

Generalizations about Advertising Effectiveness in Markets

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Based on over 260 estimates, the mean elasticity of sales or market share to advertising is 0.1 percent. Another 450 field experiments suggest that changes in media, product, target segments, advertising scheduling, and advertising content are more likely to yield changes in sales than do changes in advertising weight. Numerous other studies suggest that advertising wear-in does not exist or occurs quite rapidly while advertising wear-out occurs more slowly. Details of and differences in these results by condition are discussed in this article.

OVERVIEW

"Advertising effectiveness in markets" refers to market response to a firm's (or a brand's) advertising. I define "market response" as the firm's (or brand's) choices, sales, or market share in real market contexts. Researchers have also examined the effects of advertising on consumer awareness, attitudes, beliefs, and intentions. These effects typically have been examined in laboratory contexts and are not the focus of this review.

Researchers probably have examined the effect of advertising from the time mass advertising first began more than a hundred years ago. Scientific research, however, began to accumulate in the last 50 years (Tellis, 2004, 2007). We can classify this work into two broad paradigms of research: behavioral research and field research. Behavioral research typically uses theater or lab experiments to address the effects of advertising on mental responses of individuals such as awareness, attitudes, beliefs, and intentions. Field research, on the other hand, uses field experiments or econometric models to assess the effects of advertising on such market responses as brand choice, sales, or market share. This review summarizes what has been learnt from this latter paradigm of research.

For this essay, I define the meaning of six terms: "product," "firm," "brand," "consumer," "market," and "sales." Specifically:

- "Product" refers to any good, service, idea, or person being advertised.
- "Firm" refers to any organization that advertises, whether a for-profit commercial organization, governmental agency, or not-for-profit organization.
- "Brand" refers to the label used for the product being advertised.
- "Consumer" refers generically to the audience of the advertising—buyers, voters, members of organization, citizens, etc.
- "Market" refers to the aggregate of consumers.
- "Sales" refers to the object of transaction that the advertiser desires from the consumer, such as product purchases, votes, attendance at organizational meetings, good citizenship, etc.

I classify field research into five groups, depending on which aspect of advertising it researches: advertising elasticity, weight, frequency, wear-in/wear-out, and content. Studies are most abundant and rigorous on elasticity, abundant, but not as rigorous on weight, reasonably abundant, but not as rigorous on wear-in/wear-out, limited on frequency, and very limited on content.

RESEARCH ON ADVERTISING ELASTICITY

"Advertising elasticity" is the percentage change in sales of a brand for a 1 percent change in the level of advertising. It is free of any units. Studies

EMPIRICAL GENERALIZATION

Research on over 260 estimates of advertising elasticity leads to the following important generalization. If advertising changes by 1 percent, sales or market share will change by about 0.1 percent—that is, advertising elasticity is 0.1. The advertising elasticity is higher in Europe relative to the United States, for durables relative to nondurables, in early relative to late stages of the product life cycle, and in print over TV. The advertising elasticity is lower in models that incorporate disaggregate data, advertising carryover, quality, and promotion relative to those that do not. The advertising elasticity is lower in multiplicative models relative to other model forms, such as the additive model. The advertising elasticity is invariant over the measure of the dependent variable or the method of estimation.

in this area try to estimate the statistical relationship by which sales respond to advertising. To do so, the studies define a model with sales as the dependent variable and advertising as the independent variable. As far as possible the studies try to control for the effect of other independent variables such as price, quality, distribution, promotion, or brand name. The effect of advertising on sales is captured by a statistic called the coefficient. When the variables in the model are all measured as percentage changes or transformed by taking the logarithm of their actual values, then the estimated coefficient of advertising is an elasticity, as defined above. Such a model, which relates sales to advertising, is called an econometric model (Tellis, 1988b). The statistical field of science that carries out such studies is known as econometrics.

There are more than 260 estimates of advertising elasticity carried out in numerous studies using a variety of models and data across many countries, product categories, brands, and time periods. I restrict this summary only to brand-level—not product-level—elasticities (i.e., brands such as Tide or Toyota, not corresponding products such as detergents or automobiles). There also are two types of elasticities, current and carry-over. The current

elasticity is the percentage change in sales for a 1 percent change in advertising in the concurrent time period. Carry-over elasticity, alternatively, refers to the percentage change in sales for a 1 percent increase in advertising in subsequent time periods, after or beyond the concurrent one.

A meta-analysis is a higher level study of such primary studies that seeks to summarize the mean advertising elasticity and explain its differences across various characteristics of primary studies, such as authors, models, and ecological contexts (firm, products, or markets). There are several meta-analyses done to date (Assmus, Farley, and Lehmann, 1984; Clarke, 1976; Leone, 1995; Sethuraman and Tellis, 1991).

Generalizations from elasticity studies

Research on advertising elasticity leads to the following important generalizations:

About current effect

- If advertising changes by 1 percent, sales or market share will change by about 0.1 percent. In other words: advertising elasticity is 0.1.
- The advertising elasticity is higher in Europe relative to the United States, for durables relative to nondurables, in early relative to late stages of the product life cycle, and in print over TV.

- The advertising elasticity is lower in models that incorporate disaggregate data, advertising carryover, quality, and promotion relative to those that do not.
- The advertising elasticity is lower in multiplicative models relative to other model forms, such as the additive model.
- The advertising elasticity is invariant over the measure of the dependent variable or the method of estimation.

About carryover effect

- The carryover elasticity of advertising seems twice as large as that of the current effect.
- The estimates of the carryover effect of advertising decrease with the interval of the data used to estimate the carryover.

Implications

These results suggest the following four implications. First, advertising is not the variable of choice for increasing sales. Second, there are distinct circumstances when advertising is effective in increasing sales. Third, researchers need to be cautious about modeling advertising response. They need to properly control for independent variables, carryover effects, and multiplicative models. Fourth, researchers need to use data at the unit exposure time and correct for estimates of elasticity if they use more aggregate data (Tellis and Franses, 2006). The unit exposure time is the largest calendar period in the time frame being studied, such that advertising exposure occurs at most once in that period, and if it occurs, it does so at the same time in that period.

RESEARCH ON ADVERTISING WEIGHT

“Weight” refers to the level or intensity of the advertising budget. Typically, the studies in this group examine the effect of

The effect of advertising on sales is captured by a statistic called the coefficient. When the variables in the model are all measured as percentage changes or transformed by taking the logarithm of their actual values, then the estimated coefficient of advertising is an elasticity.

differences in advertising budget across time periods or regions. The main focus of such studies is to determine whether an increase in weight translates into a proportional or profitable increase in sales of the advertised product. Alternatively, the studies assess whether a decrease in weight results in a proportional decrease in sales of the advertised brand. While weight studies involve discrete changes in advertising levels, elasticity studies explore the relationships between sales and advertising for numerous changes in advertising that normally occur over time. Thus, research on advertising elasticity allows a more fine-grained analysis of advertising effectiveness than research on advertising weight. The large number of weight studies, nevertheless, provides many interesting generalizations that complement those from elasticity studies.

Researchers have carried out more than 450 market or field experiments to assess the effectiveness of advertising. In such experiments, researchers compare two or more similar markets, each of which differs by a particular advertising weight. In most cases, the experiments last for several time periods to enable the researchers to get a baseline sales before the change in advertising weight and assess carry-over sales after the change has been made. Six sets of experiments are probably the most important: experiments at Anheuser-

Busch (Ackoff and Emshoff, 1975), Grey and D'Arcy Advertising (Aaker and Carman, 1982), AdTel (Aaker and Carman, 1982), Campbell Soup (Eastlack and Rao, 1989), Information Resource Inc. (Lodish et al., 1995) as well as miscellaneous studies reported by Aaker and Carman (1982). These experiments varied widely in time period, markets, product contexts, advertised brands, and changes in weight. Some time periods were short; others lasted for years. Some experiments had small changes in weight; others used large changes in weights (Tellis, 2004, 2007).

Generalizations from advertising-weight studies

Research from weight studies leads to the following six important and surprising findings:

- Even if advertisers make a big increase or decrease in weight, sales do not increase or decrease by much.
- If advertisers make cuts in weight, sales do not immediately decrease.
- If advertising is effective, its effects are visible early in the life of a campaign.
- Conversely, if early advertising is ineffective, then repetition will not create or enhance its effectiveness.
- If advertisers make changes in media, product, target segments, scheduling, and especially content of the advertis-

ing, they are more likely to cause changes in sales than if they merely change weight.

- Where profitability of the advertising has been assessed, advertising seems to be profitable less than half the time.

Implications

These results suggest three implications. First, firms could be over-advertising, not only in the amount of advertising they do, but also in using the same content, positionings, product, media, and schedule too long. Second, advertising may have carryover or permanent effects, so that continued advertising at the same level is not always necessary. If the carry-over effect is present, however, it starts to occur immediately and does not build up over time. Third, a firm's budget increase or original budget itself is more fruitfully enhanced by changes in media, content, target segments, product, or schedule rather than on weight alone. In other words, variety in advertising is likely to yield better results than increases in weight.

RESEARCH ON ADVERTISING FREQUENCY

A firm's advertising budget normally affects consumers through the exposure of consumers to advertisements through the media. "Frequency," in this context, refers to the number of advertising exposures each consumer receives in a particular time period. The advertising budget in a time period ultimately translates into a sequence of individual exposures targeted to one or more consumers. Similarly, sales is an aggregate of "brand choice"—consumers' choices of brands. Research on frequency normally examines the effect of advertising frequency on consumer choice (Deighton, Henderson, and Neslin, 1994; Gibson, 1996; Jones, 1995; McDonald, 1971; Pedrick and Zufryden,

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1991; Tellis, 1988a). Such research provides a more fine-grained and insightful analysis of advertising response than comparable studies on advertising elasticity or advertising weight. In particular, such research can indicate the optimal level of exposures an advertiser should target to a particular market segment or even a particular consumer. Research on advertising frequency, however, is not without limitations. Knowing the optimal frequency does not immediately translate into ascertaining the optimal budget. The advertiser would still need models that relate advertising frequency to budget and consumer choices to sales. So the trade-off here is between detail and insight versus managerial usefulness.

Generalizations from advertising-frequency studies

Research on advertising frequency leads to the following five findings:

- The effects of advertising exposure are less prominent and immediate and more fragile than those for price or promotion on brand choice.
- In general, increasing frequency of exposures increases probability of brand choice at a decreasing rate.
- For mature, frequently purchased products, the optimum level of exposure is relatively small, ranging from one to three exposures a week.
- Brand loyalty moderates response to advertising exposures, in that estab-

lished brands have an earlier and lower peak response to advertising exposures than newer brands.

- Brand choice is more responsive to the number of consumers the advertisement reaches than to frequency with which it is repeated.

Implications

These findings suggest two implications: First, advertisers need to target loyal buyers and nonbuyers of their products with differing levels of exposures. Second, consistent with findings from prior sections, heavier exposures need to be reserved for new consumers and brands.

RESEARCH ON WEAR-IN/WEAR-OUT

What are the varying effects of advertising over the life of a campaign? This research focuses on two aspects of advertising's effects: wear-in and wear-out. An "advertising campaign" is a series of exposures of an advertisement. Wear-in transpires when the effect of an advertisement keeps increasing with repetition of the advertisement within the campaign. In contrast, wear-out occurs when the effect of an advertisement continues to decrease as the advertisement is repeated within a campaign. If they occur, wear-in normally happens early in the life of a campaign, and wear-out normally takes place later. This summary is based on individual studies or research reviews by Blair (2000), Greenberg and Sutton (1973), Masterson (1999), Pechmann and Stewart (1992), Pieters, Rosber-

gen, and Wedel (1999), Sawyer (1981), Sawyer and Ward (1976), and Tellis, Chandy, and Thaivanich (2000). Some of the research reviews did include a mix of field and laboratory studies.

Generalizations about wear-in

Research on wear-in and wear-out leads to the following important findings:

- Wear-in either does not exist or occurs quite rapidly.
- Wear-in occurs more slowly:
 - when exposures are spread apart;
 - when consumers are not forced to attend to the advertisement;
 - with advertisements that contain emotional appeals rather than arguments;
 - for consumers who are not highly motivated to attend to the advertisement or actively process the advertising content;
 - in markets relative to theater or lab settings.
- Wear-in may be stronger with advertisements that have higher persuasion scores than those with lower persuasion scores.

Generalizations about wear-out

- Advertising campaigns wear-out if run long enough.
- Wear-out occurs more slowly:
 - with advertising content that is complex, emotional, or ambiguous;
 - with advertisements that are less effective;
 - with infrequently purchased products;
 - when exposures are spread apart;
 - with light viewers of TV;
 - with campaigns that offer a richer variety of advertisements and executions.
- A break in a campaign leads to an increase in effectiveness of an advertisement; if that happens, the advertisement

Advertisers need to target loyal buyers and nonbuyers of their products with differing levels of exposures.

wears out even faster than it did the first time around.

- In rare cases (with new products, for instance), advertising seems to have permanent effects: the effect of advertising persists even after the advertising is withdrawn.

Implications

These findings have several implications for advertisers. Most importantly, an advertisement whose early performance is ineffective should be discontinued. It is futile to assume that an initially ineffective advertisement still needs to wear in; wear-in either happens quickly or it does not happen at all. Second, the findings suggest typical types of wear-in and wear-out that advertisers may expect for their campaigns. Whenever resources and time permit, however, advertisers should test their advertisements for wear-in and wear-out and accordingly decide on the duration of the advertising campaign.

RESEARCH ON ADVERTISING CONTENT

"Content" refers to what is *in* an advertisement as opposed to such external characteristics as weight or frequency. Aspects of content include the appeal (argument, emotion, and endorsement), the duration or length of the advertisement, the use of color, sound, or video, the amount/type of text, etc. While a vast number of theater and lab studies have examined the effectiveness of various aspects of advertising content, only a few market studies have done so (Chandy, Tellis, MacInnis, and Thaivanich, 2001; MacInnis, Rao, and Weiss, 2002). Thus, generalizations of findings in this area need to be made cautiously.

Generalizations about advertising content

Research on advertising content seems to suggest the following preliminary findings:

- Changes in the creative, medium, target segment, or product itself sometimes lead to changes in sales, even though increases in the level of advertising by itself does not.
- Informative appeals are more important early than late in the product's life cycle.
- Conversely, emotional appeals are more effective late rather than early in a product's life cycle.

Implications

These findings have two important implications for advertisers. First, to increase effectiveness, advertisers should modify content more than increasing weight or frequency. Second, advertisers need to test and typically vary the content of their advertising within the life stage of the product. **JAR**

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REFERENCES

- AAKER, DAVID A., and JAMES M. CARMAN. "Are You Over Advertising?" *Journal of Advertising Research* 22, 4 (1982): 57-70.
- ACKOFF, RUSSELL L., and JAMES R. EMSHOFF. "Advertising at Anheuser-Busch, Inc. (1963-68)." *Sloan Management Review* 16, 2 (1975): 1-16.
- 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.
- BLAIR, HENDERSON. "An Empirical Investigation of Advertising Wearin and Wearout." *Journal of Advertising Research* 40, 6 (2000): 95-100.
- CHANDY, RAJESH, GERARD J. TELLIS, DEBBIE MACINNIS, and PATTANA THAIVANICH. "What to Say When: Advertising Appeals in Evolving Markets." *Journal of Marketing Research* 38, 4 (2001): 399-414.
- CLARKE, DARRYL G. "Econometric Measurement of the Duration of Advertising Effect on Sales." *Journal of Marketing Research* 13, 4 (1976): 345-57.
- DEIGHTON, JOHN, CAROLINE HENDERSON, and SCOTT NESLIN. "The Effects of Advertising on Brand Switching and Repeat Purchasing." *Journal of Marketing Research* 31, 1 (1994): 28-43.
- EASTLACK, JOSEPH O., JR., and AMBAR G. RAO. "Advertising Experiments at the Campbell Soup Company." *Marketing Science* 8, 1 (1989): 57-71.
- GIBSON, LAWRENCE. "What Can One Exposure Do?" *Journal of Advertising Research* 36, 2 (1996): 9-18.

- GREENBERG, ALLAN, and CHARLES SUTTON. "Television Commercial Wearout." *Journal of Advertising Research* 13, 5 (1973): 47-54.
- JONES, JOHN PHILIP. "Single-Source Research Begins to Fulfill Its Promise." *Journal of Advertising Research* 35, 3 (1995): 9-15.
- LEONE, ROBERT P. "Generalizing What is Known about Temporal Aggregation and Advertising Carryover." *Marketing Science* 14, 3, Part 2 (1995): G141-49.
- LODISH, LEONARD M., MAGID ABRAHAM, STUART KALMENSON, JEANNE LIVELBERGER, BETH LUBETIKIN, BRUCE RICHARDSON, and MARY ELLEN STEVENS. "How T.V. Advertising Works: A Meta-Analysis of 389 Real World Split Cable T.V. Advertising." *Journal of Marketing Research* 32, 2 (1995): 125-39.
- MACINNIS, DEBORAH, AMBAR G. RAO, and ALLEN M. WEISS. "Assessing When Increased Media Weight Helps Sales of Real World Brands." *Journal of Marketing Research* 39, 4 (2002): 391-407.
- MASTERTSON, PEGGY. "The Wearout Phenomenon." *Marketing Research* 11, 3 (1999): 26-31.
- MCDONALD, COLIN. "What is the Short-Term Effect of Advertising?" Marketing Science Institute Report No. 71-142. Cambridge, MA: Marketing Science Institute, 1971.
- PECHMANN, CORNELIA, and DAVID W. STEWART. "Advertising Repetition: A Critical Review of Wearin and Wearout." *Current Issues and Research in Advertising* 11, 2 (1992): 285-330.
- PEDRICK, JAMES H., and FRED S. ZUFREYDEN. "Evaluating the Impact of Advertising Media Plans: A Model of Consumer Purchase Dynamics Using Single Source Data." *Marketing Science* 10, 2 (1991): 111-30.
- PIETERS, RIK, EDWARD ROSBERGEN, and MICHEL WEDEL. "Visual Attention to Repeated Print Advertising: A Test of Scanpath Theory." *Journal of Marketing Research* 36, 4 (1999): 424-38.
- SAWYER, ALAN. "Repetition, Cognitive Responses and Persuasion." In *Cognitive Responses in Persuasion*, Richard E. Petty, Thomas M. Ostrom, and Timothy C. Brock, eds. Hillsdale, NJ: Lawrence Erlbaum Associates, 1981.
- , and SCOTT WARD. *Carry-Over Effects in Advertising Communication: Evidence and Hypotheses from Behavioral Science*. Cambridge, MA: Marketing Science Institute, 1976.
- SETHURAMAN, RAJ, and GERARD J. TELLIS. "An Analysis of the Tradeoff between Advertising and Pricing." *Journal of Marketing Research* 31, 2 (1991): 160-74.
- TELLIS, GERARD J. "Advertising Exposure, Loyalty and Brand Purchase: A Two Stage Model of Choice." *Journal of Marketing Research* 15, 2 (1988a): 134-44.
- . "The Price Elasticity of Selective Demand." *Journal of Marketing Research* 25, 4 (1988b): 331-41.
- . *Effective Advertising: How, When, and Why Advertising Works*. Thousand Oaks, CA: Sage Publications, 2004.
- . "Advertising Effectiveness in Contemporary Markets." In *Handbook of Advertising*, Gerard J. Tellis, and Tim Ambler, eds. London: Sage Publications, 2007.
- , RAJESH CHANDY, and PATTANA THAI-VANICH. "Decomposing the Effects of Direct Advertising: Which Brand Works, When, Where, and How Long?" *Journal of Marketing Research* 37, 1 (2000): 32-46.
- , and PHILIP HANS FRANSES. "Optimal Data Interval for Advertising Response Models." *Marketing Science*, 25, 3 (2006): 217-29.