

Chapter 8

Monopoly

CHAPTER SUMMARY

Market power arises from unique resources, intellectual property, scale and scope economies, regulation, or product differentiation. A seller with market power restrains sales to raise the market price above the competitive level and extract higher profits. It maximizes profit by producing the quantity at which marginal revenue equals marginal cost.

The extent to which a monopoly should adjust the price and sales in response to changes in demand or costs depends on the shapes of both the marginal revenue and the marginal cost curves. The profit-maximizing price and quantity does not depend on fixed costs. The profit-maximizing level of promotion for a seller with market power is the incremental margin multiplied by the elasticity of demand multiplied by the sales.

A buyer with market power restrains purchases to depress the price below the competitive level and raise its net benefit. Competing sellers and, likewise, competing buyers increase profit by restraining competition. They can do so by forming a cartel or through horizontal integration.

KEY CONCEPTS

monopoly	Lerner Index
monopsony	incremental margin percentage
inframarginal units	advertising-sales ratio
contribution margin	cartel
promotion	horizontal integration
incremental margin	vertical integration
perfectly contestable market	marginal expenditure

GENERAL CHAPTER OBJECTIVES

1. Enumerate and explain the different sources of market power.

2. Analyze how a monopoly determines its profit-maximizing output and price level.
3. Explain how a monopoly should adjust price in response to changes in demand and cost.
4. Analyze how much a monopoly should spend on advertising.
5. Explain how a monopoly should adjust advertising in response to changes in price and cost.
6. Compare and contrast output and price under monopoly and perfect competition.
7. Analyze how competing sellers can raise their combined profit by restraining competition through cartels and horizontal integration.
8. Analyze how a monopsony determines its net benefit maximizing purchase and price.
9. Analyze how competing buyers can raise their combined net benefit by restraining competition.

NOTES

1. Sources of market power.

- (a) A seller (buyer) with market power can influence market demand (supply), price and quantity demanded (supplied).
- (b) **Monopoly**: a market where there is only one seller.
- (c) **Monopsony**: a market where there is only one buyer
- (d) Sources of market power for monopolies and monopsonies: barriers that deter or prevent entry by competing sellers (buyers).
 - i. Unique resources, e.g., human resources: a superstar in sport and performing arts; physical or natural resources: exclusive right to use the Eurotunnel;
 - ii. Intellectual property, e.g., ownership of patents or copyrights over inventions or expressions.
 - iii. Scale and scope economies, e.g., electricity distribution; cable TV and local telephone service.
 - iv. Government regulation, e.g., government awarded exclusive franchises (intended to avoid duplication and lower costs) for distribution of electricity and natural gas, and local telephone service; government monopolies over defense and issuance of currency.
 - v. Product differentiation through advertising, promotion, product design and location.
- (e) Additional source of market power for a monopsony: the existence of a monopoly. A seller that has a monopoly over some good or service is likely to have market power over the inputs into that item.

2. Monopoly Pricing.

- (a) A monopoly:
- i. Faces a downward sloping market demand curve.
 - ii. Can either *set price* and let the market determine how much to buy, **or** *set the quantity supplied* and let the market determine the price; but not both.
 - iii. The procedure for setting price and quantity is the same in the short and long runs.
- (b) **A monopoly that sets the price** and lets the market determine the quantity of sales.
- i. Assumption: Profit maximization.
 - ii. Profit = revenue (price * sales) less cost.
 - iii. To sell additional units, the price must be reduced.
 - iv. Total cost generally increases with the scale of production.
 - v. Marginal revenue is the change in total revenue arising from selling an additional unit. It is the price of the marginal unit minus the loss of revenue on the inframarginal units. It could be negative.
 - vi. Inframarginal units are those other than the marginal unit.
 - vii. Contribution margin is the total revenue less variable cost.
 - viii. Change in contribution margin for an additional unit sold = marginal revenue – marginal cost.
 - ix. **Price** generally exceeds **marginal revenue**, and the difference depends on the **elasticity of demand**.
 - (1). If demand is very *elastic*, the seller need not reduce the price very much to increase sales, the marginal revenue will be close to price.
 - (2). If demand is very *inelastic*, the seller must reduce the price substantially to increase sales, the marginal revenue will be much lower than price.
 - x. Profit-maximizing **scale** of production is where:
 - (1). Marginal revenue equals marginal cost, or
 - (2). The sale of an additional unit results in no change to the contribution margin.
- (c) A monopoly restrains production to increase profit.
- (d) **Economically inefficient** choice of production. Where marginal benefit exceeds marginal cost, a profit can be made through resolving the inefficiency.
- (e) Response to **changes in demand or cost**.
- i. A monopoly's response to changes in demand depends on both the new demand (new marginal revenue) and the original marginal cost.
 - ii. A monopoly's response to changes in cost depends on both the original demand and the new marginal cost.

- iii. The new profit maximizing price and scale depend on the shapes of both marginal revenue and marginal cost curves. The monopoly should adjust its price until the marginal revenue equals marginal cost.
- iv. Note: *changes in fixed cost* do not affect marginal cost, and will not affect the profit maximizing price and sales; unless, however, that fixed cost is so large that total cost exceeds total revenue, the monopoly will shut down.

3. Promotion/Advertising.

- (a) **Promotion**: the set of marketing activities that a business undertakes to communicate with its customers and sell its product, including **advertising**, sales promotion and public relations.
- (b) A monopoly has market power and can influence demand (changes in demand and/or elasticity of demand).
- (c) The net benefit of promotion/advertising to a seller is the increment in *contribution margin* (as opposed to sales) less promotion/advertising expenditure.
- (d) Profit maximizing ratio of promotion/advertising **expenditure** to sales: the *incremental margin* multiplied by the elasticity of demand with respect to an increase in promotion/advertising.
 - i. The *incremental margin* is the price less marginal cost (which is the increase in the contribution margin from selling an additional unit, holding the price constant).
 - ii. The elasticity of demand with respect to an increase in promotion/advertising is the percentage by which demand will change if the seller's promotion/advertising expenditure rises by 1%, other things equal.
- (e) A seller should raise the advertising-sales ratio when:
 - i. The incremental margin is higher as each dollar of advertising produces relatively more benefit (e.g., when a seller raises its price or its marginal cost falls).
 - ii. The advertising elasticity of demand is higher as the influence of advertising on buyer demand is relatively greater.

4. Market Structure.

- (a) **Perfect competition** (a market with numerous sellers, each too small to affect market conditions) vis a vis monopoly.
 - i. Market price: The monopoly can set a relatively higher price. Competition (and under specific conditions, even *potential* competition) pushes the market price down toward the long run average cost and results in more production.
 - ii. Output or production: The monopoly restricts production below the competitive level.

- iii. Profit: the profit of a monopoly exceeds what would be the combined profit of all the sellers if the same market were competitive.
- (b) Potential competition.
 - i. The degree to which the market price can rise above long-run average cost depends on the height of entry and exit barriers (e.g., exit and liquidation costs).
 - ii. A monopoly in a **perfectly contestable** market (one where sellers can enter and exit at no cost) cannot raise its price substantially above its long run average cost. Other sellers can profit by entering the market. The resulting increase in supply will drive the market price back toward the long run average cost.
- (c) There is *no such thing as a supply curve for a monopoly*, because monopoly cannot sell an unlimited amount at the given price.
- (d) **Lerner Index** (incremental margin percentage).
 - i. The incremental margin (price – marginal cost) divided by the price; or the incremental margin percentage.
 - ii. It measures the degree of actual and potential competition in a market.
 - iii. It enables comparison of monopoly power in markets with different price levels.
 - (1). Perfectly competitive market: price equals marginal cost, the incremental margin is 0.
 - (2). With potential competition: if a monopoly sets a price close to its marginal cost, its Lerner Index will be relatively low.
 - (3). Monopoly: the more inelastic is market demand, the higher a monopoly can raise its price above marginal cost.
 - iv. It does not detect the power that a monopoly does not exercise. E.g., if a monopoly faces inelastic demand but nevertheless sets a price close to marginal cost.

5. Monopsony.

- (a) Assumption: Maximization of net benefit.
- (b) Net benefit = benefit less expenditure.
- (c) Marginal benefit (measured in terms of the contribution = revenue less variable cost) from an input falls with the scale of purchases.
- (d) Price must be higher to induce a greater quantity of supply, so the average expenditure curve slopes upward.
- (e) Marginal expenditure is the change in expenditure resulting from the purchase of one more unit. For the average expenditure curve to slope

upward, the marginal expenditure curve must lie above the average expenditure curve and slope upward more steeply.

- (f) The net benefit maximizing **scale** of purchases is where **marginal benefit equals marginal expenditure**.
- (g) A monopsony restricts purchases (demand) to get a *lower* price and increase its benefit *above* the competitive level.

6. Restraining competition.

- (a) Competitors can restrain competition through cartel or horizontal integration.
- (b) **Cartels.**
 - i. Cartel: an agreement to restrain competition (illegal in most countries)
 - (1). A *seller* cartel restrains competition in supply (sets a maximum sales quota for each participant) to raise the market price and profit above the competitive level.
 - (2). A *buyer* cartel is an agreement to restrain competition in demand. It restrains each participant's purchases to a maximum quota to reduce the market price.
 - ii. The success of a seller or a buyer cartel depends on (private) enforcement against existing members exceeding their quotas and potential entrants.
 - iii. Factors that *increase* the effectiveness of enforcement:
 - (1). *Few* members;
 - (2). Relation of industry capacity to market demand: *little* excess capacity;
 - (3). Extent of sunk costs: sellers with *insignificant* sunk costs will be relatively less willing to cut the price and exceed quotas;
 - (4). Extent of entry and exit barriers: *not* perfectly contestable; and
 - (5). If the product is *homogeneous*, it is easier to monitor cheating. However, then incentive to cheat is greater.
- (c) **Labor unions.**
 - i. Explicit seller cartels that restrict competition among workers in selling labor.
 - (1). They restrain employment to raise wages.
 - ii. A union with closed shop (where the employer commits to not hiring non union workers) has a monopoly over labor supply.
 - iii. Use of automation or shifting production overseas represent the substitution of equipment or foreign labor for domestic labor.
- (d) **Horizontal integration.**
 - i. **Horizontal** integration: the combination of two entities, in the same or similar businesses, under a common ownership.

- (1). A combination that creates a monopoly will be able to set price and sales at monopoly levels (reduce quantity supplied, raise the market price and increase profits), subject to the entry of potential competitors.
 - (2). Competing buyers can restrain competition through horizontal integration. A combination of 2 buyers that each have 50% of the demanded purchases will create monopsony.
- ii. **Vertical** integration: the combination of the assets for two successive stages of production under a common ownership.

ANSWERS TO PROGRESS CHECKS

- 8A. No difference: The price would be identical to the marginal revenue.
- 8B. It should raise price, so reducing sales up to the quantity where its marginal cost equals its marginal revenue.
- 8C. See Figure 8C on page 540 of the text.
- 8D. The advertising-sales ratio should be $\$(140 - 70) \times 0.01 = 0.7$. Hence the advertising expenditure should be $0.7 \times 1.4 = \$0.98$ million.
- 8E. Lerner Index = $(130 - 70)/130 = 0.46$.
- 8F. A labor union will be relatively more effective in a market with relatively few workers, if all workers are working full time, if workers have few commitments to employers, and if there are significant barriers to entry and exit. The fifth factor is ambiguous.
- 8G. Solar's total expenditure is represented by either the area $uOvx$ under the marginal expenditure curve from a quantity of 0 to 6,000 tons or the rectangle $tOvz$.

ANSWERS TO REVIEW QUESTIONS

1. [omitted]
2. To sell additional units, a seller may need to reduce its price. So, when increasing sales by one unit, the seller will gain the price of the marginal unit but lose revenue on the inframarginal units. Hence, the marginal revenue is

less than or equal to the price. If the demand is very elastic, then the marginal revenue will be close to the price. If, however, the demand is very inelastic, then the marginal revenue will be much lower than the price.

3. Reduce the price, and so increase sales.
4. True.
5. Expiration of the patent will: (a) reduce Solar's market power; and (b) cause its demand to become more price elastic.
6. The profit-maximizing quantity is such that the marginal revenue equals the marginal cost. Hence, after a change in costs, the seller should look for the quantity where the marginal revenue equals the marginal cost. So, it must consider both the marginal revenue and the marginal cost.
7. The profit-maximizing advertising-sales ratio = $(100 - 40) \times 0.01 = 0.6$.
Hence the advertising expenditure should be $0.6 \times 500,000 = \$0.3$ million.
8. Raise advertising expenditure until the advertising-sales ratio equals the incremental margin multiplied by the advertising elasticity of demand.
9. The advertising elasticity of demand will be relatively higher for item (ii).
10. The incremental margin would rise and hence the Lerner Index would rise.
11. The merger would reduce the degree of potential competition.
12. Ambiguous. See Section 6 of the text.
13. Yes.
14. True.
15. If the U.S. government were to forbid the NCAA from restrictive practices, (a) Athlete's earnings would rise; and (b) The number of athletes would increase.

WORKED ANSWER TO SAMPLE DISCUSSION QUESTION

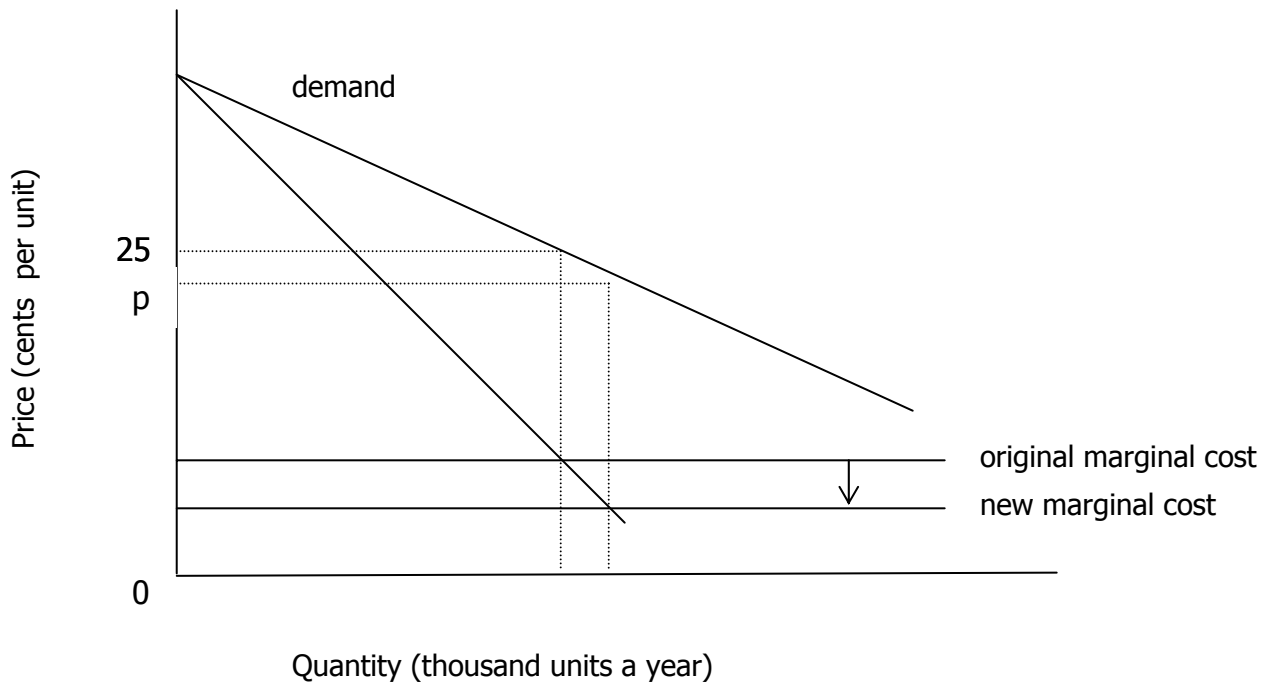
The Daily Sol is the only newspaper in Sol City. Its price has been 25 cents a copy. A recent fall in the cost of newsprint caused the Daily Sol's marginal cost

to fall by 2 cents per copy. Meanwhile, the government introduced an annual license fee of \$500,000 per newspaper.

- Using relevant diagrams, illustrate the Daily Sol's profit-maximizing price before the drop in the cost of newsprint and new license fee.
- How should the Daily Sol adjust its price to take account of the 2-cent drop in the cost of newsprint?
- How should the Daily Sol adjust its price in response to the new license fee?
- How should the Daily Sol adjust its advertising-sales ratio in response to the 2-cent drop in the cost of newsprint and new license fee?

Answer

- (a) See the figure below. The profit-maximizing price is 25 cents.



- The Daily Sol should reduce the price to p , so that at the new sales quantity, the marginal revenue equals the new marginal cost (which is 2 cents lower).
- The license fee is an addition to fixed cost. Since it does not affect the marginal cost of production, the Daily Sol should not adjust its price in response to the new license fee.
- The reduction in price is less than the reduction in marginal cost (2 cents), hence the new incremental margin is higher than the original

incremental margin. Assuming no change in the advertising elasticity of demand, the profit-maximizing advertising-sales ratio is higher.