#### **ANSWERS TO END-OF-CHAPTER QUESTIONS**

23-1 How does monopolistic competition differ from pure competition in its basic characteristics? From pure monopoly? Explain fully what product differentiation may involve. Explain how the entry of firms into its industry affects the demand curve facing a monopolistic competitor and how that, in turn, affects its economic profit.

In monopolistic competition there are many firms but not the very large numbers of pure competition. The products are differentiated, not standardized. There is some control over price in a narrow range, whereas the purely competitive firm has none. There is relatively easy entry; in pure competition, entry is completely without barriers. In monopolistic competition, there is much nonprice competition, such as advertising, trademarks, and brand names. In pure competition, there is no nonprice competition.

In pure monopoly there is only one firm. Its product is unique and there are no close substitutes. The firm has much control over price, being a price maker. Entry to its industry is blocked. Its advertising is mostly for public relations.

Product differentiation may well only be in the eye of the beholder, but that is all the monopolistic competitor needs to gain an advantage in the market—provided, of course, the consumer looks upon the assumed difference favorably. The real differences can be in quality, in services, in location, or even in promotion and packaging, which brings us back to where we started: possibly nonexistent differences. To the extent that product differentiation exists in fact or in the mind of the consumer, monopolistic competitors have some limited control over price, for they have built up some loyalty to their brand.

When economic profits are present, additional rivals will be attracted to the industry because entry is relative easy. As new firms enter, the demand curve faced by the typical firm will shift to the left (fall). Because of this, each firm has a smaller share of total demand and now faces a larger number of close-substitute products. This decline firm's demand reduces its economic profit.

23-2 (*Key Question*) Compare the elasticity of the monopolistically competitor's demand curve with that of a pure competitor and a pure monopolist. Assuming identical long-run costs, compare graphically the prices and output that would result in the long run under pure competition and under monopolistic competition. Contrast the two market structures in terms of productive and allocative efficiency. Explain: "Monopolistically competitive industries are characterized by too many firms, each of which produces too little."

The monopolistic competitor's demand curve is less elastic than a pure competitor and more elastic than a pure monopolist. Your graphs should look like Figures 21.12 and 23.1 in the chapters. Price is higher and output lower for the monopolistic competitor. Pure competition: P = MC (allocative efficiency); P = minimum ATC (productive efficiency). Monopolistic competition: P > MC (allocative efficiency) and P > minimum ATC (productive inefficiency). Monopolistic competitors have excess capacity; meaning that fewer firms operating at capacity (where P = minimum ATC) could supply the industry output.

23-3 "Monopolistic competition is monopoly up to the point at which consumers become willing to buy close-substitute products and competitive beyond that point." Explain.

As long as consumers prefer one product over another regardless of relative prices, the seller of the product is a monopolist. But in monopolistic competition this happy state is limited because there are many other firms producing similar products. When one firm's prices get "too high" (as viewed by consumers), people will switch brands. At this point, our firm has entered the competitive zone unwillingly, which is why monopolistically competitive firms are forever trying to find ways to differentiate their products more thoroughly and thus to gain more monopoly price-setting power.

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23-4 "Competition in quality and in service may be just as effective as price competition in giving buyers more for their money." Do you agree? Why? Explain why monopolistically competitive firms frequently prefer nonprice to price competition.

This can certainly be true. It depends on how much consumers value quality and service, and are willing to pay for it through higher product prices. In a monopolistically competitive market the consumer can buy a substitute brand for a lower price, if the consumer prefers a lower price to better quality and service.

The monopolistically competitive firm frequently prefers nonprice competition to price competition, because the latter can lead to the firm producing where P = ATC and thus making no economic profit or, worse, producing in the short run where P < ATC and thus losing money, with the possibility of eventually going out of business.

Nonprice competition, on the other hand, if successful, results in more monopoly power: The firm's product has become more differentiated from now less-similar competitors in the industry. This increase in monopoly power allows the firm to raise its price with less fear of losing customers. Of course, the firm must still follow the MR = MC rule, but its success in nonprice competition has shifted both the demand and MR curves upward to the right. This results in simultaneously a larger output, a higher price, and more economic profits.

- 23-5 Critically evaluate and explain:
  - a. In monopolistically competitive industries economic profits are competed away in the long run; hence, there is no valid reason to criticize the performance and efficiency of such industries.
  - b. In the long run, monopolistic competition leads to a monopolistic price but not to monopolistic profits.
  - (a). The first part of the statement may well be true, but it does not lead logically to the second part. The criticism of monopolistic competition is not related to the profit level but to the fact that the firms do not produce at the point of minimum ATC and do not equate price and MC. This is the inevitable consequence of imperfect competition and its downward sloping demand curves. With P > minimum ATC, productive efficiency is not attained. The firm is producing too little at too high a cost; it is wasting some of its productive capacity. With P > MC, the firm is not allocating resources in accordance with society's desires; the value society sets on the product (P) is greater than the cost of producing the last item (MC).
  - (b) The statement is often true, since competition of close substitutes tends to compete price of the average firm down to equality with ATC. Thus, there is no economic profit. However, the firm is producing where its (moderately) monopolistically downward-sloping demand curve is tangent to the ATC curve, short of the point of minimum ATC and thus at a higher than purely competitive price. In other words, it is at a "monopolistic" price.
- 23-6 Why do oligopolies exist? List five or six oligopolists whose products you own or regularly purchase. What distinguishes oligopoly from monopolistic competition?

Oligopolies exist for several reasons, the most common probably being economies of scale. If these are substantial, as they are in the automobile industry, for example, only very large firms can produce at minimum average cost. This makes it virtually impossible for new firms to enter the industry. A small firm could not produce at minimum cost and would soon be competed out of the business; yet to start at the required very large scale would take far more money than an unestablished firm is likely to be able to raise before proving it will be profitable.

Other barriers to entry include ownership of patents by the oligopolists and, possibly, massive advertising that gives would-be newcomers no chance to establish a presence in the public's mind. Finally, there is the urge to merge. Mergers have the clear advantage of reducing

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competition—of giving the emerging oligopolists more monopoly power. Also, they may result in more economies of scale and thereby increase that barrier to new entry.

Oligopolies with which we deal include manufacturers of automobiles, ovens, refrigerators, personal computers, gasoline, and courier services.

Oligopoly is distinguished from monopolistic competition by being composed of few firms (not many); by being mutually interdependent with regard to price (instead of control within narrow limits); by having differentiated or homogeneous products (not all differentiated); and by having significant obstacles to entry (not easy entry). Both engage in much nonprice competition.

- 23-7 (Key Question) Answer the following questions, which relate to measures of concentration:.
  - a. What is the meaning of a four-firm concentration ratio of 60 percent? 90 percent? What are the shortcomings of concentration ratios as measures of monopoly power?
  - b. Suppose that the five firms in industry A have annual sales of 30, 30, 20, 10, and 10 percent of total industry sales. For the five firms in industry B the figures are 60, 25, 5, 5, and 5 percent. Calculate the Herfindahl index for each industry and compare their likely competitiveness.

A four-firm concentration ratio of 60 percent means the largest four firms in the industry account for 60 percent of sales; a four-firm concentration ratio of 90 percent means the largest four firms account for 90 percent of sales. Shortcomings: (1) they pertain to the nation as a whole, although relevant markets may be localized; (2) they do not account for interindustry competition; (3) the data are for U.S. products—imports are excluded; and (4) they don't reveal the dispersion of size among the top four firms.

Herfindahl index for A: 2,400 (= 900 + 900 + 400 + 100 + 100). For B: 4,300 (= 3,600 + 625 + 25 + 25 + 25). We would expect industry A to be more competitive than Industry B, where one firm dominates and two firms control 85 percent of the market.

- 23-8 (*Key Question*) Explain the general meaning of the following profit payoff matrix for oligopolists C and D. All profit figures are in thousands.
  - a. Use the payoff matrix to explain the mutual interdependence that characterizes oligopolistic industries.
  - b. Assuming no collusion between C and D, what is the likely pricing outcome?
  - c. In view of your answer to 8b, explain why price collusion is mutually profitable. Why might there be a temptation to cheat on the collusive agreement?



The matrix shows the four possible profit outcomes for each of two firms, depending on which of the two price strategies each follows. Example: If C sets price at \$35 and D at \$40, C's profits will be \$59,000, and D's \$55,000.

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- (a) C and D are interdependent because their profits depend not just on their own price, but also on the other firm's price.
- (b) Likely outcome: Both firms will set price at \$35. If either charged \$40, it would be concerned the other would undercut the price and its profit by charging \$35. At \$35 for both; C's profit is \$55,000, D's, \$58,000.
- (c) Through price collusion—agreeing to charge \$40—each firm would achieve higher profits (C = \$57,000; D = \$60,000). But once both firms agree on \$40, each sees it can increase its profit even more by secretly charging \$35 while its rival charges \$40.
- 23-9 (*Key Question*) What assumptions about a rival's response to price changes underlie the kinkeddemand curve for oligopolists? Why is there a gap in the oligopolist's marginal-revenue curve? How does the kinked demand curve explain price rigidity in oligopoly? What are the shortcomings of the kinked-demand model?

Assumptions: (1) Rivals will match price cuts: (2) Rivals will ignore price increases. The gap in the MR curve results from the abrupt change in the slope of the demand curve at the going price. Firms will not change their price because they fear that if they do their total revenue and profits will fall. Shortcomings of the model: (1) It does not explain how the going price evolved in the first place; (2) it does not allow for price leadership and other forms of collusion.

23-10 Why might price collusion occur in oligopolistic industries? Assess the economic desirability of collusive pricing. What are the main obstacles to collusion? Speculate as to why price leadership is legal in the United States, whereas price fixing is not.

Price wars are a form of competition that can benefit the consumer but can be highly detrimental to producers. As a result, oligopolists are naturally drawn to the idea of price-fixing among themselves, i.e., colluding with regard to price. In a recession, it is nice to know whether one's rivals will cut prices or quantity, so that a mutually satisfactory solution can be reached. It is also convenient to be able to agree on what price to set to bankrupt any would-be interloper in the industry.

From the viewpoint of society, collusive pricing is not economically desirable. From the oligopoly's viewpoint it is highly desirable since, when entirely successful, it allows the oligopoly to set price and quantity as would a profit-maximizing monopolist.

The main obstacles to collusion are demand and cost differences (which result in different points of equality of MR and MC); the number of firms (the more firms, the lower the possibility of getting together and reaching sustainable agreement); cheating (it pays to cheat by selling more below the agreed-on price—provided the other colluders do not find out); recession (when demand slumps, the urge to shave prices—to cheat—becomes much greater); potential entry (the above-equilibrium price that is the reason for collusion may entice new firms into this profitable industry—and it may be hard to get new entrants into the combine, quite apart from the unfortunate increase in supply they will cause); legal obstacles (for a century, antitrust laws have made collusion illegal).

Price leadership is legal because although the firms may follow the dominant firm's price, they are not compelled to. Also, the tacit agreement on price does not also include an agreement to control quantity and to divide up the market.

23-11 (*Key Question*) Why is there so much advertising in monopolistic competition and oligopoly? How does such advertising help consumers and promote efficiency? Why might it be excessive at times?

Two ways for monopolistically competitive firms to maintain economic profits are through product development and advertising. Also, advertising will increase the demand for the firm's product. The oligopolist would rather not compete on a basis of price. Oligopolists can increase their market share through advertising that is financed with economic profits from past advertising campaigns. Advertising can operate as a barrier to entry.

Advertising provides information about new products and product improvements to the consumer. Advertising may result in an increase in competition by promoting new products and product improvements. It may also result in increased output for a firm, pushing it down its ATC curve and closer to productive efficiency (P = minimum ATC).

Advertising may result in manipulation and persuasion rather than information. An increase in brand loyalty through advertising will increase the producer's monopoly power. Excessive advertising may create barriers to entry into the industry.

23-12 (*Advanced analysis*) Construct a game-theory matrix involving two firms and their decisions on high versus low advertising budgets and the effects of each on profits. Show a circumstance in which both firms select high advertising budgets even though both would be more profitable with low advertising budgets. Why won't they unilaterally cut their advertising budgets?



Firm A's Advertising

Profits from each advertising strategy appear in the cells

In the payoff matrix above, each firm can choose between a low and high advertising budget. If, for example, Firm A chooses a high budget and Firm B a low budget, Firm A's profit will be \$120, and Firm B's only \$60.

The payoff matrix suggests that both firms should have high advertising budgets, but if both choose to do so, they will both be worse off relative to if they both had low budgets. Neither firm will reduce its budget because if it does and its rival doesn't, the firm reducing will lose profits to the other firm. Unless they collude, the firms will both end up with large advertising budgets and reduced profits.

23-13 (*Last Word*) What firm dominates the beer industry? What demand and supply factors have contributed to "fewness" in this industry?

Anheuser-Busch is the dominant firm in the industry.

On the demand side, there is evidence that by the 1970s tastes had changed in favor of lighter, drier beers produced by the larger brewers. Second, there has been a shift from consumption in taverns to home consumption, which means higher sales of packaged containers that can be shipped long distances.



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On the supply side, technological advances have increased bottling lines, so that the number of cans filled per hour rose from 900 in 1965 to over 2000 in 1990s; large plants have been able to take advantage of economies of scale; television advertising also favors the large producers; and extensive product differentiation exists despite the smaller number of firms, which has enabled these firms to expand still further.