Consumers' Knowledge of Supermarket Prices: the Effects of Manufacturer and Retailer Promotions

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ABSTRACT - This paper extends and clarifies previous research into consumers' price knowledge in three main ways. First, it explains why manufacturer couponing and retail dealing might be expected to have opposing effects upon consumers' price recall accuracy. Second, it re-analyzes three previous studies of consumers' price knowledge and shows that these results can be interpreted in a more meaningful fashion once one recognizes the aforementioned effects. Finally, it examines a number of other factors which are expected to affect consumers' price knowledge and suggests directions for future research.

INTRODUCTION

In recent years a number of studies have investigated consumers' awareness of grocery prices (Zbytniewski 1979, Conover 1986). However, the only consistent findings are that consumers are not as cognizant of exact prices as one might expect and that demographic variables are very poor predictors of consumers' price recall accuracy (Shilliff 1975). In the absence of testable research hypotheses, these "exploratory" studies ultimately contribute little beyond their methodological guidance and descriptive details. Also disappointing is the lack of any framework for explaining the systematic variation in consumers' price knowledge across product categories.

Fortunately, a more problem-oriented study by Albion (1983) [Albion based his study on George Stigler "The Economics of Information," Journal of Political Economy, 69 (June), 213-225.] provides a useful perspective and some indirect empirical evidence concerning factors that may affect price knowledge. In a comprehensive study of one supermarket chain, he found this retailer took significantly lower gross margins on brands that were more heavily advertised by manufacturers (controlling for turnover, shelf space and other relevant economic factors). Albion then inferred that grocery retailers appear to set prices as if consumers have better price knowledge of these heavily advertised items and discussed these findings in terms of the expected costs and benefits to the consumer of acquiring price information. For example, the heavily advertised brands tend to be available at more stores. Therefore, consumers have greater opportunity to learn these prices (i.e., lower cost of obtaining price information); likewise, the widespread availability of these brands provides an incentive to learn their prices in as much as they can be used to compare stores' overall price levels (i.e., greater benefit of price information). In view of these suggestive findings and the fact that no study to date has used a cost-benefit approach to examine consumers' price knowledge, we attempted to test the usefulness of this perspective.

The Effects of Promotions on Consumers' Price Knowledge: Manufacturer Couponing and Retail Dealing

Extending Albion's reasoning from advertising to promotion, one might expect that consumers would have greater price knowledge in product categories, that are heavily promoted by the retailer. That is, frequent price discounts, advertised price specials and use of shelf displays alert consumers to the potential for price savings in those categories. Given that most consumers will take the time to check prices in only a small number of product categories, frequently discounted categories seem more likely to receive such attention (Wells and to Sciuto 1966, Dickson and Sawyer 1986). Therefore, one hypothesis to be examined is:
Interestingly, a contrary effect may result from manufacturers' promotions. Unlike retail price promotions, manufacturers' coupons may reduce the consumer's incentive to examine retail prices. Since the magnitude of the price savings offered by most manufacturer coupons dwarfs the price differences between most brands or the size of most retail price deals, consumers may (wisely) minimize the time spent learning prices in categories where coupons are often available. Some previous research also supports this idea. Dickson and Sawyer (1986) reported that one reason which consumers gave for not examining prices was that they were using coupons. They also speculated that the place of decision may affect price recall. With coupons, the purchase decision may occur at home where price information is unavailable. Therefore, the second hypothesis to be examined is:

H2: Consumers' price knowledge is inversely related to the percentage of product category purchases which are made with a manufacturer's coupon.

Other Factors Affecting Consumers' Price Knowledge

The relations between consumers' exact price knowledge and several additional factors are also examined. In each case a speculative hypothesis is advanced and the underlying rationale is delineated below. For example, a third factor that might affect consumers' ability to recall the price of a specific item is the degree of brand loyalty in each category. Predicted here is that consumers who are loyal to a specific brand have greater incentive to learn the price of that brand. Moreover, incidental learning of that item's price is likely to be greater with repeated exposures. On the other hand, one might argue that brand loyal purchase behavior reflects a low degree of price sensitivity and will therefore be inversely related to price recall accuracy. That is, consumers who consistently purchase a particular brand are willing to forgo price discounts that are available on competing brands at the point of purchase.

H3: Consumers' price knowledge is directly related to the degree of Brand Loyalty in each product category.

A related possibility is that consumers' price knowledge will be affected by the extent of brand differentiation in each product category. In "commodity-like", undifferentiated product categories, price will be a more important attribute to consumers. Consequently, more attention to price will be warranted and price knowledge will be greater. In this study, the market share of private label brands (i.e., store and generic brands) is used as a proxy for the degree of differentiation present in each product category. Our expectation is that private label penetration will be greatest in product categories in which product differentiation is least.

H4: Consumers' price knowledge is directly related to the degree of Brand Concentration Ratio in each product category.

Another factor that increases the benefit of learning price information is the amount of money that the consumer spends in the product category. In this study the measure employed was the Average Dollar Purchase (i.e., the amount spent in the category on each occasion that the product is bought).

H5: Consumers' price knowledge is directly related to the Average Dollar Purchase in each product category.

One factor that makes it more costly for consumers to learn prices is the Number of Items in a product category (i.e., the number of brand-size combinations). When the Number of Items in a category is large, the less likely it is that consumers will check and learn the prices of any given brand and size, thereby, lowering price knowledge.

H6: Consumers' price knowledge is inversely related to the Number of Items in each product category.

A related factor, which may have an opposing effect upon consumers' price knowledge, is the Brand Concentration Ratio in each category. Presumably, when two or three brands garner the vast majority of sales, these brands will be available at most stores. Consumers will then have greater incentive and lower costs of learning the prices of these brands.

H7: Consumers' price knowledge is directly related to the Brand Concentration Ratio in each product category.

Finally, the frequency of product purchase is important for two reasons. First, the consumer's ability to recall an item's price will be inversely related to the Purchase Cycle (i.e., average time between purchases). Second, the benefit of knowing an item's price is greater when the product is purchased frequently. (Alternatively, low priced items may be purchased most frequently leading to less incentive to learn their prices in which case frequency of purchase will be inversely related to price knowledge.)

H8: Consumers' price knowledge is inversely related to the Purchase Cycle in each product category.

METHOD

Overview

To examine the extent to which the proposed variables could account for the results of previous studies of consumers' price knowledge, suitable measures were required (see Table 1). The 1983 Market Fact Book, which was available to the authors, contained most of the information pertinent to the predictor variables (e.g., proportion of category sales made with a manufacturer's coupon). Additional data (e.g., number of items per product category) were obtained from Progressive Grocer Annual Reports.

TABLE 1

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<th>CATEGORY VARIABLES</th>
<th>DESCRIPTIVE STATISTICS</th>
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Given this data base and the likelihood that some of the key variables (e.g., manufacturer couponing) would vary dramatically over an extended time period, it seemed reasonable to restrict this re-analysis to three studies conducted since 1979 (Zbytniewski 1980, Dickson and Sawyer 1986, Conover 1986). In Dickson and Sawyer, shoppers were asked to state the price of the item that they had just selected. Conover asked shoppers about items in their shopping carts at times ranging "from several seconds to perhaps 20-30 minutes" after selection. Zbytniewski asked shoppers to play a version of the "Price Is Right." Only the results pertaining to products which the shopper reported using were included herein. While these studies differed somewhat in method and results, consumers' exact price recall accuracy was assessed in the store in each case. Consequently, this measure served as our criterion variable.

Criterion Variable:

Across the three studies, there were measures of consumers' price recall accuracy of the brand(s) purchased in twenty-seven product categories. The percentage of consumers who correctly recalled the exact price is our operational measure of price knowledge in each product category. Two product categories were excluded from this reanalysis. The Market Fact Book had insufficient data on Bottled Water. Milk was also excluded due to the fact that there is often only one brand in a given supermarket.
The eight predictor variables are fairly straightforward and only two require clarification (see Table 1). Brand Concentration is measured by the Herfindahl index; that is, the sum of the squares of the market shares of the three leading brands. The Brand Loyalty measure was created by transforming each brand's market share and repurchase probability into a conventional measure of brand switching and then aggregating the brands to form a product category level measure [Since the relationship of Brand Loyalty to Price Recall Accuracy proved to be nonsignificant, the details of this procedure are omitted].

Analyses and Results

A series of regressions was run to examine the simple relation between each of the predictor variables and consumers' price recall accuracy. In each of these regressions only the predictor variable of interest, along with two dummy variables to adjust for the differences in mean recall accuracy across studies, was included. A complete summary of these results appears in Table 2.

**TABLE 2
SIMPLE REGRESSION RESULTS: PRICE RECALL AGAINST EACH PRODUCT CATEGORY VARIABLE**

The Effects of Manufacturer Couponing and Retail Dealing

While several significant findings were obtained, the results pertaining to the effects of the two types of price promotion were of greatest interest. Consistent with H1 and H2 proposed above, price recall accuracy was directly related to Retail Dealing (t=1.93; p<.06) and inversely related to Manufacturer Couponing (t=2.73; p<.01). Evidently, frequent price discounting by the retailer provides an incentive for consumers to attend to exact price information in that product category. While one might expect manufacturer couponing to have a similar impact on consumers' price vigilance, such is not the case. As noted earlier, manufacturer coupons generally offer price reduction that exceed the usual price differences between brands. Consequently, the consumer who possesses a coupon has little or no incentive to compare prices at the point of purchase - resulting in lesser price knowledge in product categories in which coupons are readily available.

Ideally, one would also like to know whether these results would still obtain if other predictor variables were included in the equation. Unfortunately, the small number of (category) observations does not permit a full multivariate analysis. However, as one check on the stability of these results, price recall accuracy was regressed against both Retail Dealing and Manufacturer Couponing along with the two dummy variables. Once again, price recall accuracy was inversely related to Manufacturer Couponing (t=2.23; p<.03) and directly related to Retail Dealing (t=1.32; p<.20). Moreover, this regression accounted for over sixty-five percent of the variance in recall accuracy across product categories and prior studies (adjusted r-squared=.67).

Other Factors Affecting Consumers' Price Knowledge. The remaining hypotheses are now examined beginning with those where significant results were obtained. H4 predicted that the amount of Private Label Penetration in each product category would be directly related to consumers' price knowledge. As indicated in Table 2 (t=2.14; p<.04), the results were in accord with this hypothesis. Given this (correlational) finding, future research might examine whether the lack of differentiation in a product category actually underlies the observed relationship between price recall accuracy and private label penetration.

H6 proposed that consumers' price knowledge would be inversely related to the Number of Items in each product category. Again (t=2.11; p<.04), the results are consistent with this hypothesis (t=2.10; p<.04).

H5 posited that price recall accuracy would be directly related to the Average Dollar Purchase in each product category. Surprisingly, consumers' price knowledge was significantly negatively related to this variable. One possible account of this result is that Average Dollar Purchase happened to be strongly correlated (r=.80) with Manufacturer Couponing in this data set leading to a serious confounding of these effects.

Three null results should also be noted. H3 predicted that price knowledge would be directly related to Brand Loyalty while H8 posited that Purchase Cycle would have a negative effect on price knowledge. Neither of these predictions was supported (see Table 2). However, Purchase Cycle and Brand Loyalty were highly correlated (r=.67). Thus, it may be the case that the (observed) net effect of these two variables is negligible. Last, H7 predicted that price knowledge would be directly related to Brand Concentration. This relationship was weak and in the direction opposite to the prediction (t=1.07; p<.29). At present, we are unable to offer an explanation for this result.

Two multivariate analyses were also conducted in order to check upon the stability of the previous (simple) results. One should note, however, that the limited number of observations combined with the inherent collinearity of these variables renders further interpretation of these data highly suspect. First, we focused on the relationships that were consistent with our predictions. Accordingly, Price Recall was regressed against Retail Dealing, Manufacturer Couponing, Number of Items and Private Label Penetration. Each of these variables remained related to Price Recall in the predicted direction but the strength of each relation was reduced below the conventional level of significance.

Finally, a regression of Price Recall against all eight predictor variables was run. None of the regression coefficients was significant in this case.

Discussion

The primary goal of this paper has been to propose and test a framework for explaining the systematic variation in consumers' price knowledge. Although the small sample size, collinearity of the predictor variables and cross-sectional nature of the analyses all suggest that the results be interpreted cautiously, the evidence strongly supported the cost-benefit approach and several of the predicted relationships.

In view of these encouraging results, another study has been designed in which product categories have been selected so that the effects of the two promotion variables will be separable. Future research will then examine whether these factors also affect other forms of price knowledge -- for example, the accuracy of consumers' knowledge of the relative prices of brands within categories or consumers' knowledge of the relative prices of items at competing supermarkets. Evidence concerning each of these questions should lend insight into consumers' marketplace behaviors and shopping behavior. From a managerial perspective the paper also produced some noteworthy findings and raises a number of questions for future research. Specifically, the results which indicate that manufacturer couponing and retail price promotions have significant and separable effects upon consumers' knowledge run counter to both current academic thought and marketing practice.

For example, the conventional wisdom holds that (manufacturer) couponing, unlike advertising, damages the "brand franchise" by increasing consumers' price sensitivity (Strang 1975). The current finding that couponing reduces consumers' price knowledge certainly calls this belief into question. Moreover, another study in progress (Buzas and Weitz 1987) indicates that retailers accept significantly lower gross margins in product categories in which the proportion of purchases made with a coupon is relatively high. Thus, retailers evidently believe that couponing increases consumer price knowledge - contrary to our results.
Recently, several researches have questioned the net returns of trade promotion to the manufacturer (Chevalier and Curhan 1976, Hardy 1986). Although these articles generally focus on the problems of limited “pass-through” by the retailer and the escalating costs of promotion incurred by manufacturers in stagnant product markets, the current results suggest an additional hazard. That is, when trade promotions are in fact translated into retail price reductions, consumers are being taught to seek out price information in the promoted product category. (Recall that consumers' price knowledge is higher when retail shelf price reductions are more prevalent). One might then speculate that, over time, this sensitization to price promotes brand switching. It may also encourage trial of private label and generic brands to the further detriment of the competing national manufacturers. On a more constructive note, the current study suggests that consumers promotions by the manufacturer (i.e., coupons) may have the opposite effect on consumers' shopping behavior and price knowledge over the long term. As is usually the case, longitudinal research would greatly enhance our understanding of the foregoing relationships, particularly about causation. Does retail dealing increase price knowledge or do retailers deal in categories with high price knowledge?

Though brief and admittedly speculative, the foregoing conjecture was intended to be provocative. Perhaps ideas such as these can begin to bridge the gulf between “basic research” on consumers’ price knowledge and the intriguing set of pricing problems on which this research might be brought to bear.

REFERENCES


Promotional tools include price discount, coupons, buy one get one etc. and each of these tools has a different level of acceptance and effectiveness.