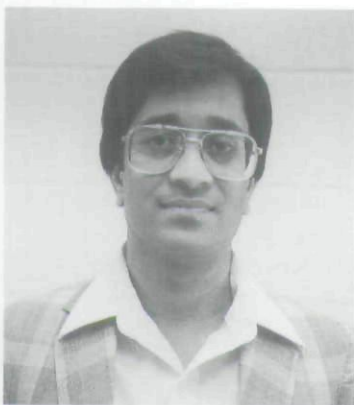


POINT OF VIEW: INTERPRETING ADVERTISING AND PRICE ELASTICITIES



GERARD J. TELLIS is associate professor of marketing at the School of Business Administration, University of Southern California, Los Angeles. He has a Ph.D. in business administration from the University of Michigan, Ann Arbor. He previously earned a B.Sc. and an M.B.A. and worked as a sales development manager for Johnson & Johnson. His research on advertising response models, pricing models, and pricing strategies has appeared in many journals, including the *Journal of Marketing*, the *Journal of Marketing Research*, and *Marketing Science*.

In a recent paper (Tellis, 1988a), I noted the "dramatic" difference in the mean elasticities estimated for advertising and price. Broadbent (1989), in this same issue of the *Journal of Advertising Research*, criticizes my comparison as deficient because it focused only on demand elasticities and not on the profitability of potential changes in advertising or pricing. I welcome Broadbent's comments. They initiate a debate on some very important aspects of strategy in the current environment. The debate will clarify misunderstandings about elasticities and about their implications. However, Broadbent may be misinterpreting the elasticities. The difference between price and advertising elasticities may be larger than we previously stated and his recommendations may depend on too many assumptions to be practical.

The Meaning of Advertising and Price Elasticities

Broadbent shows that even though advertising elasticity is smaller, increases in advertising may be more profitable than decreases in price. For this result, he makes the critical assumption that a price cut affects all buyers of the brand. The assumption may be invalid and may contradict the best principles of good pricing strategy. He also uses an advertising change which is 10 times larger than the price

change.

Basically, a price cut that leads to an increase in sales needs to affect only the incremental sales. Incremental sales come from two sources: new buyers or more frequent purchases by regular buyers. The essence of good pricing strategy is to limit the price cut to only the new buyers or the more frequent purchases of the older buyers. Attributing the price cut to all buyers, even those who would have bought at the higher price, is inefficient and probably not done even by amateur managers.

How does one limit price cuts to only incremental sales? The answer lies in what I have elsewhere called differential pricing (Tellis, 1986) and what is often called price discrimination. These terms define a set of pricing strategies by which the price setter charges a higher price to the price-insensitive segment and the lower price to only the price-sensitive segment. Private providers of service, such as doctors, lawyers, or repair agents, are known to quote prices on the basis of what buyers can afford. Retailers of durable goods (automobiles, appliances) frequently provide on-the-floor discounts to price-sensitive buyers. Manufacturers and retailers constantly target their price promotions (e.g., temporary price discounts [TPDs], rebates, or coupons) to (price-sensitive) segments. Even when buyers would purchase more if the price was dropped, firms can restrict the discount

... a price cut that leads to an increase in sales needs to affect only the incremental sales.

only to incremental sales by using a strategy of volume discounts.

How exactly can price promotions be targeted to price-sensitive segments? These promotions can be targeted to price-sensitive segments by use at certain times, places, or media; price-sensitive segments in turn look for these promotions because they have the time, interest, lower resources, or more information. For example, end-of-season discounts are targeted to buyers who are willing to wait for the lower price. Random TPDs are targeted to price-sensitive segments who can afford to watch and wait for them. Coupons are randomly distributed and targeted to consumers who are willing to spend time and effort to search, clip, and collect them. Indeed, researchers have shown that coupons or TPDs are primarily means by which firms discriminate between price sensitive and insensitive segments (Narasimhan, 1984; Varian, 1980). Some price-insensitive regular buyers may be lucky enough to get the brand at the lower price, even though they would have been willing to pay the higher price. The success of good pricing is to minimize this segment of lucky price-insensitive buyers while maximizing the number of price-sensitive buyers, who might otherwise buy another brand.

Therefore, it is both normatively unwise and practically untrue that a price cut to attract incremental sales must be applied to the whole market. Without

this critical assumption, price cuts could be more profitable than advertising increases under the same assumptions that Broadbent makes. To show this fact, I rework his main example, without changing any of the costs and response figures, but only making the more reasonable assumption that price cuts need apply to only the incremental sales. (See Table 1.)

In his example, Broadbent chooses to compare a 10 percent increase in advertising with a 1 percent decrease in price, a 10 to 1 advantage for advertising. His rationale "to get more sales (with the advertising change) than with the price change" is not compelling because it is an arbitrary correction for the smaller advertising elasticity. Normally, when one compares two instruments, they must be at the same level. Moreover, as one increases the change in one variable, because of declining returns, the percentage change in sales is likely to be lower. So the assumption of a constant (linear) response rate for a change of 10 percent as for a change of 1 percent is untenable, while that of a logarithmic response in the absence of empirical evidence is arbitrary. Even

... it is both normatively unwise and practically untrue that a price cut to attract incremental sales must be applied to the whole market.

with a 10 times larger change in advertising and the assumption of a linear response rate, price cuts could be more profitable than advertising increases, as I have shown in Table 1.

In conclusion, given a margin of 100 percent on variable costs, a price elasticity of -1.76 percent, and an advertising elasticity of $.22$ percent, both price cuts or advertising increases would increase profits; but a price cut would be more profitable than an advertising increase even though the relative price cut was one-tenth as large as the relative increase in advertising. In general, because price cuts could be targeted to price-sensitive segments while broadcast advertising cannot be so targeted, and because price elasticities are higher than advertising elasticities, price cuts *may* be a better means to in-

Table 1
Rework of Broadbent's Main Example

Condition	Original	1% Price cut	10% Advertising increase
Volume in cases	5,000,000	5,088,000	5,110,000
Price	\$20	\$20 for old \$19.80 for new	\$20
Revenue \$,000	100,000	101,742	102,200
\$10 per unit var.	50,000	50,880	51,100
Cost \$,000			
Fixed costs \$,000	20,000	20,000	20,000
Advertising \$,000	7,000	7,000	7,700
Total costs \$,000	77,000	77,880	78,800
Contribution \$,000	23,000	23,862	23,400

crease *short-term sales and profits*. A price cut always makes a short-term contribution to fixed costs if the total margins from new buyers exceeds the revenue loss due to regular buyers buying at the lower price.

New Evidence on Advertising and Price Elasticities

Our conclusion that the advertising elasticity is .22 comes from Assmus, Farley, and Lehmann's (1984) review of 122 published estimates; the conclusion that the price elasticity is -1.76 is based on my review (Tellis, 1988a) of 367 estimates of price elasticity. However, both these summary figures are arithmetic means of biased and unbiased estimates. If we correct for biases in estimates, the advertising elasticity may be lower and the price elasticity may be higher at -2.5 (Tellis, 1988a). In addition, new evidence suggests that aspects of price elasticity may be even higher, while advertising elasticity may not be any higher.

Recently, Wisniewski and Blattberg (1988) carried out an extensive field study of grocery sales response to changes in store promotion activity. The observations were weekly scanner data from 44 stores, 10 categories, over 200 brands, and over 1 to 6 years. They found that the average regular price elasticity was 2.49, identical to the corrected mean from my review. However, they found that the sales elasticity of deals is much higher, from 4.7 to 9.0. Because deals are primarily a short-term change in the offer price designed for price-sensitive segments, this figure more strictly reflects the elasticity of incremental sales that I referred to earlier. Other studies by Guadagni and Little (1983) and Gupta (1988) on scanner data also

show high elasticities for price promotions (or deals).

At the same time, new studies that have examined the sensitivity of household purchases of grocery products to household exposure to television advertising using the new scanner-TVmeter or "single source" data suggest that the effects of TV ad exposure are no higher than those obtained by the older data (e.g., Broadbent, 1986; Tellis, 1988b). The new scanner-TVmeter data are unobtrusively collected at a much lower level of aggregation than the previous sales-advertising data which were often aggregated at the quarterly level. Such aggregation inflates estimates of the effects of advertising (Clarke, 1976; Russell, 1988). Thus we may want to put more confidence on the new estimates.

We are left with the conclusion that newer estimates of price elasticity may be much higher than before, while newer estimates of TV advertising elasticity may not be higher than before. For example, if price-promotion elasticity were 8, and advertising elasticity were .22, they could differ by 40 times. These two facts together further enhance the relative importance and potential profitability of price cuts relative to advertising increases.

The Profitability of Advertising and Price Changes

In my earlier paper (Tellis, 1988a) I refrained from making any predictions about the profitability of various strategies because any such strategies are contingent on numerous other factors about which we do not have adequate knowledge in general. Particular firms may have information about such factors in particular situations, and then such analyses may be justified. But, because I did re-

spond to the above example by Broadbent, we have to make clear under what assumptions they hold. These are discussed under four headings: cost structure, competitive reaction, indirect effects, and long-term effects.

Cost Structure. The structure of costs itself directly affects the profitability of various strategies. For example, if the per unit margin is small, then even a small drop in price could easily consume the available margin and any incremental sales would not be profitable; similarly, when margins are small, the new sales from an advertising increase may never compensate for the cost of that increase. On the other hand, if firms have high absolute prices or high absolute advertising expenditures to begin with, then even small percentage decreases in price or increases in advertising may be too large relative to the available margins for profitable actions.

Competitive Reaction. In most cases, competitors are likely to react to new strategies. Such competitors could be larger or smaller, have more or less resources, have larger or smaller response elasticities, and could respond with larger or smaller changes in price or advertising. Each of these factors could radically alter the results of our analysis, and therefore mere speculation of the possibilities would not be useful.

Indirect Effects. Advertising may have indirect effects which are different and possibly more important than the more noticeable direct effects. First, advertising could increase brand loyalty. Such increases in loyalty may result not only in more frequent purchases of the favorite brand (reflected in the advertising elasticity) but also in decreases in price elasticity itself. The latter effect is less easily observed and could reduce the

need for price cuts or other more costly promotions. Second, advertising could increase the image or value of the brand, which over time could help to elevate price. Third, manufacturer's advertising may motivate retailers to better stock or promote the advertised brands which could lead to increased sales. On the other hand, advertising may increase brand visibility, competitive reaction, and, consequently, consumers' price elasticity. All these effects of advertising are more subtle and require careful documentation and analysis.

Long-term Effects. The price and advertising elasticities discussed above are indices of immediate short-term sales response to these variables. Both advertising and price promotions may have delayed or long-term effects which are not reflected in their short-term elasticities. Advertising's effect on purchases may be delayed due to delays in buyer conviction about the message, the buyer's purchase occasion, or message diffusion among other buyers. On the other hand, repeated price cuts could lower buyers' perceived quality of the brand; or repeated price cuts could increase the number of price-sensitive buyers who plan to purchase only when the brand is on discount. Any of these factors would support heavier advertising and caution against indiscriminate price cuts. Because prior research often suffered from biases of data aggregation, we do not have conclusive evidence about any of these effects.

The Challenge

The key question facing advertisers and researchers is whether

short-term advertising and price elasticities truly reflect the total effects of these two marketing variables and whether their difference is really as large as the new evidence suggests. In particular, is TV advertising primarily a means of inducing current purchases or does it play an entirely different role from the other marketing variables? While past research has provided some answers about the short-term elasticity of price and advertising, the above discussion suggests that many questions remain unanswered. For this reason, arbitrary manipulations of numbers in arbitrary problems are unlikely to be enlightening. What we need is a solid theory for the role of advertising, especially TV advertising, in contemporary markets and good evidence to support this theory. Studies based on improved data now available from scanner-TVmeter panels or from formal field experiments would be most helpful. ■

References

- Assmus, Gert; John U. Farley; and Donald R. Lehmann. "How Advertising Affects Sales: Meta-Analysis of Econometric Results." *Journal of Marketing Research* 21, 1 (1984): 65-74.
- Broadbent, Simon. "Quantifying the Sales Effects of Advertising on Individuals." In *Transcript Proceedings of the First Annual ARF Fall Conference*. New York: Advertising Research Foundation, 1986.
- . "What Is a Small Advertising Elasticity?" *Journal of Advertising Research* 29, 4 (1989): 37-39.
- Clarke, Darral G. "Sales-Advertising Cross-Elasticities and Advertising Competition." *Journal of Marketing Research* 10, 3 (1973): 250-61.
- Guadagni, Peter M., and John D. C. Little. "A Logit Model of Brand Choice Calibrated on Scanner Data." *Marketing Science* 2, 3 (1983): 203-38.
- Gupta, Sunil. "Impact of Sales Promotion on When, What and How Much to Buy." *Journal of Marketing Research* 25, 4 (1988): 342-55.
- Narasimhan, Chakravarthi. "A Price Discrimination Theory of Coupons." *Marketing Science* 3, 2 (1984): 128-47.
- Russell, Gary J. "Recovering Measures of Advertising Carry-over from Aggregate Data: The Role of the Firm's Decision Behavior." *Marketing Science* 7, 3 (1988): 252-70.
- Tellis, Gerard J. "Beyond the Many Faces of Price: An Integration of Pricing Strategies." *Journal of Marketing* 50, 4 (1986): 146-60.
- . "The Price Elasticity of Selective Demand: A Meta-Analysis of Econometric Models of Sales." *Journal of Marketing Research* 25, 4 (1988a): 331-41.
- . "Advertising Exposure, Loyalty and Brand Purchase: A Two Stage Model of Choice." *Journal of Marketing Research* 15, 2 (1988b): 134-44.
- Varian, Hal. "A Model of Sales." *The American Economic Review* 70, 4 (1980): 651-59.

Copyright of Journal of Advertising Research is the property of Cambridge University Press / UK. The copyright in an individual article may be maintained by the author in certain cases. Content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.