



## An empirically derived taxonomy of retailer pricing and promotion strategies

Ruth N. Bolton<sup>a,\*</sup>, Venkatesh Shankar<sup>b,1</sup>

<sup>a</sup> Owen Graduate School of Management, Vanderbilt University, Nashville, TN 37203, USA

<sup>b</sup> Robert H. Smith School of Business, University of Maryland, College Park, MD 20742, USA

Accepted 2 September 2003

---

### Abstract

Most research categorizes grocery retailers as following either an Every Day Low pricing (EDLP) or a High Low (Hi-Lo) pricing strategy at a store or chain level, whereas this paper studies retailer pricing and promotions at a *brand-store level*. It empirically examines 1,364 brand-store combinations from 17 chains, 212 stores and six categories of consumer package goods in five U.S. markets. Retailer pricing and promotion strategies are found to be based on combinations of four underlying dimensions: relative price, price variation, deal intensity and deal support. At the brand-store level, retailers practice five pricing strategies, labeled Exclusive, Moderately Promotional, Hi-Lo, EDLP, and Aggressive pricing. Surprisingly, the most prevalent pricing strategy is not Hi-Lo pricing strategy as is widely believed. It is one characterized by average relative brand price, low price variation, medium deal intensity, and medium deal support. The findings provide some initial benchmarks and suggest that retailers should closely monitor their competitors' price decisions at the brand level.

© 2003 by New York University. Published by Elsevier. All rights reserved.

*Keywords:* Retailing; Pricing; Promotion; Strategy; Multivariate data analysis

---

### Introduction

Most research categorizes grocery retailers as following either an Every Day Low pricing (EDLP) or High Low (Hi-Lo) pricing Strategy at the store or chain level (Bell, Ho, & Tang, 1998; Bell & Lattin, 1998; Hoch, Purk, & Dreze, 1994; Lal & Rao, 1997; Partch, 1992). However, many market researchers have observed that grocery retailers' pricing strategies and tactics are diverse and complex, including decisions on the depth, frequency, and duration of deals, feature advertising, and displays for myriad brands and categories (Dhar & Hoch, 1997; Hoch et al., 1994; Levy & Weitz, 1998). The purpose of this paper is to empirically investigate grocery retailer pricing and promotion strategies by analyzing pricing and promotion decisions for an assortment of brands and categories at different stores and markets. This study examines retailer promotion decisions—specifically *deal intensity* (depth of deal discount, frequency, and duration) and *deal support* (features and displays)—as

well as pricing decisions (relative price and price variation). We explore the underlying dimensions of retailer pricing decisions, classify the different types of pricing strategies, and characterize their prevalence across the brands and stores in our sample.

Our study investigates two broad research questions:

1. *Are there a small number of stable underlying dimensions that characterize grocery retailers' observed pricing decisions—despite the fact that these decisions appear to be very complex and different across brands, categories, and stores?*

If the answer to this question is “yes,” the identification of these dimensions will significantly enhance our understanding of retailer strategies. In particular, it will shed insight into how retailers' observed price and price-promotion decisions are developed.

2. *What are the different types of pricing strategies adopted by grocery retailers?*

Is a classification based on storewide policies (e.g., EDLP/Hi-Lo) sufficient for decision-making, or does a classification scheme based on brand-store combinations provide additional information? What pricing strategies are most prevalent among retailers at the brand-store level?

---

\* Corresponding author. Tel.: +1-615-322-5580; fax: +1-360-838-1844.

E-mail addresses: ruth.bolton@owen.vanderbilt.edu (R.N. Bolton), vshankar@rshmith.umd.edu (V. Shankar).

<sup>1</sup> Tel.: +1-301-405-2175; fax: +1-301-405-0146.

How closely coordinated are pricing and promotion (both deal intensity and support) decisions?

We address these questions by developing an empirically based taxonomy for grocery retailers' pricing and promotion decisions. Prior research has developed theory based models that describe *firms'* pricing behavior (cf. Tellis, 1986), as well as normative models that prescribe how firms should behave with regard to pricing (Lal & Narasimhan, 1995). There are also descriptive studies of *retailer* pricing (e.g., Hulbert, 1981) and promotional strategies (e.g., Blattberg & Neslin, 1989; Fader & Lodish, 1990). Recent research focuses on how retailers' pricing decisions (especially pricing levels) are related to sales, customer variables, manufacturer (e.g., Farris & Albion, 1981; Lal & Villas-Boas, 1998), category, competition, and market factors (e.g., Shankar & Bolton, 2004). A few studies have also developed optimal price and promotion models (e.g., Achabal, McIntyre, & Smith, 1990; Shankar & Krishnamurthi, 2003; Tellis & Zufryden, 1995). In contrast, we do not develop a theory of how retailers should make pricing decisions or identify market outcomes (e.g., retailer price levels or dispersion).

Instead, the major contributions of our study are:

- An empirical identification of the dimensions of grocery retailer pricing strategy
- Focusing on pricing and promotion (i.e., deal intensity and support) decisions at the brand-store level, rather than store/chain-wide or brand-specific pricing decisions
- Yielding a classification of retailer pricing strategies and a description of their prevalence within our study sample.

Our empirical analysis is based on grocery store-level scanner data on 1,364 brand-store combinations from 17 chains, 212 stores and six categories of consumer package goods in five U.S. markets. We conduct the analysis in two stages. First, we analyze retailers' observed pricing decisions for different brand-store combinations using principal component analysis and find that they reflected four underlying dimensions: price variation, relative (brand) price, deal intensity, and deal support. Second, we identify different types of retailer pricing strategy by grouping brand-store combinations and stores along these dimensions using cluster analysis. In our concluding remarks, we discuss how an understanding of underlying retailer pricing dimensions, combined with our taxonomy of retailers' pricing strategies, can provide benchmarks for retailers and manufacturers to evaluate their decisions.

### Perspective on retailer pricing

Although market researchers have observed that retailer pricing can be quite different across brands and stores, there is little research on this issue. A notable exception is a conceptual article by Tellis (1986) that develops a taxonomy that is intended to be applicable to all firms, not just retailers. His pricing strategies are: differential pricing (random dis-

counting, periodic discounting, second market discounting), competitive pricing (price signaling, penetration pricing or experience curve pricing, and geographic pricing) and product line pricing (image pricing, price bundling or premium pricing, and complementary pricing). He explicitly considers how these strategies differ depending on the existence of consumer segments, competitors in the market, and product mix. He does not consider the complementary role of promotion.

In this study, we are particularly interested in developing a taxonomy based on grocery retailers' actual pricing *and* promotion decisions. Relevant empirical research on retailer pricing and promotion can be grouped into two streams: (1) studies that have examined the determinants of price and promotional elasticities (e.g., Bolton, 1989; Hoch, Kim, Montgomery, & Rossi, 1995; Kirande & Kumar, 1995; Mulhern, Williams, & Leone 1998; Narasimhan, Neslin, & Sen, 1996; Shankar & Krishnamurthi, 1996) and (2) studies that have considered how retailer pricing and promotion tactics are related to purchase behavior, consumer variables, competition, and market factors (e.g., Fader & Lodish, 1990; Shankar & Bolton, 2004). Our research complements the latter research stream in two important ways. First, we identify the underlying strategic dimensions of retailer pricing and promotion decisions across multiple brands, categories, stores, and markets. Second, since pricing decisions are made at different levels—typically the brand level and sometimes the brand-size level (Kumar & Divakar, 1999)—we identify clusters of underlying pricing and promotion dimensions at both the store and brand level and describe their prevalence.

Although supermarket chains have “category managers” (Basuroy, Mantrala, & Walters 2001), our study focuses on price and promotion decisions at the brand level for each store (rather than each category level for each chain).<sup>2</sup> This decision—a departure from most prior research—is based on the following rationale. The most distinctive features of market-driven organizations are their mastery of the market sensing and customer linking capabilities that span the spectrum between external environment and the company, such as pricing (Day, 1994). Hence, if retailers have a market orientation, their pricing decisions are likely to be customized to reflect differences in the store's clientele and competitive environment (e.g., Alba et al., 1994; Moriarty, 1985; Urbany & Dickson, 1990, 1991), as well as for each brand and category (e.g., Farris & Albion, 1981). Retailers may also price and promote differently for store and national brands (Ailawadi, Neslin, & Gedenk, 2001; Sethuraman, 1996), but the differences between national and store brands are not the focus of our study. Instead, we focus on how retailers typically formulate pricing strategies based on their knowledge of consumer store choice, as well as brand choice and quan-

<sup>2</sup> Since the prices of different flavors or colors of a brand (e.g., mouthwash or waffle SKUs, bathroom tissue SKUs) are often the same, price decisions tend to take place at the brand level rather than the SKU level.

tity decisions. Store choice is driven by store location, destination categories, store price perception, and store service perception (Kumar & Leone, 1988). Some categories serve as traffic-builders (Walters & Mackenzie, 1988) and others act as cash cows. Thus, retailers are likely to have different pricing strategies for different category-store combinations rather than have just one storewide pricing strategy.

To verify our prediction that retailers are customizing their pricing decisions for different brand-store combinations, we conducted interviews with the marketing and category managers of a few retail chains. These managers suggested that retailers are likely to make brand price decisions (as well as category and store-level decisions) on the basis of visible competitive activity, such as price and deal activity. Next, we examined “raw” brand prices in a given week in our database (described in the following) and ascertained that they vary across stores in the same chain, and across chains in a market. We also examined the correlations among brand prices in a given category across stores in the same chain, and chains in the same market over the period of the data. These correlations were significantly low, leading us to conclude that the brand decisions are not always jointly determined at the category level. Hence, our preliminary investigations indicated that there is variation in retailer pricing decisions at brand level, so our analyses begin by measuring price and promotion decisions for each brand-store combination.

### Underlying dimensions of retailers’ pricing decisions

This study begins by investigating whether retailers’ pricing decisions—complex decisions that appear very different across brands, categories and stores—can be captured by a parsimonious set of *stable underlying dimensions*. In this section, we describe our database, explain how we calculated measures of retailers pricing decisions, and then conduct a principal components analysis (PCA) of these measures.

#### *The database*

The database consists of multi-brand, multi-category, multi-store scanner data drawn from six categories of consumer-packaged goods in five U.S. markets that include information about pricing and promotion at the retail level. The categories are spaghetti sauce, bathroom tissue, liquid bleach, ketchup, mouthwash, and frozen waffles. The cities are New York, Los Angeles, Chicago, Marion (IN), and Pittsfield (MA) and are thus fairly representative of both large and small markets in the United States. The database describes all major brands and stores in these categories and markets.<sup>3</sup> There are 17 chains and 212 stores in the

database. Altogether, the database yields 1,364 brand-store combinations. The weekly store-level scanner data were obtained from two sources, A.C. Nielsen Company and Information Resources, Inc. (IRI). Merging two different data sources makes it possible to uncover systematic patterns that exist across the different data collection and measurement conditions—increasing our ability to generalize from the study findings. To uncover stable underlying pricing dimensions and strategies, we study average pricing decisions over a two-year period (a maximum of 121 weeks in any particular store).<sup>4</sup>

The umbrella categories for these six categories are: frozen breakfast foods (i.e., waffles), oral care (i.e., mouthwash), paper (i.e., bathroom tissue), laundry care (i.e., bleach), condiments (i.e., ketchup), and pasta (i.e., spaghetti sauce). They are large categories and their roles represent much of the spectrum of category roles in a typical store. This notion is amply supported by penetration and frequency of purchase data for these categories among U.S. households (IRI Category Report, 1998). It is also supported by qualitative information obtained in an interview conducted with the Marketing Director of a leading grocery chain in the United States. He described category roles in terms of the combination of the importance of sales and profit margins. The importance of sales and profits can be low or high, yielding four combinations: (1) support role comprising low sales and low profits, (2) preferred role consisting of low sales, but high profits, (3) destination role comprising high sales, but low profits, and (4) ideal role consisting of high sales and high profits. As shown in Table 1, these particular categories are distributed across the four different category roles. Hence, we believe that these brands and categories are somewhat representative of retailers’ product assortments, allowing us to make useful generalizations about retailers’ pricing strategies.

#### *Conceptualization and measurement of pricing decisions*

A proposed conceptual framework that identifies the underlying pricing dimensions to their measures is shown in Fig. 1. We begin by developing granular measures that reflect retailers’ decisions concerning regular and deal prices. We do not consider market measures such as absolute retail price levels and price dispersion across retailers. Instead, we focus on measures of retailer pricing policy or format—that

<sup>3</sup> To preserve the confidentiality of the data, this paper does not link pricing strategies to particular brands and stores. However, the database covers all major brands and stores in these categories and markets. Chains include Albertson’s, A&P, Dominicks, Food Lion, Jewel, Kroger, Lucky,

Pathmark, Stop and Shop, Safeway, and Von. Bathroom tissue brands include Charmin, Cottonelle, Northern, Scott, Waldorf, and White Cloud. Liquid bleach brands include Chlorox and Purex. Ketchup brands include Del Monte, Heinz and Hunts. Mouthwash brands include Listerine, Plax and Scope. Spaghetti sauce brands include Prego and Ragù. Waffle brands include Aunt Jemima, Downyflake, Eggo, and Roman Meal. The database also includes private label and generic brands in these stores and categories.

<sup>4</sup> Average pricing measures are obtained by taking arithmetic means of the weekly measures subsequently provided in Table 2 over the period of the data.

Table 1  
Category roles in the store

<i>Importance of Profits</i>	<i>Low</i>	<i>High</i>
<i>Importance of Sales</i>	<b>Support Role</b> Frozen Waffles	<b>Preferred Role</b> Mouthwash
Low		
High	<b>Destination Role</b> Bath Tissue	<b>Ideal Role</b> Spaghetti Sauce

Low/high is relative to other categories in the store. Sales are in dollars, but are typically correlated with unit sales. Profit margins pertain to the category.

is, on specific measures of price and price-related promotion decisions. Retailer pricing policy or format has typically been labeled EDLP or Hi-Lo (Hoch et al., 1994). An EDLP policy involves offering consistently low prices on many brands and categories and is practiced by some supermarkets (e.g., Food Lion and Lucky). A Hi-Lo policy is characterized by steep temporary price discounts on high “regular” prices for many brands and categories and is adopted by other supermarkets (e.g., Kroger and Safeway). An EDLP policy tends to draw price sensitive shoppers, whereas a Hi-Lo policy often attracts cherry pickers (e.g., Lal & Rao, 1997). A

store selects and communicates a pricing policy (EDLP or Hi-Lo) to signal the underlying consistency of its prices to consumers.

Our study departs from prior research concerning retailers’ pricing strategies in four significant ways. First, most prior studies consider pricing formats, such as EDLP/Hi-Lo, as storewide policies, whereas we develop measures of retailers’ pricing strategies that are specific to the brand-store combination. Second, most prior studies view pricing policy as a dichotomous variable (EDLP or Hi-Lo). However, recent evidence suggests that EDLP and

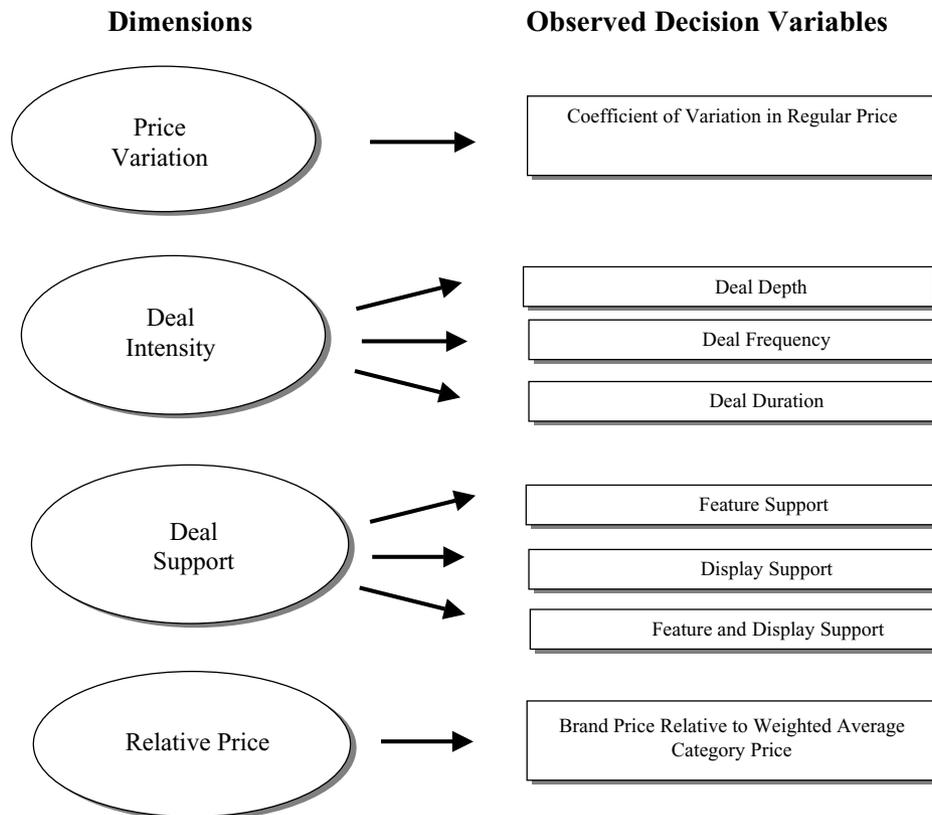


Fig. 1. Dimensions of retailer pricing strategy.

Table 2  
Retailer pricing dimensions: measures and descriptive statistics

Pricing dimensions	Measures <sup>a</sup>	Mean (SD)
Relative price Average actual price of the brand relative to other brands in the category.	Single variable/measure Average of brand price divided by the weighted average category price (where the weights are market shares within the store), over all the weeks.	1.00 (0.17)
Price variation Extent to which a retailer follows a pricing policy/format that is EDLP on one end and Hi-Lo on the other end of the continuum.	Single variable/measure Coefficient of variation: standard deviation of the brand price divided by its mean over all the weeks (reverse coded in sign so that large numerical values imply less variation).	−0.05 (0.04)
Deal intensity The depth, frequency, and duration of price cuts or deal discounts for a given brand at the retail level.	Four variables/measures (1) Deal depth 1: average deal depth (in cents) across all weeks, (2) Deal depth 2: average deal depth (in cents) across only deal weeks, (3) Deal frequency: percentage of weeks with deals, (4) Deal duration: average deal duration (in weeks). Each brand-store average is normalized by dividing by the category average to make it comparable across brand-stores.	0.12 (0.06) 0.38 (0.17) 0.35 (0.19) 0.11 (0.15)
Deal support Complementary feature and/or display decisions for a given brand.	Three variables/measures (1) Feature and deal: percentage of weeks with feature and deal, (2) Display and deal: percentage of weeks with display and deal, (3) Feature, display and deal: percentage of weeks with feature, display and deal.	0.08 (0.04) 0.06 (0.06) 0.03 (0.03)

<sup>a</sup> Single overall measures for deal intensity and deal support are created by averaging the listed measures.

Hi-Lo maybe opposite ends of a continuum of pricing policy (e.g., Hoch et al., 1994), so we measure each retailer pricing decision on a continuum. Third, although price variation refers to stable prices, many retailers that have stable prices, have *low* stable prices, to stay competitive (e.g., Wal-Mart, Food Lion, and Lucky). Hence, we consider the brand's relative price level, as well as price variation. Fourth, we believe that promotion—both deal intensity and support—are important aspects of retailer pricing decisions. Thus, we identify four pricing dimensions and develop multiple measures to describe decisions at the brand-store level. Pricing dimensions, associated and descriptive statistics are displayed in Table 2.

#### Relative price

To develop measures of retailer pricing decisions, we begin by distinguishing between “pure price” and “promotion” decisions. A retailer's pricing strategy for a brand includes two pure price decisions: price level and price variation. First, we consider how to measure the retailer's decision about a brand's price level. Different stores have different price premiums or discounts for a brand relative to (category-level) reference prices. For example, a supermarket located in an upscale neighborhood may have a different price level for a particular brand than does a supermarket in a blue-collar neighborhood relative to category prices at the stores (Hoch et al., 1995). Hence, we measure the relative price of a brand as the average (over weeks in the store) of the ratio of the brand price divided by the weighted average of all brand prices (where the weights are market shares

of the brands within the category in that store), consistent with Bolton (1989). This measure can be interpreted as follows. Since we consider price level for a brand *relative to other brands in the category*, we are implicitly choosing to measure reference price effects that operate across brands and stores within a category. This feature is useful because consumer reference price is frequently considered to be a critical component of the price level for a brand at a given store over time (Winer, 1986), where reference prices influence brand choice at the retail level (Kumar, 1998). Note that we do not measure absolute price levels because they cannot be pooled and compared across the units of analysis (stores, brands, etc.).

#### Price variation

Second, we measure the price variation for a brand in a store by calculating the coefficient of variation (i.e., the ratio of the standard deviation of actual price over the mean actual price) for the period of the data (Shankar & Krishnamurthi, 1996). The value for a brand-store pair is a dimensionless ratio that enables to compare across different brand-store combinations. The less variation in price for the brand-store pair, the closer the ratio is to zero.

#### Deal intensity

A retailer's pricing strategy for a brand includes two promotion decisions: deal intensity (deal depth, frequency, and duration) and deal support (feature, display, both or neither) decisions. First, manufacturers offer trade deals that chains (or stores) may pass along to customers—thereby influenc-

Table 3  
Correlation matrix of pricing measures<sup>a</sup>

	Relative price	Price variation	Deal intensity				Deal support		
			Deal depth (all weeks)	Deal depth (deal weeks)	Deal frequency	Deal duration	Feature support	Display support	Feature and display support
Relative price	1	<b>-0.04</b>							
Price variation	-0.04	1							
Deal depth (all weeks)	-0.14	0.02	1						
Deal depth (deal weeks)	-0.05	-0.07	0.45	1					
Deal frequency	0.01	0.07	-0.36	-0.46	1				
Deal duration	0.06	-0.14	0.17	0.12	-0.49	1			
Feature support	-0.11	0.10	-0.17	-0.07	0.39	-0.26	1		
Display support	-0.09	0.20	-0.10	-0.15	0.30	-0.28	0.51	1	
Feature and display support	-0.09	0.16	-0.17	-0.19	0.31	-0.28	0.64	0.83	1

<sup>a</sup> The numbers in bold represent the correlation among the four dimensions, namely, relative price, price variation, deal intensity, and deal support.

ing the pricing strategies of a store and its competitors. Stiff competition and value-driven consumers have created an environment marked by high markdowns and promotions (Kumar & Pereira, 1997; Levy, 1999). Thus, retailers' pricing strategies include decisions on deal intensity—that is, the depth, frequency and duration of deals—ultimately determining the final price paid by the consumers for a brand. These decisions have important effects on the variability in category sales. Higher deal depth, greater deal frequency, and longer deal duration reflect higher overall deal intensity for a brand in a given category and store. These tactical decisions are interrelated for a given brand or category (Alba et al., 1994) and may be different for different brands within a category (Tellis & Zufryden, 1995), across categories and across stores. For example, deal frequency and deal magnitude may be negatively correlated for some brands (Alba et al., 1994). Hence, we calculate four measures of deal intensity: two measures of average deal depth (average over all weeks and average over only deal weeks), deal frequency and deal duration.

#### Deal support

Second, a retailer's pricing strategy for a brand includes support of price discounts with newspaper features or displays (or both) during some weeks, but not in other weeks (Blattberg & Neslin, 1989, 1990; Inman & McAlister, 1993). Deals, if supported by features or displays, may benefit both consumers (nearly half of whom are non-vigilant about prices) and the retailer (Dickson & Sawyer, 1990). We believe that the deal support across multiple brands within a category and across categories in a given store is an important complementary aspect of retailers' pricing decisions. Retailers who provide higher deal support for a brand have a higher incidence of features and displays. We calculate three different measures of deal support: proportion of weeks with feature support, proportion of weeks with display support, and proportion of weeks with feature and display support.

Thus, we are able to obtain nine retail pricing measures from the data base: relative price, price variation, depth of deals during all weeks, deal depth during promoted weeks, frequency of deals, duration of deals, proportion of weeks

with feature support, proportion of weeks with display support, and proportion of weeks with feature and display support (see Tables 2 and 3). Since our focus is on stable pricing dimensions and strategies, all nine measures are calculated over a two-year period.

#### Underlying pricing dimensions identified from the principal components analysis

Seven of the nine measures concern promotion decisions (deal intensity and support), rather than price decisions. Since there is likely to be redundancy in these measures, we conducted a PCA, with a varimax rotation, to identify their underlying dimensions. The results are displayed in Table 4. As expected, we obtained two factors that explained 70% of the variance. They are:

- *Deal intensity* and deal depth (both measures), deal frequency, and duration of deals.
- *Deal support*: frequency of deal and feature, deal and display, and deal, feature, and display.

Our measures of deal intensity and support are similar to those used by Kumar, Ghosh, and Tellis (1992) in their study of repeat purchase behavior.

The PCA results indicate that retailers intensively promote some brands or categories (i.e., higher composite of deal depth, frequency, and longer duration) and do not promote others. They also indicate that retailers coordinate the price and promotional activities in some brands or categories much more closely than they do in others. Thus, deal intensity and deal support—together with relative price and price variation (each measured by a single item)—can be considered to represent four underlying dimensions of retailing pricing strategies.<sup>5</sup> For the purposes of this study, we chose to measure deal intensity and deal support by three and four item additive indices, respectively. We used additive indices

<sup>5</sup> PCA results need not have conformed to the deal intensity and support classification scheme that was used in developing the measures. For example, a single factor might have been uncovered, or display items might have loaded together on one factor.

Table 4  
Principal components analysis results

Variable	Factor1 (deal intensity) $\lambda$	Factor 2 (deal support) $\lambda$
Average deal depth across all weeks	0.72	0.31
Average deal depth across only deal weeks	0.71	0.10
Deal frequency	0.83	0.35
Deal duration	0.81	0.09
Percentage of weeks with feature and deal	0.06	0.87
Percentage of weeks with display and deal	0.08	0.80
Percentage of weeks with feature, display, and deal	0.06	0.93
Eigenvalue	2.38	2.51
Percent variance explained	30	40

rather than factor scores because these are more easily interpretable by managers.

#### *Examining the variability in the underlying pricing dimensions*

We verified that there is considerable variability in retailer's positions on these four dimensions and that the underlying pricing dimensions are relatively distinct (i.e., non-overlapping) in the following way. First, we conducted an analysis of variance (ANOVA) for each pricing dimension to test for differences across stores. The  $F$ -statistic for each dimension was significant at  $p < .001$ . The  $R^2$  ranged from a low of .20 for relative price to a high of .43 for deal intensity. Thus, our ANOVA results indicated the four retailer pricing dimensions (at the brand level) are significantly different across the stores (including stores within the same chain). We conducted the same analysis for chains, and also found significant differences.

Next, we investigated the inter-relatedness of these four pricing dimensions by calculating their correlations. The correlations among the nine pricing measures, and the four underlying pricing dimensions, are shown in Table 3. The correlation of relative price with the other three underlying dimensions is as follows: price variation (.04), deal intensity (–.02) and deal support (.11). The correlation of price variation with the remaining dimensions is as follows: deal intensity (–.07) and deal support (.16). The correlation of deal intensity with deal support is the largest (.32) because the existence of some level of promotion is a necessary condition for the existence of any deal support. Thus, the dimensions are generally independent, although (not surprisingly) the correlation between deal intensity and deal support is the highest.<sup>6</sup>

#### **Types of retailer pricing strategies**

Retailers may choose different combinations of dimensions, resulting in different types of pricing strategies. These

<sup>6</sup> If our analyses use factor scores (rather than additive indices) to represent the pricing dimensions, we obtain substantively the same results. The reason is that the additive indices are (almost) uncorrelated, as the factors scores are (by definition).

strategies may be specific to a brand-store combination or simply to the store. Some strategies may be more prevalent than others. To identify these strategies, we performed cluster analyses at both the brand-store and the store levels.

#### *Brand-store-level strategies*

The results from the  $k$ -means cluster analysis for brand-store combinations appear in Table 5.<sup>7</sup> The results of an analysis of variance indicate that the means of all the four dimensions are significantly different ( $p < .05$ ) across the five clusters.<sup>8</sup>

There are five clusters of pricing and promotion strategies at the brand-store level, labeled: Exclusive, Moderately Promotional, Hi-Lo, EDLP, and Aggressive pricing strategies. Table 5 shows a description of each strategy in terms of the combinations of pricing dimensions. It also shows the distribution of brand-store combinations across the five clusters, as well as each cluster's mean scores on each of the pricing dimensions. We classified each of the brand-store combinations as high, medium (average), or low on each of the four pricing dimensions based on their median scores.

A Hi-Lo pricing strategy (11.2%) is characterized by average relative price, high price variation, high deal intensity, and high deal support. We use this term because this strategy is comparable to a storewide Hi-Lo pricing strategy, albeit at the brand-store level. This combination of dimensions and levels seems intended to make a retailer competitive with its rivals primarily through promotions. In other words, retailers use in-store merchandising within categories to price discriminate (Dhar & Hoch, 1997). Analogously, our EDLP pricing strategy (45%) consists of average relative price, low price variation, moderate deal intensity, and moderate deal support. As above, we use this term because this pricing strategy is comparable to a storewide EDLP strategy, albeit at the brand-store level. This combination of dimensions seems intended to offer value to customers.

<sup>7</sup> Due to space limitations, only the aggregate results are shown. We also did a hierarchical cluster analysis (Ward's method). The results were similar.

<sup>8</sup> The  $F$  tests described in this paper are used only for descriptive purposes and strictly speaking, cannot be interpreted as tests of the hypothesis that the cluster means are equal (Aldenderfer & Blashfield, 1984).

Table 5  
Pricing strategies and the mean scores on the dimensions (clustering by brand-store)<sup>a</sup>

Cluster number (size)	Pricing dimensions (pricing strategy/cluster)	Relative price	Price variation	Deal intensity	Deal support
1 (102)	Exclusive pricing (7.5%)	1.407 (high)	0.048 (medium)	0.193 (low)	0.019 (low)
2 (192)	Moderately Promotional pricing (14.1%)	1.145 (average)	0.047 (medium)	0.309 (medium)	0.050 (medium)
3 (153)	Hi-Lo pricing (11.2%)	1.007 (average)	0.051 (high)	0.441 (high)	0.095 (high)
4 (613)	EDLP pricing (44.9%)	0.984 (average)	0.042 (low)	0.262 (medium)	0.061 (medium)
5 (304)	Aggressive pricing (22.3%)	0.792 (low)	0.052 (high)	0.243 (low–medium)	0.041 (medium)

<sup>a</sup> Based on 1,364 brand-store combinations. Low, medium (average), and high labels are based on median scores on each dimension.

Hi-Lo pricing and EDLP pricing are used by about half (56%) the brands in our database. However, the pricing and promotional strategies of almost half (44%) the brands in our stores do not correspond to practices currently recognized by marketing scholars and practitioners. For example, Aggressive pricing—which is utilized by nearly one-fourth (22%) of all brands in our stores—is not reported in the business press. With an Aggressive pricing strategy, retailers offer low prices and medium deal support, accompanied by high price variation and low–medium deal intensity—price rather than deal is used to greater extent as the weapon in this strategy. In summary, while chains and stores may use these positioning or signaling strategies, retailers practice different strategies at the brand-store level. Conventional wisdom states that retailers practice two pricing strategies along a continuum: EDLP and Hi-Lo pricing strategies. However, we do *not* find that EDLP and Hi-Lo strategies represent an underlying continuum. Instead, the strategies we uncovered are combinations of the four independent pricing dimensions, where each dimension is a separate continuum.

EDLP pricing and Aggressive pricing are the most commonly adopted pricing strategies at a brand-store level. We believe this reflects the competitive nature of the retailing landscape. Moderately Promotional pricing (14.1%)—corresponding to an undifferentiated strategy—is also fairly common. In contrast, Exclusive pricing (7.5%) is the least adopted strategy. Since it is characterized by low deal intensity, low deal support, and a high brand premium, this strategy can only be profitable for a small number of brands. We speculate that it is only appropriate for brands with high brand equity and manufacturer advertising.

### Store-level strategies

The results from the *k*-means cluster analysis for store level appear in Table 6. There are five clusters of pricing and promotion strategies at the store level. We have labeled them: Exclusive, Premium, Hi-Lo, Low, and Aggressive pricing strategies. Table 6 shows the combinations of pricing dimensions for each pricing strategy. It also shows the distribution of stores across the five clusters, as well as each cluster's mean scores on each pricing dimension. Based on the results from an analysis of variance, the means of all the four dimensions are significantly different ( $p < .05$ ) across the five clusters.

The five clusters of pricing and promotion strategies at the store level are different from the five clusters identified in the brand-store-level analysis. Two clusters are somewhat similar at both levels: Hi-Lo (9.0%) and Exclusive pricing strategies (2.3%). Note that both these strategies are infrequently practiced. The Hi-Lo strategy is characterized by high deal intensity and support, but it has medium price variation (*vis-à-vis* the brand-store case that is marked by high price variation). As expected, Exclusive pricing (2.3%) at the store level is the least adopted strategy because it is likely to be appropriate only for stores with upscale image and high-end clientele. The remaining three store-level strategies do not correspond to brand-store-level strategies. Hi-Lo and Low pricing are used by about half (52%) the stores in our database. Similar to the brand-store-level analysis, the pricing and promotional strategies of almost half (48%) the stores do not correspond currently recognized to practices. These other strategies include Premium pricing (11.8%), Aggressive pricing (34.0%), and Exclusive pricing (2.3%).

Table 6  
Pricing strategies and the mean scores on the dimensions (clustering by store)<sup>a</sup>

Cluster number (size)	Pricing dimensions (pricing strategy/cluster)	Relative price	Price variation	Deal intensity	Deal support
1 (5)	Exclusive pricing (2.3%)	1.402 (high)	0.012 (low)	0.150 (low)	0.023 (low)
2 (25)	Premium pricing (11.8%)	1.167 (high)	0.044 (medium)	0.275 (medium)	0.052 (medium)
3 (19)	Hi-Lo pricing (9.0%)	1.062 (average)	0.043 (medium)	0.380 (high)	0.082 (high)
4 (91)	Low pricing (42.9%)	0.922 (low)	0.045 (medium)	0.259 (low)	0.058 (medium)
5 (72)	Aggressive pricing (34.0%)	1.019 (average)	0.049 (high)	0.265 (low)	0.050 (medium)

<sup>a</sup> Based on average scores of dimensions across brands in 212 stores. Low, medium (average), and high labels are based on median scores for each pricing dimension.

Low pricing and Aggressive pricing strategies are adopted by over three-fourths of the stores, reflecting the competitive retail environment. For example, there is no strategy corresponding to an EDLP pricing strategy cluster at the store level. Among the five strategies identified at the store level, the strategy closest to the commonly used term, EDLP strategy, is Low pricing (42.9%)—but price variation is moderate, not low, as the phrase “everyday low price” would suggest. Again, we do *not* find that EDLP and Hi-Lo strategies represent an underlying continuum. Instead, the strategies we have uncovered are combinations of the four independent pricing dimensions, where each dimension is a separate continuum.

The strategies identified herein are consistent with pricing practices of retailers as gathered from depth interviews with managers (who wish to remain anonymous) of four retail chains in our sample. Based on our interviews, the pricing practice at a retail chain can be generally summarized as follows. A chain classifies its stores into geodemographic groups primarily based on location, demographics, and competition. A chain has umbrella categories and categories (as described earlier), with category managers for each. Each category manager plans broad pricing strategies for her/his category—and brands within it—including regular price point and promotion type and level based on factors such as past history, competition, and trade deals. These broad strategies are made for key brands and stores, and include such strategies or low stable prices (EDLP), or frequent promotions (Hi-Lo) or maintenance of exclusive image/price. Although the retailers we interviewed did not quite use terms like Exclusive pricing and Aggressive pricing, they do think along these lines by brand and store. For example, some of the terms that we heard category managers use to denote Aggressive pricing included “Sensitive pricing” and “Deep” pricing. These pricing strategies are then translated into specific decisions such as regular price, deal discounts, and feature for all brands and all stores within the chain at a weekly level based on some decision calculus—typically through spreadsheets that involve adjustments to past period decisions. Thus, we concluded that there is some face validity to the identified pricing strategies.

### Summary

Both brand-store and brand-level cluster analyses reveal that retailers adopt a variety of pricing strategies that extend beyond the conventional Hi-Lo and EDLP strategies. Some strategies are more frequently adopted at the brand-store level than at the store level and *vice-versa*. The distinctive nature of the brand-store pricing strategies underscores the fact that retailers customize their pricing strategies at the more fundamental brand-store level, in addition to the store level. Classification of retailer pricing strategies at the store level cannot reveal these differences. Thus, our results suggest a new level of complexity in pricing strategies, thereby extending Lal and Rao’s (1997) theoretical insight that retailers’

pricing strategies are based on a basket of brands and categories. They also extend Dhar, Hoch, and Kumar’s (2001) finding that retailer pricing is not just storewide, but is category-specific to show that retailer pricing is brand-store specific. Surprisingly, when retailer pricing is considered at the brand-store level, the most prevalent strategy is not Hi-Lo as is widely believed at the store level. It is one characterized by average relative brand price, low price variation, medium deal intensity, and medium deal support.

### Discussion of managerial implications

We have extended earlier research on the nature of retailers’ pricing strategies in three ways. First, we have empirically identified three new pricing dimensions—relative price, deal intensity, and deal support—that complement earlier research that has focused on pricing policy or price variation (Hoch et al., 1994; Shankar & Krishnamurthi, 1996). The four pricing dimensions characterize pricing strategy for a diverse set of brands, categories, stores and geographic regions. Second, our results show that retailers pricing practices vary within the same store—stores do not follow uniform pricing practices across brands and categories. Third, we have empirically described retailers diverse pricing strategies (combinations of different levels of dimensions)—with value pricing and aggressive pricing are most prevalent—providing some empirical support for Levy and Weitz’s (1998) observation of pricing diversity.

#### *Pricing strategies are multi-dimensional*

Prior research has focused exclusively on a single dimension—price variation (i.e., EDLP vs. Hi-Lo pricing)—implying a single pricing continuum. By examining a broader set of measures, our results show that retailer pricing strategies reflect a richer set of dimensions—including relative price, deal intensity, and deal support. Each of these dimensions is continuous, and can be combined with any level of another dimension. Depending on the combination of the levels of these dimensions, retailers can utilize diverse pricing strategies at the brand-store level—i.e., an undifferentiated strategy such as Moderately Promotional pricing, niche strategies such as Exclusive or Aggressive pricing, or mass-customized strategies such as Hi-Lo and EDLP pricing.

#### *Underlying pricing dimensions are stable, but pricing strategies are brand-store specific*

Although four pricing dimensions can be used to characterize all retail pricing decisions, retailers do not use the same pricing strategies for different brands, categories, stores, and geographic regions. For example, a retailer will not necessarily offer consistently low prices for all brands and categories in a given market place. This result implies

that retailers are using their intimate knowledge of brands and markets to customize their pricing strategies—either to stimulate the purchases of promotion merchandise or to encourage regular price merchandise purchases on the same shopping trip. Hence, there is an opportunity for manufacturers to develop and exploit information about retailers' pricing strategies across brands and categories to become a "category captain," to support their brands with targeted marketing efforts, and to build better relationships with retailers. As a category captain for a retail chain, a manufacturer, with its resources, can help the retailer better plan its pricing and promotions for all the brands in that category (based on store-level data) that moves the retailer toward a desirable pricing strategy for the manufacturer's brands. For example, Johnson (1999) makes some pragmatic recommendations regarding how manufacturers can manage their brands when retailers begin to move toward a EDLP pricing strategy. For example, she suggested the manufacturer avoid price-related promotions and move toward on-pack promotions (e.g., collectibles linked to manufacturer advertising) that would attract switching consumers.

*Retailer pricing strategy is not restricted to EDLP or Hi-Lo pricing strategies*

Prior research and conventional wisdom assume that retailer pricing strategies fall under one of EDLP and Hi-Lo pricing strategies. This view of retailer pricing strategy is primarily at the store or chain level and is largely driven by the store or chain positioning. Chains typically communicate or signal their pricing policy as one of these two strategies. For example, Wal-Mart's positioning slogan, "Low prices, always," indicates an EDLP strategy. Similarly, Food Lion and Lucky have also positioned themselves as EDLP chains. However, the number of chains with EDLP positioning is small. Most of the grocery retail chains in the United States are positioned as Hi-Lo pricing chains (Partch, 1992). For example, 15 out of the 17 chains in our data base are positioned as Hi-Lo chains (as determined by our examination of the company's annual reports and other publicly available documents).

Our analysis of pricing decisions in 17 chains, 212 stores, six categories and five markets reveal some surprising insights about how retailers depart from overall Hi-Lo pricing and promotion strategies when they customize their decisions for a particular brand and store. First, it shows that at the brand-store level, retailers practice five types of pricing strategies, which we label as Exclusive, Moderately Promotional, Hi-Lo, EDLP, and Aggressive pricing—not just two types of pricing strategies as is widely believed. Second, an interesting finding is that the most prevalent pricing strategy is not any strategy close to Hi-Lo pricing strategy as casual observation of chains and their pricing may suggest. It is a pricing strategy that is closer to EDLP strategy than any other strategy. The second most prevalent strategy, Aggressive pricing, is not close to a Hi-Lo pricing strategy either.

These findings point out that although retailers may signal to consumers a positioning strategy of EDLP or Hi-Lo pricing strategy at the store or chain level, they actually engage in different pricing strategies at the brand-store level.

This apparent contradiction can be explained by the fact that EDLP is simpler to communicate internally and easier to implement. However, Dolan and Simon (1996) observe that pricing decisions—as opposed to other marketing decisions—are the key to profitability for most companies, and nowhere is this more evident than in retailing with its accompanying razor-thin margins. Thus, retailers must become proactive—rather than passive price-takers—customizing price at the brand-store level to local conditions. This argument is particularly compelling for retailers who encounter dramatic differences in profitability associated with different store-wide pricing policies (Hoch et al., 1994). Our study extends this argument by showing alternative ways that retailers—and their competitors—can (and do) customize their own pricing and promotion strategies to different brands and stores. Retailers should closely monitor competitor behavior—at specific stores, for specific brands—to see what pricing strategy is being adopted for a particular brand at a specific store. Only then, they can form reasonable managerial expectations about their competitor pricing, and develop their own strategies. In particular, the theoretical literature on price promotions emphasizes that competition among retailers is a critical determinant of optimal pricing strategies (cf. Pesendorfer, 2002).

This study can help retailers better understand their current pricing strategies across brands and stores. We believe that our results generalize to other supermarket brands and categories because our analyses are based on a census of brands and stores in a representative cross-section of category roles and markets. Hence, these results provide a benchmark for assessing an individual store's pricing decisions. For example, retailers can use our taxonomy to classify their pricing strategy for a particular brand-store combination (or store), and then compare it with the clusters of retailer pricing strategies described in Tables 5 and 6. This benchmarking procedure allows the retailer to think about how his/her pricing strategies may differ from competitors' pricing strategies. Retailers have pricing latitude when they differentiate themselves along non-pricing dimensions (e.g., by coordinating price and promotion, emphasizing different categories, serving different clientele). Consequently, we observe a diverse set of pricing strategies that are (apparently) successful in the marketplace.

A retail store can observe its closest competitor store's pricing and promotion decisions over a period of time and infer the competitor's pricing strategy. For example, in our data, a store in a non-metro market can observe that its closest competitor store (mid-large sized store belonging to a medium sized chain), for a leading brand of bleach, has relative price of 0.993, price variation of 0.297, deal intensity of 0.488, and deal support of 0.182. Using Table 5, the store can infer that this observed pricing corresponds closest to a

Hi-Lo strategy for this brand. However, there is an important caveat to such inferences. The retailer must be sensitive to the fact that retailer pricing strategies within a given market are interdependent. In other words, when a retailer observes its closest competitor's pricing and promotion decisions, it may well be observing some of the competitor's reactions to its own pricing (Coughlan & Mantrala, 1994; Dickson & Urbany, 1994; Shankar & Bolton, 2004). This paradox raises interesting questions for future research.

Nevertheless, based on the previous discussion, a retailer can develop useful benchmarks for its pricing and promotion strategies for each category through the following approach that could be undertaken by the appropriate category manager.

- Observe and record the weekly prices and deal depth of each brand-size within the category for each competitor, over a reasonable long time frame (typically a year to account for seasonality, holidays, and special events).
- Compute measures of the underlying pricing dimensions as specified in Table 2 (brand price can be computed as an average of price per unit weight across all the brand sizes. In the absence of market-share data of each brand at competitor stores, market shares of those brands in own store can be used as proxy).
- Classify the pricing strategy for each brand at each competitor store based on Table 5.
- Get a broader picture of the competitor pricing strategy for that category by comparing the pricing strategies across brands within the category across all competitor stores.
- Choose own pricing strategy for each brand within the category from the diverse set of possible combinations of levels of pricing dimensions based on how the strategy will match up with the closest competitors' pricing strategies.
- Observe and record changes in competitors' pricing strategies in response to own pricing strategies over the long-term (at least one quarter).
- Respond to competitors' reactions for those brands that may be appropriate in the long-term.

### Limitations and future research

This study has limitations that suggest some interesting opportunities for future research. First, we believe that an important practical extension of our work would be the development of deal depth and deal support benchmarks for manufacturers and retailers.<sup>9</sup> These benchmarks might describe the relative incidence of different deal depths and deal support levels. For example, a retailer might find it useful to know the percentage of deals that have (a) a deal depth of 5% or less and (b) are accompanied by features only. This statistic could be accompanied by summary measures of the average deal duration and average time between pro-

motions. This information could also be provided for categories and stores in different geographic regions, as well as broken down by category types (e.g., "destination category") and store types (e.g., "large urban store"). Such benchmark information would make it possible to say which pricing strategies are most prevalent for which categories (e.g., destination or support categories)—and describe exactly how they are implemented by retailers.

Second, this study describes five retailer pricing strategies—but it does not assess their profitability. Subsequent research might explore when and how these strategies are employed—and assess the profitability of implementing these strategies for different brands, categories and stores. Third, it would be useful to develop a model of optimal retailer pricing that extends Achabal et al.'s (1990) and Tellis and Zufryden's (1995) models of optimal depth and timing of promotions to include regular price decisions. The model by Shankar and Krishnamurthi (2003) is a step in this direction.

Fourth, our ability to generalize from our findings is limited by our data sources. Although the categories and markets we studied were reasonably diverse and the retail chains among the largest in the United States, it would be desirable if future research could replicate the study using a probability sample of categories and markets. Fifth, in the same way that Noble and Gruca (1999) broke new ground in industrial pricing, it would be particularly useful for researchers to investigate new domains, such as the pricing and promotion of non-grocery retailers, and of services. Sixth, retailer pricing in response to major retail competitive events may be quite different from retailer pricing in the stable environments that we studied. For example, Kroger and Safeway retail chains have drastically cut prices in response the entry of "Neighborhood Markets" grocery chain from Wal-Mart (Business Week, 2002). Studying such pricing decisions will contribute to a deeper understanding of retailer pricing strategies, and the dynamic way that they unfold.

### Acknowledgements

We thank the editors, three anonymous reviewers, and participants at presentations at Harvard University and INSEAD for useful comments. We also thank the Marketing Science Institute (MSI) for financial support, and Information Resources, Incorporated and the A.C. Nielsen Company for contributing the data sets. Our thanks are also due to Valerie Durrant, Xing Pan, and Ying-Ping Yu for their assistance in assembling the data.

### References

- Achabal, Dale D., Shelby, McIntyre, & Smith, S. A. (1990, Winter). Maximizing profits from periodic department store promotions. *Journal of Retailing*, 66(4), 383–407.

<sup>9</sup> We are indebted to an anonymous reviewer for this suggestion.

- Alba, Joseph W., Broniarczyk, Susan M., Shimp, Terence A., & Urbany, Joel E. (1994). The influence of prior beliefs, frequency cues, and magnitude cues on consumers' perceptions of comparative price data. *Journal of Consumer Research*, 21(2), 219–235.
- Aldenderfer, M., & Blashfield, Roger. (1984). *Cluster analysis*. Beverly Hills, CA: Sage Publications.
- Ailawadi, Kusum L., Neslin, Scott A., & Gedenk, Karen. (2001). Pursuing the value conscious consumer: Store brand versus national brand promotions. *Journal of Marketing*, 65(1), 71–89.
- Basuroy, Suman, Mantrala, Murali, & Walters, Rockney. (2001). The impact of category management on retail prices and performance: Theory and evidence. *Journal of Marketing*, 65(4), 16–32.
- Bell, David R., & Lattin, James M. (1998). Grocery shopping behavior and consumer response to retailer price format: Why 'Large Basket' shoppers prefer EDLP. *Marketing Science*, 17(1), 66–88.
- Bell, David R., Ho, Teck-Hua, & Tang, Christopher S. (1998, August). Determining where to shop: Fixed and variable costs of shopping. *Journal of Marketing Research*, 35, 352–369.
- Blattberg, Robert C., & Neslin, Scott A. (1989). Sales promotion: The long and short of it. *Marketing Letters*, 1(2), 81–97.
- Blattberg, Robert C., & Neslin, Scott A. (1990). *Sales promotions: Concepts, methods, and strategies*. Englewood Cliffs, NJ: Prentice Hall.
- Bolton, Ruth. (1989, Winter). Relationship between market characteristics and promotional price elasticities. *Marketing Science*, 10(1), 24–39.
- Business Week. (2002, April 15). *Wal-Mart is eating everybody's lunch* (p. 43).
- Coughlan, Anne T., & Mantrala, Murali K. (1994). Dynamic competitive retail pricing with uncertainty and learning. *Managerial and Decision Economics*, 15(1), 3–20.
- Day, G. S. (1994, October). The capabilities of market-driven organizations. *Journal of Marketing*, 58, 37–52.
- Dhar, Sanjay K., & Hoch, Stephen J. (1997). Why store brand penetration varies by retailer. *Marketing Science*, 16(3), 208–227.
- Dhar, Sanjay K., Hoch, Stephen J., & Kumar, Nanda. (2001). Effective category management depends on the role of the category. *Journal of Retailing*, 77(2), 165–184.
- Dickson, Peter R., & Sawyer, Alan G. (1990, July). The price knowledge and search of supermarket shoppers. *Journal of Marketing*, 54, 42–53.
- Dickson, Peter R., & Urbany, Joel. (1994, Spring). Retailer's reaction to a competitor's price change. *Journal of Retailing*, 70, 1–22.
- Dolan, R. J., & Simon, H. (1996). *Power pricing: How managing price transforms the bottom line*. New York: The Free Press.
- Fader, Peter, & Lodish, Leonard M. (1990, October). A cross-category analysis of category structure and promotional activity for grocery products. *Journal of Marketing*, 54, 52–65.
- Farris, Paul, & Albion. (1981). *The effect of manufacturer advertising on retail prices* (MSI Working Paper).
- Hoch, Stephen J., Dreze, Xavier, & Purk, Mary. (1994). The EDLP, Hi-Low, and margin arithmetic. *Journal of Marketing*, 58, 16–27.
- Hoch, Stephen J., Kim, Byung Do, Montgomery, Alan, & Rossi, Peter. (1995). Determinants of store-level price elasticity. *Journal of Marketing Research*, 32, 17–29.
- Hulbert, J. (1981). Descriptive models of marketing decisions. *Marketing decision models* (pp. 19–53). New York: North Holland.
- Inman, J. Jeffrey, & McAlister, Leigh. (1993, Fall). A retailer promotional policy model considering promotion signal sensitivity. *Marketing Science*, 12(4), 339–356.
- Johnson, Maureen. (1999). From understanding consumer behavior to testing category strategies. *Journal of the Marketing Research Society*, 41(3), 259–288.
- Kirande, Kiren W., & Kumar, V. (1995). The effect of brand characteristics and retail policies on response to retail price promotions: Implications for retailers. *Journal of Retailing*, 71(3), 249–278.
- Kumar, Pankaj, & Divakar, Suresh. (1999). Size does matter: Analyzing brand-size competition using store level scanner data. *Journal of Retailing*, 75(1), 59–76.
- Kumar, V. (1998). The impact of internal and external reference prices on brand choice: The moderating role of contextual variables. *Journal of Retailing*, 74(3), 421–426.
- Kumar, V., Ghosh, Amit, & Tellis, Gerard J. (1992). A decomposition of repeat buying. *Marketing Letters*, 3(4), 407–417.
- Kumar, V., & Pereira, Arun. (1997). Assessing the competitive impact of type, timing, frequency and magnitude of retail promotions. *Journal of Business Research*, 40(1), 1–14.
- Kumar, V., & Leone, Robert. (1988). Measuring the effect of retail store promotions on brand and store substitution. *Journal of Marketing Research*, 25(2), 178–185.
- Lal, R., & Narasimhan, . (1995). The inverse relationship between manufacturer and retailer margins: A theory. *Marketing Science*, 15(2), 132–151.
- Lal, R., & Villas-Boas, J. Miguel. (1998). Price promotions and trade deals with multiproduct retailers. *Management Science*, 44(7), 935–949.
- Lal, Rajiv, & Rao, Ram C. (1997). Supermarket competition: The case of everyday low pricing. *Marketing Science*, 16(1), 60–80.
- Levy, Michael. (1999, September 20). Revolutionizing the retail pricing game. *Discount Store News*, 38(19), 15.
- Levy, Michael, & Barton A. Weitz (1998). *Retailing management* (3rd ed.). New York: Irwin/McGraw-Hill.
- Moriarty, Mark M. (1985). Retail promotional effects on intra- and inter-brand sales performance. *Journal of Retailing*, 62(3), 27–47.
- Mulhern, Francis, Williams, Jerome, & Leone, Robert. (1998). Variability of brand price elasticities across retail stores: Ethnic, income, and brand determinants. *Journal of Retailing*, 3, 401–426.
- Narasimhan, Chakravarthi, Neslin, Scott A., & Sen, Subrata K. (1996). Promotional elasticities and category characteristics. *Journal of Marketing*, 60, 17–30.
- Noble, Peter M., & Gruca, Thomas S. (1999). Industrial pricing: Theory and managerial practice. *Marketing Science*, 18(3), 435–454.
- Partch, Ken. (1992, October). Why the issue of EDLP won't go away. *Supermarket business* (pp. 19–22).
- Pesendorfer, Martin. (2002). Retail sales: A study of pricing behavior in supermarkets. *Journal of Business*, 75(2), 33–66.
- Sethuraman, Raj. (1996). A model of how discounting high-priced brands affect the sales of low-priced brands. *Journal of Marketing Research*, 33, 399–409.
- Shankar, V., & Bolton Ruth, N. (2004). An empirical analysis of determinants of retailer pricing strategy. *Marketing Science*.
- Shankar, Venkatesh, & Krishnamurthi, Lakshman. (1996). Relating price sensitivity to retailer promotional variables and pricing policy. *Journal of Retailing*, 72(3), 249–273.
- Shankar, Venkatesh, & Krishnamurthi Lakshman. (2003). *RETPRICE: A retailer pricing and promotion decision support model* (Working Paper). University of Maryland, College Park, MD.
- Tellis, Gerard J. (1986, October). Beyond the many faces of price: An integration of pricing strategies. *Journal of Marketing*, 50, 160–246.
- Tellis, Gerard J., & Zufryden, Fred. (1995). Tackling the retailer decision maze: Which brand to discount, how much, when and why? *Marketing Science*, 14(3), 271–299.
- Urbany, Joel E., & Dickson, Peter R. (1990). Prospect theory and pricing decisions. *Journal of Behavioral Economics*, 19(1), 69–80.
- Urbany, Joel E., & Dickson, Peter R. (1991). Competitive price-cutting momentum and pricing reactions. *Marketing Letters*, 2(4), 393–402.
- Walters, Rockney, & Mackenzie, Scott B. (1988). A structural equation analysis of the impact of price promotions on store performance. *Journal of Marketing Research*, 25(1), 51–63.
- Winer, Russell. (1986). A reference price model of brand choice for frequently purchased products. *Journal of Consumer Research*, 13, 250–256.