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Using a unique data set, the authors examine the role of manufacturer and retailer characteristics in the joint determination of trade promotion budgets for supermarket brands and their allocation across trade promotion types. They find that manufacturer variables, such as brand position in retailer product category and brand price premium, and annual retailer sales determine trade promotion budgets. Furthermore, retail companies with larger shares of private labels in product category sales, larger annual sales, and stronger brand positioning are able to increase the allocation of promotional funds to off-invoices and decrease allocation to performance-based trade promotions, such as scanbacks/accruals and billbacks. Manufacturers with formal trade promotion policies tend to decrease allocation to off-invoices. The authors discuss marketing policy implications of this study and provide research directions.

Empirical Analysis of Budget and Allocation of Trade Promotions in the U.S. Supermarket Industry

Trade promotions constitute a growing category of manufacturer incentives directed to channel members and wholesale and retail distributors rather than to consumers. In general, these promotions influence resellers' sales, prices, and merchandising practices by providing various inducements. Use of trade promotions by manufacturers of consumer packaged goods to distributors has increased eightfold since 1996, and in 2004, it totaled approximately \$80 billion (Joyce 2005).¹ Trade promotion spending accounted for approximately 70% of a manufacturer's marketing budget in 2002, compared with less than 25% two decades ago.

¹The numbers reported in the trade press may be somewhat exaggerated. For a discussion of accounting issues involved with promotion costs, see Farris and Quelch (1987).

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Furthermore, it is the second-largest manufacturer expense after the cost of goods, representing 17.4% of gross sales in 2003 versus 13.5% in 1997 (Cannondale Associates 2003).

Manufacturers use trade promotions² to counter the popularity of lower-price store brands, to pass along discounts to price-sensitive segments of shoppers (e.g., through a frequent shopper program), to enhance brand exposure with target consumers, or simply to provide additional stimulus to move excess inventory or counteract competitors (Drèze and Bell 2003). Retailers favor trade spending because it builds store traffic and improves retail margins and because the majority of the costs (and risks) are typically borne by the brand manufacturer.

In contrast to one-time, up-front payments (now called "slotting allowances") and simple "cents-off" discounts, trade promotion types became varied (Scheffman 2002), including off-invoices, billbacks, scanbacks, accrual funds, co-op advertising, extended payment terms, free goods, and others, used singly or in combination (Kasulis et al. 1999). Given the proliferation of these types, the process of allocating a trade promotion budget is complex. The portion of trade promotion budgets allocated to off-invoice allowances has decreased from 90% in the mid-1990s to approximately 35% in 2003 (Cannondale Associates 2003).

²Our focus is on trade promotions. For a discussion of managerial perspectives on consumer promotions and trade promotions, see Narasimhan (1990).

Despite the magnitude of trade promotions and the variety of types in use, no research has focused on the process and factors involved in the determination of promotional budgets and their allocation. This is partly due to the difficulty in gaining access to data from confidential supplier-retailer negotiations (Drèze and Bell 2003; Kasulis et al. 1999). This article examines the determinants of trade promotion budget and allocation.

We organize this article as follows: First, we develop a classification of trade promotion types. Second, we review the trade promotion literature. Third, we develop a framework of how manufacturers and retailers determine trade promotion budgets and their allocation, and we formulate several hypotheses for empirical test. Fourth, we describe our unique data and empirical procedures. Finally, we present the findings and conclude with the implications of our work for researchers, managers, and public policy makers.

CLASSIFICATION OF TRADE PROMOTION TYPES

Given the recent spate of trade promotion types and lack of standard terminology, we conducted in-depth interviews with executives from three manufacturers and three retailers to develop a richer classification. On the basis of these interviews and extant literature, we classify trade promotion types into four groups: off-invoice allowances; scanbacks and accrual programs; billbacks; and all “others,” such as trade development funds and cooperative advertising allowances. Whereas the first type is purely discount based, the next two (scanbacks/accruals and billbacks) are performance based.

Discount-Based Promotions

Discount-based promotions are essentially off-invoice (temporary) price reductions in the normal price of goods subtracted from the initial invoice from supplier to retailer. The manufacturer gives these discounts on all cases received at the retail warehouse, not on cases sold from the stores. In general, proof of performance is not a requirement for getting these discounts. Discount-based promotions tend to enhance retailers’ abilities to make discretionary use of these funds, increasing the probability of retailers’ opportunistic behavior, such as forward buying and diverting. These practices are rational retailer behavior as long as the additional carrying cost to hold extra merchandise is lower than the additional margins earned (Buzzell, Quelch, and Salmon 1990). Because discount-based promotions come with the fewest restrictions, retailers typically prefer this type of trade promotion because it allows for maximum fund flexibility. Even when manufacturers offer a deep discount on a particular brand, there is no guarantee that retailers will pass the entire discount on to consumers (Besanko, Dubé, and Gupta 2005).

Scanbacks and Accrual Funds

Scanbacks are negotiated discounts per case after a pre-specified level of sales performance has been completed and verified by scanning data from ACNielsen or Information Resources Inc. (IRI). Retailers may accept a manufacturer’s check for payment for these discounts, or they may simply deduct the calculated amount from subsequent invoices. Similarly, retailers obtain accrual funds from suppliers for promotional spending based on each case of merchandise ordered and scanned at the retail level. That is,

retailers “earn” promotional funding only for cases sold through the stores. After this funding is earned, the supplier and the retailer decide on allocation to particular promotion types. In general, the manufacturer “holds” the funds as they accrue until the retail promotion is conducted, and then time payment is made. Normally, the manufacturer estimates annual accrual funding at the beginning of the year according to the previous year’s performance, adjusting for expected changes in the current year; then, it pays monthly or quarterly.³ Because both scanbacks and accrual funds are paid on the basis of cases sold at the store, there is no incentive for forward buying or diverting, because no supplier payments are made to the retailer unless the product is scanned.

Billbacks

With billback promotional provisions, retailers “bill” a given, negotiated amount for each case of goods purchased from a supplier after performance has been completed. However, unlike scanbacks/accruals, these funds are paid on cases received at the retail warehouse, not on cases sold through the stores; thus, this type of promotion enables the retailer to engage in forward buying and diverting. Although billbacks are not as flexible as off-invoice promotions and impose additional demands on the retailer, retailers typically prefer this format to accrual funds or scanbacks because they can accumulate stock in advance at reduced prices and divert goods. Retailers may accept direct payment for billbacks or simply deduct the specified amount from subsequent invoices. This type is more common with wholesalers and small independent retailers because scanning information is not often available on such entities from IRI or ACNielsen. Conversely, manufacturers prefer scanbacks/accruals to billbacks.

Others

This broad category includes various other trade promotion types, such as trade development funds, coupon advertising handling fees, and cooperative advertising programs. Marketing development funds are payments for programs that do not appear on invoices, such as displays, features, merchandising, and retailer television advertising. Coupon ad-handling fees are charges to a manufacturer for handling costs to run a coupon ad promotion in a retailer’s weekly circular. These are not typically tied to any required sales performance.

LITERATURE REVIEW

Four themes are evident in prior trade promotion studies: (1) the explanation of the growth of trade promotions, (2) the extent of pass-through, (3) the allocation of trade promotion funds, and (4) the balance of power between retailers and manufacturers. First, researchers have explained the growth and profitability of trade promotions. Various studies (Ailawadi, Farris, and Shames 1999; Curhan and Kopp

³A common device is to estimate the annual accrual fund by assuming some volume of business; then, the retailer deducts a fixed percentage of this fund for every weekly invoice (e.g., 1/52nd) all year, making adjustments if there is a difference between the estimated and the actual. Manufacturers sometimes pay this money up front, in anticipation of performance, and then adjust it up or down on the basis of actual performance on a monthly or quarterly basis.

1988; Drèze and Bell 2003; Srinivasan et al. 2004; Tyagi 1999) examine the retail response to trade promotions. These studies suggest that, in general, trade promotions cannot be shown to be efficient for the channel, but historical trade practices tend to persist.

Second, another body of research focuses on the extent of pass-through—that is, the percentage of discounts retailers actually pass on to consumers in the form of lower prices. The main conclusions of these studies provide support in developing our hypotheses. The major findings are as follows:

1. The extent of retailer pass-through ranges widely depending on the product category and retail price zone, and it tends to be higher for larger brands than for smaller brands (Besanko, Dubé, and Gupta 2005; Bucklin 1987; Chevalier and Curhan 1976; Tyagi 1999);
2. Only 13% of manufacturers reported receiving a good value for their trade promotion expenditures and, furthermore, claimed that only about half of trade funds were actually passed on to consumers (Cannondale Associates 2003);
3. Higher retail margins from trade funds depend on product-market characteristics, such as the retailer's clientele and the heterogeneity in consumer search costs, and on frequency and budget of manufacturer deals, a subject we explore herein (see also Kumar, Rajiv, and Jeuland 2001; Neslin, Powell, and Stone 1995);
4. Manufacturers persist in offering trade promotions despite poor retail pass-through (Kim and Staelin 1999); and
5. There is no relationship between brand position in a retailer's product category and the extent of pass-through (Walters 1989).

Third, when considering allocation of trade promotion funds, retailers tend to prefer discount-based promotions for flexibility. Conversely, manufacturers prefer performance-based trade promotions (Drèze and Bell 2003).

Fourth, a stream of research stemming primarily from industrial organization economics examines the distortions of demand that result from trade promotions, which arguably lead to inefficient resource allocation due to relative retail-supplier power balance (Scheffman 2002; Sullivan 2002). Furthermore, suppliers may actually motivate retailers with certain promotion funds (e.g., slotting allowances) and may better coordinate channel activity and improve consumer welfare (Hamilton 2003).

In Table 1, we summarize selected research that focuses on empirical and theoretical aspects of trade promotions. The majority of prior studies are theoretical or conceptual, and for the most part, empirical testing has been restricted to single product categories in individual firms. There is little empirical work on allocation of trade promotion funds, principally because of the difficulty in obtaining industry data (Drèze and Bell 2003; Kasulis et al. 1999). Although data from manufacturers are frequently available, obtaining data from retailers has proved difficult for three reasons: (1) Retailers often carry a huge number of products, (2) supermarket companies focus on product category rather than on brand, and (3) the information required is essentially proprietary. This article attempts to fill this important gap in the literature.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Conceptual Framework

We conceptualize a relatively formal interaction between a manufacturer and a retailer in the budget and allocation

decisions for the trade promotion of a given brand. The process can be jointly determined, the manufacturer can set the budget first and then negotiate on the allocation, or the manufacturer can negotiate on the allocation first and then set the budget. Our interviews with a convenience sample of buyers from 15 supermarket companies indicate that, in general, budget and allocation decisions are not jointly determined. Of these buyers, 10 mentioned that the manufacturer determines the budget first and then negotiates with the retailer on its allocation. However, the respondents also pointed out that the retailer is sometimes successful in continuing to receive additional promotional funds from the manufacturer as the year progresses, after the initial budget determination. This process may be akin to the determination of advertising budgets using the top-down or "objective-and-task" approach (Kotler 2003). Given the ambiguity of the trade promotion decision process, we empirically test different specifications of the determination of trade promotion budget and its allocation. We define "trade promotion budget" as the total trade promotion dollars the retailer receives from a manufacturer, and we define "trade promotion allocation" as the percentage of these dollars allocated to each of the four categories of trade promotion described previously. In general, we postulate that both manufacturer characteristics and retailer characteristics affect the budget and its allocation (see Figure 1).

Hypotheses

Trade promotion budget: manufacturer characteristics. We posit that manufacturer characteristics, such as the manufacturer's brand price premium, company size, and brand position in retailer's product category, are likely to affect trade promotion budget. Brand price premium is a key dimension of brand equity.⁴ For example, consumers who are highly loyal to a particular brand require a larger price differential over a competing low-loyalty brand before they switch (Agrawal 1996). Evidence is mixed regarding the relationship between trade promotion budgets and variables related to brand equity. Whereas Davis, Inman, and McAllister (1992) find no evidence of a negative relationship between trade promotions and brand evaluation, Neslin and Shoemaker (1989) and Gedenk and Neslin (1999) show that buying on promotion does not provide as much brand reinforcement as buying not on promotion. In the latter two studies, the resultant postpromotion probabilities of choice of a brand are higher than if no promotion occurred at all. Seetharaman (2004) develops choice models to show that lagged promotions have a carryover effect on habit persistence. The trade literature (Hawkes 1999) points out that though retailers recognize that trade promotions may erode brand equity, they are not willing to give them up as long as it does not reduce their bottom line. Many retailers are indifferent to brand erosion because manufacturers' trade promotions do not affect the equity of the retailer brands.

The marketing mix of consumer packaged goods manufacturers has changed in recent years, favoring push strategies in the form of trade promotions. This shift has been

⁴Price premiums are a perfect measure of brand equity if and only if prices capture all relevant information about products (e.g., quality, brand loyalty) and if consumers are perfectly informed when making consumption choices (Brendt, Griliches, and Rappaport 1995). For a complete discussion of brand equity measurement, see Agarwal and Rao (1996).

Table 1
SUMMARY OF SELECTED RESEARCH ON TRADE PROMOTIONS

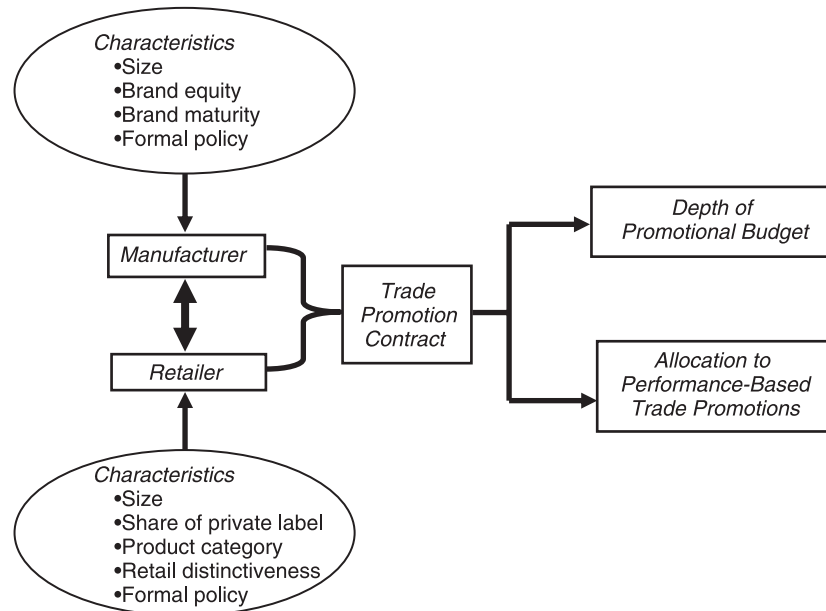
<i>Study</i>	<i>Theoretical/ Empirical</i>	<i>Focus</i>	<i>Main Contribution/Finding</i>
Chevalier and Curhan (1976)	Empirical	Pass-through	Retailers promote only a limited number of items for which they accept trade promotion funds from vendors.
Bucklin (1987)	Empirical	Pass-through	Positive relationship between own-brand pass-through and brand share.
Curhan and Kopp (1988)	Empirical	Profitability	Identifies key factors manufacturers should account for to ensure retailer support for trade deals.
Walters (1989)	Empirical	Pass-through	Determines the factors that influence retailer merchandising support to a manufacturer-sponsored promotion.
Lal (1990)	Theoretical	Profitability and allocation	Shows that off-invoices and billback can help suppliers increase profits.
Neslin, Powell, and Stone (1995)	Empirical	Profitability	Influence of retailer and consumer responses to manufacturer's optimal advertising and promotion strategy.
Lal and Villa-Boas (1998)	Theoretical	Pass-through	Market structure determines whether promotions across brands are positively or negatively correlated.
Murry and Heide (1998)	Empirical	Allocation and pass-through	Examines retailer agreement to participate in promotions sponsored by manufacturers and retailer's compliance with the agreement.
Ailawadi, Farris, and Shames (1999)	Theoretical	Profitability	Performance-based types yield higher returns to manufacturers over everyday-low-price retailer strategies.
Kim and Staelin (1999)	Theoretical	Pass-through	Under certain conditions, retailers are not able to increase profits through higher trade promotion allowances.
Tyagi (1999)	Theoretical	Pass-through	Identifies consumer demand characteristics that influence extent of pass-through.
Kasulis et al. (1999)	Theoretical	Allocation	Relative market power between suppliers and retailers is a major force driving negotiation of trade deals.
Silva-Risso, Bucklin, and Morrison (1999)	Theoretical empirical	Profitability and pass-through	Develop a decision support system to support the planning of trade promotional calendars.
Kumar, Rajiv, and Jeuland (2001)	Theoretical	Pass-through	Strategic considerations determine retailer's decision to pass trade deals on to consumers.
Scheffman (2002)	Theoretical	Policy	Examines the role of marketing on antitrust issues, in particular the impact of trade promotions on competition.
Sullivan (2002)	Theoretical	Policy	Analysis of trade promotions can help address policies related to antitrust enforcement.
Hamilton (2003)	Theoretical	Policy	Slotting allowances help coordinate channel activity, greater supplier sales, and consumer welfare.
Drèze and Bell (2003)	Theoretical empirical	Allocation	If terms are the same, manufacturers prefer scanbacks, whereas retailers prefer off-invoice allowances.
Srinivasan et al. (2004)	Empirical	Profitability	Factors affecting the profitability of trade promotions for manufacturers and retailers; the impact on manufacturer revenues is positive, but the impact on retailer revenues is mixed.
Besanko, Dubé, and Gupta (2005)	Empirical	Pass-through	Pass-through varies substantially across product categories, and there is strong evidence of asymmetric retailer response to trade promotions on large versus small brands.

widely interpreted in the trade press as the outcome of manufacturers losing their dominant position to retailers. According to Kasulis and colleagues (1999), trade promotions are a function of the manufacturer's market power. Thus, we expect that larger manufacturers can decrease trade promotion budgets compared with their smaller counterparts. Moreover, size may affect the relative power

between the specific negotiating dyad of manufacturer and retailer.

There is evidence in the trade literature that manufacturers of brands with small but growing shares tend to gain trial by being more aggressive in their trade promotion and media advertising relative to total brand sales than their large-share counterparts (e.g., Wellman and Capowski

Figure 1
FRAMEWORK FOR ANALYSIS OF BUDGET AND ALLOCATION OF TRADE PROMOTIONS



1999). Furthermore, manufacturer revenue elasticities are higher for promotions of small-share brands than for promotions of large-share brands (Srinivisan et al. 2004). Nevertheless, if we compare trade promotion dollars, brands with larger shares in a retailer product category are expected to have higher budgets than their smaller-share counterparts. In accordance with the literature examining the impact of manufacturer characteristics on trade promotion budget, we offer the following hypothesis:

- H₁: The trade promotion budget decreases with brand price premium, decreases with size of manufacturer, and increases with brand position in product category.

Trade promotion budget: retailer characteristics. The rapid concentration of the food retail sector in recent years has produced substantial changes in the balance of market power between food manufacturers and supermarket companies (e.g., Buzzell, Quelch, and Salmon 1990; Lee, Padmanabhan, and Whang 1997). We use retailer annual sales as an indicator of retailer market power in the negotiation of trade promotions. Thus, we expect that retail companies leverage their sales volume to increase manufacturers' trade promotion budgets. No previous empirical work has explicitly assessed the impact of retail branding on trade promotion budget. However, in line with the work of Ailawadi and Keller (2004), it is possible to conjecture that the relationship between retail branding and trade promotions is positive. Because retailers that have a high–low price strategy tend to have large retail promotion budgets, it could be argued that having a strong brand enables retailers to command greater trade promotion budgets from their suppliers.

Cotterill (2001) addresses the links between trade promotions and retailer private labels by using a structural model of price transmission and accounting for the existence of successive oligopolies in the distribution channel. This

model demonstrates that members of the channel (i.e., manufacturers and retailers) avoid Nash equilibrium by increasing trade promotions and by increasing the share of a retailer's private label. An implicit result of this model is that the correlation between trade promotions and share of private label is positive.

Nevertheless, Cotterill and Putsis (2000) find that the relationship between the effective retail prices of private and national brands tends to be positive. Thus, if a given retailer emphasizes getting extremely large trade promotions from national brand manufacturers and if these promotions are passed on to consumers, such discounts may hinder the ability of private brands to compete with national brands. Therefore, this effect is ambiguous. On the basis of this discussion, we offer the following hypothesis:

- H₂: The trade promotion budget increases with retailer size and retail branding, and the influence of share of private label in a product category is ambiguous.

Allocation across trade promotion types: manufacturer characteristics. In theoretical and empirical work, Bell and Drèze (2002) and Drèze and Bell (2003) compare retailer pricing and profitability between off-invoices and scanbacks. Their theory shows that, all else being equal, retailers prefer off-invoices over scanbacks, whereas manufacturers prefer scanbacks over off-invoices. Retailers prefer off-invoices because of the flexibility offered in their use (e.g., allowing the retailer to forward buy and even engaging in diverting). However, this greater retailer flexibility comes at a cost to the manufacturers; that is, they lose control over their marketing mix. Kasulis and colleagues (1999) develop a conceptual framework to show that a manufacturer with horizontal market power should maximize allocation to performance-based trade promotions.

Brand position in a retailer's product category should be a determinant of allocation (Srinivasan et al. 2004). Thus, manufacturer brands with larger shares in a product category should allocate less to off-invoices. In addition, the existence of formal policies for the allocation of trade promotions is likely to influence promotion type selection. There is extensive research on the linkages between trade promotions and retailer pricing policies (e.g., Ailawadi, Farris, and Shames 1999; Lal and Villas-Boas 1998). Nevertheless, there is no previous empirical evidence to show that a company (retailer or manufacturer) relying on formal policies for promotion negotiation is able to influence the allocation of promotional funds. We hypothesize that companies with formal promotional policies are able to negotiate trade promotions that are more beneficial to them. This discussion leads to the following hypothesis:

H₃: The allocation to off-invoice allowances decreases with brand price premium, manufacturer size, brand position on product category, and manufacturer formal policies, and the allocations to scanbacks/accruals and to billbacks increase with manufacturer size, brand position on product category, brand price premium, and manufacturer formal policies.

Allocation across trade promotion types: retailer characteristics. Rapid concentration of the supermarket sector has changed the balance of power between manufacturers and supermarket companies. In particular, certain retailer characteristics may allow retailers to prefer specific trade promotion types. For example, the emergence of the "retailer as a brand" has been one of the most prominent trends in the supermarket industry over the past decade (Ailawadi and Keller 2004). Understanding how to enhance a retailer brand and its impact on customer loyalty is an important issue for both retailers and manufacturers. Retailers with strong retail brands may seek a larger allocation to off-invoices and a smaller allocation to performance-based promotion types.

Company size may also influence a retailer's ability to influence the allocation of trade promotion funds. Kasulis and colleagues (1999) suggest that empirical research should be conducted to examine whether dominant retailers have the ability to select trade promotion types that allow them to shift profits away from manufacturers (to retailers). In this spirit, Murry and Heide (1998) show that organizational characteristics (e.g., greater incentive premiums, discount-based trade promotion types, lower manufacturer monitoring efforts) tend to increase the retailer's willingness to accept trade promotions. These studies, together with Drèze and Bell's (2003) study on allocation, suggest that a retailer in a dominant position prefers off-invoices over performance-based types.

Extant literature shows that retailers introduce private labels not only to increase profits but also to improve their negotiating position with manufacturers (Ailawadi and Harlam 2004). Srinivasan and colleagues (2004) find that manufacturers obtain greater benefits from offering off-invoices when the retailer private-label share is low. As they note, however, their study is limited to a single retailer and only one type of trade promotion (off-invoices).

Similar to the arguments we developed previously for manufacturers, retailers that have formal policies for the allocation of trade promotions may be able to shift funds from performance-based promotions to off-invoices. Thus,

we offer the following hypothesis about retailer characteristics:

H₄: The allocation to off-invoice allowances increases with retailer size, retail branding, private-label share, and retailer formal policy; conversely, the allocations to scanbacks/accruals and to billbacks decrease with retail branding, retailer size, private-label share, and retailer formal policy.

OPERATIONALIZATION OF VARIABLES

In Table 2, we show how the variables are operationalized in our study, their sources, and their hypothesized effects on budget and allocation. Again, trade promotion budget is the promotion dollars received from a manufacturer, and trade promotion allocation is the percentage of dollars allocated to each of the four categories of trade promotion.

Manufacturer Characteristics

We measure brand price premium as the difference between the brand's price and the average price of all brands in the corresponding product category (after normalizing prices to a common unit). We employ manufacturer annual sales as a measure for company size. We construct a dummy variable of a manufacturer's brand position in a retailer's product category that is equal to one for leading and second brands and to zero for growing brands (brands with small but growing shares). We use another dummy variable to measure whether the manufacturer has formal policies regarding the allocation of trade promotions.

Retailer Characteristics

We employ consumer ratings of supermarket companies to measure retailer branding and retailer annual sales as a measure for company size. To measure the importance of a retailer's private label, we calculate the share of private label in a retailer's product category sales, and as with manufacturers, we construct a categorical variable to denote whether the retailer has formal policies for allocation.

THE SURVEY INSTRUMENT AND DATA

We use a unique data set collected from 36 U.S. supermarket companies, accounting for approximately \$200 billion of annual revenues, approximately 40% of total U.S. supermarket sales. None of the companies participating in the study employ a pure everyday-low-price (EDLP) strategy.⁵

Using brand as the unit of observation, we construct a survey instrument that elicits detailed information regarding the trade promotions negotiated between supermarket companies and their suppliers during 2002. As we show in Table 3, the average annual sales of retail companies in our sample was \$9.6 billion in 2002 versus the U.S. supermarket industry average of \$8.2 billion in the same year (*Supermarket News* 2004); approximately 75% of the companies were exclusively retailers (the remainder were hybrid

⁵"Pure" EDLP retailers do not receive promotional funds from vendors. However, retailers that purport to follow EDLP strategies admit that they engage in price discounting on major ad items each week for selected categories. Wal-Mart, an example of a "near-EDLP" retailer, increasingly engages in selected price discounting. In general, for the products and categories for which retailers follow EDLP pricing strategies, the "equivalent" support is obtained through a lower cost of goods.

Table 2
HYPOTHESIZED EFFECTS OF MANUFACTURER AND RETAILER CHARACTERISTICS OF TRADE PROMOTION BUDGET AND ALLOCATION

Variable Set	Operational Measures	Effect on Budget	Effect on Allocation to Off-Invoices	Effect on Allocation to Accrual/Scanbacks	Effect on Allocation to Billbacks	Effect on Allocation to Others
Manufacturer characteristics	<i>Manufacturer annual sales</i> : total manufacturer sales in 2002 (Source: www.hoovers.com)	-	-	+	+	+/-
	<i>Brand position</i> : 1 if leading or second brand in retailer's product category, and 0 if growing brand (Source: survey instrument)	+	-	+	+	+/-
	<i>Price premium</i> : Price per unit of volume less the average price in the product category divided by the average price in the product category (Source: own survey of supermarket companies)	-	-	+	+	+/-
	<i>Manufacturer policy</i> : 1 if manufacturer has formal policies for the allocation of trade promotion dollars, and 0 if otherwise (Source: survey instrument)	N.A.	-	+	+	+/-
Retailer characteristics	<i>Retailer annual sales</i> : Total retailer sales in 2002 (Source: <i>Supermarket News</i> 2004)	+	+	-	-	+/-
	<i>Retailer branding</i> : Index ranging from 0 to 100 with consumer ratings of supermarket companies (Source: <i>Consumer Reports</i> 2003)	+	+	-	-	+/-
	<i>Share of private label</i> : Share of private label in product category sales in 2002 (Source: survey instrument)	+/-	+	-	-	+/-
	<i>Retailer policy</i> : 1 if retailer has formal policies for the allocation of trade promotion dollars, and 0 if otherwise (Source: survey instrument)	N.A.	+	-	-	+/-

Notes: N.A. = not applicable.

wholesaler/retailers). The average share of retailers' private-label sales in our sample as a function of total product category sales was 6.8% (the 2002 U.S. supermarket industry average for the five product categories in our sample was 6.3%; *Grocery Headquarters* 2003). This is low compared with the average private-label share of 16% for all U.S. supermarket firms in 2002. Only 14% of retail companies had a formal policy for promotion negotiations. Our sample also includes various manufacturers, from small producers of a single brand with only a few million dollars of annual sales to giant food manufacturers participating in multiple product categories with annual sales of more than \$50 billion. Similar to retailers, only 11% of manufacturers in our sample had specific policies for the negotiation of trade promotions.⁶ In addition, retailers in our sample represent different regions of the country: 18.9% of our observations come from national retailers, and the rest are regional (Northeast 15.5%, Southeast 27.6%, Midwest 12.2%, Northwest 15.5%, and Southwest 1.3%). Thus, we believe that the results are cautiously representative of the broader supermarket industry.

Selection of Product Categories

Each retail company provided data for 2 product categories that we randomly selected from a total of 5: ready-to-

eat cereal, frozen dinners/entrées, coffee, laundry detergent, and pet food. These 5 product categories represented approximately 20% of the top 25 product-category sales in the U.S. supermarket sector in 2002 (*Grocery Headquarters* 2003). Our 5 product categories differ according to their product perishability, frequency of purchase, price level, cost of storage, and purchase "intensity" (i.e., whether consumers purchase the good "on impulse"). We used IRI data on the level of retail discount and the number of units sold on promotion in 2003 for 25 product categories (including the 5 in our study) to gauge the "representativeness" of the set used in our study. Our 5 product categories averaged a 25% discount, whereas the other 20 product categories had an average discount of 23%. Likewise, units sold on promotion were 37% and 35% for our 5 categories and for the other 20, respectively. Assuming similar pass-through across product categories, these comparisons indicate that trade promotion activity in our 5 categories is comparable to the top 25 supermarket product categories.

Responses

Completing our survey was demanding for the respondents. One respondent revealed that he spent a full week on his own personal time to complete the survey. Despite the uncommonly demanding survey, two features of our study facilitated our response success. First, we ensured complete confidentiality for all respondents, and second, respondents became eligible for 20 scholarships to an annual management development program. The value of each of these

⁶Manufacturers in our sample have trade promotion policies that either are brand specific or vary across retail companies. Thus, we discuss manufacturer policies at the brand level.

Table 3
MEANS AND STANDARD DEVIATIONS OF MODEL VARIABLES

<i>Variable</i>	<i>Measure</i>	<i>Units</i>	<i>N</i>	<i>M</i>	<i>SD</i>
<i>Dependent Variables</i>					
Budget	Amount of promotional funds received from manufacturer in 2002	Log of trade promotion (\$)	164	13.5	1.93
Allocation of off-invoices	Percentage of funds allocated to off-invoices	%	164	25.9	32.6
Allocation of accruals/ scanbacks	Percentage of funds allocated to accruals and scanbacks	%	164	31.0	38.1
Allocation of billbacks	Percentage of funds allocated to billbacks	%	164	30.1	35.0
Allocation of others	Percentage of funds allocated to others	%	164	13.0	18.2
<i>Retailer Variables</i>					
Retailer sales	Annual sales of retailer	Billions of dollars	164	9.6	11.1
Private label	Share of private label in annual product category sales	%	164	6.8	6.1
Retailer policy	1 if the retailer has a policy for allocation of trade promotions, and 0 if otherwise	—	164	.14	.34
Retailer branding ^a	Consumer ratings of supermarket companies	Index (0–100)	164	73.4	2.9
<i>Manufacturer Variables</i>					
Brand position	1 if the brand is a leader or second in category, and 0 if growing	—	164	.67	.47
Price premium	Price per unit of volume less the average price in the product category divided by average price of category	Index	164	.00	.09
Manufacturer sales	Annual sales of manufacturer	Billions of dollars	164	15.3	14.6
Manufacturer policy	1 if the retailer has a policy for allocation of trade promotions, and 0 if otherwise	—	164	.11	.32
<i>Product Category Variables</i>					
Coffee	1 if the brand is in the coffee category, and 0 if otherwise	—	164	.16	.37
Ready-to-eat cereal	1 if the brand is in the ready-to-eat cereal category, and 0 if otherwise	—	164	.28	.45
Laundry	1 if the brand is in the laundry category, and 0 if otherwise	—	164	.16	.37
Frozen dinners	1 if the brand is in the frozen-dinner category, and 0 if otherwise	—	164	.26	.44
Pet food	1 if the brand is in the pet food category, and 0 if otherwise	—	164	.14	.35

^aThese values are imputed. The original variable had 120 observations, with a mean and variance of 74.0 and 3.95, respectively.

scholarships was \$7,000. Thus, we believe that the quality of our data is good.

At the brand level, there are 216 observations (36 supermarket companies \times 2 product categories \times 3 brands), of which 164 are usable. There are 52 unusable observations because some respondents did not correctly follow directions.

Data Set

Our unit of analysis is a particular brand during 2002, not the individual trade promotion contract. Our data set contains information on the total amount of trade promotion dollars received from manufacturers and the percentage allocation of these funds to off-invoices, accruals/scanbacks, billbacks, and others at the brand level for the five categories under study. We supplemented the survey data with secondary data on retailer sales, manufacturer sales, brand price premium, and retail branding.

Trade Promotion Budget

Our budget measure is the trade promotional dollars to the brand the retailer received from a manufacturer in 2002, which we obtained directly in our survey. However, we use the logarithm of the dollars received as our trade promotion measure because of the skewed distribution of the trade promotion budget across retailers and brands (skewness of the budget variable is 2.41).

Allocation of Trade Promotions

As Table 3 shows, the allocation of promotional funds to accruals/scanbacks constitutes the largest portion of promotional funding in our sample (31.0%), followed by billbacks (3.1%), off-invoices (25.9%), and others (13.0%). These values are comparable to those reported in trade publications from private marketing research companies (e.g., Cannondale Associates 2003) and suggest that our sample is reasonably representative of all trade promotions negotiated in 2002.

Missing Data

Approximately 30% of the retail branding observations were missing. To reduce efficiency losses, we replaced missing observations with conditional mean-imputed values based on dependent and independent variables (see Little 1992). This method generates missing independent variables by employing a weighted least squares regression on all other variables and replacing the missing values with the predicted values from the regression. We show the original and imputed values of retail branding in Table 3.

We show the means of the budget and allocations for different classes of the explanatory variables in Table 4. In general, the variation among the means for each explanatory variable is consistent with our conjectures. We address the few exceptions in our forthcoming estimation of a multivariate model.

Table 4
MEANS OF TRADE PROMOTION BUDGET AND ALLOCATIONS FOR SUBGROUPS OF EXPLANATORY VARIABLES

		<i>Budget</i> (Million of Dollars)	<i>Off-Invoices</i>	<i>Billbacks</i>	<i>Accruals and Scanbacks</i>	<i>Others</i>
<i>Manufacturer Variables</i>						
Brand position	Leading/second	2.77	.24	.31	.31	.12
	Growing	1.17	.29	.26	.29	.14
Price premium	Positive	1.96	.25	.33	.29	.12
	Negative	2.50	.26	.27	.32	.13
Manufacturer sales	Above 15.3 ^a	1.74	.20	.32	.35	.11
	Below 15.3	2.54	.28	.28	.28	.14
Manufacturer policy	In place	N.A.	.12	.43	.28	.15
	Not in place	N.A.	.27	.28	.31	.12
<i>Retailer Variables</i>						
Retailer sales	Above 9.6 ^a	3.70	.33	.27	.26	.11
	Below 9.6	1.18	.20	.31	.34	.14
Private label	Above 6.8 ^a	2.89	.30	.26	.29	.13
	Below 6.8	1.78	.22	.32	.31	.12
Retailer branding	Above 73.4 ^a	1.49	.28	.29	.27	.14
	Below 73.4	2.93	.24	.30	.34	.11
Retailer policy	In place	N.A.	.40	.33	.10	.15
	Not in place	N.A.	.23	.29	.34	.12

^aSample mean.

Notes: N.A. = not applicable.

TRADE PROMOTION NEGOTIATION PROCESS

To examine the type of negotiation process that is possibly at work in trade promotions, we estimated three types of equation systems: (1) a joint model⁷ in which both budget and allocations are jointly estimated, allowing for correlations among the error terms; (2) a model in which budget is estimated first and the budget is used as a predictor in the equations for each of the allocations (top-down); and (3) a model in which equations for the allocations are estimated first and then the budget is estimated using allocations as predictor variables (objective and task).

⁷Note that this joint model is reduced form and not structural, which cannot be estimated because our data are cross-sectional in nature.

We use the QLIM procedure (which we describe in greater detail subsequently) to estimate the joint model. For the budget-allocation model, we first estimated the equation for the logarithm of the budget using ordinary least squares. Next, we use the logarithm of the budget as an explanatory variable in the subsystem of allocation equations. We estimated this subsystem using the QLIM procedure. For the allocation-budget model, we first estimated the subsystem of four allocation equations using the QLIM procedure. Then, we estimate the budget equation as a single equation, including each allocation variable at a time (i.e., we estimate the budget equation four times).

Table 5 presents the signs of the coefficients of different explanatory variables for the five equations for the three different equation systems. Except for three coefficients iden-

Table 5
SIGNS OF ESTIMATED EFFECTS OF EXPLANATORY VARIABLES FOR THREE ALTERNATIVE MODEL SPECIFICATIONS

<i>Specification</i>	<i>Equation</i>	<i>Position</i>	<i>Price Premium</i>	<i>Manufacturer Sales</i>	<i>Manufacturer Policy</i>	<i>Retailer Sales</i>	<i>Retailer Policy</i>	<i>Private Label Share</i>	<i>Retailer Branding</i>
Budget first, allocations second	Budget	+	-	-	N.A.	+	N.A.	-	-
	Off-invoice	-	-	-	-	+	+	+	+
	Accruals and scanbacks	+	-	+	+	-	-	-	+
	Billbacks	+	+	-	+	-	+	-	-
	Others	-	-	-	+	-	- ^a	+	+
Allocations first, budget second	Budget	+	-	-	N.A.	+	N.A.	-	-
	Off-invoice	-	-	-	-	+	+	+	+
	Accruals and scanbacks	+	-	+	+	-	-	-	+
	Billbacks	+	+	-	+	-	+	-	-
	Others	-	-	-	+	-	+	+	+
Budget and allocations joint	Budget	+	-	-	N.A.	+	N.A.	+ ^a	-
	Off-invoice	-	-	-	-	+	+	+	+
	Accruals and scanbacks	- ^a	-	+	+	-	-	-	+
	Billbacks	+	+	-	+	-	+	-	-
	Others	-	-	-	+	-	+	+	+

^aIndicates exceptions.

Notes: N.A. = not applicable; see text for the specification.

Table 6
FIT MEASURES FOR THREE ALTERNATIVE MODEL
SPECIFICATIONS

Variable	Joint	Objective and Task	
		Top-Down (Budget First)	(Allocation First)
Budget (R ²)	—	.16	.17
Allocation (pseudo-R ²)	—	.35	.26
Overall measure (average)	.29	.26	.22

tified in the table, the signs are the same in the three equation systems, attesting to the robustness of the results.

We computed the R-square for the budget equation and pseudo-R-square for the allocation equations; these appear in Table 6. The differences in the overall measure of fit for three alternative negotiation processes are minimal. Therefore, it is difficult to identify the “true” nature of the trade promotion negotiation process.⁸ Nevertheless, the joint model fits the data slightly better, and we use it to discuss the empirical results.

THE JOINT MODEL

The estimated equations for the joint model are as follows:

$$\begin{aligned}
 (1) \quad y_{1,ijk} &= \mathbf{R}_{ijk}\beta_1 + \mathbf{M}_{ljk}\alpha_1 + \partial_1 \mathbf{Z}_j + \varepsilon_{1,ij} + \varepsilon_{1,ijk}, \\
 y_{2,ijk}^* &= \mathbf{R}_{ijk}\beta_2 + \mathbf{M}_{ljk}\alpha_2 + \partial_2 \mathbf{Z}_j + \varepsilon_{2,ij} + \varepsilon_{2,ijk}, \\
 y_{3,ijk}^* &= \mathbf{R}_{ijk}\beta_3 + \mathbf{M}_{ljk}\alpha_3 + \partial_3 \mathbf{Z}_j + \varepsilon_{3,ij} + \varepsilon_{3,ijk}, \\
 y_{4,ijk}^* &= \mathbf{R}_{ijk}\beta_4 + \mathbf{M}_{ljk}\alpha_4 + \partial_4 \mathbf{Z}_j + \varepsilon_{4,ij} + \varepsilon_{4,ijk}, \text{ and} \\
 y_{5,ijk}^* &= \mathbf{R}_{ijk}\beta_5 + \mathbf{M}_{ljk}\alpha_5 + \partial_5 \mathbf{Z}_j + \varepsilon_{5,ij} + \varepsilon_{5,ijk}; \\
 y_n &= y_{n,ijk} \text{ if } y_{n,ijk}^* \geq 0, \text{ and } y_n = 0, \text{ if } y_{n,ijk}^* < 0, \\
 &\text{for } n = 2, 3, 4, 5,
 \end{aligned}$$

where i , l , j , and k represent retailer, manufacturer, product category, and brand, respectively. The endogenous variables are the natural logarithm of trade promotion budget (y_1) and its percentage allocation to off-invoices (y_2^*), accruals/scanbacks (y_3^*), billbacks (y_4^*), and other types (y_5^*). The allocation variables are censored at zero and identified with an asterisk. The vectors of explanatory variables include retailer i characteristics for brand k in product category j (\mathbf{R}_{ijk}), characteristics of manufacturer l for brand k in product category j (\mathbf{M}_{ljk}), and a vector of product category dummy variables (\mathbf{Z}_j). Specifically, these vectors of variables are as follows:

$$\begin{aligned}
 \mathbf{R}_{ijk} &= [\text{annual sales, share of private label in product category sales, retailer branding}], \\
 \mathbf{M}_{ljk} &= [\text{annual sales, brand price premium, brand position in product category sales}], \text{ and} \\
 \mathbf{Z}_j &= [\text{dummy variables for coffee, ready-to-eat cereal, laundry detergent, frozen dinners}].
 \end{aligned}$$

⁸We need longitudinal data to estimate a structural model, which postulates a sequence between the two decisions (budget and allocation).

We acknowledge that the budget equation suffers from possible ambiguity because of reverse causality (i.e., low budgets can either cause or be caused by brand position). Our limited data do not enable us to correct for this problem. In our model, the five endogenous variables are inter-related. Therefore, we assume that the error structure takes the form $\varepsilon_{n,ij} + \varepsilon_{n,ijk}$ ($n = 1, 2, 3, 4, 5$). This error structure accounts for a general shift for a given retailer, given that we have various explanatory variables that are retailer specific (e.g., retailer sales). The vector of error terms ($\varepsilon_{1,ijk}$, $\varepsilon_{2,ijk}$, $\varepsilon_{3,ijk}$, $\varepsilon_{4,ijk}$, $\varepsilon_{5,ijk}$) have multivariate normal distribution with a mean of 0 and a variance-covariance matrix of Σ , which needs to be estimated. Conversely, because each retail firm provided responses for three brands in two of the five product categories, we allow for heteroskedasticity of the regression disturbance and model it as a function of retailer and product category variables. For example, there may be a correlation between the responses for a particular retailer for brands in the two product categories. Therefore, in each equation, we include the random error component $\varepsilon_{n,ij}$ ($n = 1, 2, 3, 4, 5$) to reflect the possible heteroskedastic nature of our data, and we express the variance of these error terms, $\varepsilon_{n,ij}$ ($n = 1, \dots, 5$), as an exponential function of the natural logarithm of annual retailer sales (RS_i) and the vector of product category dummies (\mathbf{Z}_j):

$$(2) \quad E(\varepsilon_{n,ij}^2) = f(RS_i \gamma_{1n}, \mathbf{Z}_j \gamma_{2n}) = \delta_n^2 \left[1 + \exp(RS_i \gamma_{1n} + \mathbf{Z}_j \gamma_{2n}) \right],$$

where δ_n is the variance of the residual of equation n and (γ_{1n} , γ_{2n}) are the estimated parameters of the heteroskedastic function corresponding to equation n ($n = 1, \dots, 5$).

Our approach to modeling the error variance has partially addressed the issue of a possible effect of the covariance in the responses across retailers and brands (due to the repeated measures nature of our data). That is, our error term, $\varepsilon_{n,ij}$ ($n = 1, \dots, 5$), is decomposed, so it controls for unobserved factors that may cause a retailer to demand different budget levels or types of trade promotions across product categories.⁹

Because the logarithm of the budget is a continuous variable and the allocation variables are censored, we employ the joint estimation procedure QLIM in SAS Version 9.01 (SAS Institute 2005). This procedure enables us to estimate multivariate models with censored and continuous endogenous variables. To set up the likelihood function, the QLIM algorithm follows Genz's (1992) approach and employs Monte Carlo integration procedures to compute the multivariate normal integrations of the system of equations in Equation 1. We obtain the parameter estimates using the method of simulated scores developed by Hajivassiliou and McFadden (1998), who demonstrate that the method-of-simulated-scores estimators are consistent and uniformly asymptotically normal.¹⁰

⁹A limitation of our approach is that we do not control for possible correlation across these unobserved effects. To our knowledge, standard procedures to include such correlations are not available in a multivariate setting with a combination of continuous and limited dependent variables. Developing such an algorithm would be worthwhile, but it is beyond the scope of this study.

¹⁰For more details on the method for simulated scores for the estimation of multivariate models with endogenous limited dependent variables, refer to Hajivassiliou (1996) and Hajivassiliou and McFadden (1998).

Table 7
JOINT MODEL PARAMETER ESTIMATES: DETERMINANTS OF TRADE PROMOTION BUDGET AND ITS ALLOCATION

Dependent Variable	Budget	Allocation to Off-Invoices		Allocation to Accruals and Scanbacks		Allocation to Billbacks		Allocation to Other Types	
		Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Intercept	15.700*** (3.072) ^a	-1.428 (.963)	—	.018 (1.708)	—	2.018** (.901)	—	.134 (.321)	—
Brand position	.976*** (.266)	-.031 (.063)	-.030	-.032 (.070)	.001	.067 (.065)	.029	-.012 (.025)	-.002
Price premium	-4.415*** (1.504)	-.255 (.423)	-.149	-.040 (.456)	-.028	.190 (.331)	.126	-.008 (.114)	-.035
Manufacturer sales	-.018 (.012)	-.002 (.003)	-.001	.005* (.002)	.003	-.002 (.002)	-.001	-.001 (.001)	-.001
Manufacturer policy	—	-.249** (.120)	-.224	.004 (.118)	-.020	.258*** (.110)	.228	.046 (.039)	.048
Retailer sales	.039** (.015)	.007*** (.002)	.006	-.001 (.004)	-.001	-.005** (.003)	-.004	-.004*** (.001)	-.003
Share private label	.191 (4.949)	2.446*** (.950)	1.802	-1.525** (.645)	-1.181	-1.462*** (.569)	-1.108	.584** (.184)	.491
Retailer branding	-.043 (.042)	.016 (.011)	.006	.006 (.014)	.005	-.022* (.012)	-.019	.011* (.006)	.007
Retailer policy	—	.025 (.083)	.040	-.170* (.104)	-.185	.132* (.079)	.170	.011 (.034)	.006
Coffee	-.166 (.774)	.141 (.182)	.050	-.153 (.132)	-.164	.088 (.137)	.081	.125 (.061)	.105
Ready-to-eat cereal	.716 (.575)	.227 (.252)	.163	-.060 (.114)	-.052	-.207* (.121)	-.192	.180*** (.052)	.155
Laundry detergent	-1.332* (.738)	.307 (.241)	.238	-.262** (.129)	-.261	.075 (.126)	.071	.087 (.060)	.076
Frozen dinners	.670 (.529)	.460* (.265)	.345	-.235** (.119)	-.230	-.149 (.121)	-.161	.168*** (.057)	.143
SE	1.101*** (.393)	.246** (.152)	—	.236*** (.046)	—	.293*** (.058)	—	.130*** (.013)	—
Pseudo-R ²	.17	.40	—	.20	—	.17	—	.25	—
Model fit summary	Number of observations = 164, pseudo-R ² = .29, log-likelihood = -429.37, and Akaike information criterion = 1065.								

* $p < .10$.

** $p < .05$.

*** $p < .01$.

^aRobust standard errors.

RESULTS FROM THE JOINT MODEL

We present the results in three parts: (1) model fit, (2) estimated coefficients for the trade promotion budget equation, and (3) estimated coefficients for the allocation equations. We also discuss the implications of the partial repeated measures design used in our data collection. Table 7 shows all parameter estimates and standard errors of the joint model of budget and allocation of trade promotions and related statistics from the QLIM procedure.¹¹

Model Fit¹²

The pseudo-R-square suggests that our model explains 29% of the variance of the endogenous variables. This

¹¹Our sample consists of 42 brands, and only 18 pairs of brands are mentioned by more than two retailers. We calculated the correlation between brand pairs for the residuals of the five endogenous variables in the joint model across retailers. We found that 17% of the correlations across brands are significant at the 1% level, and 40% are significant at the 10% level. These results indicate that the empirical results are unlikely to be affected by the issue of the repeated measures nature of our data.

¹²We assessed the predictive validity of our model from data we obtained from three retailers that responded to our original survey for two product categories and three brands (18 observations) for 2004. For the budget equation, the R-square value between the actual and the predicted values is .98, and the R-square values for the allocations to off-invoices, accruals/scanbacks, billbacks, and others are .66, .58, .20, and .70, respectively. Overall, the joint model appears to have good predictive validity.

measure of fit varies across equations, ranging from 40% (allocation to off-invoices) to 16% (allocation to billbacks).

The estimated variance-covariance matrix of the vector of error terms ($\epsilon_{1,ijk}$, $\epsilon_{2,ijk}$, $\epsilon_{3,ijk}$, $\epsilon_{4,ijk}$, $\epsilon_{5,ijk}$) shows significant correlations across equations.¹³ In particular, the correlation between the allocation to off-invoices and the allocation to accruals/scanbacks and billbacks is negative and significant at the 5% level. Likewise, the correlation between allocation to accruals/scanbacks and billbacks is negative and significant at the 1% level. These results show strong substitutability between off-invoices and trade promotions based on performance. Correlation coefficients between the error terms of the budget equation and each of the allocation equations are positive for allocation to off-invoices and to others but negative for accruals/scanbacks and billbacks. However, these correlations are not statistically significant.

¹³Correlation estimates and their standard errors are as follows: (1) off-invoices and billbacks: correlation = -.17, standard error = .08; (2) off-invoices and accruals/scanbacks: correlation = -.43, standard error = .06; (3) accrual/scanbacks and billbacks: correlation = -.72, standard error = .04; (4) budget and off-invoices: correlation = .05, standard error = .09; (5) budget and billbacks: correlation = -.02, standard error = .08; (6) budget and accruals/scanbacks: correlation = -.07, standard error = .09; and (7) budget and others: correlation = .01, standard error = .08.

Trade Promotion Budget Equation

Estimated coefficients. The estimated coefficients for two of the manufacturer variables—brand position and brand price premium (brand equity)—exhibit the expected signs and are significant at the 1% level. The sign of the coefficient for manufacturer sales is negative but not significant. These estimates provide support for H_1 . Furthermore, the retailer sales variable is positively related to the budget (at the 5% level of significance); none of the other retailer characteristics are significant. This result provides partial support for H_2 .

Marginal effects. The estimated coefficients in the budget equation represent the percentage impact on budget of a one-unit change in the explanatory variables. Accordingly, the trade promotion budget of a leading or second brand is 97.6% higher than the budget of a growing brand. Furthermore, a brand with a 1% price premium has a budget that is 4.41% smaller than a brand with no price premium. This result suggests that manufacturers of brands with higher brand equity have the ability to decrease trade promotion budgets. Conversely, our estimates indicate that larger retailers are able to increase trade promotion budgets; retailers with an additional billion dollars of annual sales receive an additional 3.9% trade promotion budget from a manufacturer of a particular brand.

Trade Promotion Allocation Equations

Estimates. Among the set of manufacturer characteristics, manufacturer policy is negatively related to allocation to off-invoices and positively related to billbacks; these effects are significant at the 5% level. These findings provide partial support for H_3 .

Our analysis shows strong relationships of retailer characteristics to different types of allocation of trade promotion budget. Higher retailer annual sales are positively related to allocation to off-invoices and negatively correlated to billbacks and to other types; these effects are significant at least at the 5% level. Higher share of private label in product category increases the allocation to off-invoices but decreases the allocation to accrual/scanbacks and billbacks; these effects are significant at least at the 5% level. The allocation to other types is also related to the share of private label in the category (with a 5% level of statistical significance). Retailer allocation policies are associated with decreases in the allocation to accruals/scanbacks at the 5% level of significance. Furthermore, the results show that retail branding has a negative association with allocation to billbacks at the 10% level of significance. These results provide support for H_4 .

Marginal effects. Because the endogenous variables in the allocation equations are censored, estimating the marginal effects of the explanatory variables requires mathematical computations. We use the sample means to calculate the marginal effects of the manufacturer and retailer variables.¹⁴

The marginal effects suggest that retailer variables emerge as the main determinants of allocation. Retailers with a percentage share of private label 1% above the mean (in a particular product category) can (1) increase the allocation to off-invoices by 1.8%; (2) decrease the allocation to accruals/scanbacks and to billbacks by 1.18% and 1.11%, respectively; and (3) increase allocation to other types by .49%. These findings imply that retailers leverage their share of private label to increase allocation to types that allow them greater control regarding the use of trade promotion funds. The marginal effects also indicate that retailers with annual sales of \$1 billion above the sample mean have allocations to off-invoices that are .6% higher than the mean and have allocations to billbacks and to others that are .4% and .3% lower than the mean, respectively. The marginal effect of annual retailer sales on allocation to accruals/scanbacks has a negative sign, but it is statistically nonsignificant.

The existence of a formal policy toward allocation by retailers makes a considerable difference, resulting in a lower allocation of 18.5% to accrual/scanbacks and a higher allocation to billbacks of 17% compared with retailers that do not have a formal allocation policy. In addition, an increase of 1% above average in a retail branding score corresponds to an increase of 1.9% in the allocation to billbacks and .7% in the allocation to other types (e.g., market development funds). Furthermore, share of private label is related to all allocation decisions. The other retailer variables are related to at least one of the allocation equations. In summary, our estimates indicate that a retailer may be able to shift funds from performance-based types to off-invoices, which gives it more flexibility in the utilization of trade promotion funds.

Although all retailer variables affect allocation decisions, the marginal effects indicate that the only manufacturer variable that influences allocation is the existence of a formal manufacturer policy for the negotiation of trade promotions. That is, a manufacturer with a formal policy has a 22.4% lower allocation to off-invoices and a 22.8% higher allocation to billbacks than a manufacturer without a policy. Other manufacturer variables, such as brand position, price premium, and annual sales, do not exhibit a relationship to allocation.

Summary of Findings

Our estimates provide support for the four hypotheses we developed in this article. Overall, the results suggest that trade promotion budget is negatively related to price premium, manufacturer sales, the position of the brand in the product category (leading, second, and growing), and retailer sales. Furthermore, our analysis suggests that the allocation to accruals/scanbacks and to billbacks decreases and the allocation to off-invoices increases with retailer characteristics, such as sales share of private label, retailer size, retailer policy, and retail brand image, and it increases with a manufacturer's formal policy of allocation. These findings provide mixed evidence regarding the notion of conventional industry and, to some degree, academic research that, in recent years, the balance of power has been gradually shifting in favor of retailers and away from manufacturers. The results indicate that manufacturers may have greater autonomy in the determination of trade promotion budgets, whereas retailers may have greater control over the allocation decisions.

¹⁴For a continuous explanatory variable x_j , we calculate the marginal effects as $\beta_j \Phi[\mathbf{X}(\boldsymbol{\beta}/\boldsymbol{\delta})]$, where \mathbf{X} and $\boldsymbol{\beta}$ are the vector of explanatory variables evaluated at the means and the vector of parameters estimates, respectively; Φ is the standard normal cumulative distribution function; $\boldsymbol{\delta}$ is the estimated standard error of the residual; and β_j is the coefficient corresponding to variable x_j . For a dummy variable, we calculate the marginal effects by taking the difference between the expression $\mathbf{X}\boldsymbol{\beta} + \delta\lambda[\mathbf{X}(\boldsymbol{\beta}/\boldsymbol{\delta})]$ at $X_j = 1$ and at $X_j = 0$.

CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH

Our study provides evidence that characteristics of brand, product category, retailer, and manufacturer help explain the budget of trade promotions and the choice of trade promotion type. Our analysis provides mild support for a joint process in which the manufacturer and the retailer negotiate the trade promotion budget and its allocation to various types. Other models of budget and allocation determination may also apply equally well in practice. Our estimates show that both manufacturers and retailers can influence the allocation of promotional funds, the former in favor of performance-based types (scanbacks/accruals and bill-backs) and the latter in favor of off-invoice promotions, which allow them greater control over use of these funds.

Channel coordination is often facilitated when one party of the supplier-buyer dyad is in a dominant position to exert market power. However, the results suggest that neither supermarket companies nor grocery manufacturers have a dominant position in the negotiation of promotions, at least not along all dimensions. Therefore, we believe that trade promotions are and will continue to be a contentious issue between retailers and manufacturers, if for no other reason than their different promotional objectives. That is, the fundamental objective of manufacturers is to maximize profits (or sales) of their brands. In contrast, the basic objective of retailers is to maximize category profits (or category sales) or sometimes simply profits (or sales) of the entire total store/company. Such conflict is inherent in many buyer-seller relationships, but the information provided in this study helps make the promotional negotiation more transparent. Transparency is the prerequisite for alliance building and systemwide efficiency.

This study is valuable to public policy makers in particular because it sheds light on various regulatory issues related to food channel structure and behavior in the context of market power. The results indicate that the many manufacturer and retail characteristics that affect trade promotion outcomes (budget and allocation) may generate demand distortions and nonoptimal allocation of resources. Specifically, the findings can help policy makers identify key variables that manufacturers and retailers use in their attempt to exert market power in the distribution channel. Moreover, regulators could use the allocation and budget of trade promotions as elements in the measurement of performance and behavior of the food channel. In addition, the results show that policy makers should account for the differences across product categories in the evaluation of channel performance.

Although our study identifies trade promotion budget and allocation differences across product categories, we believe that an extension of this study should measure determinants of trade promotion outcomes in a greater number of specific product categories. Understanding the factors that contribute to the differences across product categories is a worthwhile topic for further research. Future studies could collect additional data to identify particular product category characteristics (e.g., cost of storage, perishability of goods, opportunity for product diversion, frequency of purchase) that are likely to affect trade promotion negotiation

outcomes. With data sets similar to the one we described in this study, building models to predict the actual volume of trade promotions should be possible and useful for both private and public decision makers.

We believe that our empirical study is an excellent starting point for developing realistic game-theoretic models to map the negotiation process between retailers and manufacturers for trade promotion expenditures. These models should incorporate important variables omitted in our study, such as frequency of promotions and the retailer's extent of forward buying. This modeling effort should consider issues such as the process the manufacturer uses to adjust the trade promotion budget and its allocation during the year as information becomes available on the effects of implemented promotional events, including the opportunistic behavior of retailers. These models will be dynamic in nature. Our work in this article examined the outcomes of such a process for one calendar year.

Our analysis is necessarily cross-sectional, but future studies should consider the intertemporal relationships between budget and allocation. In particular, the effects of the allocation of a previous year might influence the present year's budget of trade promotion and its allocation. A dynamic model will enable researchers to develop an understanding of the structure of the negotiation of trade promotions. Such a model will also enable the testing of possible reverse causality between such variables as trade promotion budget and brand position in a retailer's product category. Constructing dynamic models will be possible in the near future because in 2002, the Financial Accounting Standards Board began to collect data annually on trade promotions, which will soon enable researchers to explore the time-series properties of trade promotion outcomes and to develop more sophisticated empirical models based on panel data.

Diverting products from one channel (or one firm) to another to take advantage of price disparities is an unexplored but critical issue in the consumer packaged goods industry. We believe that there are strong links between trade promotions and diverting. Does a higher budget of trade promotions create incentives for retailers to divert manufacturer brands? Which trade promotion activities inadvertently encourage retailers to divert? What are the implications for the industry in terms of channel efficiency and economic welfare? These questions warrant additional empirical work to address the relationship between trade promotion negotiations and diverting.

Further empirical research on trade promotions should also account for competitive structures and regulatory environments in which both manufacturer and retail companies operate. For example, future studies could focus on international comparisons of determinants of trade promotion outcomes. International comparisons would provide additional variability to future empirical modeling and could highlight the importance of market structure characteristics (e.g., competitive structure, government regulation, cultural differences) in trade promotion negotiations. Finally, the welfare consequences of trade promotions should be examined, and strategies to improve channel coordination should be identified.

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