Chapter 21: Advertising, Competition, and Brand Names

Learning Objectives

Students should learn to:

1. Explain what is meant by too little or too much advertising.
2. Explain the free-rider problem as it applies to advertising and relate it to the free-rider problem that occurs with service and retail firms as discussed in Chapter 9.
3. Cite empirical cross section or case studies relating industry concentration and competitive practices with advertising.
4. Solve a spatial competition model where each consumer has a preferred brand located distance d from Brand X.
5. Add advertising to the model above and solve for the optimal levels of price and advertising.
6. Show the effects of advertising and the costs of advertising on firm level profits in a market equilibrium.
7. Explain how a firm might use "slotting allowances" to ensure adequate provision of promotional services and how the practice could also foreclose competition.
8. Explain why a firm may want to use cooperative advertising to soften competition at the wholesale level by encouraging retail price maintenance.
9. Understand that the informative role of advertising can sometimes be identified empirically, and have a deeper understanding of regressions with limited dependent variables.

Suggested Lecture Outline:

Spend two fifty-minute long lectures on this chapter

Lecture 1:

1. Review Hotelling's model.
2. Advertising and Information in Product Differentiated Markets
3. Optimal advertising and pricing in a spatial model
4. Adverting and building brand value

Lecture 2:

1. (continuation) Brand name advertising and prices
2. Too much or too little advertising?
3. Cooperative advertising

Suggestions for the Instructor:

1. The spatial model is ideal for the analysis of brand competition. One may want to provide a review handout or ask the students to work a problem.
2. An interesting and important part of the solution of the brand competition model is its symmetry.
3. The section on cooperative advertising should be closely tied to vertical relations and restraints. One could also discuss how a firm might use advertising to implicitly set price.
4. A student project might be to have the students collect newspaper or magazine advertisements of different types and then categorize them as to major purpose (provide information, enhance image, obtain a competitive edge, differentiate a fairly homogeneous product, introduce a new product, etc).

Solutions to End of the Chapter Problems:

Problem 1

Consider a firm that is initially at a short-run equilibrium in price and "variety" space. Now consider what happens if a new firm enters the market and produces a slightly differentiated product. Consumer surplus will rise as prices fall and the probability that a consumer will find a price close to their own preferences increased. In this case, the effect of more variety and firms on consumer surplus is unambiguously positive. As more firms enter, the profit per firm will fall as prices fall and existing firms face more variety competition. But with more firms, the aggregate industry profits may rise or fall depending on the whether the profit per firm effect is outweighed by the increase in the number of firms. If industry profits rise, then total surplus rises but if industry profits fall, the gain in consumer surplus must be compared to the loss in producer profits. Thus, from any initial situation, an increase in variety can be either good or bad in terms of total surplus.

We have too many brands if the loss in consumer surplus from eliminating one brand is less than the gain in firm profits. We have too few brands if the addition of a new product would lead to more consumer surplus than any net loss in producer profits.

The reason the market could lead to too many brands is that firms may engage in a variety game similar to the prisoner's dilemma that occurs in Bertrand pricing games. A firm only considers the effect that adding a variety or brand has on its own profits and ignores the negative effects it may have on the profits of another firm. If all firms do this, they may end up with more brands and less profits, than if they collectively agreed to reduce the number of brands and direct competition.

Problem 2

(a) Let p_1 denote the price charged by Quick Cuts and p_2 denotes the price charged by Le Coupe. Let *x* denote the location of the consumer, who is indifferent between Quick Cuts and Le Coupe. Then

$$p_1 + tx = p_2 + t(1-x) \Rightarrow t(2x-1) = p_2 - p_1 \Rightarrow x = \frac{1}{2} + \frac{p_2 - p_1}{2t}$$

Therefore, the demand for Quick Cuts is

$$D_1(p_1, p_2) = 1000\left[\frac{1}{2} + \frac{p_2 - p_2}{2t}\right]$$

Demand for Le Coupe is

$$D_2(p_1, p_2) = 1000(1-x) = 1000\left[\frac{1}{2} - \frac{p_2 - p_2}{2t}\right]$$

(b) Profits of Quick Cuts is

$$\pi_1(p_1, p_2) = 1000(p_1 - 6)\left[\frac{1}{2} + \frac{p_2 - p_2}{2t}\right]$$

Profits of Le Coupe is

$$\pi_2(p_1, p_2) = 1000(p_2 - 18)\left[\frac{1}{2} - \frac{p_2 - p_2}{2t}\right]$$

Profit maximizations yield $p_1 = t + 10 = 22, p_2 = t + 14 = 26$

(c) Market share of Quick Cuts is

$$x = \frac{1}{2} + \frac{p_2 - p_1}{2t} = \frac{1}{2} + \frac{2}{t} = \frac{2}{3}$$

Market Share of Le Coupe is $1 - x = \frac{1}{3}$

Problem 3

(a) If $t = 20$,

Price of Quick Cuts is $p_1 = t + 10 = 30$

Price of Le Coupe is $p_2 = t + 14 = 34$

Market share of Quick Cuts is $x = \frac{1}{2} + \frac{p_2 - p_1}{2t} = \frac{1}{2} + \frac{2}{20} = \frac{3}{5}$

Market Share of Le Coupe is $1 - x = \frac{2}{5}$

(b) If $t = 6$,

Price of Quick Cuts is $p_1 = t + 10 = 16$

Price of Le Coupe is $p_2 = t + 14 = 20$

Market share of Quick Cuts is $x = \frac{1}{2} + \frac{p_2 - p_1}{2t} = \frac{1}{2} + \frac{2}{12} = \frac{2}{3}$

Market Share of Le Coupe is $1 - x = \frac{1}{3}$

Problem 4

(a) Since Quick Cuts has a lower marginal cost, it has a greater incentive to advertise.

(b) Proportion of consumers informed about Quick Cuts = ½

Proportion of consumers informed about Le Coupe = ¾

Proportion of consumers not informed about Quick Cuts = ½

Proportion of consumers not informed about Le Coupe = ¼

Proportion of consumers informed only about Quick Cuts = 1/8

Proportion of consumers informed only about Le Coupe = 3/8

Proportion of consumers informed about both = 3/8

Proportion of consumes not informed about either = 1/8

Let p_1, p_2 be the prices charged by Quick Cuts and Le Coupe, respectively. Therefore, their profits are given by

$$\pi_1 = \frac{1}{8}N(p_1 - 6) + \frac{3}{8}N(p_1 - 6)\left[\frac{1}{2} + \frac{p_2 - p_1}{2t}\right] = 125(p_1 - 6) + 375(p_1 - 6)\left[\frac{1}{2} + \frac{p_2 - p_1}{24}\right]$$

$$\pi_{2L} = \frac{3}{8}N(p_2 - 18) + \frac{3}{8}N(p_2 - 18)\left[\frac{1}{2} - \frac{p_2 - p_1}{24}\right] = 375(p_2 - 18) + 375(p_2 - 18)\left[\frac{1}{2} - \frac{p_2 - p_1}{24}\right]$$

By simultaneously maximizing π_1 and π_2, obtain the optimal prices.

$p_1 = \$27.33 \quad p_2 = \$28.67$

Problem 5

- **(a)** Extending Reach
- **(b)** Extending Reach
- **(c)** Building Value and/or Building Value
- **(d)** Building Value
- **(e)** Building Value
- **(f)** Extending Reach
- **(g)** Extending Reach
- **(h)** Building Value
- **(i)** Building Value

Problem 6

(a) Since the firm is advertising for 100 seconds, it is facing an inverse demand curve

$$P = 1 - \frac{1}{\sqrt{\alpha}}Q = 1 - \frac{1}{\sqrt{100}}Q = 1 - \frac{1}{10}Q$$

$$MR = 1 - \frac{1}{5}Q$$

Equating MR = MC, obtain $1 - \frac{1}{5}Q = 0 \Rightarrow Q = 5 \Rightarrow P = \frac{1}{2}$

Therefore, profit is

$$\frac{5}{2}(1{,}000{,}000) - 10{,}000(100) = 1.5 million$$

(b) Since the firm is advertising for 625 seconds, it is facing an inverse demand curve

$$P = 1 - \frac{1}{\sqrt{\alpha}}Q = 1 - \frac{1}{\sqrt{625}}Q = 1 - \frac{1}{25}Q$$

$$MR = 1 - \frac{2}{25}Q$$

Equating MR = MC, obtain $1 - \frac{2}{25}Q = 0 \Rightarrow Q = \frac{25}{2} \Rightarrow P = \frac{1}{2}$

Therefore, its profit is

$$\frac{25}{4}(1{,}000{,}000) - 5000(625)) = 3.125 million$$

Problem 7

For this problem the quality $a_1 \geq 1$ and the cost of advertising should be $\alpha \frac{a_1^2}{4}$ where $\alpha < \frac{8}{9}$.

(a) The marginal consumer is the one whose surplus from consuming good 1 is the same as from consuming good 2.

(b) Solving first for prices given quality choice a_1 yields $p_1 = \frac{2a_1}{3} \quad p_2 = \frac{a_1}{3}$; and then solve for firm 1's profit maximizing quality choice yields

$$a_1 = \frac{8}{9\alpha} \quad p_1 = \frac{16_1}{27\alpha} \quad p_2 = \frac{8_1}{27\alpha}$$

(c) Firm 2 would choose the highest quality possible or $a_2 = .5$.