CHAPTER 6

MARKET STRUCTURE

CHAPTER SUMMARY

This chapter presents an economic analysis of market structure. It starts with perfect competition as a benchmark. Potential barriers to entry, that might limit competition, are examined. Subsequently, the chapter analyzes monopoly, monopolistic competition, and oligopoly. The chapter provides a brief introduction to elementary game theory. (Chapter 9 provides a more comprehensive treatment of game theory.)

CHAPTER OUTLINE

MARKETS
COMPETITIVE MARKETS
  Firm Supply
    Short-Run Supply Decisions
    Long-Run Supply Decisions
  Competitive Equilibrium
    Strategic Considerations
      Managerial Application: Entry in Low Carb Food
      Superior Firms
      Academic Application: Phantom Freight
BARRIERS TO ENTRY
  Incumbent Reactions
    Specific Assets
    Scale Economies
    Reputation Effects
    Excess Capacity
      Historical Application: Excess Capacity at ALCOA
      Managerial Application: Entry in Consumer Electronics
  Incumbent Advantages
    Precommitment Contracts
    Licenses and Patents
    Learning-Curve Effects
    Pioneering Brand Advantages
  Exit Costs
    Managerial Application: Government Restrictions on Exit
MONOPOLY
  Profit Maximization
  Unexploited Gains from Trade
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MONOPOLISTIC COMPETITION
Managerial Application: Monopolistic Competition in Golf Balls

OLIGOPOLY
Nash Equilibrium
Output Competition
Price Competition
Managerial Application: Price Wars
Empirical Evidence
Cooperation and the Prisoners’ Dilemma
Prisoners’ Dilemma
Cartels
Managerial Application: Collusion in the Lysine Industry

SUMMARY

TEACHING THE CHAPTER

Chapter 6 focuses on market structure, a concept that students must understand so they can properly assess the business environment, which is an important component of the analysis presented in later chapters of the text. There are several key concepts in this chapter that will be referred to throughout the book. Most of the material in this chapter is likely to be review, so instructors can determine the appropriate mix of class discussion and problem solving that is needed for their students and the goals of the course. The basics of game theory are presented in this chapter using the prisoner’s dilemma.

The Self-Evaluation Problems are graphical and quantitative in nature, serving as a good review of the tools presented in the chapter. The Review Questions provide a good review of the characteristics of market structure and other main concepts in the chapter. There are several questions that provide additional review of the quantitative and analytical concepts presented in the chapter and a few questions that review the concept of a Nash Equilibrium, which is covered more fully in Chapter 9.

There are three Analyzing Managerial Decisions scenarios presented in this chapter. The first, “United Airlines”, asks students to evaluate the costs of production and determine which costs are most relevant in determining whether the airline should continue to run a particular flight. The second, “Pricing and Investment Decisions”, is a quantitative scenario that asks students to determine the profit-maximizing output for a good and to consider how short-run capacity constraints might affect their choice of output. Students are also asked to consider how they might behave in the long-run in this industry. The third scenario “Entry Decision” asks students to evaluate how they would behave as a Cournot competitor including determining whether there a first-mover advantage exists in the market. (See the Solutions Manual for the answers to these problems).
REVIEW QUESTIONS

Note: Questions 6-2, 6-7, and 6-8 require knowledge about the relation between the area under the marginal cost curve and total costs. This relation is not examined in detail in the book. An instructor should review this relation in class before assigning these problems.

6–1. What four basic conditions characterize a competitive market?

- A large number of either actual or potential buyers and sellers.
- Product homogeneity.
- Rapid dissemination of accurate information at low cost.
- Free entry and exit in the market.

6–2. The short-run marginal cost of the Ohio Bag Company is 2Q. Price is $100. The company operates in a competitive industry. Currently, the company is producing 40 units per period. What is the optimal short-run output? Calculate the profits that Ohio Bag is losing through suboptimal output.

The optimal short-run output is where marginal cost = marginal revenue (in this case price). Therefore, the optimal output is 50 units. Current profits are TR - TC = $4,000 - $1,600 = $2,400. Note: assuming no fixed costs, total costs are equal to the area under the marginal cost curve (area = 1/2BH). Profits with optimal output = $5,000 - $2,500 = $2,500. The firm is forgoing $100 through suboptimal output choice.

6–3. Should a company ever produce an output if the managers know it will lose money over the period? Explain.

The firm should operate in the short run, as long as it obtains enough revenue to cover its variable costs. Revenue in excess of variable costs helps to cover fixed costs (which are incurred even if the firm does not operate).

Economic profits are “abnormal profits” (profits above what it takes to entice investment in the industry). Firms in a competitive industry can earn economic profits in the short run. The existence of economic profits will attract entry into the industry. Thus, firms are unlikely to earn economic profits over a long time period. Even in relatively competitive industries, however, there are firms that do exceptionally well over long time periods, for example by being the low-cost producer or having some particular advantage relative to competitors, such as location. These are inframarginal rents (not monopoly rents). The excess returns often do not go to the owner of the enterprise, but rather to the factor input that produces the particular advantage. We discuss these issues in greater detail in Chapter 8.

6–5. The Johnson Oil Company has just hired the best manager in the industry. Should the owners of the company anticipate economic profits? Explain.

No. The excess returns are likely to go to the manager. The manager’s salary will be bid up by other firms who want the manager’s services.

6–6. A Michigan Court ruled in the 1990s that General Motors did not have the right to close a particular Michigan plant and lay people off. Do you think this ruling benefited the people of Michigan? Explain.

It might have benefited some Michigan people in the short run (for example, the employees at the plant). Over the long run, the ruling might have significant negative effects. In particular, companies will be less likely to invest in new plants in the state if they think that they will not be free to close them should the plants prove to be unprofitable. This reduction in investment can hurt people in the state (for example, by providing less future employment and a lower tax base).

6–7. The Suji Corporation has a monopoly in a particular chemical market. The industry demand curve is $P = 1,000 − 5Q$. Marginal cost is $3Q$. What is Suji’s profit-maximizing output and price? Calculate the corresponding profits.

The optimal output of 76.92 is found by setting $MR = MC$: $1000 - 10Q = 3Q$. The corresponding price of $615.40$ is found from the demand curve. The profits are $TR - TC = $47,336.57 - $8,875.03 = $38,461.54$. Note: we are assuming that there are no fixed costs. Thus, total cost is the area under the marginal cost curve.
6–8. Assume the industry demand for a product is: \( P = 1,000 - 20Q \). Assume that the marginal cost of product is $10 per unit.

a. What price and output will occur under pure competition? What price and output will occur under pure monopoly (assume one price is charged to all customers)?

Price equals marginal cost under pure competition. Thus, price = $10 and quantity = 49.5. The monopolist will set marginal revenue (\( 1000 - 40Q \)) equal to marginal cost. The corresponding price and quantity are $505 and 24.75.

b. Draw a graph that shows the lost gains from trade that result from having a monopoly.

The graph is the same as in Figure 6.5 (except that a different demand curve is used).

6–9. In 1981, the United States negotiated an agreement with the Japanese. The agreement called for Japanese auto firms to limit exports to the United States. The Japanese government was charged with helping make sure the agreement was met by Japanese firms. Were the Japanese firms necessarily hurt by this limited ability to export? Explain.

No. The limit on exports might have helped to support a higher price for Japanese automobiles in the United States. The governments might be viewed as helping the Japanese firms to support a cartel to limit quantity and increase price (that is, to reach the monopoly solution).

6–10. Compare the industry output and price in a Cournot versus a competitive equilibrium. Do firms earn economic profits in the Cournot model? Does economic theory predict that firms always earn economic profits in oligopolistic industries? Explain. What does the empirical evidence indicate?

Output is lower and price is higher in the Cournot equilibrium. Firms earn economic profits in the Cournot equilibrium (unless the number of firms is large). Economic theory does not predict that firms will always earn economic profits in oligopolistic industries. For example, if the firms compete on price rather than quantity, the result can be the competitive outcome and no economic profits are earned. The empirical evidence indicates that firms in some oligopolistic industries earn economic profits.
A Nash equilibrium is a set of actions (or strategies) such that each player is doing the best it can given the actions of its opponents. A joint confession is the Nash equilibrium in the prisoner’s dilemma. Given one person confesses, it is in the interests of the other party to confess as well (indeed, confession is a dominant strategy — it is in a player’s interest to confess no matter what the other player does.)

6-12. Candak Corporation produces professional quality digital cameras. The market for professional digital cameras is monopolistically competitive. Assume that the inverse demand curve faced by Candak (given its competitors’ prices) can be expressed as \( P = 5,000 - .2Q \) and Candak’s total costs can be expressed as \( TC = 20,000,000 + .05Q^2 \). Answer the following questions.

a. What price and quantity will Candak choose?

To find the optimal price and quantity, we set marginal revenue equal to marginal cost. Marginal revenue equals \( 5000 - .4Q \) (the derivative of total revenue) and marginal cost equals \( .1Q \) (the derivative of total cost). Setting these equal and solving for \( Q \) yields:

\[
5000 - .4Q = .1Q \\
.5Q = 5000 \\
Q = 10,000
\]

Plugging this quantity into the demand curve gives us the price as follows: \( P = 5000 - .2(10,000) \) \( P = $3,000 \)

b. Is this likely to be a long-run equilibrium for Candak Corporation? Why or why not? If not, what is likely to happen in the market for professional digital cameras, and how will it affect Candak?

Since the market is monopolistically competitive, this will not be a long-run equilibrium. To see this, first note that Candak’s average cost at the equilibrium point above can be expressed as:

\[
20,000,000/Q + .05Q = 2000 + 500 = $2500
\]

Since price ($3000) is above average cost, the firm is making a positive economic profit. Since entry is possible in a monopolistically competitive market, these profits will attract entry by other firms. This will reduce demand for Candak’s products (shift its demand curve to the left). In the long run, Candak should be expected to produce at a point where price equals (long run) average cost and there is no economic profit.
6–13. Will a monopolist ever choose to produce on the inelastic portion of its demand curve? Explain.

No. If a monopolist is producing on the inelastic portion of its demand curve, it can increase revenue by increasing price. The corresponding decrease in quantity also implies that costs will decrease. Recall that with a linear demand curve, marginal revenue equals zero at the midpoint of the demand curve, which is also the point at which total revenue is maximized and the elasticity of demand is equal to 1. Since marginal cost will not be negative, the point at which marginal revenue equals marginal cost must occur at or to the left of this point (since marginal revenue is decreasing in quantity). It is also true that the elasticity of demand is always greater than 1 to the left of this point.