Industrial Organization 05

Advertising

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Outline

1. Definition of informative and persuasive advertising
2. Examples measuring advertising intensity by sector
3. Advertising spending by a monopoly
4. Effects of advertising on competition

Information and Persuasion

We distinguish two types of goods (Nelson, 1970 and 1974):

- "Research goods"
- "Experience goods"

Research goods

Goods whose quality can be certified before purchase.

Experience goods

Goods whose quality characteristics cannot be observed before purchase (or it would be too costly).

Information and Persuasion

According to Nelson, the nature of an "experience good" depends on the cost for a consumer to research information on the product quality.

We distinguish two types of information:

- *Hard information*: existence of the product, its price, the retailers distributing it, its characteristics (direct information).
- *Soft information*: indirect information.

Information and Persuasion

The distinction between research goods and experience goods leads to distinguish two types of advertising:

- Informative advertising
- Persuasive advertising

Informative advertising

Provides information on the product characteristics, to reveal an objective differentiation.

Persuasive advertising

Seeks to modify consumers preferences, to create a subjective differentiation.

Information and Persuasion

Which form of advertising is the most common?

→ The ratio advertising to sales is 3 times superior for experience goods than for research goods (according to Nelson, 1976).

What is a priori the difference between informative advertising and persuasive advertising in terms of social welfare?

- Informative advertising: some value a priori
- Persuasive advertising: value less clear

Information and Persuasion

For example, we have studied the impact of advertising on "Yoplait 150", introduced in the US in 1987.

The data (sales, advertising) have shown that

- The probability of purchasing Yoplait 150 = 1,85 x advertising exposition - 0,24 x advertising exposition x number of previous purchases + (other control variables).
- Where advertising exposition = number of 30-seconds ads watched by the consumer within a week.

→ Consistent with the idea of informative advertising.

Information and Persuasion

In 1984, The American Congress has implemented an accelerated authorization process for generic drugs.

Between 1984 and 1998, their market share has varied from 18% to 42%.

And yet, the branded drug price hasn't decreased, on the contrary, it has increased.

This is explained, in particular, by the intensive advertising campaigns conducted by the labs distributing these branded drugs.

→ Consistent with the idea of pervasive advertising.

Advertising as a Signal

For experience goods it could be difficult to make informative advertising.

Nonetheless, advertising can act as a signal send to consumers to indicate that quality is high.

Let's assume that there are low quality (experience) goods and high quality goods and that the purchases are repeated.

High-quality providers can have incentives to spend a large amount of money in advertising to signal themselves as providers of high-quality goods.

Advertising as a Signal

Idea: It is only rational to spend a lot if the firm offers a high-quality product.

Conditions for this strategy to be credible?

→ A high quality firm should have a higher interest in making consumers try its product than low quality firms.

Is this type of advertising a waste?

→ Not necessarily, the equilibrium with advertising could be more efficient than the equilibrium without.

Advertising Spendings Intensity

We observe that the ration of advertising on sales (or turnover) varies between industries:

- Salt: 0 to 0.5%
- Breakfast cereals: 8 to 13%

A simple formula (the Dorfman-Steiner formula) provides an explanation:

$$\frac{a}{R} = \frac{p - C'}{p}\eta = \frac{\eta}{\epsilon}$$

where

- η denotes the advertising spending elasticity of demand
- ϵ denotes the elasticity of demand
- a the advertising investments
- R the revenues

Advertising Spendings Intensity

Let's consider a monopoly firm.

The demand function is $q = D(p, a)$.

The monopoly maximizes its profit

$$pD(p, a) - C(D(p, a)) - a,$$

with respect to p and a.

The first order conditions are:

$$D(p, a) + pD_p(p, a) = C'(D(p, a)) D_p(p, a),$$

and

$$pD_a(p, a) = C'(D(p, a)) D_a(p, a) + 1.$$

Advertising Spendings Intensity

The first FOC is given by

$$D(p,a) + pD_p(p,a) = C'(D(p,a))\,D_p(p,a),$$

If we denote

$$\varepsilon = -\frac{pD_p(p,a)}{D(p,a)},$$

we find the inverse price elasticity rule:

$$\frac{p - C'}{p} = \frac{1}{\epsilon}.$$

Advertising Spendings Intensity

The second FOC is

$$pD_a(p,a) = C'(D(p,a))D_a(p,a) + 1,$$

with

$$(p - C')D_a = 1.$$

We define:

$$\eta = \frac{aD_a(p,a)}{D(p,a)}$$

so

$$D_a(p,a) = \eta\frac{D(p,a)}{a},$$

and

$$(p - C')\eta D(p,a) = a.$$

Advertising Spendings Intensity

We have

$$(p - C')\,\eta D(p,a) = a.$$

therefore

$$\frac{(p - C')}{p}\eta = \frac{a}{pD(p,a)} = \frac{a}{R} = \frac{\eta}{\epsilon}.$$

Conclusion:

For the monopoly, the optimal ratio between Advertising spending and turnover is equal to the relation of the elasticity of demands with respect to the Advertising and the price.

Advertising Spendings Intensity

Some examples (according to Metwally, 1975):

- Instant coffee: $\eta/\epsilon = 0,019$ and $a/R = 0,020$
- Bottles of beer: $\eta/\epsilon = 0,008$ and $a/R = 0,011$
- Cigarettes: $\eta/\epsilon = 0,019$ and $a/R = 0,046$
- Soap: $\eta/\epsilon = 0,013$ and $a/R = 0,012$
- Washing powder: $\eta/\epsilon = 0,019$ and $a/R = 0,030$
- Toothpaste: $\eta/\epsilon = 0,024$ and $a/R = 0,059$
- Engine oil: $\eta/\epsilon = 0,017$ and $a/R = 0,016$

Advertising Spendings Intensity

Dorfman-Steiner formula:

$$\frac{a}{R} = \frac{\eta}{\epsilon}$$

We can apply the D-S formula to get an intuition on the effect of the market structure on advertising spending.

How does the firm's price elasticity vary in function of the number of competitors?

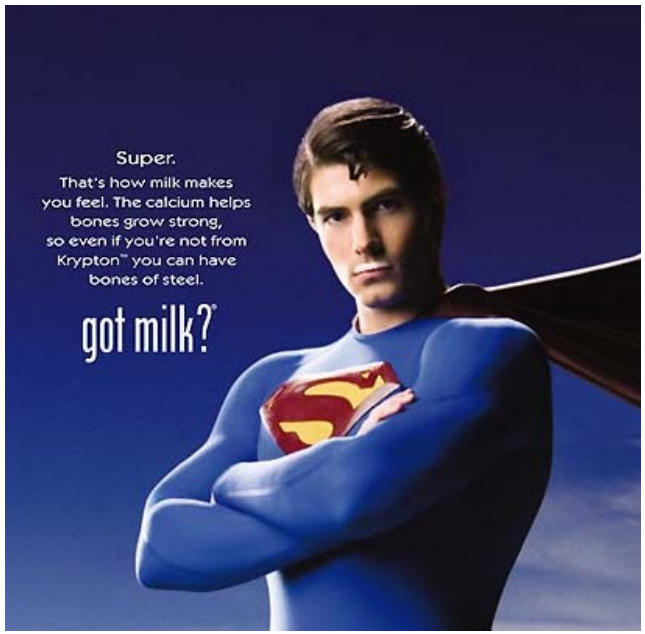
→ It tends to increase.

→ And therefore the advertising intensity tends to decrease.

Advertising Spendings Intensity

What is the effect of an increase in the number of firms on η ?

If advertising is a public good? = the advertising increases each firm's demand



→ Therefore, the elasticity of advertising (and as such the advertising intensity) decreases with the number of firms.

Advertising Spendings Intensity

If, on the contrary, the only effect of advertising is to make consumers switch from a firm to another?

→ A priori, the elasticity of advertising (and as such the advertising intensity) can increase with the number of firms (the incitations to capture competitors' market increases with the number of competitors).

Advertising Spendings Intensity

This analysis suggests an ambiguous relationship between the intensity of advertising spending and the number of firms.

Empirical studies suggest that:

- Starting with a small number of firms: increasing the number of firms will increase advertising intensity
- Starting with a large number of firms: increasing the number of firms will decrease advertising intensity

Price Competition and Advertising

General intuition

Advertising is an instrument of competition, like prices.

For example, what would happen if the only effect of advertising were to shift market shares?

→ We would have a mechanism "à la Bertrand": increase of advertising spending until the profits reach zero.

But advertising expenses differ from prices:

- Interactions are less frequent
- Advertising is an investment and may have long-term effects

Advertising Can Soften Price Competition

- Let's assume a competitive framework à la Hotelling (linear differentiation)
- The two firms are located at the two extremes of the varieties interval
- The consumers are uniformly distributed on the interval
- But we assume that they ignore the differences between the goods of the two firms

- What happens? → we have a competition "à la Bertrand" and therefore the firms obtain zero profits

- If firms can make informative advertising, what happens? → We have a competition "à la Hotelling" and therefore firms make strictly positive profits.

Conclusion: Informative advertising can increase the differentiation and decrease the intensity of price competition.

Advertising Can Strengthen Price Competition

- Two firms sell homogeneous (identical) goods
- Consumers are willing to pay v for the good
- But they ignore the existence and the prices of firms, they have to carry out a research step
- Let's suppose they can only make one research
- What is the equilibrium price? $\rightarrow$ the equilibrium price is $p = v$
- If firms can make informative Advertising, what happens? $\rightarrow$ the equilibrium price is $p = c$

Conclusion: Informative advertising can increase the intensity of price competition.

Advertising as an Entry Barrier

Theory of John Sutton (1991)

In markets where it is possible to differentiate in the eyes of consumers, we observe important advertising spending levels and a high degree of concentration.

→ Advertising as an entry barrier.

Advertising as an Entry Barrier

RealLemon example (1978), lemon juice brand:

- The brand RealLemon of Borden dominated the US markets for several years
- Entry of a competitor Golden Crown, with an identical good
- But intensive advertising campaigns from RealLemon → GC had to set a price 15 to 25% lower
- Leading to a price war
- Complaint against Borden in front of the FTC which concluded on a abuse of dominant position from Borden (complaint withdrawn in appeal)

Take-Aways

- There are two types of advertising: informative advertising (provides information on product characteristics) and persuasive advertising (seeks to create a subjective differentiation).
- The monopoly invests in advertising such that the ratio of its spending on its turnover is equal to the ratio of the demand elasticity to advertising on the price elasticity of demand.
- Advertising on product characteristics tends to soften competition, as it increases the possibility of differentiation for firms.
- Advertising on prices tends to increase price competition.