Consumer Perceptions of Promotional Activity

Several models of consumer response to promotions suggest that a current decision on brand and purchase quantity depends on the expected time until the next price reduction and the expected size of future reductions. In spite of the importance of expected deal frequency and expected deal price to a consumer's decision, relatively little empirical work has been reported on those topics. The authors investigate several aspects of consumer perceptions of deal frequency and deal prices. First, a conceptual model is presented to describe how consumers develop and use those perceptions. Second, results of an extensive survey are used to estimate the degree of consumer knowledge about deal frequency and deal prices. Third, hypotheses about which types of consumers have better knowledge of promotions are tested. Results from the survey indicate that many consumers are reasonably accurate about deal frequency and sale price. In addition, recall on deal frequency and sale price is higher for consumers with larger family sizes and those who read weekly fliers for items on sale, devote a higher percentage of product class purchases to the brand, and purchase the package size more frequently. It is lower for older buyers.

Consumers routinely face the decision of what brand to buy and in what quantity. The decision is complicated by temporary price reductions for various brands and by the fact that the size of the price reductions varies across deals. Common sense and formal economic analysis (Blattberg et al. 1978) suggest that a consumer's decision on brand and purchase quantity may depend on the size of the price reduction and the time until the next price reduction. For example, if a consumer's preferred brand of soft drink is on deal every other week, stockpiling eight weeks' worth of the brand may not make sense. In spite of the importance of expected deal frequency and expected deal price to a consumer's decision, relatively little theoretical or empirical work has been reported on those topics.

Our study has three general objectives. The first is to develop a conceptual model to describe the interactions between consumers and retailers or manufacturers as retail price promotions are implemented. The model describes how consumers encode information on deal activities. It also indicates how retailers or manufacturers influence in-store promotional activity and could use information on consumer perceptions and purchasing to design future promotions. The model provides a basis for identifying several key constructs in consumer decision making about deal purchases and suggests several hypotheses about the relationship between consumer characteristics and perceptions of deal activity.

The second objective is to conduct an empirical analysis of certain key constructs in the model. In particular, we want to estimate the degree of consumer knowledge about deal activities. These findings are expected to improve our understanding of why and how consumers react to price promotions. If many consumers are aware of the deal frequency for individual brands, consumer response to deals on highly promoted brands may be very different from their response to deals on brands that are not often promoted. Manufacturers and retailers could take those reactions into account in designing promotions for different brands.

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4 / Journal of Marketing, April 1991
The third objective is to test hypotheses about the association between a household’s characteristics and its perceptions of deal activities. We want to determine which consumers have more accurate knowledge of deal frequency, sale price, and regular price than others. These findings could be used to segment the market, for mailing coupons, for designing specific promotions, and for improving models of consumer response to promotions.

The two major constructs of the conceptual model that are examined here are deal frequency and deal prices. Buyers’ perceptions of deal frequency for a specific brand-size have several implications. If most consumers perceive that a specific brand-size is promoted frequently, they might not feel a need to stockpile the brand (i.e., accelerate purchases) when it is promoted, which could account in part for the findings on stockpiling by Gupta (1988) and on purchase timing by Neslin, Henderson, and Quelch (1985).

If promotions for a brand are perceived as occurring frequently, retailers may not be able to use deals to reduce their inventory holding costs (see Blattberg, Eppen, and Lieberman 1981). Also, a large proportion of purchases for the brand-size may be made on deal, decreasing the brand’s profitability. In addition, if most consumers perceive that their preferred brands are often on deal, they may be less willing to respond to deals on less preferred brands.

Conversely, if deals on a particular brand-size are perceived to be infrequent, consumers may buy larger quantities when it is offered on promotion and retailers could use deals to reduce their inventory costs. Moreover, consumers may be willing to switch among several brands in the product class if they perceive that promotions are rare in that product class.

Perceptions of deal prices may also have an important role in consumer decision making. For example, if most consumers have an accurate perception of the typical deal price for a 2-liter container of Coke, they may not react favorably to a Coke promotion in which the price discount is less than the regular discount. Alternatively, if most consumers do not have a perception or have an inaccurate perception of the typical deal price, consumer reactions to a small discount could be very different. Information on consumers’ deal price perceptions could help manufacturers and retailers in determining the amount of discount for a price promotion.

**The Role of Consumer Expectations About Price and Deal Frequency in Prior Studies**

One possible role of expectations about future prices in current consumer decisions was described by Blattberg, Buesing, Peacock, and Sen (BBPS) in 1978. They assumed that a household’s objective is to minimize expected costs over present and future periods. "Thus expectations about future demand and future prices affect the present period’s decisions" (p. 371).

In a 1981 study, Blattberg, Eppen, and Lieberman (BEL) based their expression for the optimal purchase quantity on the assumption that the next price promotion will not occur before that optimal quantity is depleted (p. 120). If a consumer expects a deal to occur before the optimal quantity is depleted, the quantity purchased may be different. A second aspect of the BEL model indicates the importance of price perceptions. The model (equation 1, p. 119) includes a term, D, to indicate the price reduction. Inclusion of a term like D implies that a consumer has a perception of the price reduction. If the regular price is not displayed and the perception of D is inaccurate, consumers may not react as predicted by using the true value of D in the model.

The important role of deal and nondeal price perceptions is illustrated also in the model of the purchase quantity decision developed by Neslin, Henderson, and Quelch (NHQ) in 1985 (p. 150). Their model includes the difference between the current price and the price of the brand in the previous week. Thus, before using either the NHQ, BEL, or BBPS model, it appears important to conduct an empirical analysis to determine whether consumers have perceptions of deal prices and to determine the accuracy of those perceptions. In addition, it appears important to determine consumer perceptions of deal frequency using the BEL model.

Some researchers have assumed that consumers notice prices and update a reference price each time they encounter the brand (Friedman 1979; Raman and Bass 1986; Rinne 1981; Winer 1986). Reference price usually has been computed as some function of past prices (Emery 1970; Rinne 1981). Consequently, a consumer’s reference price could be influenced by how frequently the brand-size is promoted. Because reference prices are assumed to be based on a consumer’s perception of prices (Monroe 1973), a consumer’s perception of deal frequency and deal prices could have a critical role in determining his or her reference price.

Research also provides evidence of the discounting of discounts by consumers (Gupta and Cooper 1989), implying that consumers have perceptions of the regular price and sale price. In a similar vein, Blair and Landon (1981) show that the full savings claims made by reference prices in retail advertisements are not accepted by many consumers. This finding suggests that many consumers have perceptions of regular prices. It is also supported by related work on the effect of merchant-supplied information and deal prices on a consumer’s reference price (Berkowitz and Walton 1980; Della Bitta, Monroe, and McGinnis 1981; Lichtenstein and Bearden 1989).
In summary, many researchers have assumed that perceptions of deal prices and deal frequency are an important determinant of consumer purchase decisions. We examine the accuracy and determinants of those perceptions rather than the buyer's decision processes.

**The Relationship of Our Study to Prior Studies on Price Perceptions**

Our study objectives are related to but distinctly different from those of several prior studies on prices. The objective in several studies was to determine how much consumers know about regular (i.e., nondeal) prices (Allen, Harrel, and Hutt 1976; Conover 1988; Gabor and Granger 1961).

One objective in a study conducted by Dickson and Sawyer (1990) was to determine whether or not consumers knew whether an item they had just selected was being offered on a special or at the regular price. The researchers also determined consumer perceptions of prices for certain brands that the consumer had just selected from the shelf.

Our study objectives differ from those of prior studies in several ways. One of our prime objectives is to obtain consumer perceptions of how frequently various brand-sizes are promoted. To the best of our knowledge, no prior study has determined consumer perceptions of deal frequency.

For consumer perceptions of prices, Dickson and Sawyer's objective was to determine the consumer's level of awareness for the price of an item he or she had just chosen. If the item was on sale (was not on sale), the price provided by the consumer was considered to be the consumer's perception of the sale price (regular price). Our objective is to determine the level of consumer knowledge of both the "typical" sale price and regular price for a pre-set list of brand-sizes. The measures are developed among households that buy the product class. The specific brand-sizes studied are not necessarily brand-sizes that the household prefers, has just purchased, or buys on a regular basis. As a result of the differences in study objectives, our study differs methodologically from previous studies on price perception.

**Conceptual Framework**

We propose a conceptual framework that links managerial pricing and promotion policies with consumer purchase behavior. The framework identifies constructs that are assumed to be important for managerial and consumer decisions. It also describes the assumed relationships between the characteristics of individuals and their perceptions of deal activity.

Consumers are assumed to process deal information, form perceptions of past deal activity, and purchase as outlined in Figure 1. Many of the model's concepts on information processing (particularly boxes G, J, N, and Q) were suggested by the work of Jacoby and Olson (1977), Zeithaml (1982, 1988), and Dickson and Sawyer (1990). Boxes N and O reflect the assumption that a consumer's expectations of deal frequency and sale price are determined largely by their perceptions of the frequency and discounts of past promotions (Lattin and Bucklin 1989, p. 299).

Boxes P, O, and R indicate our assumption that the consumer's expectations of future prices and deal frequency are combined with information on current market conditions to determine current purchases. It is also assumed in the model that consumer purchase decisions (box Q), perceptions (box N), and expectations of deal activity (box O) will affect future managerial pricing and promotion policies (box D). Hence, managers need to know about consumer perceptions in order to make good decisions about the size and timing of future price discounts.

Boxes C and I reflect the findings that recall is an increasing function of the frequency of exposure to the stimuli (e.g., Kintsch 1970) and the importance of the stimuli to the goals of the individual (e.g., Harley 1965; Shifffrin and Atkinson 1969). Box M reflects the finding that consumers differ in their ability to encode information (Hulicka and Weiss 1965). As a result, we outline separately the consumer characteristics that

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**FIGURE 1**

Conceptual Model of Promotional Activity

![Diagram](https://example.com/diagram.png)
influence the frequency of exposure to the deal stimulus (box C) or opportunity to encode, involvement with the stimulus (box I) or motivation to encode, and ability to encode price information (box M).

**Consumer Characteristics That Influence Frequency of Exposure to Stimulus**

Cacioppo and Petty (1979) found that message repetition enhances the opportunity to process the content of the message. By definition, a more experienced shopper makes more shopping trips and hence has a greater opportunity to be exposed to a deal. Because women are the principal shoppers in most households, they presumably would be exposed more to the dealing stimulus and thus have better recall of deal frequency and sale price than men (boxes A, B, and C).

The more the household buys a product class, the more it will be exposed to deals for all brands within that product class. The frequency of exposure to sale price and deal frequency for a specific brand would be influenced also by the household’s loyalty to the brand. Because prices of products are dependent on the package size, the exposure to the sale price and deal frequency for specific package sizes would depend on the frequency of purchasing the specific package size (boxes E and C).

In addition, product characteristics may influence exposure to the stimulus. If brands promote more frequently, consumers would have a greater opportunity to be exposed to the sale price. The result would be an increase in the accuracy of recall for sale price (boxes C, G, and J).

Whereas the preceding variables apply to prices, frequency of exposure to sale price (and deal frequency) may depend on attitudes toward and behaviors associated with deals. For example, consumers with general attitudes involving greater concerns about sales may be more exposed to sale prices and deal frequency. Consumers who exhibit certain behaviors associated with deal information such as using coupons and store fliers more frequently may be more exposed to the stimulus as well (boxes F and C).

**Consumer Characteristics That Influence Involvement With Stimulus**

Celsi and Olson (1988) provide evidence that involvement has a motivational role in consumers’ attention and comprehension processes. Motivation to process information has been conceptualized by most researchers in terms of consumers’ involvement with the information stimulus (e.g., Bloch and Richins 1983; Cohen 1983; Petty and Cacioppo 1981), which suggests that consumers who have reasons to be more motivated by deals would have better recall of deal frequency and sale price. We expect that consumers with lower income or larger families may have a greater interest in saving money (e.g., Blattberg et al. 1978) or increased involvement with the stimulus (see H, K, I, and J). Consumers with greater interest in sales are hypothesized to be more motivated to process deal information (boxes F and I) and to use coupons and fliers more frequently.

**Consumer Characteristic That Influences Ability to Encode and Recall Stimulus**

In comparison with older subjects, younger subjects seem to carry out mental operations that result in more elaborate encoding of information (Hulicka and Weiss 1965). In addition, older adults appear more susceptible than younger adults to interference from the irrelevant components of a stimulus (Kausler 1982; Kausler and Klein 1978; Rabbitt 1965). Many studies have shown poorer memory performance of older people (Burke and Light 1981; Moenster 1972; Zeithaml and Fuerst 1983). Hence, we expect younger people to have better recall of dealing activity (boxes L, M, and J).

**Key Constructs and Relationships in the Model**

The conceptual model suggests the importance of certain constructs and relationships between those constructs. Many of the constructs and relationships have been studied previously. For example, encoding of price information has been examined (Jacoby and Olson 1977; Zeithaml 1982; Zeithaml and Fuerst 1983). However, much less is known about other constructs and relationships in the model.

One primary goal of our study is to examine certain constructs in the model that have not been studied extensively, such as a consumer’s perceptions of deal frequency. A second goal is to develop and test hypotheses about relationships between constructs in the model.

**Examining Constructs for Consumer Perceptions of Deal Activity**

Two key constructs in the model that have not been studied extensively are consumer perceptions of deal frequency and sale price (Figure 1, Box N). The questions we seek to answer about these constructs are: How many consumers have perceptions of deal frequency, sale price, regular price, and deal occurrence for different brand-sizes? How accurate are these perceptions? How does the accuracy vary across a set of brand-sizes?

**Relationships Between Model Constructs**

Several hypotheses can be derived from the model that relate consumer and product characteristics to consumer perceptions of deal activity (see the Conceptual
Framework section and Figure 1, boxes A–C, E–N). The first four hypotheses relate consumer characteristics to consumer perceptions.

H1: The likelihood of having an opinion on deal frequency for a brand-size is higher for a consumer who (a) has a larger family, (b) is female, (c) is younger, (d) has a higher frequency of purchase for the product class and (e) package size, (f) devotes a higher proportion of purchases in the category to that brand, (g) is more concerned about sales, (h) uses coupons and (i) flies more frequently, (j) has a lower income, and (k) shops more frequently.

H2, H3, and H4 are identical to H1 with the exception that the dependent variables are recall accuracy on deal frequency (H2), likelihood of having an opinion on sale price (H3), and accuracy of perception for sale price (H4). Where the meaning is clear, the expression “likelihood of having an opinion” is replaced by “recall.”

An alternative to H1 and H3 is that experts not only might know more, but also might perceive issues that nonexperts do not (Stabell 1978, p. 119). As a result, they may process such information differently, be more uncertain, and be less willing to state an opinion.

In addition to consumer characteristics, product characteristics may influence frequency of exposure to the stimulus. Recall has been shown to be an increasing function of the frequency of the stimulus (Kintsch 1970). Consequently, if brands promote more frequently, consumers would have a greater opportunity of being exposed to the sale price. The result would be increased accuracy of recall for sale price (see Figure 1, boxes C, G, J).

H5: The accuracy of recall for the sale price of a brand is higher for a brand that has a higher frequency of promotion.

One would expect that consumers’ perceptions of past dealing activity would influence their expectations of future deals (Lattin and Bucklin 1989; Figure 1, boxes N and O).

H6: Expectations of future deal frequency are correlated positively with perceptions of past deal frequency.

Method

Actual deal frequency, regular prices, and sale prices were collected for a set of brand-sizes for a period of 12 weeks at a Grand Union supermarket in a residential area of Manhattan. Consumer perceptions of the same variables then were collected via a mail survey among persons who lived within two blocks of the supermarket.1 The time interval of 12 weeks was chosen for two reasons. First, if the interval were too long, many consumers might have been unable to recall the past promotions. Second, many of the brand-sizes we wanted to study were promoted only two times in a period as long as 12 weeks. If a much shorter interval were studied, it would be difficult for a consumer to give a meaningful response about deal frequency.

Questions were included in the survey to obtain various demographic and purchase characteristics. The 7-page questionnaire took about 15 minutes to complete. As part of an extensive series of pretests, personal interviews were conducted with many consumers who had completed the questionnaire to determine whether they had understood the questions and whether the requested tasks were considered reasonable and feasible.

A Susan B. Anthony dollar and a chance to win a $100 sweepstakes were offered to encourage participation. In total 1180 questionnaires were distributed. Subjects were instructed to complete the survey if the Grand Union store was their primary grocery store and if they were primary shoppers for the household. A total of 400 subjects returned the survey—a good response given the length of the questionnaire and the fact that many households used other stores for their primary shopping. Interviews with some nonrespondents revealed that lack of response could have been due to time pressure, no interest in the topic, primary shopping being done at another store, and being away during the survey period.

Because the subjects are residents of an urban area, they are more likely than suburban or rural households to use a shopping cart and less likely to use a car. However, many shopping carts are big enough to contain large package sizes or multiple units. In addition, the common usage of promotions in the store suggests that these buyers do respond to the promotions.

Two sets of brand-sizes were developed and used in the empirical analyses. One set (Table 1), consisting of eight brand-sizes, was used to determine whether buyers can discriminate between promoted and non-promoted brand-sizes. It therefore comprises both brand-sizes that were promoted and those not promoted in the test period. The second set (Table 2), consisting of nine brand-sizes, was used to determine consumer knowledge of deal prices and deal frequency. As most of the questions made sense only for items that were promoted, and to avoid possible frustration among the respondents, this set contained only brand-sizes that actually had been promoted during the test period.

Several criteria were used to select the brand-sizes within the two sets. Brand-sizes and product classes were chosen to ensure considerable variance in terms of product class purchase frequency, market share, and frequency of promotion. In addition, because the analyses are based on buyers of a product class, only

\[1\] A two-stage sampling process was used. In stage 1, a random sample of buildings was drawn from the list of buildings where it was feasible to gain entry. Three institutional buildings were excluded from the sample as they were believed to be atypical. In stage 2, a questionnaire was delivered to all residents in the buildings selected.
TABLE 1
Consumer Perceptions of Whether Specific Brand-Sizes Had Been on Sale in the Past 12 Weeks

<table>
<thead>
<tr>
<th>Brand-Size</th>
<th>Correct Answer</th>
<th>Percentage of Product Class Buyers Who Had An Opinion</th>
<th>Percentage of Product Class Buyers Who Are Correct</th>
<th>Number of Product Class Buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coke (2 lit.)</td>
<td>Yes</td>
<td>84.9</td>
<td>77.2</td>
<td>306</td>
</tr>
<tr>
<td>Pepsi (2 lit.)</td>
<td>Yes</td>
<td>79.4</td>
<td>72.0</td>
<td>306</td>
</tr>
<tr>
<td>Farmland Milk (half gal.)</td>
<td>No</td>
<td>71.7</td>
<td>59.8</td>
<td>400</td>
</tr>
<tr>
<td>Minute Maid orange juice</td>
<td>Yes</td>
<td>77.6</td>
<td>59.4</td>
<td>296</td>
</tr>
<tr>
<td>(half gal.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealtest ice cream (half gal.)</td>
<td>Yes</td>
<td>65.2</td>
<td>52.6</td>
<td>298</td>
</tr>
<tr>
<td>Diamond Crystal salt (1 lb)</td>
<td>No</td>
<td>56.5</td>
<td>46.8</td>
<td>400</td>
</tr>
<tr>
<td>Ruffles potato chips</td>
<td>Yes</td>
<td>72.1</td>
<td>63.2</td>
<td>220</td>
</tr>
<tr>
<td>(6.5–7 oz)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brawny paper towels</td>
<td>Yes</td>
<td>67.4</td>
<td>65.6</td>
<td>366</td>
</tr>
<tr>
<td>(1 roll)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>71.9</td>
<td>60.8</td>
<td></td>
</tr>
</tbody>
</table>

Findings on Consumer Perceptions of Deal Frequency and Prices

The first set of findings describe consumer perceptions of several key constructs in the model: deal occurrence, deal frequency, deal prices, and regular prices. The consumer perceptions are compared with data on the actual store conditions. These comparisons should improve our understanding of why consumers react to promotions as they do.

**Ability to Recall Whether a Brand-Size Was on Deal**

We asked consumers whether a specific brand-size had been promoted in the last 12 weeks. The proportion of buyers of the product class who had an opinion ranges from 57 to 85%. On average (across brandsizes), 72% of the 400 subjects had an opinion on whether a brand-size had been on sale or not (see Table 1).

Table 1 shows that 61% of the buyers knew correctly, on average, whether a brand had or had not been on sale in the last 12 weeks. If there were no association between what people answered and the

TABLE 2
Consumer Perceptions of Deal Frequency for Specific Brand-Sizes (For how many weeks was the brand-size on sale in the past 12 weeks?)

<table>
<thead>
<tr>
<th>Brand-Size</th>
<th>Percentage of Product Class Buyers Who Had An Opinion</th>
<th>Actual Deal Frequency</th>
<th>Perceived Deal Frequency</th>
<th>Percentage of Product Class Buyers Exactly Correct</th>
<th>Percentage of Product Class Buyers Correct Within One Week</th>
<th>Mean Relative Deviationb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coke (2 lit.)</td>
<td>81.7</td>
<td>6</td>
<td>6</td>
<td>4.5</td>
<td>21.8</td>
<td>28.4</td>
</tr>
<tr>
<td>Pepsi (2 lit.)</td>
<td>79.7</td>
<td>6</td>
<td>6</td>
<td>4.2</td>
<td>26.8</td>
<td>26.8</td>
</tr>
<tr>
<td>7UP (2 lit.)</td>
<td>71.9</td>
<td>3</td>
<td>2</td>
<td>2.9</td>
<td>9.5</td>
<td>38.9</td>
</tr>
<tr>
<td>Sealtest</td>
<td>66.8</td>
<td>2</td>
<td>2</td>
<td>2.1</td>
<td>20.2</td>
<td>45.3</td>
</tr>
<tr>
<td>(half gal.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dolly Madison</td>
<td>64.4</td>
<td>2</td>
<td>2</td>
<td>1.9</td>
<td>20.8</td>
<td>40.6</td>
</tr>
<tr>
<td>(half gal.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minute Maid</td>
<td>74.7</td>
<td>5</td>
<td>2</td>
<td>2.6</td>
<td>2.0</td>
<td>19.9</td>
</tr>
<tr>
<td>(half gal.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brawny</td>
<td>65.0</td>
<td>1</td>
<td>2</td>
<td>2.5</td>
<td>12.8</td>
<td>39.5</td>
</tr>
<tr>
<td>(1 roll)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bounty</td>
<td>68.0</td>
<td>2</td>
<td>2</td>
<td>2.2</td>
<td>18.0</td>
<td>64.3</td>
</tr>
<tr>
<td>Ruffles</td>
<td>72.3</td>
<td>1</td>
<td>2</td>
<td>3.0</td>
<td>14.1</td>
<td>36.3</td>
</tr>
<tr>
<td>(6.5–7 oz)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>71.6</td>
<td>3.1</td>
<td>2.9</td>
<td>2.9</td>
<td>15.6</td>
<td>35.5</td>
</tr>
</tbody>
</table>

*The number of buyers for each product class is reported in Table 1.

*Mean relative deviation = absolute value (actual deal frequency – stated deal frequency) / actual deal frequency averaged over all the respondents.

Consumer Perceptions of Promotional Activity / 9

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correct answer, the average percentage of correct answers purely due to chance (Morrison 1969, p. 158) would be 42.3%.\textsuperscript{2} Hence, the level of correct responses is considerably higher than would be expected if the subjects were simply guessing.

One might think that with the high level of promotions there would be a general tendency for subjects to guess that each brand-size had been on sale at least once in the last 12 weeks. Therefore one might expect to observe a high number of incorrect answers for brands that had not been on sale. However, among the 71% of buyers who had an opinion on Farmland Milk, 83% correctly noted that the product had not been promoted in the past 12 weeks. The corresponding figures for Diamond Crystal salt (also not promoted) are 57% and 82% (see Table 1).

**Consumer Perceptions of Deal Frequency**

Subjects were asked how many weeks the brand-size was on sale in the past 12 weeks.\textsuperscript{3} The proportion of consumers who had an opinion on deal frequency for a brand ranges from 64.4 to 81.7%. On average, 71.6% of the buyers of the product class had an opinion on how often a brand-size had been on sale (see Table 2).

The results on accuracy of perception for deal frequency also are reported in Table 2. The accuracy ranges from a low of 2% for Minute Maid to a high of 21.8% for Coke. On average across all brand-sizes, 15.6% of the answers are exactly correct. In five of the nine cases (Coke, Pepsi, Sealtest and Dolly Madison ice creams, Bounty paper towels), the modal response is the correct response for deal frequency. If one uses a broader definition of “correct” (within one week), 35.5% of the buyers of the product class were correct about deal frequency on average (across brand-sizes).

The subjects who responded to the question on deal frequency had a choice of 13 answers (0 to 12 weeks) and thus a 7.7% probability of being correct as a result of pure random guessing. The proportion of correct answers among those who had an opinion is 22% (15.6%/72%). Thus the accuracy on deal frequency is about three times greater than would be expected if the subjects were guessing at random.

The sign of the error is positive (actual deal frequency greater than stated deal frequency) for Coke, Pepsi, 7Up, and Minute Maid. These brands were promoted three or more times in the 12-week period. The error is negative for Brawny, Bounty, and Ruffles, which were promoted two or fewer times in the 12-week period. This result appears to be consistent with the findings on decision theory (Kahneman and Tversky 1979). That is, when events occur very frequently, people tend to think that they occur less often than they do, and vice versa. This was the case for eight of the nine brands. These results suggest that a majority of consumers recognize the difference between frequently promoted brand-sizes such as Coke and Pepsi and infrequently promoted brand-sizes such as Brawny and Ruffles. However, they have a clear tendency to underestimate the frequency of the high frequency items and to overestimate the frequency for the infrequently promoted items.

**Consumer Perceptions of Sale Price**

If consumers thought that a brand-size had been on sale in the past 12 weeks, they were asked what they thought the typical sale price for the brand-size had been. This open-ended question was repeated for each of the nine brand-sizes. The proportion of buyers who had an opinion (correct or incorrect) ranged from a high of 69.9% for Coke to a low of 39.6% for Dolly Madison. Those two brands also had the highest and lowest perceptions of deal frequency. The results are reported in Table 3. On average across the nine brand-sizes, 53% of the subjects had an opinion on sale price.

Accuracy (percentage of product class buyers who knew the exact sale price) ranges from 9.8 to 33.2%. On average, 19.5% of buyers of the product class knew the exact sale price.\textsuperscript{4} In seven of the nine cases (Coke, Pepsi, Sealtest and Dolly Madison ice creams, Brawny and Bounty paper towels, and Ruffles potato chips), the modal response is the correct response for sale price. Table 3 shows that on average, 38% of the responses are within 20 cents of the actual sale price.

Accuracy on sale price was measured also by the mean relative deviation\textsuperscript{5} because 20 cents may be a large relative deviation for a low price item but a small one for a high price item. Looking at relative deviation gives additional insight into price accuracy. A similar measure of accuracy has been used by Conover (1986), Dickson and Sawyer (1990), and Zeithaml (1984) for studying consumer perceptions of regular prices. The relative deviation ranges from .12 for Ruffles potato chips to .27 for Coke and Pepsi. The mean relative deviation for sale price across the nine brand-

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\textsuperscript{2}[(overall percentage of "yes" answers) × (percentage of products on sale) + (overall percentage of "no" answers) × (percentage of products not on sale)] × percentage response = [(677 × 6/8) + (323 × 2/8)] × 71.9% = 58.3% × 71.9% = 42.3%.

\textsuperscript{3}In this store, the number of weeks on sale is equivalent to the number of times promoted, because all observed promotions were for a period of one week.

\textsuperscript{4}For two of the brands, Dolly Madison and Minute Maid, two sale prices were considered correct because these brands were offered on sale at two different sale prices in the 12-week period.

\textsuperscript{5}Mean relative deviation = [absolute value (actual sale price – stated sale price)]/actual sale price, averaged over all buyers.
TABLE 3
Consumer Perceptions of Sale Price and Regular Price for Specific Brand-Sizes (What is the sale (regular) price?)

<table>
<thead>
<tr>
<th>Brand-Size</th>
<th>Sale Price</th>
<th></th>
<th></th>
<th>Regular Price</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage of Buyers Who Had Opinion</td>
<td>Actual Sale Price ($)</td>
<td>Percentage of Buyers Exactly Correct</td>
<td>Percentage of Buyers Within $.20</td>
<td>Percentage of Buyers Who Had Opinion</td>
<td>Actual Regular Price ($)</td>
</tr>
<tr>
<td>Coke (2 lit.)</td>
<td>69.9</td>
<td>.79</td>
<td>32.4</td>
<td>54.6</td>
<td>69.3</td>
<td>1.29</td>
</tr>
<tr>
<td>Pepsi (2 lit.)</td>
<td>63.1</td>
<td>.79</td>
<td>28.4</td>
<td>48.3</td>
<td>64.1</td>
<td>1.29</td>
</tr>
<tr>
<td>7UP (2 lit.)</td>
<td>55.9</td>
<td>.99</td>
<td>18.3</td>
<td>46.4</td>
<td>61.1</td>
<td>1.29</td>
</tr>
<tr>
<td>Sealtest (half gal.)</td>
<td>43.3</td>
<td>1.99</td>
<td>12.4</td>
<td>20.6</td>
<td>54.0</td>
<td>3.19</td>
</tr>
<tr>
<td>Dolly Madison (half gal.)</td>
<td>39.6</td>
<td>1.99</td>
<td>9.7</td>
<td>21.1</td>
<td>49.7</td>
<td>2.99</td>
</tr>
<tr>
<td>Minute Maid (half gal.)</td>
<td>52.7</td>
<td>1.89</td>
<td>4.7</td>
<td>27.7</td>
<td>61.8</td>
<td>2.59</td>
</tr>
<tr>
<td>Brawny (1 roll)</td>
<td>43.7</td>
<td>.79</td>
<td>9.8</td>
<td>38.2</td>
<td>50.8</td>
<td>.99</td>
</tr>
<tr>
<td>Bounty (1 roll)</td>
<td>47.3</td>
<td>.79</td>
<td>13.7</td>
<td>41.4</td>
<td>55.7</td>
<td>1.15</td>
</tr>
<tr>
<td>Ruffles (6.5-7 oz)</td>
<td>57.7</td>
<td>.99</td>
<td>33.2</td>
<td>47.1</td>
<td>61.4</td>
<td>1.29</td>
</tr>
<tr>
<td>Mean</td>
<td>52.6</td>
<td>19.5</td>
<td>38.4</td>
<td>58.7</td>
<td>53.1</td>
<td>15.0</td>
</tr>
</tbody>
</table>

**"Buyers" refers to all buyers of the product class. The number of buyers for each product class is reported in Table 1.**

**aPercent between $1.04 and $2.04.**

sizes is .19. Thus the average absolute error in stating the deal price is equal to 19% of the actual deal price.

The results on sale price suggest that from 10 to 33% of buyers could recall the information necessary to recognize that a deal price with a small discount is not the "typical" deal price. These buyers were in a position to compare the current sale price with the sale price typically offered.

**Consumer Perceptions of Regular Prices**

The proportion of buyers who had an opinion on regular price (correct or incorrect) ranges from 49.7 to 69.3%. On average across nine brand-sizes, 58.7% of buyers had a perception of regular price. The accuracy ranges from a low of .6% to 32%; 15% of buyers of the product class were correct (on average) to the exact cent (see Table 3). On average across all nine brand-sizes, 34% of buyers were correct within 20 cents of the actual regular price.

Our findings on regular price are consistent with those of previous research (Allen, Harrel, and Hutt 1976; Conover 1986; Gabor and Granger 1961). In the Allen, Harrel, and Hutt (AHH) study, 750 consumers were asked the regular price of interviewer-selected items from those purchased by the subject in the last two weeks; 20% of the buyers knew the exact price. In Conover's telephone survey, 28% of the consumers correctly identified the regular price for a brand they had chosen two days previously. In the Dickson and Sawyer study, 77% of consumers had a perception, and 60% of those consumers (46% overall) stated the correct regular price of a purchased item at the point of purchase. Because our study was performed at a location other than the point of purchase, and we investigated prices for a pre-set list of brand-sizes, we expected our results on the accuracy of recall for regular prices to be closer to the AHH and Conover findings.

A large proportion of buyers for all nine brand-sizes had an opinion on all three pieces of information, namely deal price, regular price, and deal frequency (e.g., 64% for Coke and 42% each for Dolly Madison ice creams and Bounty paper towels). A small percentage of buyers were exactly correct about all three pieces of information (e.g., 11.1% for Coke) and a larger percentage were reasonably correct about all three pieces of information (e.g., 19% of consumers were correct within 20 cents of sale price and regular price and within one week of deal frequency for Coke).

The preceding results suggest why some consumers may not feel a need to stockpile the brand when it is promoted. Consequently, retailers may be limited in their ability to use deals to transfer their inventory holding costs to consumers (Blattberg, Eppen, and Lieberman 1981).

**Findings on Relationships Between Model Constructs**

**Consumer Characteristics and Perceptions of Deals**

H1 through H4 describe how consumer knowledge of deal frequency and sale price is related to various con-
TABLE 4
Number of Brands (of 9) for Which Different Household Characteristics Are Significant in Explaining the Ability to Recall Deal Frequency and Sale Price (Among Buyers of the Product Class)

<table>
<thead>
<tr>
<th>Likelihood of Recall</th>
<th>Accuracy of Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal Frequency</td>
<td>Sale Price</td>
</tr>
<tr>
<td>(H1)</td>
<td>(H2)</td>
</tr>
<tr>
<td>Usage of store flier</td>
<td>8</td>
</tr>
<tr>
<td>Usage of coupon</td>
<td>1</td>
</tr>
<tr>
<td>Concern for sales</td>
<td>0</td>
</tr>
<tr>
<td>Frequency of purchasing the package size</td>
<td>7</td>
</tr>
<tr>
<td>Family size</td>
<td>7</td>
</tr>
<tr>
<td>Age</td>
<td>9b</td>
</tr>
<tr>
<td>Sex</td>
<td>0</td>
</tr>
<tr>
<td>Income</td>
<td>0</td>
</tr>
<tr>
<td>Product class purchase frequency</td>
<td>2</td>
</tr>
<tr>
<td>Brand proportion</td>
<td>4h</td>
</tr>
<tr>
<td>Frequency of shopping</td>
<td>0</td>
</tr>
</tbody>
</table>

*Accuracy is measured among respondents who had an opinion.
*Younger people more likely to recall.
*Older people are more accurate.
*Women are more accurate for Pepsi and 7Up.
*Men are more accurate.
*Higher income people are more likely to recall.
*Higher income people are more accurate.
*Coefficient for Minute Maid orange juice was negative.

Consumer characteristics. These hypotheses are tested by the following procedure. In total there are four dependent variables. For opinion on deal frequency (sale price), the dependent variable is whether or not a respondent has an opinion (correct or incorrect) on deal frequency (sale price) for a specific brand-size. For accuracy of recall on deal frequency (sale price), the dependent variable is the absolute value of the relative deviation of deal frequency (sale price) as shown in Table 2.

Two estimated procedures are used. The binary logit model (McFadden 1974) is used when the dependent variable is the likelihood of having an opinion. The dependent variable (opinion) assumes a value of 1 if a subject has an opinion (correct or incorrect). Regression analysis is used when the dependent variable is accuracy. To preserve independence of observations, the models are estimated separately for each brand-size.

A common set of 11 independent variables is used for all models (see Table 4). Three of the variables measure a consumer’s interest in deals (Figure 1, box F).

- Usage of store flier: how often the respondent reported reading the weekly store flier of items on sale.
- Concern for sales: how concerned the consumer is about buying grocery products on sale.
- Usage of coupon: how actively they searched for coupons on certain products.

These variables are measured on 5-point scales. Package-size frequency is measured as the frequency (on a 5-point scale) of purchasing different package-sizes in a product category. Brand proportion is measured by the brand’s share of the household’s last 10 purchases in the product category. Product class frequency measures the consumer’s rate of buying the product category. Frequency of shopping is measured as the number of times per week the buyer shops at Grand Union.

In this analysis, we consider an independent variable as being managerially significant only if it is significant at the .05 level for three or more of the nine brand-sizes. The rationale is that, with nine brand-sizes, an independent variable may be significant at the .05 level for one brand-size or another just by chance.

Determinants of Consumer Perceptions of Deal Frequency

Buyers who had an opinion on deal frequency (H1) were younger (p < .05 in 9 of 9 models), had larger families (p < .05 in 7 of 9 models), reported that they read the weekly flier of items on sale more frequently (p < .05 in 8 of 9 models), purchased the package size more frequently (p < .05 in 7 of 9 models), and devoted more of their product class purchases to the brand (p < .05 in 4 of 9 models). The estimated signs of all but one of the significant coefficients are as predicted in H1.

The following findings pertain to the accuracy of deal frequency perceptions (H2). Consumers whose perceptions of deal frequency are more accurate were more concerned about buying grocery products on sale (p < .05 in 4 of 9 models), purchased that package

*If one assumes each brand-size to be an independent test, the probability of an independent variable being falsely significant at the .05 level for three of nine brand-sizes is only .0077.
*For Minute Maid orange juice, the coefficient has the wrong sign.
size more often (p < .05 in 3 of 9 models), had higher income (p < .05 in 3 of 9 models), and were older (p < .05 in 4 of 9 models). The coefficients for income have signs opposite those hypothesized. However, the findings on income are consistent with similar findings reported on deal-proneness (Blattberg et al. 1978; Teel, Williams, and Bearden 1980) and use of coupons (Nielsen 1980) in that higher income people are found to be more deal prone and coupon prone. The coefficient for age also is not as hypothesized for accuracy. Among consumers who could recall, older people were more likely to be accurate. However, as noted previously, younger people were more likely to recall deal frequency.

**Determinants of Consumer Perceptions of Sale Price**

The results on buyers who were more likely to have an opinion on sale price (H₃), as expected, bear many similarities to our results on the likelihood of recall for deal frequency (H₁). For example, buyers who were more likely to have an opinion on sale price were younger (p < .05 in 9 of 9 models), had larger family size (p < .05 in 3 of 9 models), read the weekly flier of items on sale more frequently (p < .05 in 9 of 9 models), and reported purchasing the package size more frequently (p < .05 in 6 of 9 models). The signs of all coefficients, with the exception of age, are as expected.

Buyers who were more accurate on sale price (H₄) were male (p < .05 in 3 of 9 models), read the weekly flier of items on sale more frequently (p < .05 in 4 of 9 models), and purchased the package size more frequently (p < .05 in 4 of 9 models). Interestingly, though women were as likely to have a perception of sale price as men, their perceptions for sale price were less accurate.

**Accuracy of Perceptions for Buyers and Nonbuyers of the Brand**

An interesting question relating to H₁ through H₄ is whether there are differences in the likelihood of recall and accuracy between buyers and nonbuyers of a specific brand-size. On the basis of the literature reviewed (e.g., Kintsch 1970), we expected that buyers of a specific brand-size would be more likely to have an opinion on sale price, deal frequency, and regular price and more likely to be accurate than nonbuyers. The results for two brands are reported in Table 5.

The likelihood of recall of sale price, regular price, or deal frequency is almost twice as high among buyers of a brand-size. The percentage of consumers giving accurate responses is between two and five times as great among buyers of the brand as it is among nonbuyers. For example, 30% of the buyers of Coke 2-liter size, but only 6% of the nonbuyers, knew the exact deal frequency of the brand. The corresponding figures for Dolly Madison ice cream are 35% and 14%. These findings indicate that many buyers of a specific brand-size have a relatively good idea of how frequently the brand-size has been promoted on price deals.

**Product Characteristics and Perception of Deals**

H₅ states that the accuracy of recall of sale price is higher for a brand that has a higher frequency of promotion. It is tested by estimating a regression equation across brands. Each of the nine brand-sizes constitutes one observation. The dependent variable is the mean accuracy of sale price for that brand-size across buyers of the product class. The independent variables are the four product and buyer characteristics that vary systematically among the brand-sizes. Characteristics such as age that do not vary among brand-sizes are not included. The independent variables are deal frequency, mean (across all buyers) package-size purchase frequency, mean brand proportion, and mean product-class purchase frequency. H₅ is supported. Accuracy of recall of sale price is significantly higher (p < .05) for the brand-sizes that were promoted more frequently.

**Relationship Between Expected Deal Frequency and Perceptions of Past Deal Frequency**

H₆ pertains to the relation between a consumer’s expected future deal frequency and his or her perception

<table>
<thead>
<tr>
<th>TABLE 5</th>
<th>Consumer Recall Level and Accuracy for Buyers and Nonbuyers of a Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coke (2 lit.)</td>
</tr>
<tr>
<td></td>
<td>Buyers of Brand (218)</td>
</tr>
<tr>
<td>Had an opinion on sale price</td>
<td>80</td>
</tr>
<tr>
<td>Accurate recall of sale price</td>
<td>42</td>
</tr>
<tr>
<td>Had an opinion on deal frequency</td>
<td>85</td>
</tr>
<tr>
<td>Accurate recall of deal frequency</td>
<td>30</td>
</tr>
<tr>
<td>Had an opinion on regular price</td>
<td>80</td>
</tr>
<tr>
<td>Accurate recall of regular price</td>
<td>38</td>
</tr>
</tbody>
</table>

| Consumer Perceptions of Promotional Activity | 13 |
of past deal frequency for the same brand-size. Expected deal frequency was measured by asking consumers how often they thought each of the four brand-sizes would be on sale in the next 12 weeks. The correlation between perceived past deal frequency and expected future deal frequency ranges from .56 for Sealtest ice cream to .71 for Ruffles potato chips. These coefficients are significantly different from zero at the .001 level. Thus H₆ is supported.

Discussion and Summary

Our empirical results lead to the following observations.

1. The proportion of product-class buyers knowing correctly whether a specific brand-size had been on sale in the past 12 weeks ranges from a low of 46.8 to 77.2%. Buyers' knowledge of which specific brand-sizes are promoted could affect their image of the brand, might induce them to purchase a specific brand only when it is on deal, or might induce them to wait for a deal on a specific brand when they want to purchase the product class.

2. The proportion of product-class buyers having an opinion about deal frequency for a specific brand-size ranges from 64.4 to 81.7%. On average, across nine brand-sizes studied, one-third of buyers were reasonably accurate and 15% were exactly accurate. This knowledge could be used by some buyers to decide how large a quantity to purchase when the brand is promoted. It would enable them to plan their purchases to make use of deals, and could determine the effectiveness of a specific promotion. For example, a buyer who expects Coke to be on sale every other week may purchase only a two-week supply of Coke when he or she finds it on sale. In addition, if consumers do not notice how often brands are on sale, frequent promotions of a brand-size may not hurt the brand image.

3. Subjects tended to overestimate the deal frequency for brands that were not often promoted and to underestimate the deal frequency for brands that were not promoted very often.

4. The proportion of product-class buyers having an opinion on the sale price of a specific brand-size ranges from 43.3 to 69.9%. On average, across the nine brand-sizes studied, about half of the buyers were reasonably accurate and the average error in stating the deal price was about 20% of the deal price. Hence, some buyers appear to be able to distinguish between a large and small price discount for certain brand-sizes. A buyer's knowledge of the typical sale price for a brand-size would enable the buyer to judge whether a current deal for that brand-size is a good value in relation to past offers. This knowledge could be of greater consequence in frequently promoted product classes in which consumers may not respond to price discounts they consider less than typical. Also, it gives an indication of whether buyers have noticed sale prices for products or whether they buy an item as long as it is on sale, irrespective of the sale price.

5. On average, across the nine brand-sizes studied, a third of the buyers had a reasonably accurate opinion on the regular price of a specific brand-size. These buyers could contrast the sale price with their perceived regular price to evaluate the "goodness" of a specific price deal. If buyers do not know the regular price, they may not be able to judge the magnitude of a price deal (e.g., see Lichtenstein and Bearden 1989). In this case it might be important for retailers to provide the reference price information at the point of purchase.

6. The likelihood of recall of deal frequency and sale price is higher for consumers who have larger families, read weekly fliers, purchase the package size more frequently, and devote a higher percentage of product class purchases to the brand. It is lower for older households.

7. Accuracy of knowledge for deal frequency and sale price is higher for households that read fliers more frequently, have a greater concern about buying grocery products on sale, and are more frequent purchasers of the package size. Accuracy of sale price is also higher for men than women. Accuracy of deal frequency is higher for older people than younger people. Hence, new entrants seeking to achieve trial through price promotions may benefit by targeting such customers. In addition, the market could be segmented on the basis of age and purchase frequency of the package size for estimating models of consumer response to price promotions.

8. On average, buyers of a brand are between two and five times more accurate on sale price, regular price, and deal frequency than nonbuyers of the brand. Therefore the findings for "buyers of brand" in Table 5 may be particularly relevant to brand managers and retailers. For example, 42% of the buyers of Coke (2 liter) were exactly correct in knowing the sale price in the Grand Union studied. Similarly, 30% of the Coke buyers knew the exact deal frequency for Coke.

9. The accuracy of recall of sale price is higher for a brand that has a higher frequency of promotion. This finding suggests that a brand that has a higher frequency of promotion may achieve a less than usual sales response for smaller than usual price discounts.

10. Expected deal frequency is correlated positively with perceived past deal frequency.

Finally, some caveats are warranted. Response rate in our survey may have been greater for consumers who care about prices or are well informed about them. If so, the estimates of consumer knowledge about deal frequency and deal prices reported here may be higher than the levels in the total population. In addition, a prior study (Wells and LoSciato 1966) has shown price to be relatively more important in urban than in suburban stores, which also suggests that our findings overstate the true level of consumer knowledge.

Other Implications

Our empirical findings suggest that deals on frequently promoted brand-sizes are not viewed as surprises by many consumers. These knowledgeable consumers are in a position to purchase from deal to deal, or make many of their purchases on deal. The result could be reduced profitability of the brand to
the retailer and the manufacturer. This effect could be particularly strong among regular purchasers of the brand and heavy buyers (see Table 4) because those consumers have more accurate perceptions of deal frequency and deal prices. Also, if consumers perceive a high deal frequency on their more preferred brands, they may not be as responsive to deals on new brands or on less preferred brands. An extension of our study to other brand-sizes might indicate why consumer reactions to promotions vary among product classes (see Blattberg, Eppen, and Lieberman 1981; Neslin, Henderson, and Quelch 1985; Shoemaker 1979). For example, consumers may stockpile much less in frequently promoted product classes.

If a brand offers a discount that is smaller than its “typical” discount, some buyers of the product class are likely to recognize that it is not a great buy. The reason is that some buyers compare the current sale price with the sale price offered at other times in making their purchase decision. They may not stock up as they would with a larger discount. Retailers are likely to find that this strategy does not reduce their inventory costs.

Our findings suggest several ideas for future research. The study shows that many consumers are aware of deal frequency and sale price. Future research could examine how consumers use that knowledge in their decision process. One approach would be to examine purchase panel data and determine how many households purchase primarily from deal to deal. If households that are knowledgeable about deal prices use that information to make purchase decisions, one might expect those households to make more of their purchases for certain product classes on deal than the average buyer.

It is also of interest to note that many buyers do not have good information on deal prices and deal frequency. Retailers or manufacturers could test new methods of informing those buyers. For example, they might use information displays (Russo 1977) or provide price data in a more credible and memorable way (see Lichtenstein and Bearden 1989).

Our findings suggest a need to extend current promotion models to include consumer expectations of deals. Incorporating such expectations may lead to predictions of purchase quantity and brand choice decisions that are very different from predictions of models that do not incorporate those expectations. In addition, our results linking consumer characteristics to knowledge of deals suggest reasons for building or estimating models of consumer response to price changes at the level of market segments.

REFERENCES


Reprint No. JMS52101