
Chapter 7: Answers to Questions and Problems

1. The four-firm concentration ratio is,
$$C_4 = \frac{\$175,000 + \$150,000 + \$125,000 + \$100,000}{\$1,000,000} = 0.55.$$
2.
 - a. The HHI is
$$HHI = 10,000 \left[\left(\frac{\$200,000}{\$1,100,000} \right)^2 + \left(\frac{\$400,000}{\$1,100,000} \right)^2 + \left(\frac{\$500,000}{\$1,100,000} \right)^2 \right] = 3,719.$$
 - b. The four-firm concentration ratio is 100 percent.
 - c. If the firms with sales of \$200,000 and \$400,000 were allowed to merge, the resulting HHI would increase by 1,322 to 5,041. Since the pre-merger HHI exceeds that under the *Guidelines* (1,800) and the HHI increases by more than that permitted under the *Guidelines* (100), the merger is likely to be challenged.
3. The elasticity of demand for a representative firm in the industry is -1.5 , since
$$0.6 = \frac{-0.9}{E_F} \Rightarrow E_F = \frac{-0.9}{0.6} = -1.5.$$
4.
 - a. \$100. To see this, solve the Lerner index formula for P to obtain
$$P = \left(\frac{1}{1-L} \right) MC = \left(\frac{1}{1-0.65} \right) \$35 = \$100.$$
 - b. Since $P = \left(\frac{1}{1-L} \right) MC$, it follows that the markup factor is $\left(\frac{1}{1-0.65} \right) = 2.86$.
That is, the price charged by the firm is 2.86 times the marginal cost of producing the product.
 - c. The above calculations suggest price competition is not very rigorous and that the firm enjoys market power.
5. Managers should not specialize in learning to manage a particular type of market structure. Market structure generally evolves over time, and managers must adapt to these changes.
6. To the extent that the HHIs are based on too narrow a definition of the product (or geographic) market or the impact of foreign competition, the merger might be allowed. It might also be allowed if one of the firms is in financial trouble, or if significant economies of scale exist in the industry.

7. As shown in the text, the HHI is

$$10,000 \sum_{i=1}^n \left(\frac{S_i}{S_T} \right)^2 = 10,000 \left[\left(\frac{S_1}{S_T} \right)^2 + \left(\frac{S_2}{S_T} \right)^2 + \dots + \left(\frac{S_i}{S_T} \right)^2 + \left(\frac{S_j}{S_T} \right)^2 + \dots + \left(\frac{S_n}{S_T} \right)^2 \right]. \quad (1)$$

When firms i and j merge, the HHI becomes

$$10,000 \left[\left(\frac{S_1}{S_T} \right)^2 + \left(\frac{S_2}{S_T} \right)^2 + \dots + \left(\frac{S_i + S_j}{S_T} \right)^2 + \dots + \left(\frac{S_n}{S_T} \right)^2 \right]. \quad (2)$$

The difference between (2) and (1) is that $\left(\frac{S_i}{S_T} \right)^2 + \left(\frac{S_j}{S_T} \right)^2$ becomes $\left(\frac{S_i + S_j}{S_T} \right)^2$.

Thus, we can calculate how a merger between firms i and j will change the HHI by knowing only those two firms' market shares. In general, since

$$\left(\frac{S_i + S_j}{S_T} \right)^2 = \left(\frac{S_i}{S_T} \right)^2 + \frac{2S_i S_j}{(S_T)^2} + \left(\frac{S_j}{S_T} \right)^2, \text{ we know that a merger between firms } i \text{ and } j$$

will cause the HHI to increase by $2w_i w_j \times 10,000$, where w_i and w_j are the pre-merger market shares of the two merging firms. Using the information in the problem, $2(.2)(.2)(10,000) = 800$ represents the increase in the HHI due to the merger.

8. No. The conditions for perfect competition include:
- There are many buyers and sellers of products.
 - The products are homogenous.
 - Consumers and producers have perfect information.
 - There is free entry and exit.
9. The four-firm concentration ratios in Table 7-2 are likely to overstate the level of concentration in the U.S. Imported beers account for much of the sales in the U.S. It is likely that the brewing industry is much less concentrated than Table 7-2 leads us to believe.
10. This industry is most likely monopolistically competitive. Monopolistically competitive industries have concentration measures close to zero, but since each firm's product is slightly differentiated, the Rothschild index will be greater than zero (unlike perfectly competitive markets).

11. Monopolistically competitive. In a monopolistically competitive market, there are many firms, but each firm produces a differentiated product. According to the *causal view*, the structure of differentiated products causes firms to capitalize on the absence of close substitutes by charging higher prices and earning higher profit. Thus, structure causes conduct resulting in performance. According to the *feedback critique*, the conduct of firms may determine the market structure. Firms' products may be differentiated because of firms' conduct in the industry. Examples of such conduct include advertising and other behavioral tactics that feedback into demand, causing consumers to view products as differentiated. Thus, it is not at all clear that differentiated products are a structural variable. The willingness of consumers to pay for product variety gives firms an incentive to offer different products (thin-and-crispy pizza, pan pizza, pizza delivery, etc.).
12. Merger (a) is the only horizontal merger, and therefore the only merger that would be scrutinized under the *Guidelines* for horizontal mergers. Merger (b) is a conglomerate merger, while merger (c) is a vertical merger.
13. While the pre-merger four-firm concentration ratio is 72 percent, the pre-merger HHI is only 1,535. The merger would increase the HHI by only 100 to 1,635. The merger is unlikely to be blocked based on the merger guidelines.
14. If approved, the merger would raise the HHI by $2(.27)(.13)(10,000) = 702$ points (see the solution to problem 7). Since the pre-merger HHI is 3,025, which is greater than the Guidelines (1,800), and the HHI increases by 702 (which is greater than the 100 points permitted in the *Guidelines*), it is unlikely that the merger will receive unconditional approval.
15. See Table 7-1.

	Own Price Elasticity of Demand for		
	Own Price Elasticity of Market Demand	Representative Firm's Product	Rothschild Index
Agriculture	-1.8	-96.2	0.019
Construction	-1.0	-5.2	0.192
Durable manufacturing	-1.4	-3.5	0.400
Nondurable manufacturing	-1.3	-3.4	0.382
Transportation	-1.0	-1.9	0.526
Communication and utilities	-1.2	-1.8	0.667
Wholesale trade	-1.5	-1.6	0.938
Retail trade	-1.2	-1.8	0.667
Finance	-0.1	-5.5	0.018
Services	-1.2	-26.4	0.045

Table 7-1

Based on the Rothschild indices in Table 7-1, wholesale trade most closely resembles a monopoly, while finance most closely resembles perfect competition.

16. The Lerner index is $L = \frac{P - MC}{P} = \frac{\$3 - \$0.30}{\$3} = 0.9$, which indicates the firm has considerable market power. This makes sense because the product that the firm sells is currently under patent protection, which essentially makes the firm a legal monopoly.
17. Based on the information contained in Table 7-3 of the text, the food and apparel industries are most competitive and therefore probably represent the best match for the expertise of these managers.
18. The market for color film in the U.S. is highly concentrated. The five-firm concentration ratio is 100 percent and Kodak alone accounts for 67 percent of all rolls sold. Market demand for color film is relatively elastic at -1.75; indicating that a 10 percent increase in price leads to a 17.5 percent decline in quantity demand for color film. The Rothschild index indicates that market demand relative to the demand for Kodak color film is $R = \frac{-1.75}{-2} = 0.875$, indicating that Kodak's demand is, roughly, as sensitive to price changes as is the entire market demand. The Lerner index for Kodak is $L = \frac{\$6.95 - \$3.475}{\$6.95} = 0.50$, indicating that Kodak's markup factor is 2. For every \$1 spent on color film, \$0.50 is markup. Taken together, these things suggest that the color film industry in the U.S. closely resembles an oligopoly.
19. Note first that a merger with Unilever or Tricor Braun is not a horizontal merger. Moreover, while a horizontal merger with either Dole or Goya is likely to enhance Del Monte's profitability (profits as a percentage of sales are 8.7 and 7.1, respectively and the Lerner Indices are 0.14 and 0.32, respectively), the market for canned tomatoes and canned pineapple are highly concentrated. The four-firm concentration ratio and HHI for the canned tomatoes market are, respectively, 86.3 percent and 3,297. Similarly, the four-firm concentration ratio and HHI in the canned pineapple industry are 94.2 percent and 5,457, respectively. This information suggests that potential mergers in these industries are likely to be scrutinized.