Introduction to Industrial Organization
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Lecture Note 18

Advertising (Chapter 13)

Example: pharmaceutical industry advertising and promotion expenses are larger than R&D investment.

Persuasion v.s. Information
First of all, economists classify goods and advertising about goods in different categories. Goods include *Search* good and *experience* good.

1. Search good: one whose features the consumer can ascertain before purchase. (personal computer: speed, hard drive, etc. can be described)
2. Experience good: one whose features can be ascertained only upon consumption. (ex: new flavor yogurt, new brand soft drink, a specific brand red wine)

The difference in goods leads to the difference in advertising: persuasion and information (or persuasive advertising and informative advertising).

Informative advertising: describes the product's existence, its characteristics (e.g. weight, size, speed) and selling terms (e.g., price, financing interest rate).

Persuasive advertising: designed to change consumers' preferences ("our product tastes better" etc.)

So which form of advertising is more important? Is the average advertising more persuasive or more informative?

Empirical evidences show that both are important.

Empirical evidence 1: informative advertising plays an important role
1. Yoplait 150 yogurt, the second largest yogurt manufacturer in the US, introduced Yoplait 150 in April 1987. Based on the Nielsen data, an econometric estimation can be performed of the factors that influence the decision of buying Yoplait 150 on a given shopping trip. The results are the following:

2. Probability of buying Yoplait 150= 1.85*Advertising exposure-0.24*Advertising exposure*No. previous purchases +other variables

3. Where advertising exposure is the number of 30-second ads for Yoplait 150 observed by each consumer during the week of the shopping trip. The first coefficient, positive, indicates that the more Yoplait spends on advertising, the greater the probability of a purchase. The second

coefficient, negative, indicates that the more accustomed a consumer becomes to Yoplait, the less advertising expenditures will influence his or her decision. This result is consistent with the view that advertising had an informative role (in this case, information about the product's existence).

Empirical evidence 2: persuasive advertising plays an important role in maintaining the market power of branded pharmaceuticals

Brand drugs vs Generics
1. In 1984, US congress allowed drug manufacturers to market generic versions of off-patent branded drugs.
2. This was to limit the increase in pharmaceutical prices. However, the prices of branded drugs have not decreased, given the fact that the market share of generics has grown from 18% to 42%.
3. The above results coming from the large investment in advertising by large pharmaceutical firms. In 1998 only, it is estimated that more than 10bil was spent on ads and promotions.
4. Brand firms invest a lot on advertising, while generic drug maker companies invest much less.

Signaling

Advertising expenditures may serve to signal product quality. Suppose that firms launch high-quality products with expensive advertising campaigns. The implicit message of this "money-burning" effort can be interpreted: because our quality is high, we can afford to spend this much money on advertising. Then consumer might believe this is a high-quality product.

Then if this is a real high-quality product, consumers will continue to buy it repeatedly. If it was a low-quality product, consumer will not purchase it again. This explains why low-quality product firms do not spend too much money on advertising.

In another word, in equilibrium, advertising is a sign that the product is of high quality.

Advertising Intensity

Advertising-to-revenues ratio (a/R) measures advertising intensity. Each industry had different a/R ratio; this means that some industries spend more on advertising than others. For example, in salt industry this ratio is 0-0.5%. In breakfast cereals industry, this ratio is 8%-13%.

What explains this difference in advertising intensity?

Answer 1: Figure 13.1.

Both graph (a) and (b) assume a fixed amount spent on advertising. Case (a) is the case in which advertising expenditures have little impact on demand. For example, Cement. Construction companies are not very sensitive to cement advertising. Case (b) corresponds to the case when the

demand curve is sensitive to advertising expenditures. For example, Soft drinks.

The main point of figure 13.1 is that the marginal gain from advertising expenditures is greater the more sensitive the demand curve is to advertising expenditures. As a result, we would expect firms to advertise more when the demand curve is more sensitive to advertising expenditures.
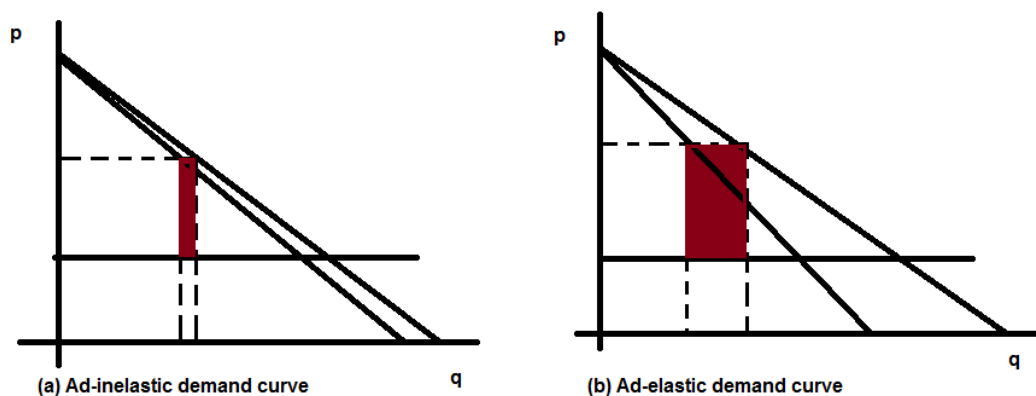

Figure 13.1 Advertising Elasticity and Returns from Advertising

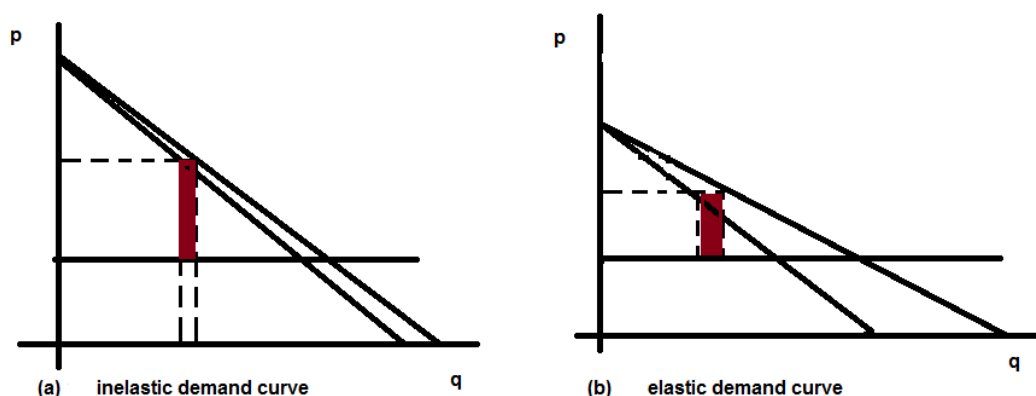Answer 2: Figure 13.2.

Figure 13. 2   Demand Elasticity and Returns from Advertising

Figure 13.2 makes another point. In both (a) and (b), advertising had the same impact on quantity demanded; so the returns from advertising would be the same. The difference between two cases is that the demand curve is more elastic in case (b). the greater the demand elasticity, the lower the optimal price. This implies a lower price-cost margin when elasticity is higher. Given the lower price-cost margin, the returns from advertising is smaller even though the increase in quantity demanded is the same.

The marginal gain from advertising is greater the greater the price-cost margin.

Dorfman-Steiner formula:

$$\frac{a}{R} = \frac{p - mc}{p} \quad \boxed{=} \quad \frac{\eta_\square}{\epsilon}$$

η is the demand elasticity with respect to advertising expenditures and ϵ the price elasticity of demand. This is, η measures how much quantity demand increases when advertising expenditures are increased by 1%.

This above equation means that the advertising-to-sales ratio is greater the greater the advertising elasticity of demand and the lower the price elasticity of demand or the greater the price-cost margin.

Table 13.1 shows the values of the various terms for a number of consumer products in Australia.

market	Dorfman-Steiner Formula $\frac{\eta_\square}{\epsilon}$	a/R
Instant coffee	0.019	0.020
Bottle beer	0.008	0.011
Cigarettes	0.019	0.046
Toilet soap	0.013	0.012
Laundry washing powder	0.019	0.030
toothpaste	0.024	0.059
Paint	0.009	0.019
Motor spirit	0.017	0.016

Market structure and advertising intensity

We have seen how advertising intensity depends on the type product. A second question is: how does advertising intensity vary with market structure? Do firms advertise more in industries with many small firms, or in industries with a few large ones?

First let's see how price elasticities vary with market structure.

The greater the number of firms, the greater the firm's price elasticity of demand. By decreasing its price, not only is firm I increasing total demand, it is also increasing its market share; the second effect is greater the lower firm I's market share is. So on price elasticity, we would expect advertising intensity to be lower the more fragmented the industry is. In other words, the more competitive the industry is, the lower the price-cost margin. The lower the price-cost margin, the lower the optimal advertising intensity.

Let's now look at the effect of market structure on the firm's advertising elasticity of demand. Let's consider two extreme cases:

1) Advertising increases every firm's demand equally. (e.g. advertising milk without brand name➜ advertising is a public good for all milk sellers)

In this case, each firm's advertising elasticity decreases as concentration decreases. The more fragmented the industry is, the lower the benefit from advertising that is captured by the firm that pays for it.

For example, the diamond industry. DeBeers had dominated the industry for decades; controlling more than 90% of the distribution of diamonds. DeBeers also has been the exclusive source of diamond advertising. ("Diamonds are forever"). The rise of Russian producers and newly found Canadian mines. This might lead to less advertising expenditure from DeBeers. Hence consumer will think of that diamonds are not scarce.

2) The total demand is fixed and independent of advertising. ➜ the only effect of advertising by firm I is to shift demand across rival firms. (e.g.: prescription drugs when there is competition between a branded drug and the corresponding generic competitors: the main effect of advertising is not to make consumers buy larger quantities of the drug but rather to make them switch between generic and branded drugs.)

The advertising elasticity increases as we go from one to two firms. Under monopoly, the advertising elasticity would be zero as there are no competitors, whereas under duopoly it would be positive. Generally, we might expect the elasticity to increase as market concentration decreases, starting from high levels of concentration.

Example：the case of spandex, an elastic fiber used in various types of fashionable clothing. The industry dominated by DuPont, whose Lycra brand name commands a market share in excess of 60%. One of the main reasons for DuPont's market dominance is the enormous advertising investment it made in promoting the Lycra brand name.

Spandex was invented by DuPont in 1959. If DuPont still held exclusive patent rights on spandex, would it be spending more or less on advertising? On one hand, DuPont's advertising fosters the consumption of spandex, which benefits both DuPont and its rivals. Given free-riding problem, we would expect DuPont to spend less when it competes against rival firms. On the other hand, one of the main reasons for DuPont's advertising effort is to keep spandex from turning into a commodity. In this sense, competition may be a factor for increased advertising.

To summarize, as the umber of firms increases and industry concentration decreases, here are three effects that determine the variation in advertising intensity. 1) each firm's margin decreases; 2) each firm captures a lower share of the demand increasing effect of advertising; 3) each firm captures a greater share of the demand-shifting effect of advertising. The first two effects imply a decrease in advertising intensity, whereas the third one implies an increase in advertising intensity. The net effect is ambiguous.

Advertising soften price competition

Generally, advertising product characteristics increases product differentiation and consequently softens competition.

An interesting example of this strategy is given by Procter&Gamble's (P&G). It's recent advertising strategy for its Crest MultiCare toothpaste.

In June 1998, P&G paid for full-page ads in about 100 US newspapers. The ads featured side-by-side comparisons between P7G's Crest MultiCare and Colgate's total on a number of toothpaste benefits. Both brands checked on a number of items, such as "help fight cavities" and "help brush away plaque." However, when it came to "helps reduce and prevent gingivitis and reduce plaque," only the Colgate total box was ticked. On the other hand, only Crest's MultiCare checked on "better taste" and "fresher feeling breath".

It is highly unusual for P&G- in fact, for any firm-to cede an advantage to a competitor in this way. P7G asserts that their "policy is to play fair, so our ad did acknowledge the competition's gingivitis claim." However, one can argue that it is in P7G's own interest to act in this way. First, praising the competitor's product makes it more difficult for Colgate to challenge the ad's claims. Second, as the analysis in the text suggests, one important effect of the ad is to increase the consumers' perception of differences between the two brands, thus softening price competition.