



Exploring the effect of retail sector and firm characteristics on retail price promotion strategy

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Abstract

This study examines why retail price promotion strategies vary across retail sectors and across firms within sectors. Using hierarchical linear modeling and a sample of 38 firms from 11 retail sectors, the authors investigate how two sector-level characteristics, related to product assortment perishability and heterogeneity, and three firm-level characteristics, related to retailer differentiation, number of stores, and average store size, influence price promotion decisions. The results indicate that assortment heterogeneity moderates the positive influence of perishability on price promotion activity; scale and scope also have significant effects. These results offer fresh insight into the ongoing debate surrounding stable versus promotional pricing, suggesting that the benefits of a particular strategy are driven largely by a complex interaction between sector-level characteristics as well as firm-level cost advantages.

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Introduction

The successful use of everyday low pricing by companies such as Wal-Mart and The Home Depot has triggered interest in everyday stable pricing as an alternative to promotional pricing policies. Advocates of stable pricing urge retailers to cut back on promotions, differentiate their customer service and product assortments to increase customer loyalty, improve inventory management, and reduce labor and advertising expenses (Ortmeyer, Quelch, & Salmon 1991). However, it is not clear that a strategy based on differentiation and stable prices is viable in every retail sector. Moreover, the use of heavily-advertised sales events, with their ability to generate excitement, attract shoppers, clear out time-sensitive merchandise, and sell complementary, high-margin items, is deeply ingrained in retail strategy (Blattberg, Briesch, & Fox 1995; Kumar & Leone, 1988; Mulhern & Leone, 1991).

Much of the research examining stable pricing has been limited to single retail sectors and has produced conflicting results as to the relative benefits of stable versus pro-

motional pricing. In the grocery supermarket sector, for example, Lal and Rao (1997) demonstrate that, under certain conditions, the presence of everyday low price (EDLP) and price-promotion policies can provide a perfect Nash equilibrium; that is, given the existence of a promotional-pricing competitor, adopting an EDLP policy is profit maximizing. However, Hoch, Drèze, and Purk (1994) conclude, on the basis of two extensive field experiments in a Chicago supermarket, that an EDLP policy leads to lower profits because volume increases do not fully compensate for lower profit margins.

Our goal is to offer fresh insight into why retailers elect different approaches to price promotion. To accomplish this, we draw from the marketing and competitive strategy literatures to develop a broad conceptual framework of the determinants of price promotion strategy, which we define as a coordinated set of pricing and promotion decisions designed to communicate a price position to consumers and influence short-term sales response and overall market performance (Kumar & Pereira, 1995, 1997; Lal & Rao, 1997). We then test the conceptual model by examining price promotion decisions implemented by 38 national retailers representing 11 retail sectors across five geographic marketplaces over 3 months. This examination leads to the identification of key sector-level characteristics that help to

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explain why price promotion strategies vary across retail sectors and key firm-level characteristics that help to explain why price promotion strategies vary across competitors within retail sectors.

In the following section, we present the conceptual model that links retail sector and firm characteristics to price promotion strategy. We then describe the empirical study and results. In the last section, we explore research and managerial implications. These implications include speculations suggested by our results that retailers can redefine competition within their sectors by modifying key sector characteristics.

Determinants of retail price promotion strategy

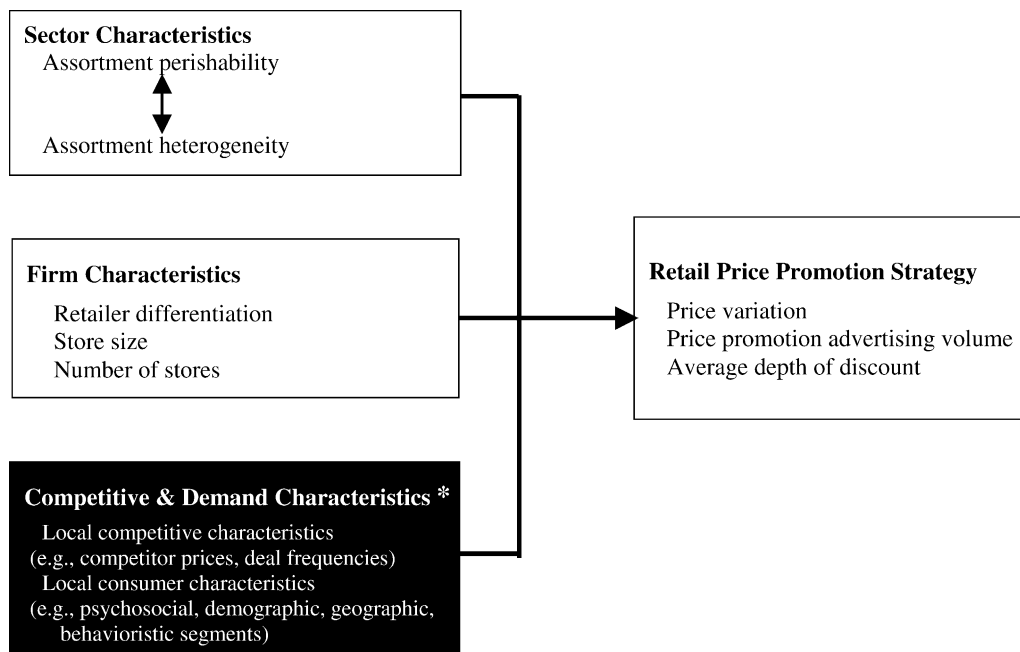
A retailer's approach to pricing and price promotion emanates from strategic decisions related to competitive positioning (Lal & Rao, 1997). Strategic considerations address the extent to which price promotions will be used; if price promotions are to be used, tactical implementation involves the type, timing, frequency, and depth of the promotions (e.g., Krishna, 1994; Kumar & Pereira, 1997; Shankar & Bolton, 1999). Following this literature, we examine three distinct and important components of price promotion strategy:

- Price variation policy represents the firm's price position, one that can range from stable pricing, featuring consistent, everyday prices and few price discounts, to highly promotional pricing, featuring frequent price discounts

(Hoch et al., 1994; Lal & Rao, 1997; Shankar & Bolton, 1999; Shankar & Krishnamurthi, 1996). For clarity in discussing relationships with predictor variables, we define and make price variation policy operational as the relative level of advertised price variation. Low levels of price variation are consistent with a stable price variation policy and high levels of price variation are consistent with a HiLo price variation policy.

- Price promotion advertising volume is the volume of advertising dedicated to communicating a price position. This dimension is independent of price variation policy, in that retailers can elect to advertise everyday prices that promote a stable price position or sale events that emphasize discounted prices.
- Depth of discount is the average magnitude of the discount offered on featured sale items (Shankar & Bolton, 1999; Shankar & Krishnamurthi, 1996). Although average depth of discount is relevant only with promotional pricing (i.e., there are no discounts with a completely stable price variation policy), it represents a discrete decision.

The conceptual model presented in Fig. 1 proposes three broad categories of antecedents to retail price promotion strategy: supply-side sector characteristics, individual firm characteristics, and competitive and demand characteristics manifest in the consumer marketplace. The model incorporates insights from the structure-conduct-performance paradigm, which holds that industry structure drives firm conduct, which in turn drives firm performance (Porter, 1980). Following this theory, we propose that retail price



* These characteristics are conceptually related to price promotion strategy but are not examined in the current study.

Fig. 1. Determinants of retail price promotion strategy.

promotion strategy is influenced by retail sector membership and examine two key supply-side characteristics associated with retail sectors, product *assortment perishability* and *assortment heterogeneity*. Assortment perishability is a function of the speed at which a typical assortment loses value or becomes obsolete over time. Assortment heterogeneity is the degree of between-store variability in product assortments among firms competing in the same retail sector.

We also recognize that firm differences likely influence a retailer's price promotion strategy. This perspective builds on research that emphasizes the importance of firm-level strategy and resources and downplays the importance of industry or strategic group membership (Barney, 1991; Rumelt, 1991). We capture firm-level strategy and resources as *retailer differentiation*, an assessment of the relative superiority of a retailer's offering compared to competitors', average *store size* (i.e., the average size in square feet for each store) and *number of stores* in the chain, which represent firm-level resources as well as operational efficiencies associated with economies of scale and scope.

Although we acknowledge that marketplace factors such as competitor actions and consumer responses to promotional activities also influence price promotion strategy (see e.g., Dickson & Urbany, 1994; Hoch, Kim, Montgomery, & Rossi, 1995), this study takes a strategic, macro approach to firm behavior and focuses on sector- and firm-level antecedents. As discussed below, the empirical analysis controls for marketplace variations, thereby attenuating the potential for bias due to omitted variables. Next, we examine the components of our model in greater detail.

Supply-side sector characteristics

Retail firms traditionally are categorized according to their membership in specific sectors. These sectors are defined according to product assortment, which is the basis for the standard industrial classification (SIC) system for retail trade. Each sector is served by specialized trade organizations, events, and publications (e.g., *Progressive Grocer*, *Discount Store News*). Because retailers' pricing and price promotion decisions depend to some degree on manufacturers' promotional policies (Dickson & Urbany, 1994; Hoch et al., 1994; Thomas, Staatz, & Pierson, 1995), the promotional practices of suppliers and resellers in one channel (e.g., the grocery sector) may be similar to each other but vary from the practices of suppliers and resellers in other channels (e.g., the department store sector).

We propose that supply-side sector characteristics associated with assortment perishability and heterogeneity play a significant role in determining retailers' price promotion strategies. These characteristics likely affect both manufacturers and retailers and should influence price promotion strategy throughout the channel. Surprisingly, though there is strong practical and conceptual support linking each of these sector-level characteristics to price promotion strategy,

the literature provides little empirical support and thoughtful consideration suggests that the relationships may be more complex than has been previously explored.

Assortment perishability

The potentially destabilizing effect of perishability on prices has been recognized by economists (Stigler, 1987) and marketers (Tellis, 1986). Perishability has been proposed as a key factor driving dynamic pricing systems such as those implemented by the airlines (Bhattacharjee & Ramesh, 2000; Weatherford & Bodily, 1992). Shankar and Bolton (1999) speculate that assortment perishability might be an important determinant of retail price promotion. Anecdotal, price discounts linked with perishable products, including fashion, electronics, and perishable food items, are routinely observed.

Perishability is directly related to shelf life, in that products with a long shelf life have low levels of perishability and products with a short shelf life have high levels of perishability. Perishability increases when product innovation is frequent, products are physically perishable, or seasonality is a factor. These various forms of obsolescence have the same pricing implication, in that the product's value decreases relative to time. This decrease in value produces an incentive to offer price promotions to clear out obsolescent merchandise. All else being equal, then, we expect price promotion activity to be higher in sectors characterized by perishable product assortments.

H1. At the retail sector level, controlling for marketplace variations, product assortment perishability has a positive effect on

- (a) price variation,
- (b) price promotion advertising volume, and
- (c) average depth of discount.

Assortment heterogeneity

The conceptual link between assortment heterogeneity and prices can be traced to Chamberlin's (1965) theory of monopolistic competition, which predicts that higher levels of heterogeneity across competitors within an industry lead to a reduction in direct price competition, greater latitude in price-setting, and greater variability in observed prices. Chamberlin's followers developed the structure-conduct-performance paradigm, which argues that greater latitude in price setting translates into greater industry profits (Bain, 1968; Ekelund & Hebert, 1990; Porter, 1980). Studies have supported the indirect link between industry-level product heterogeneity and firm performance (Robinson & McDougall, 1998; Sandberg, 1986), but to our knowledge no empirical study has examined the direct link between assortment heterogeneity and pricing or price promotion strategy.

Dickson's (1992) theory of competitive rationality provides another perspective linking heterogeneity to overall market dynamism and price promotion activity. Heterogeneity of supply (i.e., product assortments) results in heterogeneity in demand as buyers learn of and respond to different product offerings. The different response patterns then lead to imbalances in supply and demand and to market dynamism as sellers shift their efforts to serve more attractive segments. This type of market dynamism likely leads to price dynamism, as sellers of more/less preferred products raise/lower prices in response to market shifts and imbalances. Thus, overall price promotion activity likely increases as assortment heterogeneity and market dynamism increase.

Assortment perishability and heterogeneity are conceptually distinct concepts, but they are practically related in that some forms of perishability may lead to increased heterogeneity. This is particularly the case when perishability is driven by innovation. As models exhibiting new features are introduced, assortment heterogeneity increases as older models coexist with newer models, even as the obsolescence of the older models triggers price promotion. By stimulating supply-demand imbalances and market dynamism, assortment heterogeneity also might lead to perishability of less-preferred offerings.

Though assortment heterogeneity and perishability may be linked, the resulting level of price promotion activity within any sector likely depends on whether heterogeneity occurs within-retailer or cross-retailer. Within-retailer heterogeneity occurs in a sector when there is greater concentration at the retail level than at the manufacturer level, in which case large-scale, retail oligopolists develop broad and deep assortments that are supplied by multiple, differentiated manufacturers pursuing intensive distribution. This results in internal heterogeneity in the assortments carried by each retailer but little heterogeneity in assortments across retailers within that sector. An example can be found in the electronics superstore sector, where there are high levels of within-retailer perishability and heterogeneity as new models with varying features are introduced and occupy shelf space alongside older models, also with varying features. However, there is relatively little cross-retailer heterogeneity because electronics retailers tend to carry similar assortments provided by the same manufacturers.

Cross-retailer heterogeneity occurs when concentration at the retail- and manufacturer-level is approximately equal and differentiated manufacturers seek exclusive distribution. Retailers compete in monopolistic competition by developing unique assortments. Each retailer carries a limited number of different brands (low within-retailer heterogeneity) that are highly distinct from other retailers' offerings. An extreme example can be found in haute culture, where small boutique fashion stores may carry a single designer label. Each boutique maintains a unique position in a heterogeneous marketplace, selling perish-

able fashion items but offering relatively little internal variety.

We believe that promotional pricing activity will be higher in high perishability sectors marked by homogeneous, cross-retailer assortments and lower in high perishability sectors marked by distinctive, heterogeneous cross-retailer assortments. In high-perishability/low-heterogeneity retail sectors (e.g., electronics superstores), manufacturers and retailers are motivated to clear out obsolescent merchandise to make room for newer models. Given the low level of cross-retailer heterogeneity, retailers are motivated to advertise price promotions to generate excitement and traffic that will clear out the obsolescent merchandise along with complementary items.

In high-perishability/high-heterogeneity sectors (e.g., high-end fashion stores), retailers continuously offer new products in an attempt to avoid head-to-head competition with other retailers. Perceived distinctiveness is based not only on evidence of physical and image differences in products, but also on high rates of change in the actual products (Robinson & McDougall, 1998; Sandberg, 1986). These retailers are defined by the uniqueness of their products, sometimes tied to a single image or designer, and they typically practice an everyday high price strategy to reinforce the perceived exclusivity and cachet of their offerings. Because promotional pricing would detract from this positioning, they are more likely to use outlet stores or targeted personal invitations to move perishable merchandise rather than heavily-advertised price discounts.

Collectively, this suggests that heterogeneity acts as a quasi-moderator variable (Sharma, Durand, & Gur-Arie, 1981); that is, one independently related to the dependent variable (price promotion) and interacting with other predictor variables (perishability). Consistent with Dickson's (1992) theory of competitive rationality, we expect a positive direct association between assortment heterogeneity and price promotion activity. Consistent with the expectation that retailers offering differentiated, perishable assortments are motivated to avoid large-scale price promotions in an attempt to maintain an image of exclusivity, we expect that heterogeneity will attenuate the positive effect of perishability on price promotion activity. These expectations are formalized in the following hypothesis:

H2. At the retail sector level, controlling for marketplace variations, product assortment heterogeneity acts as a quasi moderator, exerting

- (a) a direct positive effect on (i) price variation, (ii) price promotion advertising volume, and (iii) average depth of discount, and
- (b) a moderating effect on the association between assortment perishability and (i) price variation, (ii) price promotion advertising volume, and (iii) average depth of discount.

Firm characteristics

At the most basic level, firm-level strategy seeks to develop positional advantages based on differentiation or cost advantages. Recognizing that these strategic choices likely influence price promotion strategy, we consider three characteristics that are directly linked to firm-level strategy: retailer differentiation and two sources of cost advantage—average store size and number of stores in the chain.

Retailer differentiation

Even in sectors marked by homogeneous product assortments, retailers can avoid direct competition by creating a distinctive position on a variety of image dimensions, including customer service and store environment (Mazursky & Jacoby, 1986). For example, retailers in mature, commodity-based sectors, which are constrained in terms of product differentiation (e.g., traditional supermarkets), can use operational initiatives such as increased speed of service and extended store hours to create value.

As differentiation increases, we expect retailers to follow a less promotional pricing policy. When successfully implemented, differentiation decreases price elasticity (Chamberlin, 1965), which in turn should reduce the importance of price promotion. Retailers emphasizing differentiation should shift to image-focused rather than price-oriented communications, resulting in a decrease in price promotion advertising volume.

However, when retailers with greater differentiation do offer price promotions, we expect that they will employ deeper promotional discounts because their original margins typically are greater than those of less differentiated competitors (Hoch et al., 1994). Faced with higher cost structures associated with their differentiation efforts, these retailers may use dramatic but infrequent sale events to increase traffic and sales while protecting image and price credibility. We therefore hypothesize that

H3. At the retail firm level, controlling for marketplace variations, as retailer differentiation increases

- (a) price variation will decrease,
- (b) price promotion advertising volume will decrease, and
- (c) average depth of discount will increase.

Store size and number of stores

The expected relationship between price promotion strategies and number of stores and average store size is based on cost advantages associated with operational scale and scope. A retailer's scale can be considered within the context of the number of stores managed by the retail firm; that is, holding store size constant, increasing the number of stores increases operational scale. The size of a physical store largely determines the number of product categories and/or items

that can be offered; thus, as store size increases, operational scope increases.

Retailers with greater scale and scope are more likely to benefit most from supply chain efficiencies and cost reductions associated with an EDLP policy (Thomas et al., 1995). Because of their wider and deeper assortments, larger stores draw from larger trading areas and may attract price-sensitive, "large basket" shoppers who prefer everyday low prices (Bell & Lattin, 1998; Tang, Bell, & Ho, 2001), whereas smaller stores attract more secondary shoppers who are location- and convenience-sensitive (Hoch et al., 1995). Prior research supports a negative relationship between the size of the merchandise assortment (which is related to store size) and average prices, price variability, and promotion intensity in the supermarket sector (Shankar & Bolton, 1999). Holding store size constant, increasing the number of stores should produce economies of scale associated with purchasing and distribution efficiencies, which are leveraged best by an EDLP policy (Thomas et al., 1995). Thus, we expect that the number of stores and the average store size will be negatively associated with price variation and average depth of discount.

It also has been argued that larger stores are likely to engage in competitive pricing to defend market share (Shankar & Bolton, 1999). We expect that the pressure to defend share will manifest as a positive relationship between store size and price promotion advertising volume. Large-store and large-chain retailers with clustered locations gain most from investments in high-volume, price-oriented advertising, either promotional or nonpromotional. These retailers benefit from higher market power, which allows them to negotiate lower advertising costs and more substantial manufacturer support through advertising allowances. Small-store or small-chain retailers that are less capable of capturing promotional synergies related to broad and deep assortments are less likely to reap the same level of advertising benefits.

Summarizing, we expect that larger scale and scope translates into cost efficiencies that are more compatible with a price promotion strategy that emphasizes stable, low prices with few discounts. Accordingly, these large-scale and scope retailers likely advertise their price position more than smaller retailers, but focus their advertising on stable low prices rather than on deeply-discounted, promotional prices. More formally

H4. At the retail firm level, controlling for marketplace variations and store size, as the number of stores increases

- (a) price variation will decrease,
- (b) price promotion advertising volume will increase, and
- (c) average depth of discount will decrease.

H5. At the retail firm level, controlling for marketplace variations and number of stores, as average store size increases

- (a) price variation will decrease,
- (b) price promotion advertising volume will increase, and
- (c) average depth of discount will decrease.

Methodology

To test the hypotheses, we collected data for 38 retailers across 11 retail sectors (Table A.1). The sample of companies was chosen to represent key national competitors in a variety of retail sectors. We gathered measures for this study from three sources, using objective measures whenever possible.

Measuring price promotion strategy

To measure the dependent variables—price variation, price promotion advertising volume, and average depth of discount—we tracked advertisements in five metropolitan areas' leading newspapers: *The Los Angeles Times*, *The Dallas Morning News*, *The Boston Globe*, *The Chicago Tribune*, and *The Raleigh News & Observer*. All advertisements, including inserts, were collected daily, 7 days a week, for a 3-month period, from July 1 to September 30. We used five geographically dispersed markets and a 3-month observation period to offset the possibility that a retailer's price promotion activities might exhibit extreme regional or temporal differences.

The use of the newspaper medium to examine price promotion activities is appropriate for three reasons: (1) price information is nearly twice as common in newspaper advertisements as in advertising in general (Abernethy & Franke, 1996); (2) with the recent trend toward integrated marketing communication, advertising and promotion are coordinated and implemented contemporaneously to gain synergies (Shankar & Bolton, 1999); and (3) newspaper advertising reflects a level of measurement that is consistent with our objective of exploring variations in price promotion strategy at the sector, firm, and marketplace level, but not at the individual store level. A comparison of the total recorded newspaper promotion volume for each of the 38 retail chains with the newspaper advertising dollar volume reported by Competitive Media Reporting (1998) for each chain for the same time period indicated a high correlation ($r = .78$), suggesting that our choice of markets and newspapers provided a representative sample.

We analyzed the information content of the advertisements and coded the content into three major categories: temporary price promotion (i.e., featuring temporary sales events and discounts), positional price promotion (i.e., featuring everyday prices); positional nonprice promotion (i.e., price not mentioned) also was coded but was not used in this study. The unit of measure was the amount of page space allocated to each type of information. For example, if a half-page advertisement allocated 50% of the space to temporary price promotions and 50% to positional price promotion, the coded measure would be one-quarter page of temporary price promotion and one-quarter page of positional price promotion.

The dependent measures were aggregated by month (3) and market (5), producing as many as 15 distinct observations for each dependent measure, depending on the number of markets in which each retailer competed. Price promotion advertising volume was calculated as the number of pages that focused on price promotion, either temporary price promotion or positional price promotion (i.e., the sum of the two). Price variation was made operational as the percentage of price promotion advertising allocated to temporary price promotions (i.e., temporary price promotion advertising volume divided by total price promotion advertising volume). Depth of discount was measured as the average depth of price discounts offered in each advertisement.

Two judges were trained to code all advertisements (8030 pages), and a third judge was trained to conduct random reliability checks on 18% of the advertisements coded by the other two judges (1438 pages). Reliability assessments indicated that interrater agreement was very high for price promotion advertising volume ($r = .98$) and slightly lower for price variation ($r = .89$) and average depth of discount ($r = .78$, Table A.2).

To explore the discriminant validity of the dependent measures, we examined the correlations between price variation and price promotion advertising volume ($r = .04$, $p > .10$), between price promotion advertising volume and average depth of discount ($r = -.08$, $p > .10$), and between price variation and average depth of discount ($r = .54$, $p < .01$). The correlation between price variation and average depth of discount is inflated by the fact that average depth of discount is by definition 0 when price variation is 0; if price variation values of 0 are eliminated from the analysis, the correlation drops to .33.

Measuring retail sector characteristics

A panel of retail experts provided the measures of assortment heterogeneity and perishability. There is substantial support in the literature for the use of expert panels to measure complex phenomena, such as industry-level success factors (Sousa De Vasconcelos e Sa & Hambrick, 1989); specific functions of new products (Rangan, Menezes, & Maier, 1992); performance of markets for potential entry (Papadopoulos, 1989); fit of business-level strategic variables and typologies across industries (Segev, 1989); companies' corporate and business level strategies (Willard & Cooper, 1985) and technological strength (Narin, Noma, & Perry, 1987). Prior studies also have validated the use of expert assessments by comparing them to objective measures (Albert, Avery, Narin, & McAllister, 1991; Narin et al., 1987).

The panel consisted of six professors of retailing—four current or past directors of university retailing centers and four endowed retailing chairs—and two practitioners who are senior retailing consultants, each with at least 20 years

of experience. To gauge the reliability of the panel's assessments of assortment perishability and heterogeneity, we examined the extent to which the experts agreed in their evaluations. A high level of agreement would suggest that panel experts were capable of providing accurate assessments of the constructs, whereas a low level of agreement would indicate that the constructs were poorly defined or the experts were incapable of providing accurate assessments (Kolbe & Burnett, 1991). This examination found a high level of interrater agreement ($\alpha = 0.88$), which suggests clear construct definitions and accurate expert assessments. The relatively low correlation ($r = .25$) between the assortment heterogeneity and perishability measures suggests that the two constructs are conceptually distinct.

Measuring firm characteristics

We obtained objective measures of firm characteristics from the retailers' 1998 annual reports, which were concurrent with the time period covered in the advertising content analysis. For retailer differentiation, we used a composite score that incorporated service intensity (i.e., number of employees per square foot of retail space for each retailer) and atmospherics (i.e., furniture, fixtures and equipment dollars per total square feet). These measures represent two key value dimensions that are not confounded with the sector-level assortment heterogeneity measure. Because these two objective measures indicated an acceptable level of reliability ($\alpha = 0.73$), we standardized and summed the measures to form a composite retailer differentiation score.

We obtained objective measures of the number of stores and average square feet of retail space per store for each retailer from the annual reports. We implemented log transformations for these two measures to normalize their distributions and increase scale commensurability. Firm characteristics for each retailer and sector averages are reported in Table A.1.

Analysis and results

We conducted hierarchical linear modeling (HLM) to test H1–5 for each dependent measure. As described by Bryk and Raudenbush (1992), HLM uses maximum likelihood estimation to fit multilevel, hierarchical models. There are two advantages to using HLM in the current analysis. First, HLM allows for fixed effects associated with independent variables specified at multiple levels of theory and measurement. In the current study, the dependent variables are conceptualized and measured at the firm level, as are retailer differentiation, number of stores, and average store size. Assortment perishability and heterogeneity are conceptualized and measured at the sector level.

The second advantage is that random effects can be modeled as cross-level variations in slopes or intercepts in HLM.

This allowed us to specify a random marketplace effect so that the intercept varied across markets by firm (see "Market (firm) random intercept effects" in Table 1). This specification controls for market variations and attenuates the possibility of bias due to omitted variables at the marketplace level. Additional details on model specification for the multilevel analysis are provided in the appendix.

To test for the moderating effects predicted by H2, we conducted a variation on hierarchical moderator analysis (Arnold, 1982; Sharma et al., 1981). This approach requires comparing the fit of three nested models, one with no effects for the moderator variable, a second with direct effects only for the moderator variable, and a third with direct and interaction terms. Moderation is supported if the fit for Model 3 is significantly greater than the fit for Model 2. If moderation is supported, a significantly better fit for Model 2 than for Model 1 indicates that the moderator is a quasi moderator; otherwise, it is a pure moderator. When using regression analysis, best fit is determined by examining incremental improvements in R^2 using an F test with one degree of freedom in the numerator. Using maximum likelihood estimation in HLM, the -2 log likelihood ($-2LL$) criterion, which follows a χ^2 distribution, offers a statistical test for assessing fit; smaller $-2LL$ numbers equate to better fit.

Price variation

We present results with price variation as the dependent variable in the first three numerical columns in Table 1. Examining the hierarchical moderator analysis first, the $-2LL$ criterion suggests that adding the interaction term improves model fit and that adding assortment heterogeneity as an independent variable also improves model fit. The χ^2 difference tests are significant ($p < .01$) and the individual coefficients are significant in the expected direction. Specifically, the coefficient for the assortment heterogeneity \times assortment perishability interaction term is significantly negative ($p < .01$), and the coefficients for assortment perishability and heterogeneity are both significantly positive ($p < .01$). These results provide support for H1a, H2a(i), and H2b(i), relating retail sector characteristics to price variation.

To further explore the nature of the interaction effect, we split the sample into two groups—low and high heterogeneity—and re-ran the analysis. The results indicated that the perishability coefficient was significantly positive ($p < .01$) for the low heterogeneity group and non-significant for the high heterogeneity group. This implies that price variation is low when assortment perishability and heterogeneity are both low, and that price variation increases as assortment perishability increases if heterogeneity is low but not if heterogeneity is high.

H3a, which predicted that price variation would decrease as retailer differentiation increased, is not supported. The results also do not support H4a, which predicted a negative association between number of stores and price variation,

Table 1
The effect of retail sector, firm and marketplace characteristics on price promotion strategy (*t* scores in parentheses)

Independent variables	Dependent variables ^c								
	Price variation			Price promotion advertising volume			Average depth of discount		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Market (firm) random intercept effects	0.07 ^a (4.50)	0.06 ^a (4.34)	0.05 ^a (4.37)	2.55 ^a (7.02)	2.54 ^a (6.99)	1.27 ^a (6.67)	0.62 ^a (2.46)	0.54 ^a (2.34)	0.48 ^b (2.26)
Sector characteristics									
H1: assortment perishability	0.20 ^a (18.69)	0.07 ^a (2.47)	0.20 ^a (4.52)	0.64 ^a (12.26)	0.55 ^a (3.47)	2.03 ^a (11.20)	0.83 ^a (21.42)	0.46 ^a (4.19)	0.87 ^a (5.08)
H2a: assortment heterogeneity		0.14 ^a (4.47)	0.18 ^a (5.59)		0.11 (.64)	0.50 ^a (3.95)		0.42 ^a (3.48)	0.53 ^a (4.35)
H2b: assortment perishability × assortment heterogeneity			−0.56 ^a (−3.69)			−6.42 ^a (−10.49)			−1.79 ^a (−3.01)
Firm characteristics									
H3: retailer differentiation	0.01 (0.17)	0.01 (0.19)	0.01 (0.28)	0.06 (0.40)	0.06 (.41)	0.10 (.86)	−0.17 (−1.46)	−0.16 (−1.50)	−0.17 (−1.59)
H4: number of stores	−0.06 (−1.26)	−0.05 (−1.13)	−0.05 (−1.22)	0.35 (1.63)	0.36 ^b (1.67)	0.36 ^b (2.34)	−0.42 ^a (−2.61)	−0.38 ^a (−2.51)	−0.40 ^a (−2.71)
H5: average store size	−0.20 ^a (−3.44)	−0.18 ^a (−3.26)	−0.18 ^a (−3.36)	0.46 (1.58)	0.47 (1.63)	0.55 ^a (2.59)	−0.90 ^a (−4.19)	−0.83 ^a (−4.07)	−0.84 ^a (−4.24)
Fit criterion									
−2 log likelihood (−2LL)	175.77	157.18	144.26	876.03	875.62	797.95	877.60	866.01	857.24
Change in −2LL (1 <i>df</i>)		18.59 ^a	12.92 ^a		0.41	77.67 ^a		11.59 ^a	8.77 ^a

^a Significant at $p < .01$.

^b Significant at $p < .05$ (one-tailed *t* tests).

^c Individual parameters are unstandardized coefficient estimates with *t* values in parentheses.

but do support H5a ($p < .01$), which predicted a negative association between store size and price variation. These results suggest that retailers with smaller stores use more price variation whereas retailers with larger stores are more likely to promote stable everyday prices. The number of stores has no effect on price variation.

Price promotion advertising volume

We present results with price promotion advertising volume as the dependent variable in the second set of three numerical columns in Table 1. In support of H2b(ii), the results in Model 3 suggest that assortment heterogeneity moderates the relationship between perishability and price promotion advertising volume; the addition of the interaction term improves model fit ($p < .01$) and the coefficient is significantly negative ($p < .01$). The Model 2 results do not support H2a(ii), which predicted that heterogeneity would have a positive, direct effect on price promotion advertising volume. Both the χ^2 difference value and the heterogeneity coefficient are nonsignificant. These results indicate that heterogeneity is a pure (rather than quasi) moderator of the positive relationship between perishability and price promotion advertising volume. As predicted by H1b, perishability is positively associated with price promotion advertising volume.

Splitting the sample into low and high heterogeneity groups indicated that the perishability coefficient was significantly positive ($p < .01$) for the low heterogeneity group and significantly negative ($p < .01$) for the high heterogeneity group. This suggests that price promotion advertising volume is low when assortment perishability and heterogeneity are both low, and that price promotion advertising volume increases as assortment perishability increases if heterogeneity is low but that price promotion advertising volume actually decreases as assortment perishability increases if heterogeneity is high.

H3b, which predicted a negative relationship between retailer differentiation and price promotion advertising volume, is not supported. The Model 3 results offer support for the predictions that price promotion advertising volume is positively related to number of stores (H4b; $p < .05$) and to average store size (H5b; $p < .01$). These results suggest that firms with fewer, smaller stores are less likely to promote their prices than are firms with a greater number of larger stores.

Average depth of discount

The results with average depth of discount as the dependent variable, presented in the last set of three numerical columns in Table 1, offer strong support for H2a(iii) and H2b(iii). Specifically, the addition of the interaction variable and the direct effect for heterogeneity both improve model fit ($p < .01$); the direct effect of heterogeneity is signifi-

cantly positive ($p < .01$) and the interaction coefficient is significantly negative ($p < .01$). H1c, which predicted that perishability would be positively associated with average depth of discount, also is supported ($p < .01$). Splitting the sample into low and high heterogeneity groups indicated that the perishability coefficient was significantly positive ($p < .05$) for both the low and high heterogeneity groups, which suggests that depth of discount is low when assortment perishability and heterogeneity are both low, and that depth of discount increases as assortment perishability increases but that the rate of increase is lower if heterogeneity is high than if heterogeneity is low.

H3c, which predicted a positive relationship between retailer differentiation and average depth of discount, is not supported. H4c, which predicted a negative association between number of stores and average depth of discount, is supported ($p < .05$), as is H5c, which predicted a negative association between store size and average depth of discount ($p < .01$). Thus, firms with fewer, smaller stores tend to offer deeper discounts than do firms with a greater number of larger stores.

Marketplace variations

Although this research did not explicitly examine the effect of local marketplace conditions on price promotion decisions, the significant market (firm) random intercept term for each of the dependent variables in Table 1 indicates that price promotion activity did vary significantly within firms across markets. To further explore the relative size of these effects, we conducted a nested analysis of variance (ANOVA) with price promotion activity as dependent variables and sector, firm, and market as class variables. This analysis indicated that with price variation as the dependent variable, sector explained 36% of the variance, firm explained 18% of the variance, and market explained 18% of variance; with price promotion advertising volume as the dependent variable, sector explained 34% of the variance, firm explained 27% of the variance, and market explained 33% of variance; and with average depth of discount as the dependent variable, sector explained 15% of the variance, firm explained 36% of the variance, and market explained 19% of variance. While this analysis supports the role of local marketplace conditions in explaining price promotion activity (especially price promotion advertising volume), it also underscores the relative importance of sector and firm characteristics in explaining price promotion strategy.

Discussion

Summarizing the results (Table 2), we found support for the expected moderating role of assortment heterogeneity in all three analyses, although the nonsignificant direct

Table 2
Summary of results

Independent variables	Dependent variables		
	Price variation	Price promotion advertising volume	Average depth of discount
Assortment perishability	Positive effect H1a supported	Positive effect H1b supported	Positive effect H1c supported
Assortment heterogeneity	Positive effect H2a(i) supported	No effect H2a(ii) not supported	Positive effect H2a(iii) supported
Perishability \times heterogeneity	Negative interaction H2b(I) supported	Negative interaction H2b(ii) supported	Negative interaction H2b(iii) supported
Retailer differentiation	No effect H3a not supported	No effect H3b not supported	No effect H3c not supported
Number of stores	No effect H4a not supported	Positive effect H4b supported	Negative effect H4c supported
Average store size	Negative effect H5a supported	Positive effect H5b supported	Negative effect H5c supported

relationship between assortment heterogeneity and price promotion advertising volume indicates that the relationship is not the same in all three cases. These sector-level results point to systematic differences in price variation, price promotion advertising volume, and average depth of promotional discount, related to assortment perishability and the moderating effect of assortment heterogeneity. The results also offer a plausible explanation as to why a dominant approach to price promotion strategy exists in many retail sectors, with more apparent differences across sectors.

We found no support for the prediction that retailer differentiation would be related to price promotion strategy. We found consistent support for our predictions that store size would be associated with greater price promotion advertising volume and less price variation and average depth of discount. There was mixed support for the predictions that a larger number of stores would be positively associated with price promotion advertising volume (supported), negatively associated with price variation (not supported), and negatively associated with average depth of discount (supported). Collectively, the firm-level results confirm the important role that scale and scope economies play in price promotion decisions. We now explore the implications of these findings.

Research implications

Our findings offer new insights into the debate about the relative advantages of stable versus variable price promotion strategies. The key implication is that the advantages of stable or promotional pricing likely are limited to certain retail sectors. Thus, empirical studies demonstrating that EDLP is not profit-maximizing in the grocery industry, for example, may not be generalizable to other retail sectors. In-depth studies examining the office supply sector, the discount sector, or the fashion sector may lead to significantly different conclusions.

Our results elucidate the relationship between price promotion strategy and assortment perishability and heterogeneity. Although the independent effects of these two variables have been suggested before in the literature, to our knowledge this is the first study to examine, conceptually or empirically, a moderating role for assortment heterogeneity. Particularly interesting are the findings that when heterogeneity is high, perishability had no effect on price variation, a negative effect on price promotion advertising volume, and a positive effect on average depth of discount. These findings are consistent with our expectation that retailers in high-perishability, high-heterogeneity sectors spurn price promotion messages that dilute their image of exclusivity. When these companies engage in price promotion, they do so in a limited manner, offering deep discounts on presumably obsolete models or fashions.

The fact that heterogeneity exerted a direct, positive effect (in addition to a moderator effect) on price variation and average depth of discount but not on price promotion advertising volume also is worth noting. This suggests that in sectors marked by high assortment heterogeneity, competitors do not focus their promotion efforts on price-based advertisements. This finding is counter to our prediction, but it does make some intuitive sense. Facing less pressure to compete on price, competitors in heterogeneous sectors may be better served by advertising that emphasizes the distinctiveness of their assortment rather than their prices. When prices are advertised, however, our results indicate that they feature heavy discounts, apparently designed to generate traffic and enhance promotional attractiveness.

Additional research is needed to explore why cost advantages associated with economies of scope and, to a lesser extent, economies of scale were related to price promotion strategy but retailer differentiation was not. It appears that retailers implementing a cost leadership strategy embrace the complementary cost efficiencies that stable pricing provides, but that retailers adopting a differentiation strategy

do not demonstrate any consistency with respect to price promotion. Perhaps the differentiated retailers in our sample failed to fully recognize the benefits of their advantageous position. Or, perhaps price promotion strategies implemented by retailers pursuing differentiation are more vulnerable to competitive forces than are the strategies of cost leaders; in other words, whereas cost leadership can insulate a retailer from the vagaries of constant price promotion, differentiation cannot.

Understanding why retailers adopt strategies that involve different approaches to price promotion is an important first step toward explaining the relationship between price promotion and firm performance. The hypotheses examined in this study are based on normative assumptions; that is, managers should use the level of price promotion that is optimal given the sector and firm characteristics that apply. By extension, the findings imply that the retail sector and firm characteristics investigated here should moderate the relationship between price promotion strategy and firm performance. For example, the relationship is likely nonpositive for retailers operating in sectors that feature low or high levels of both assortment heterogeneity and perishability but likely positive for retailers operating in sectors that feature high levels of perishability and low levels of heterogeneity. Further research should examine whether these and other sector and firm characteristics moderate the link between retail price promotion strategy and firm performance.

Managerial implications

Our framework and findings can be used to understand how retail managers can challenge and break away from pricing norms. For example, the electronics sector carries relatively homogeneous assortments that exhibit high levels of perishability; consistent with our expectations, these retailers generally use heavy price promotion to reinforce their “value” orientation. However, differences in strategies also are evident within the sector: Tandy and CompUSA have significantly higher price variation and average depth of discount and lower price promotion advertising volume, whereas Best Buy and Circuit City have significantly higher price promotion advertising volume and lower price variation and average depth of discount (Table A.1). One plausible explanation for this divergence is a different level of assortment perishability for these two subgroups. Tandy and CompUSA sell computer and electronics products almost exclusively, whereas Best Buy and Circuit City, in addition to electronics, carry small and large household appliances, which are considerably less perishable and therefore require less price promotion activity. This suggests that effective alignment of firm-level goals and price promotion strategy may require shifts in product assortments.

Our framework may be especially useful when applied to hybrid sectors such as supermarkets and traditional department stores. These sectors exhibit moderate levels of

overall assortment heterogeneity and perishability and high promotional activity (Table A.1). Their broad product assortments include a variety of items, ranging from low to high in both perishability and heterogeneity. For example, supermarkets offer national (manufacturer) brand packaged goods, store-brand packaged goods, and perishable items in the deli, seafood, and bakery departments. Similarly, traditional department stores offer basic, commodity-type soft goods, store-brand apparel, and designer apparel items that follow fashion seasons. Because their assortments include many product categories that are not strongly differentiated, these retailers face intense competition. The perishable product categories encourage price promotions that attract customers and move obsolescent inventory. Thus, although stable pricing has attracted keen attention from retailers in these sectors, our findings suggest that highly promotional strategies may be more effective.

In the traditional department store sector, Dillard's has deviated from the norm by moving toward an *everyday fair pricing strategy*. Dillard's is likely to struggle with this positioning (as Sears did in the past) unless it can increase the perishability and/or differentiation of its offering relative to its competitors by improving service, increasing the percentage of high-quality, private-label fashions, or enhancing atmospherics. Ultimately, this type of strategic shift would challenge mobility barriers and place Dillard's in more direct competition with fashion department stores, which typically demonstrate lower levels of price promotion. A strategic shift also may occur in the supermarket sector as Wal-Mart moves the sector towards supercenters that carry a larger proportion of homogeneous, nonperishable products.

This post hoc analysis suggests that within-sector variations in price promotion strategy may be linked to assortment differences in rather complex ways. We conceptualized and made assortment perishability operational at the sector level, but differences across retailers within a single sector (such as those in the consumer electronics sector) also may drive within-sector variation. A retailer adopting a price promotion strategy that is not consistent with sector characteristics may be successful by altering the heterogeneity and perishability of its product assortment (e.g., Best Buy and Circuit City offering stable household appliances; Wal-Mart supercenters increasing the proportion of nonperishable goods), which ultimately may redefine sector-level conditions. This implies a bi-directional or reciprocal relationship between structure and conduct. Thus, while our results offer support for the traditional perspective that industry structure affects firm conduct, the results also intimate that successful firm conduct ultimately can alter industry structure.

Limitations

This study forges a new direction for price promotion research, but it is not without limitations. Although

newspapers are the preferred medium for promoting prices (Abernethy & Franke, 1996), newspaper advertising does not capture the full scope of retail price promotion activity. The failure to capture in-store and direct mail promotions, for example, is a limitation of the current study. In addition, our sample of newspapers, which included only major newspapers in major markets, could bias the results if retailers implement different price promotion campaigns across different types of newspapers.

Our characterization of price promotion strategy as consisting of three dimensions may not be comprehensive. For example, although the idea of promotion frequency is implicitly captured in the price promotion advertising volume measure, a more explicit examination of promotion frequency may be informative. Our sample of sectors and firms was limited, and it may have been preferable to develop objective measures of assortment perishability and assortment heterogeneity rather than subjective, expert assessments. Finally, the lack of significant findings for the retailer differentiation variable may be attributable to the implementation, which captured the intensity of investment in service personnel and store atmospherics but did not capture other value dimensions such as product superiority.

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Appendix A

This appendix provides measurement details, including firm and sector scores for the variables of interest, a summary of the advertisement coding, and a description of the hierarchical linear model specification.

Model specification

The hierarchical linear model can partition variance in the dependent variable on the basis of sector, firm, and marketplace effects (see Bryk and Raudenbush (1992) for

additional details on specifying fixed and random effects in hierarchical models). At level one (i.e., the geographic marketplace) the dependent variable is determined by (1) an intercept that represents the mean value for firm j in sector k (β_{0jk}), (2) a series of random deviations from the sector-firm mean that capture marketplace variations for each firm (u_{ijk}), and (3) a random error term (r_{ijk}):

$$Y_{ijk(t=1-3)} = \beta_{0jk} + u_{ijk} + r_{ijk} \quad (\text{A.1})$$

where Y_{ijk} is the price promotion strategy in market i for firm j in sector k ; β_{0jk} the mean price promotion strategy level for firm j in sector k ; $u_{ijk} \sim N(0, \tau_{ijk})$, and $r_{ijk} \sim N(0, \Sigma)$.

At level two, the sector-firm intercept (β_{0jk}) is determined by a conditional model that includes (1) a sector-level mean (γ_{00k}), and (2) firm-level (j) independent variables:

$$\beta_{0jk} = \gamma_{00k} + \gamma_{01k}RD_{0jk} + \gamma_{02k}SS_{0jk} + \gamma_{03k}NS_{0jk} \quad (\text{A.2})$$

where γ_{00k} is the mean price promotion strategy level in sector k ; RD denotes the retailer differentiation strategy; SS is the store size; and NS is the number of stores.

At level three, the sector-level intercepts (γ_{00k}) are determined by a conditional model that includes the sector-level independent variables and interactions.

$$\gamma_{00k} = \gamma_{001}AH_k + \gamma_{002}AP_k + \gamma_{003}AH_k \times AP_k + u_{00k} \quad (\text{A.3})$$

where AH is the assortment heterogeneity and; AP is the assortment perishability.

Prior to substituting the level-three equation into the level-two equation, we centered the firm-level independent variables around the sector means; this process partitions the sector- and firm-level effects that are captured in the firm-level measure and produces the following model:

$$Y_{ijk} = \gamma_{001}AH_k + \gamma_{002}AP_k + \gamma_{003}AH_k \times AP_k + \gamma_{01k}RD_{0jk} + \gamma_{02k}(SS_{0jk} - \overline{SS}_k) + \gamma_{03k}(NS_{0jk} - \overline{NS}_k) \quad (\text{A.4})$$

which specifies that firm price promotion strategy is a function of (1) fixed sector-level effects (captured in line one), (2) fixed firm-level effects (captured in line two), (3) random marketplace effects (u_{ijk} in line three), and (4) a random error term (r_{ijk}). The random marketplace effect allows the intercept to vary across markets by firm. This term is labeled “Market (firm) random intercept effects” in Table 1.

Table A.1

Retail sector means and firm scores for variables of interest

Retail sectors and firms	Price variation		Price promotion advertising volume		Average depth of discount		Assortment perishability	Assortment heterogeneity	Retailer differentiation (standardized)	Store size ^b	No. of stores ^b
	Mean	Grouping ^a	Mean	Grouping ^a	Mean	Grouping ^a					
Traditional department stores	0.83	A	63.3	A	0.29	A	3.25	2.50	−1.01	11.66	6.48
Macy's	0.86	1	44.2	2	0.34	1/2			−0.82	12.22	5.99
JC Penney	0.94	1	38.2	2	0.30	2			−0.57	11.50	7.09
Sears	0.86	1	122.8	1	0.22	3			−0.65	10.81	7.96
Montgomery Ward	0.71	1	23.1	2	0.30	2			−2.31	11.78	5.71
Dillard's	0.54	2	49.0	2	0.40	1			−0.70	11.99	5.60
Discount stores	0.78	A	54.7	A	0.22	A	2.12	2.13	−1.08	11.26	7.09
Service Merchandise	0.92	1	16.1	3	0.44	1			−1.41	10.82	5.89
Target	0.92	1	66.5	1	0.18	2			−1.17	11.60	6.68
Kmart	0.74	2	66.5	1	0.18	2			−1.02	11.17	7.67
Wal-Mart	0.21	3	32.0	2	0.18	2			−0.72	11.43	8.13
Grocery stores	0.85	A	12.4	C/D	0.32	A	2.43	2.63	0.96	10.56	6.49
Food Lion	0.98	1	2.2	3	0.25	1			−0.44	10.35	7.05
Kroger	0.90	1	25.7	1	0.38	1			0.20	10.90	7.24
Albertson's	0.68	1	5.2	1/2	0.24	1			−0.22	10.79	6.78
Winn Dixie	0.57	1	5.8	1/2	0.30	1			0.50	10.66	7.06
Whole Foods	1.00	1	0.3	3	0.40	1			4.75	10.09	4.33
Furniture stores	0.78	A	4.1	C/D/E	0.24	A	1.62	3.63	−0.32	9.51	5.49
Bombay Company	0.88	1	5.3	2	0.24	1			−0.08	8.01	6.03
Ethan Allen	0.88	1	0.5	2	0.23	1			3.07	9.62	4.22
Heilig Meyers	0.72	1	3.0	2	0.32	1			−2.40	10.00	7.13
Haverty's	0.33	2	12.4	1	0.05	2			−1.86	10.39	4.58
Fashion department stores	0.79	A	1.5	D/E	0.31	A	4.25	3.00	0.97	11.56	4.27
Nordstrom's	0.73	1	3.4	1	0.29	1			1.71	11.83	4.53
Neiman Marcus	1.00	1	0.8	2	0.33	1			1.31	11.72	3.71
Saks Fifth Avenue	0.63	1	1.0	2	0.30	1			−0.11	11.13	4.58
Off-price stores	0.55	B	1.6	D/E	0.28	A	3.87	3.50	−1.27	9.80	6.02
Men's Warehouse	1.00	1	0.8	1	0.60	1			−0.06	8.54	5.98
Steinmart	0.74	1/2	2.4	1	0.33	2			−2.02	10.55	5.02
TJMaxx	0.13	2	1.2	1	0.08	3			−1.74	10.31	7.07
Specialty clothing	0.43	B/C	1.1	D/E	0.25	A	4.12	4.00	3.48	8.51	6.61
Talbot's	0.56	1	0.9	1	0.45	1			4.26	8.01	6.40
The Gap	0.47	1	1.8	1	0.10	1			3.87	8.88	7.66
Ann Taylor	0.00	1	0.5	1	0.00	1			2.31	8.63	5.78
Electronics stores	0.47	B/C	42.4	B	0.22	A	3.25	2.25	1.25	9.56	6.40
Tandy	0.71	1	9.8	3	0.35	1			0.88	7.76	8.51
CompUSA	0.56	1	14.9	3	0.26	2			0.65	10.22	5.09
Circuit City	0.31	2	65.8	2	0.13	3			3.50	9.60	6.33
Best Buy	0.26	2	76.5	1	0.16	3			−0.05	10.67	5.65

Table A.1 (Continued)

Retail sectors and firms	Price variation		Price promotion advertising volume		Average depth of discount		Assortment perishability	Assortment heterogeneity	Retailer differentiation (standardized)	Store size ^b	No. of stores ^b
	Mean	Grouping ^a	Mean	Grouping ^a	Mean	Grouping ^a					
Office supply stores	0.31	C/D	14.2	C	0.21	A	1.75	1.88	−1.13	9.97	6.53
Staples	0.54	1	12.8	1	0.26	1			−0.98	9.62	6.61
OfficeMax	0.28	2	17.6	1	0.20	1			−1.57	10.06	6.57
Office Depot	0.22	2	11.8	1	0.20	1			−0.83	10.22	6.40
Home improvement stores	0.15	D/E	6.4	C/D/E	0.09	B	1.37	2.63	−1.13	11.44	6.27
Lowe's	0.28	1	3.4	1	0.17	1			−0.81	11.31	6.10
Home Depot	0.10	1	7.3	1	0.06	1			−1.45	11.57	6.44
Book stores	0.00	E	0.4	E	0.00	B	2.25	2.25	−0.15	9.22	6.98
Barnes and Noble	0.00	1	0.8	1	0.00	1			−0.60	9.45	6.92
Borders	0.00	1	0.0	1	N/A	N/A			0.30	8.99	7.03

^a Groupings are based on Duncan multiple-range tests. Sectors with different grouping letters are significantly ($p < .05$) different from one another, and firms within sectors that have different grouping numbers are significantly different from one another. N/A indicates firms that either offered no price promotion or provided no details on the depth of discounts.

^b Store size and number of store values are log transformations.

Table A.2
Details on advertisement coding and reliability checks

Price promotion measures	Overall sample	Reliability checks	
	Total number of pages of advertisements coded and average price variation and depth of discount	Total number of pages of advertisements subjected to reliability checks and average price variation and depth of discount	Interrater agreement (correlations)
Temporary price promotion advertising volume	5090	940	.98
Positional price promotion advertising volume	2604	468	.97
Total price promotion advertising volume	7694	1408	.98
Total advertising volume	8030	1438	.99
Average price variation (%) ^a	56	57	.89
Average depth of discount (%) ^a	24	25	.78

^a Price variation and depth of discount represent average monthly observations.

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