of this price change on their own private label. In the end they may decide to pocket the national brand's lower price in the form of higher margins and the NB has little recourse.

In a high percentage of categories private labels have exhibited substantial long-term positive growth trends. This contrasts with NB's who have grown in far fewer categories and also show negative growth in many other categories. To the best of our knowledge our data-set is the most extensive that has been brought to bear on this problem in terms of the number of categories

analyzed and length of time considered. These results indicate private labels exhibit unique growth characteristics.

The private labels analyzed in this paper are not those of a single retailer, but aggregates of private labels across all retailers. We know that local markets are heterogeneous with big differences in the performance of store brands both across retailers (Dhar and Hoch 1997) and across categories (Hoch and Banerji 1993). The leading national brand is not the same across all geographic markets or even within the same market. Over the 3 year period 1993-95, the leading national brand in the coffee category was Folgers, but across chains Folgers was the top brand in only 65% of chains and the fastest growing brand in only 20% of the chains. If each retailer targets the leading national brand in its chain, the consumer segments reached by private labels may be quite different. The importance of this heterogeneity is that national brands are not competing against a single private label, but a family of private labels each of whom pursue idiosyncratic local policies. Therefore defensive marketing strategies for national brands against encroachment by private labels cannot be narrowly targeted at a single consumer segment, and hence traditional strategies used to compete against other national brands may prove very ineffective. We hope the findings of this paper will encourage other researchers to continue empirical and theoretical research into the unique behavior of private labels at both the micro and macro-levels.

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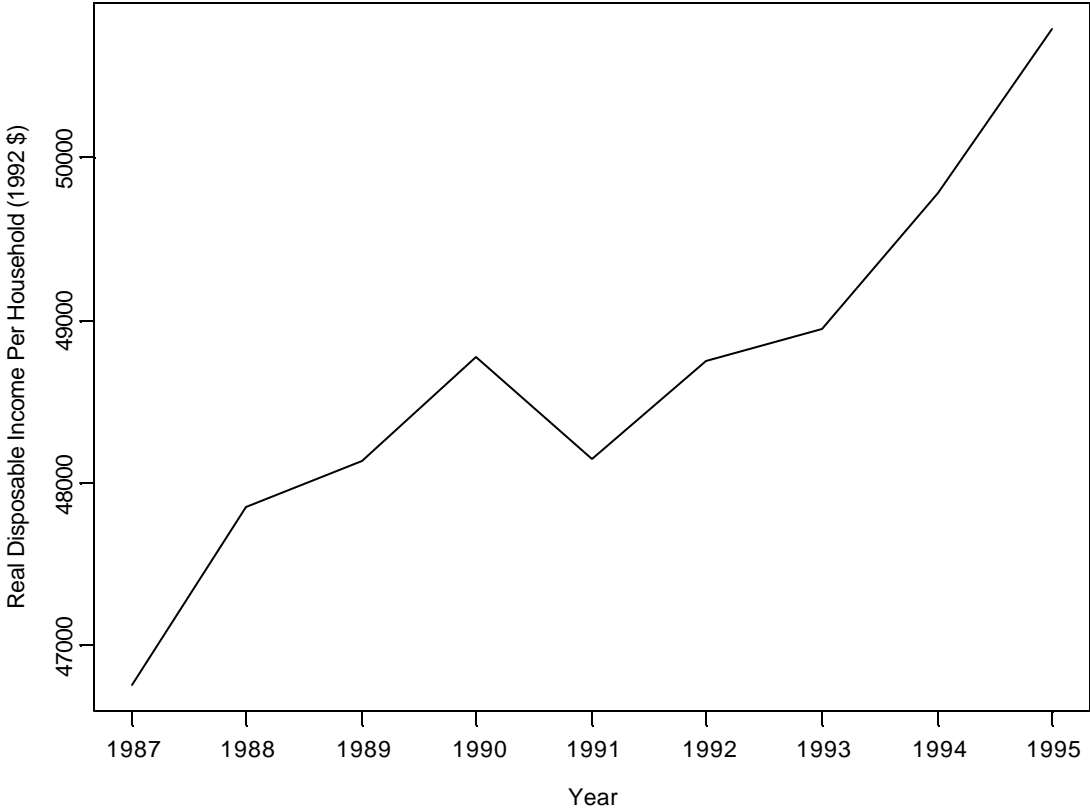
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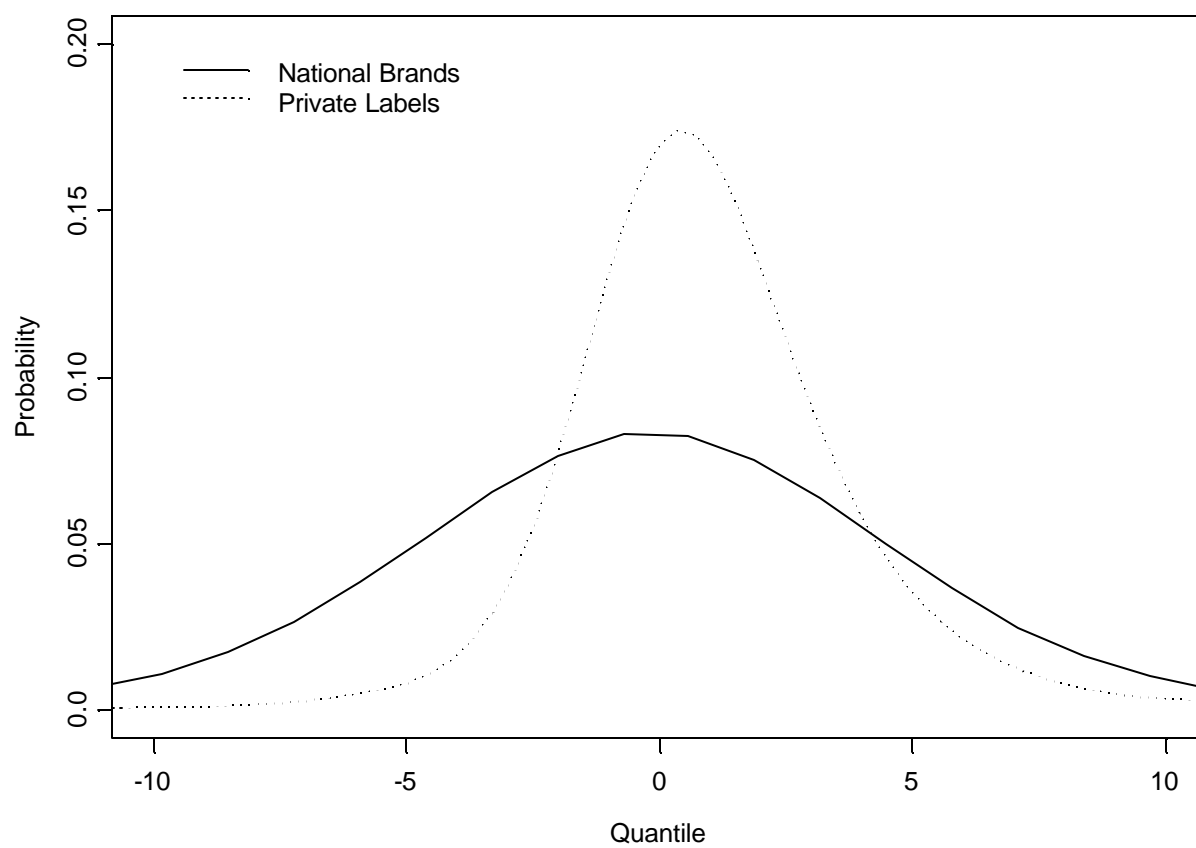
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**Figure 1**

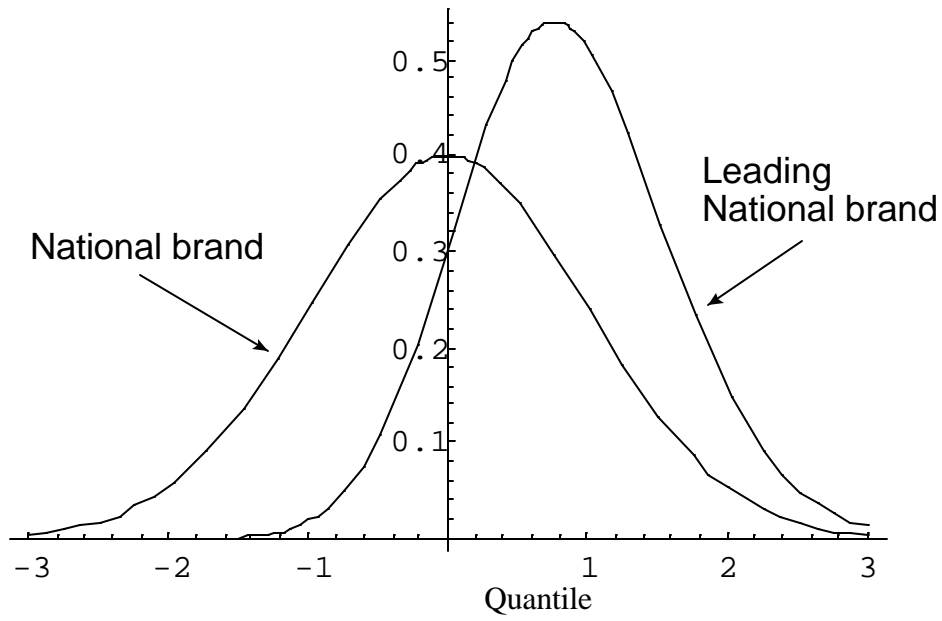
Real Personal Disposable Income



**Figure 2**

Empirical distribution of change in annual market share for the national brands and private label.





**Figure 3:**

Distribution of national brand growth (when growth follows a standard normal distribution) and the corresponding leading national brand (i.e. the maximum from a bivariate normal distribution).