Imperfect Competition:

Monopoly, Monopolistic Competition & Oligopoly

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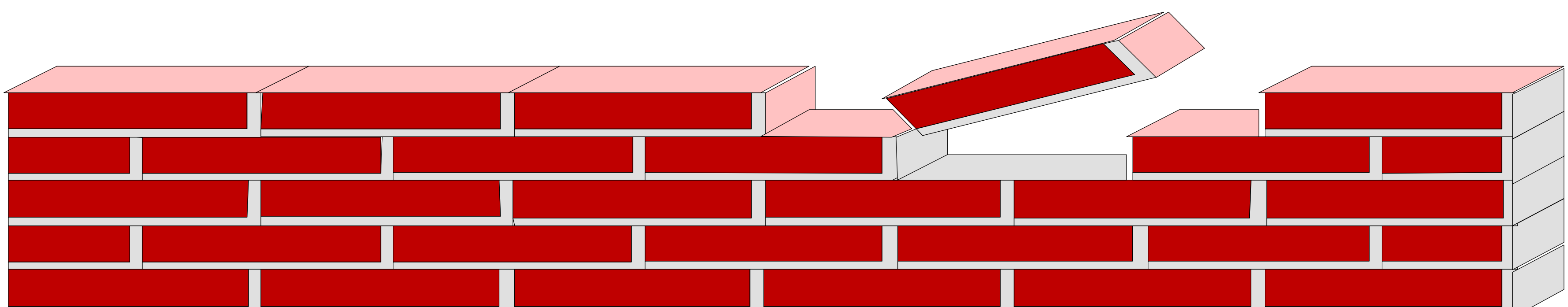
For HS 101

Monopoly

- While a competitive firm is a *price taker*, a monopoly firm is a *price maker*.
- A firm is considered a *monopoly* if . . .
  - it is the sole seller of its product.
  - its product does not have close substitutes.

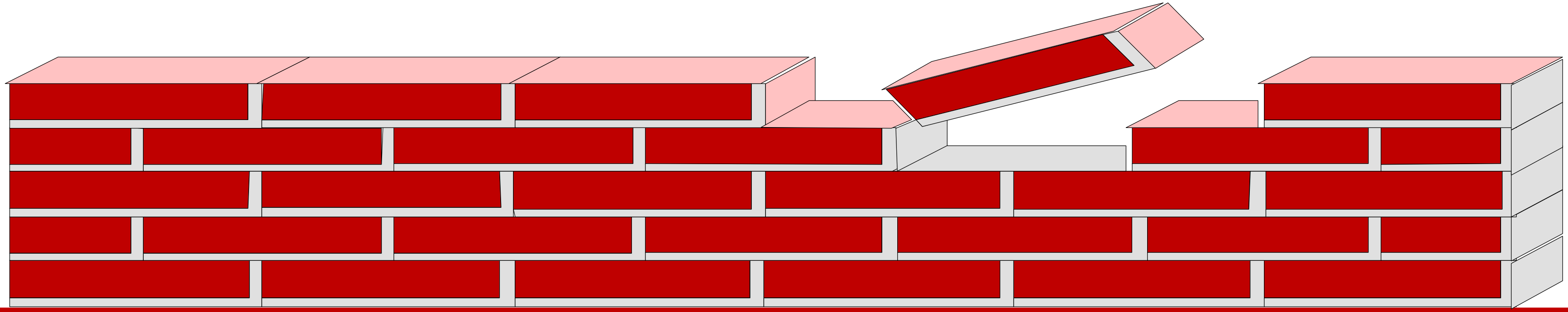
WHY MONOPOLIES ARISE

- The fundamental cause of monopoly is *barriers to entry*.



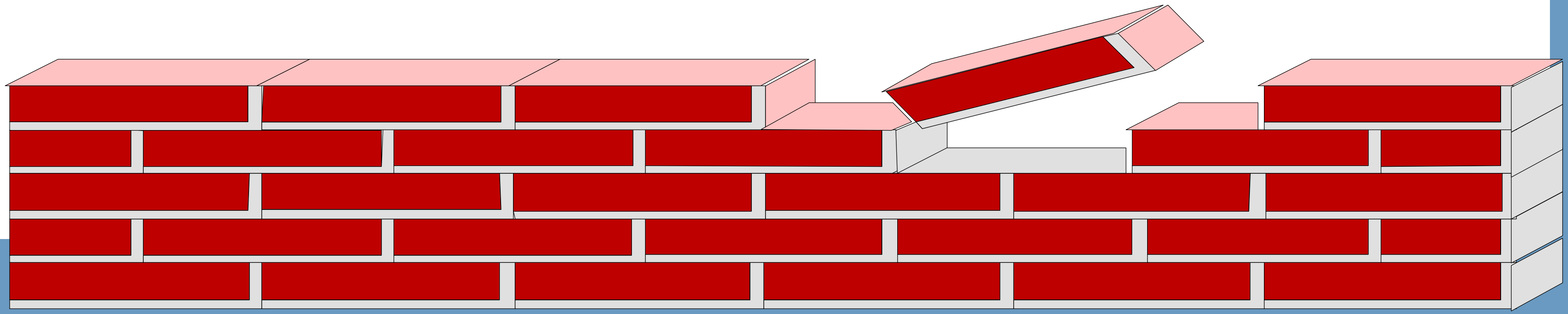
WHY MONOPOLIES ARISE

- Barriers to entry have three sources:
  - Ownership of a key resource.
  - The government gives a single firm the exclusive right to produce some good.
  - Costs of production make a single producer more efficient than a large number of producers.



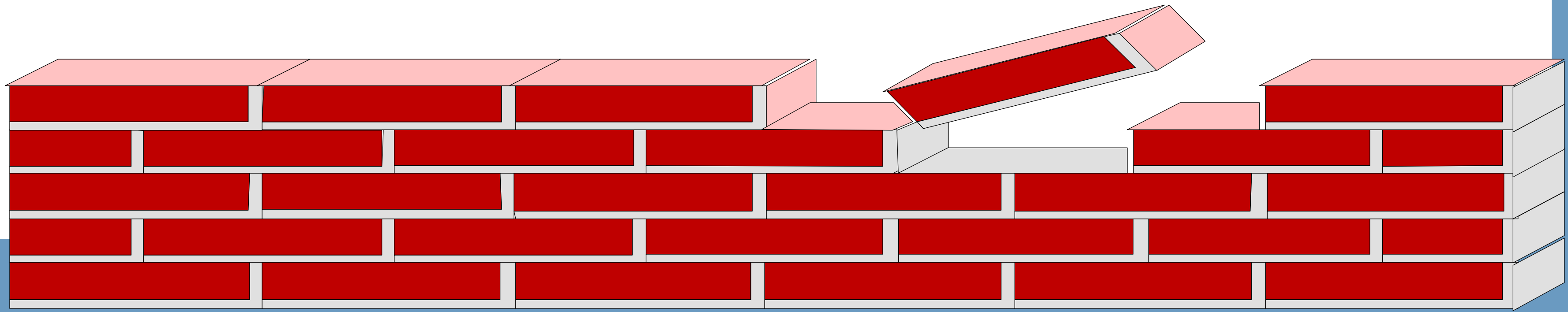
Monopoly Resources

- Although exclusive ownership of a key resource is a potential source of monopoly, in practice monopolies rarely arise for this reason.



Government-Created Monopolies

- Governments may restrict entry by giving a single firm the exclusive right to sell a particular good in certain markets.
- Patent and copyright laws are two important examples of how government creates a monopoly to serve the public interest.



Natural Monopolies

- An industry is a *natural monopoly* when a single firm can supply a good or service to an entire market at a smaller cost than could two or more firms.
- A natural monopoly arises when there are economies of scale over the relevant range of output.

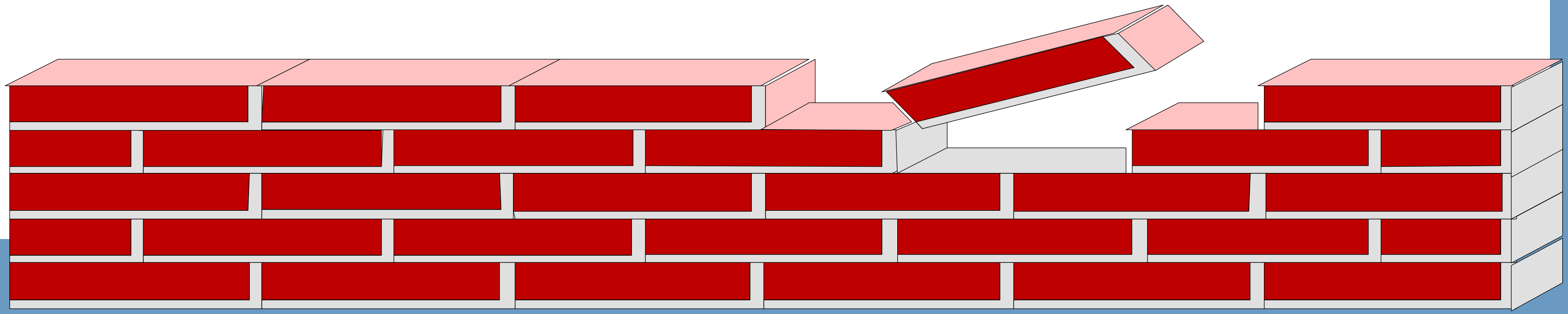
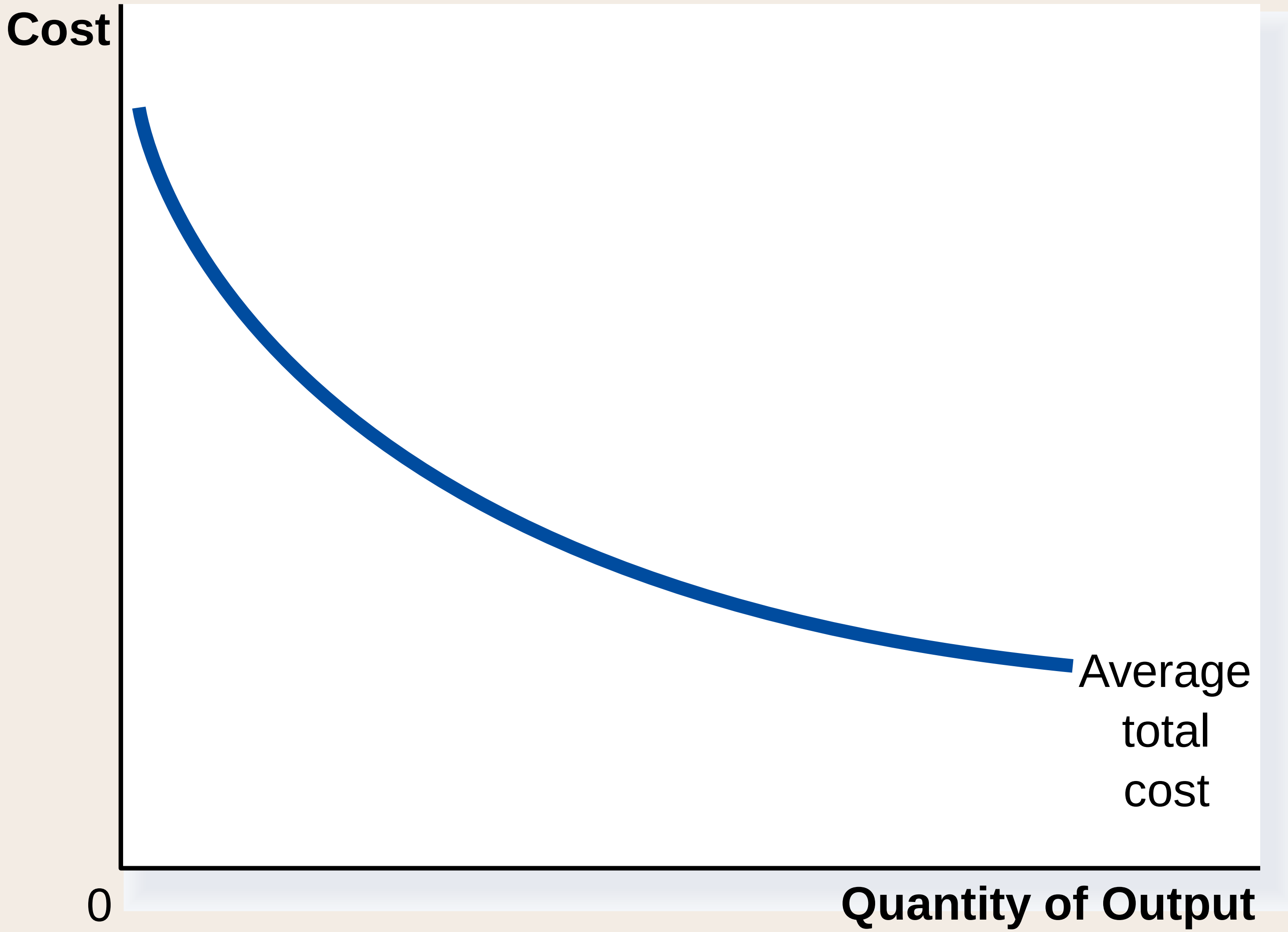


Figure 1 Economies of Scale as a Cause of Monopoly

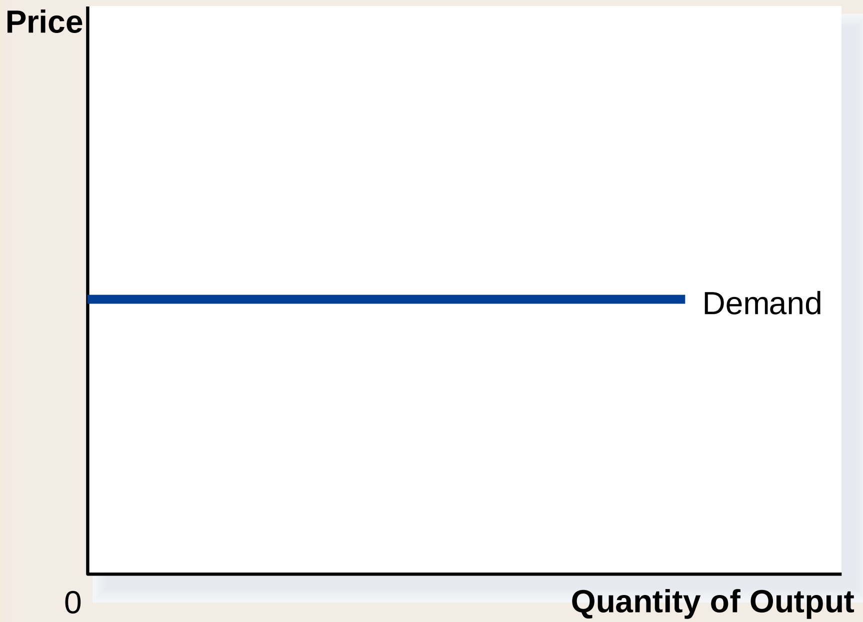


HOW MONOPOLIES MAKE PRODUCTION AND PRICING DECISIONS

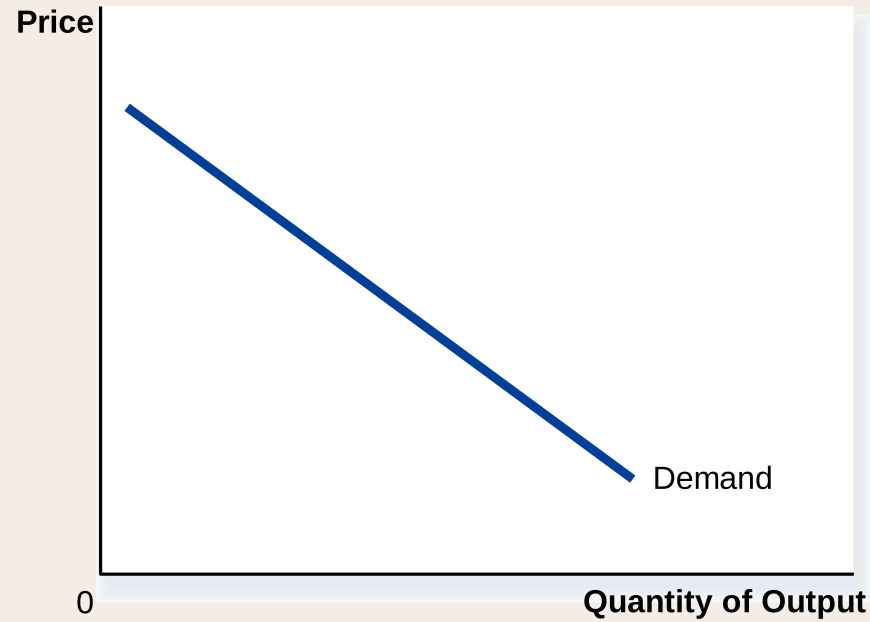
- Monopoly versus Competition
  - Monopoly
    - Is the sole producer
    - Faces a downward-sloping demand curve
    - Is a price maker
    - Reduces price to increase sales
  - Competitive Firm
    - Is one of many producers
    - Faces a horizontal demand curve
    - Is a price taker
    - Sells as much or as little at same price

Figure 2 Demand Curves for Competitive and Monopoly Firms

(a) A Competitive Firm's Demand Curve



(b) A Monopolist's Demand Curve



Since a monopoly is the sole producer in its market, it faces the market demand curve.

A Monopoly's Revenue

- Total Revenue
  - $P \times Q = TR$
- Average Revenue
  - $TR/Q = AR = P$
- Marginal Revenue
  - $\Delta TR/\Delta Q = MR$

Table 1 A Monopoly's Total, Average, and Marginal Revenue

Quantity of Water (Q)	Price (P)	Total Revenue ($TR = P \times Q$)	Average Revenue ($AR = TR / Q$)	Marginal Revenue ($MR = \Delta TR / \Delta Q$)
0 gallons	$11	$ 0	—	
				$10
1	10	10	$10	
				8
2	9	18	9	
				6
3	8	24	8	
				4
4	7	28	7	
				2
5	6	30	6	
				0
6	5	30	5	
				–2
7	4	28	4	
				–4
8	3	24	3	

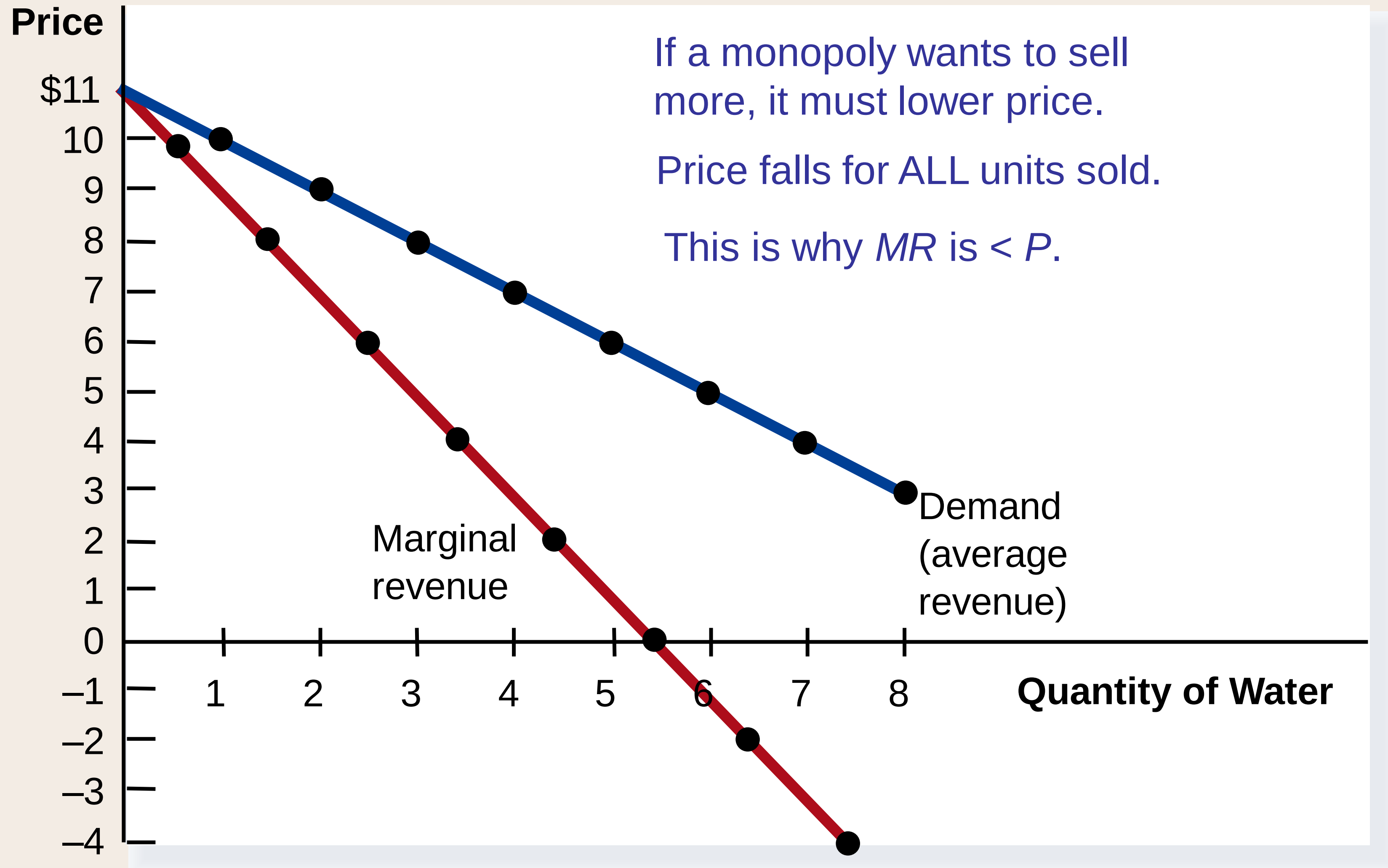
A Monopoly's Revenue

- A Monopoly's Marginal Revenue
  - A monopolist's marginal revenue is always less than the price of its good.
    - The demand curve is downward sloping.
    - When a monopoly drops the price to sell one more unit, the revenue received from previously sold units also decreases.

A Monopoly's Revenue

- A Monopoly's Marginal Revenue
  - When a monopoly increases the amount it sells, it has two effects on total revenue ($P \times Q$).
    - The output effect—more output is sold, so Q is higher.
    - The price effect—price falls, so P is lower.

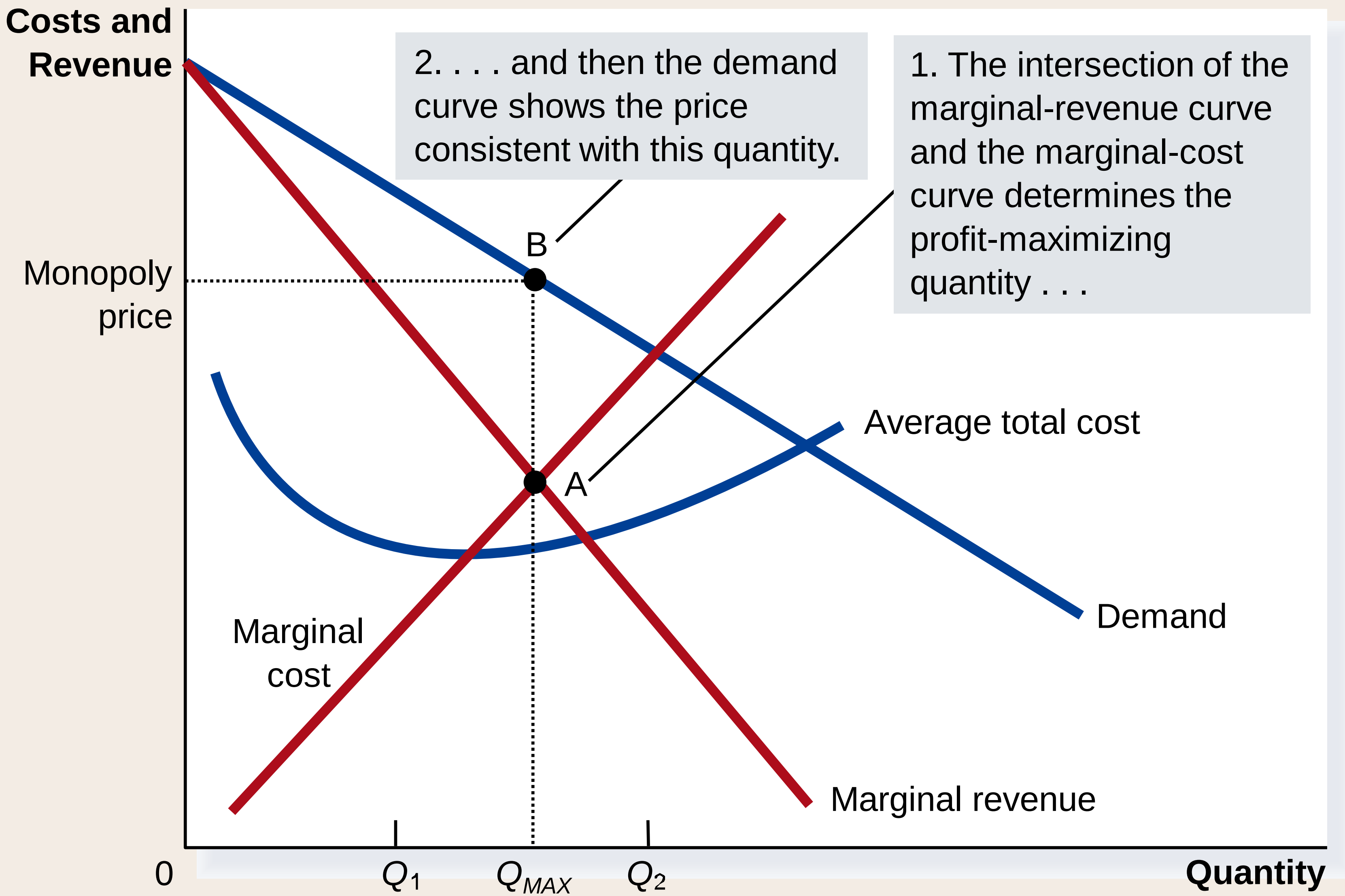
Figure 3 Demand and Marginal-Revenue Curves for a Monopoly



Profit Maximization

- A monopoly maximizes profit by producing the quantity at which marginal revenue equals marginal cost.
- It then uses the demand curve to find the price that will induce consumers to buy that quantity.

Figure 4 Profit Maximization for a Monopoly



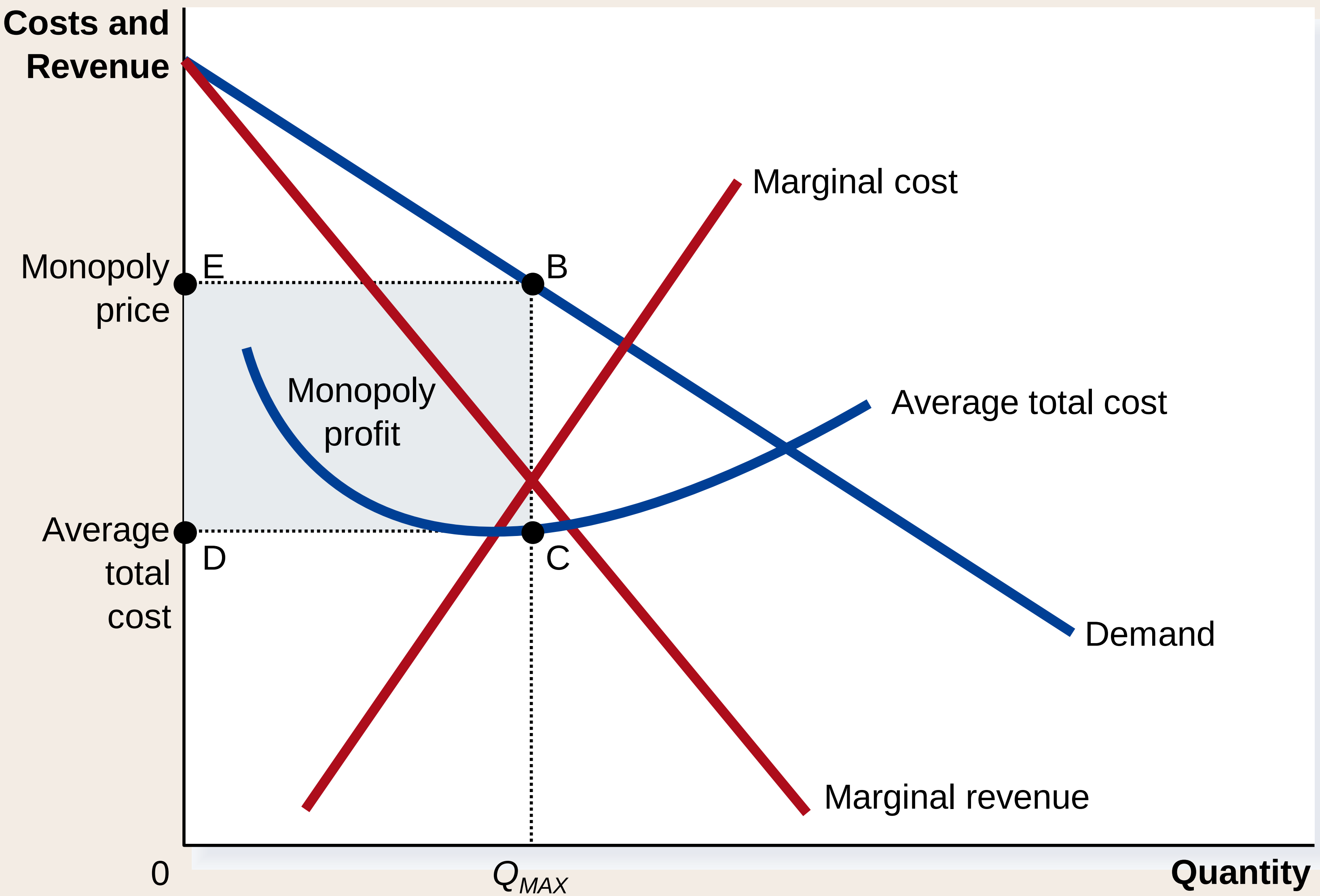
Profit Maximization

- Comparing Monopoly and Competition
  - For a competitive firm, price equals marginal cost.
    - $P = MR = MC$
  - For a monopoly firm, price exceeds marginal cost.
    - $P > MR = MC$
- Remember, all profit-maximizing firms set $MR = MC$.

A Monopoly' s Profit

- Profit equals total revenue minus total costs.
  - Profit = $TR - TC$
  - Profit = $(TR/Q - TC/Q) \times Q$
  - Profit = $(P - ATC) \times Q$

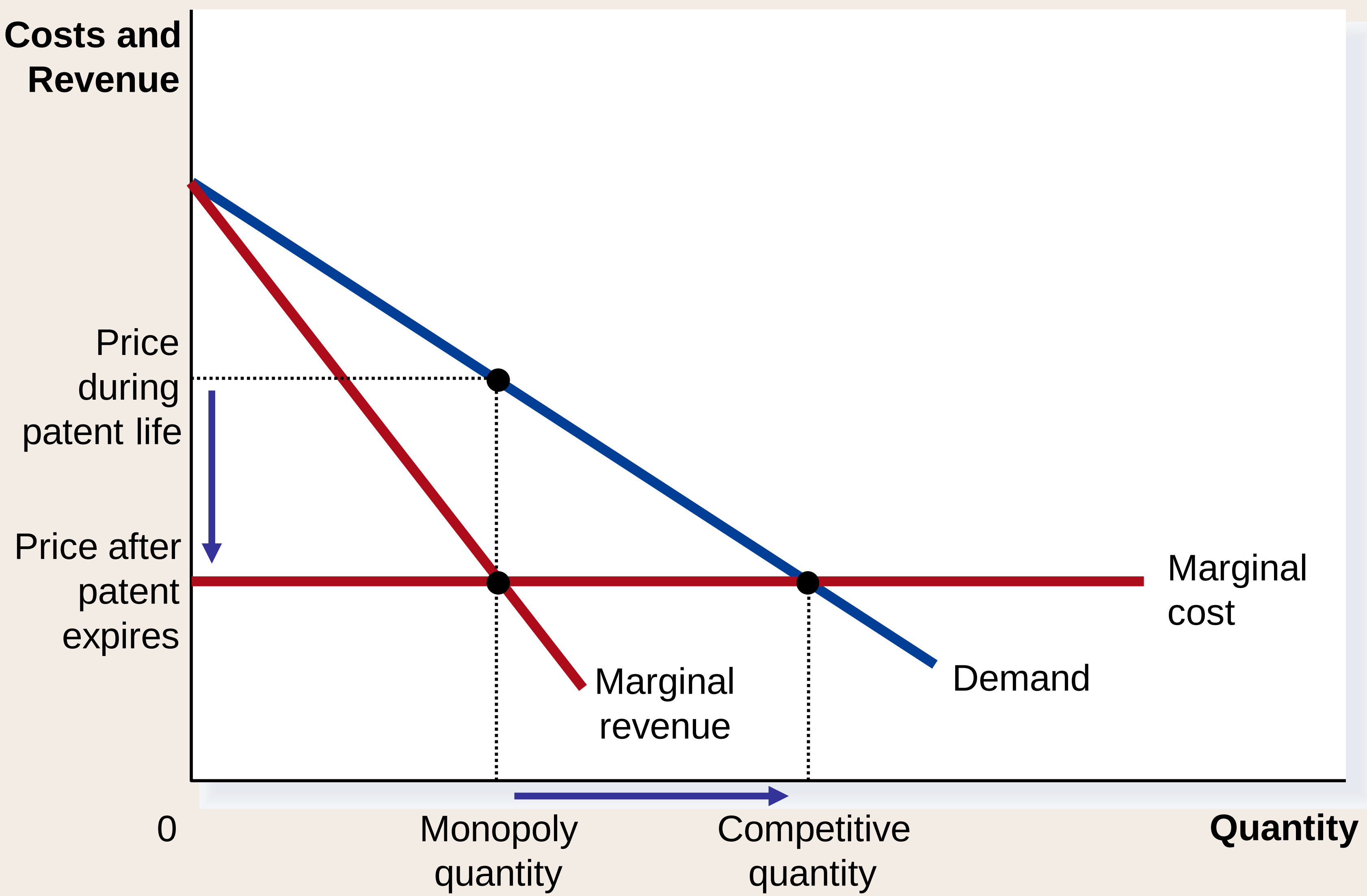
Figure 5 The Monopolist's Profit



A Monopolist’s Profit

- The monopolist will receive economic profits as long as price is greater than average total cost.

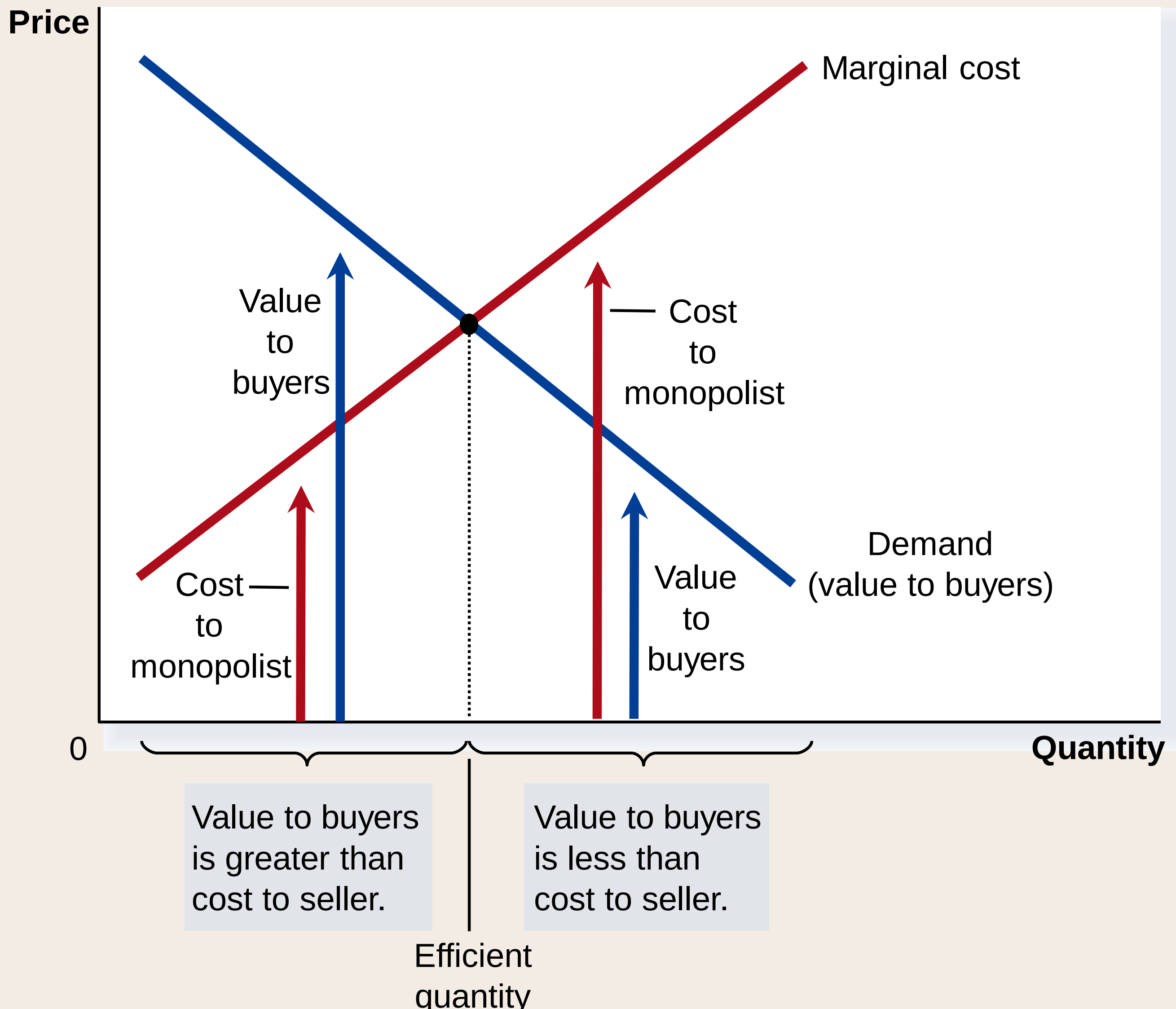
Figure 6 The Market for Drugs



THE WELFARE COST OF MONOPOLY

- In contrast to a competitive firm, the monopoly charges a price above the marginal cost.
- From the standpoint of consumers, this high price makes monopoly undesirable.
- However, from the standpoint of the owners of the firm, the high price makes monopoly very desirable.

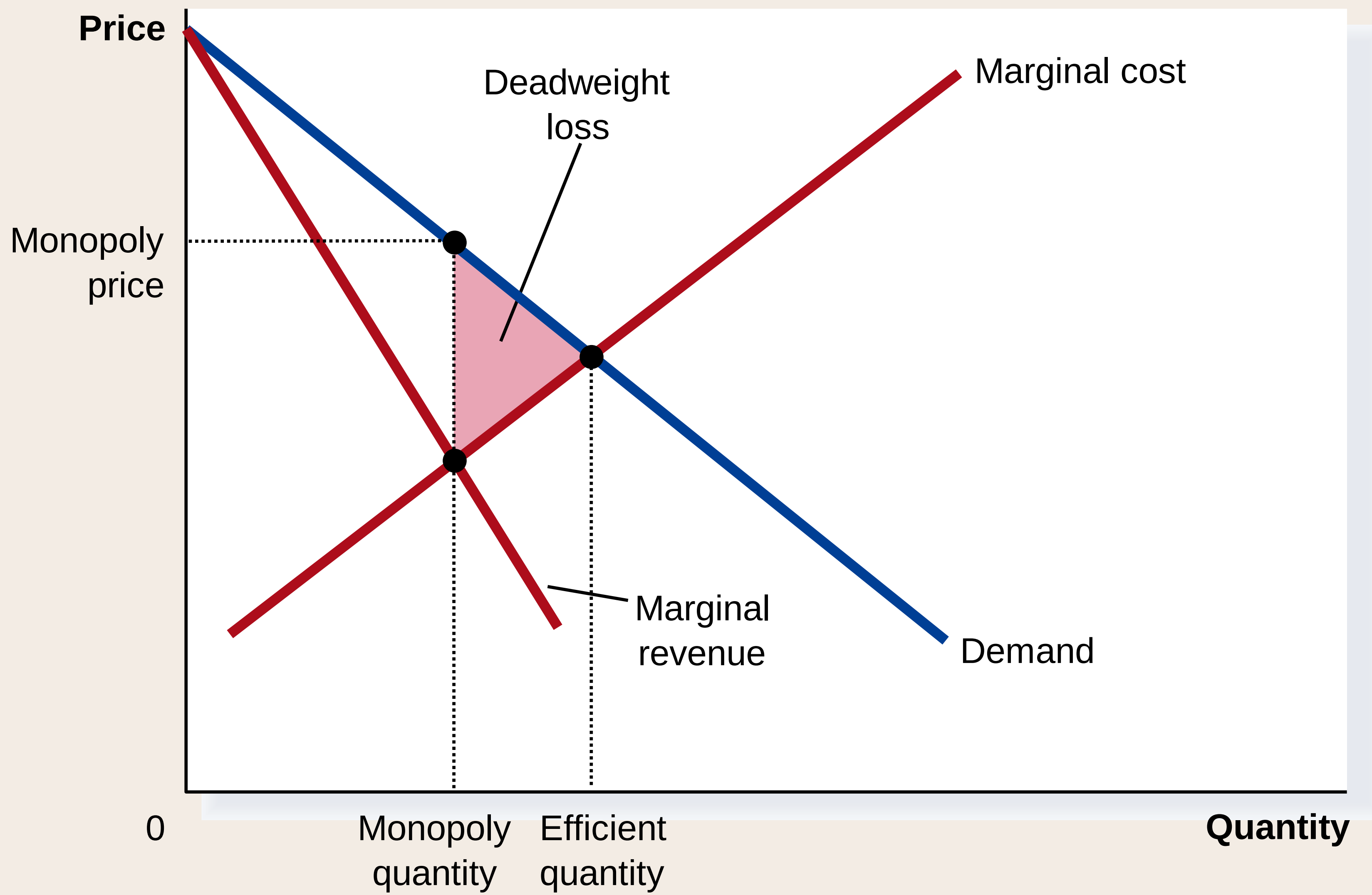
Figure 7 The Efficient Level of Output



The Deadweight Loss

- Because a monopoly sets its price above marginal cost, it places a wedge between the consumer's willingness to pay and the producer's cost.
  - This wedge causes the quantity sold to fall short of the social optimum.

Figure 8 The Inefficiency of Monopoly



The Deadweight Loss

- The Inefficiency of Monopoly
  - The monopolist produces less than the socially efficient quantity of output.

The Monopoly’s Profit: A Social Cost?

- The deadweight loss caused by a monopoly is similar to the deadweight loss caused by a tax.
- The difference between the two cases is that the government gets the revenue from a tax, whereas a private firm gets the monopoly profit.

PUBLIC POLICY TOWARD MONOPOLIES

- Government responds to the problem of monopoly in one of four ways.
  - Making monopolized industries more competitive.
  - Regulating the behavior of monopolies.
  - Turning some private monopolies into public enterprises.
  - Doing nothing at all.

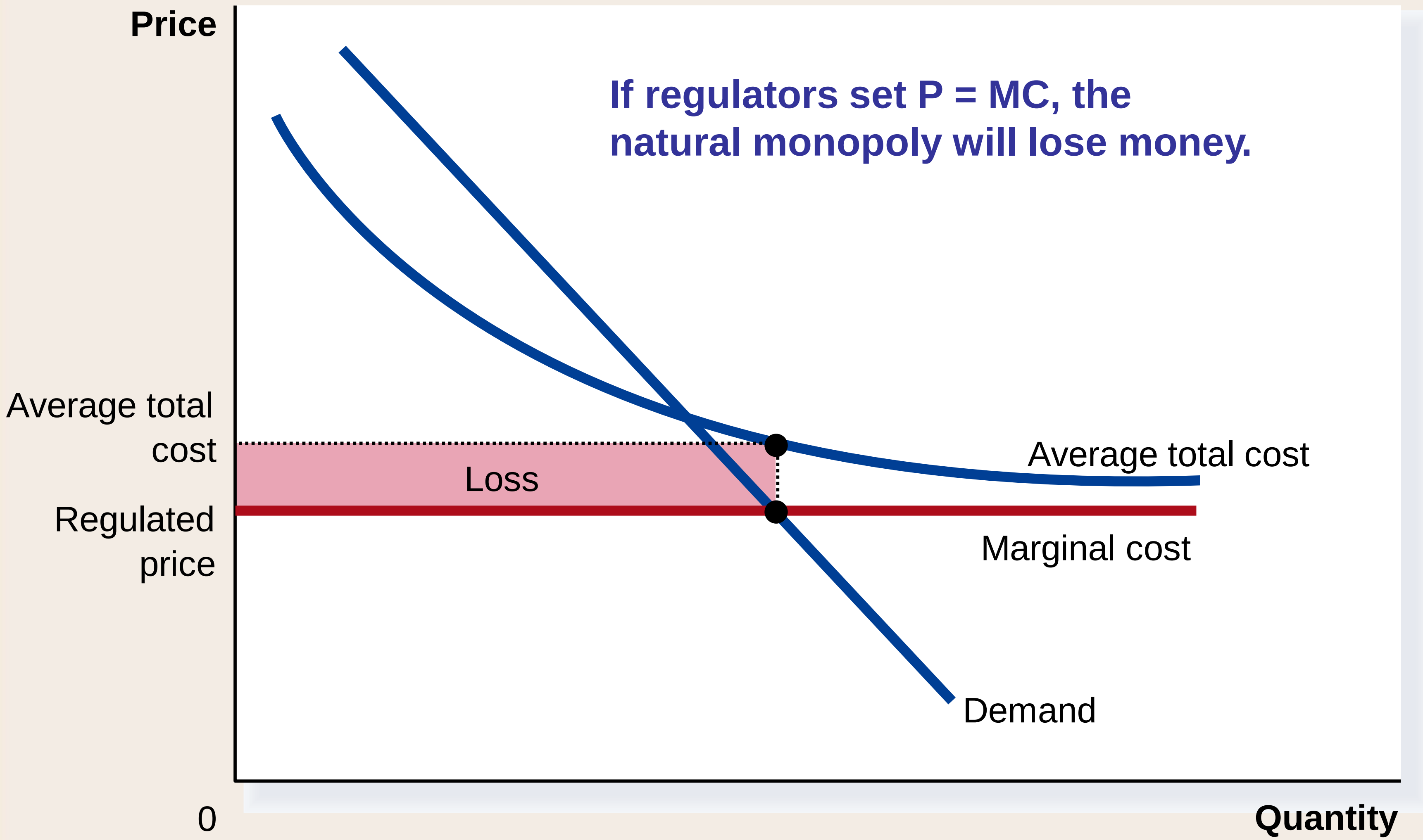
Increasing Competition with Antitrust Laws

- Antitrust laws are a collection of statutes aimed at curbing monopoly power.
- Antitrust laws give government various ways to promote competition.
  - They allow government to prevent mergers.
  - They allow government to break up companies.
  - They prevent companies from performing activities that make markets less competitive.

Regulation

- Government may regulate the prices that the monopoly charges.
  - The allocation of resources will be efficient if price is set to equal marginal cost.

Figure 9 Marginal-Cost Pricing for a Natural Monopoly



Regulation

- In practice, regulators will allow monopolists to keep some of the benefits from lower costs in the form of higher profit, a practice that requires some departure from marginal-cost pricing.

Public Ownership

- Rather than regulating a natural monopoly that is run by a private firm, the government can run the monopoly by itself (e.g. in India, the government runs the Railways and Postal Service).

Doing Nothing

- Government can do nothing at all if the market failure is deemed small compared to the imperfections of public policies.

PRICE DISCRIMINATION

- *Price discrimination* is the business practice of selling the same good at different prices to different customers, even though the costs for producing for the two customers are the same.

The Analytics of Price Discrimination

- Price discrimination is not possible when a good is sold in a competitive market since there are many firms all selling at the market price. In order to price discriminate, the firm must have some *market power*.
- Perfect Price Discrimination
  - Perfect price discrimination refers to the situation when the monopolist knows exactly the willingness to pay of each customer and can charge each customer a different price.

The Analytics of Price Discrimination

- Two important effects of price discrimination:
  - It can increase the monopolist's profits.
  - It can reduce deadweight loss.

Figure 10 Welfare with and without Price Discrimination

(a) Monopolist with Single Price

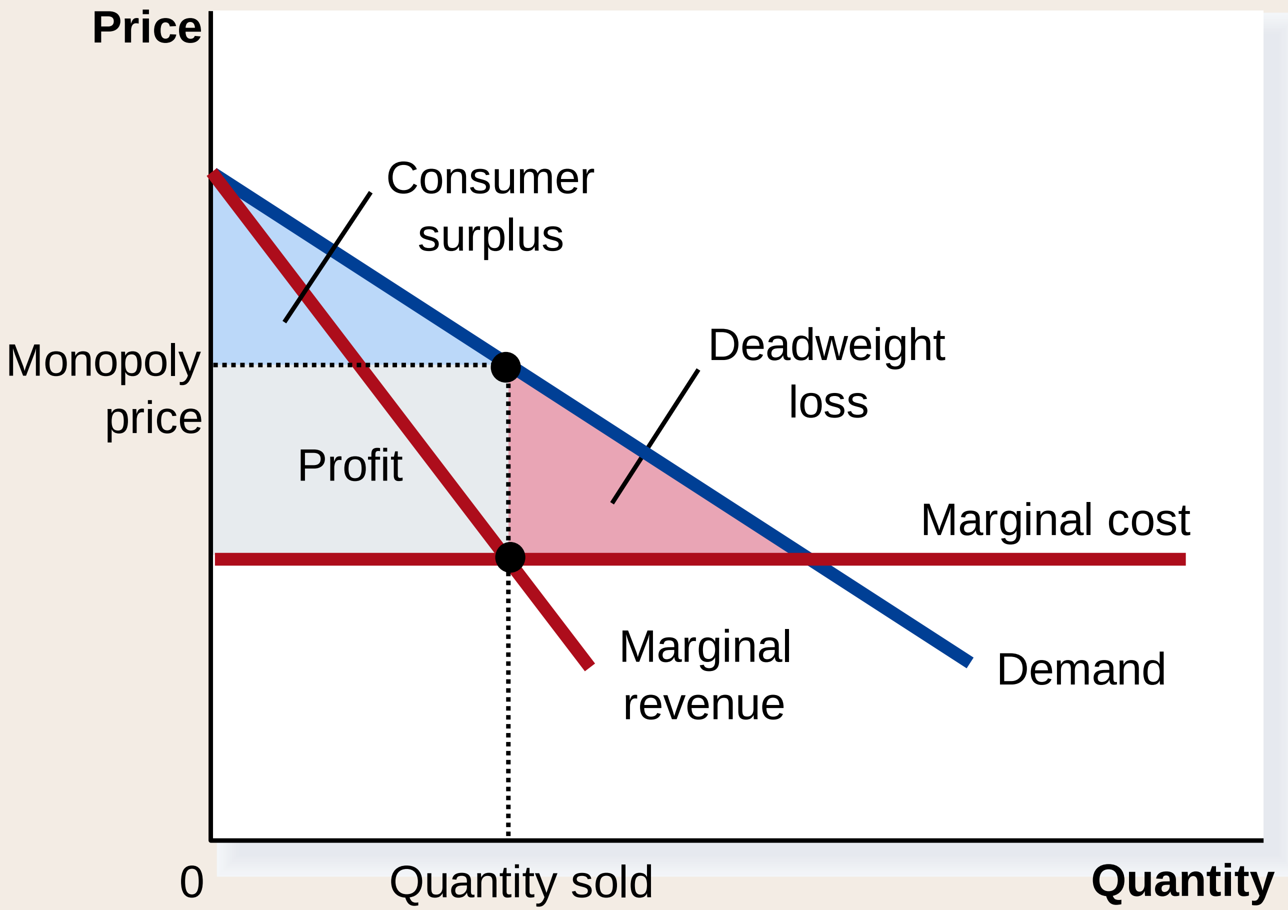
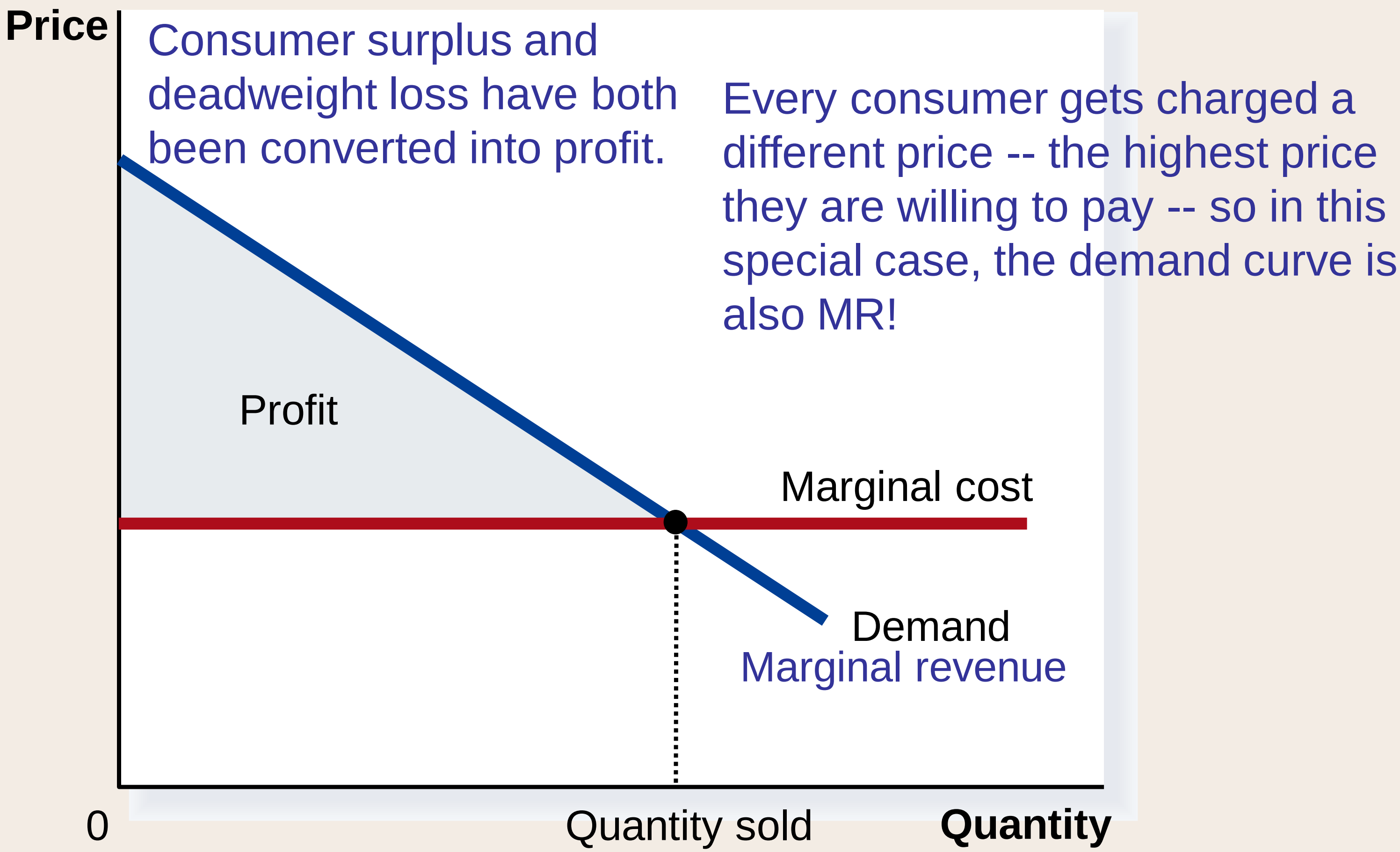


Figure 10 Welfare with and without Price Discrimination

(b) Monopolist with <u>Perfect</u> Price Discrimination



Examples of Price Discrimination

- Movie tickets
- Airline prices
- Discount coupons
- Financial aid
- Quantity discounts

CONCLUSION: THE PREVALENCE OF MONOPOLY

- How prevalent are the problems of monopolies?
  - Monopolies are common.
  - Most firms have some control over their prices because of differentiated products.
  - Firms with substantial monopoly power are rare.
  - Few goods are truly unique.

Table 2 Competition versus Monopoly: A Summary Comparison

	Competition	Monopoly
Similarities		
Goal of firms	Maximize profits	Maximize profits
Rule for maximizing	$MR = MC$	$MR = MC$
Can earn economic profits in the short run?	Yes	Yes
Differences		
Number of firms	Many	One
Marginal revenue	$MR = P$	$MR < P$
Price	$P = MC$	$P > MC$
Produces welfare-maximizing level of output?	Yes	No
Entry in long run?	Yes	No
Can earn economic profits in long run?	No	Yes
Price discrimination possible?	No	Yes

Monopolistic Competition

- Imperfect competition refers to those market structures that fall between perfect competition and pure monopoly.

Monopolistic Competition

- Types of Imperfectly Competitive Markets
  - *Monopolistic Competition*
    - Many firms selling products that are similar but not identical.
  - Oligopoly
    - Only a few sellers, each offering a similar or identical product to the others.

Monopolistic Competition

- Markets that have some features of competition and some features of monopoly.
- Attributes of monopolistic competition:
  - Many sellers
  - Product differentiation
  - Free entry and exit

Monopolistic Competition

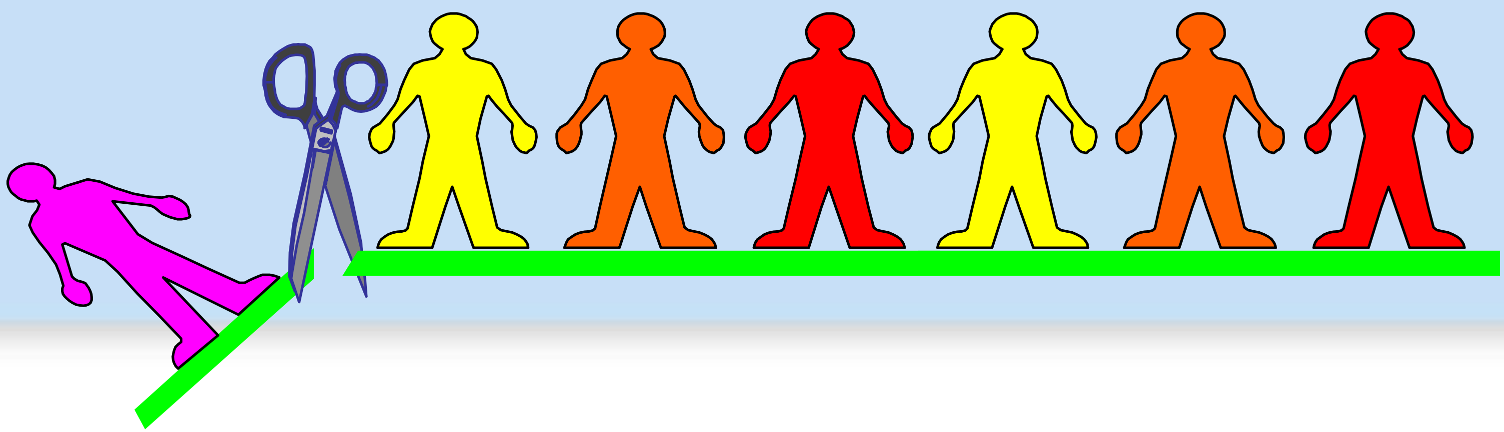
- Many Sellers
  - There are many firms competing for the same group of customers.
    - Product examples include books, CDs, movies, computer games, restaurants, piano lessons, cookies, furniture, etc.

Monopolistic Competition

- Product Differentiation
  - Each firm produces a product that is at least *slightly different* from those of other firms.
  - Rather than being a price taker, each firm faces a *downward-sloping demand curve*.

Monopolistic Competition

- Free Entry or Exit
- Firms can enter or exit the market without restriction.
- The number of firms in the market adjusts until economic profits are zero.

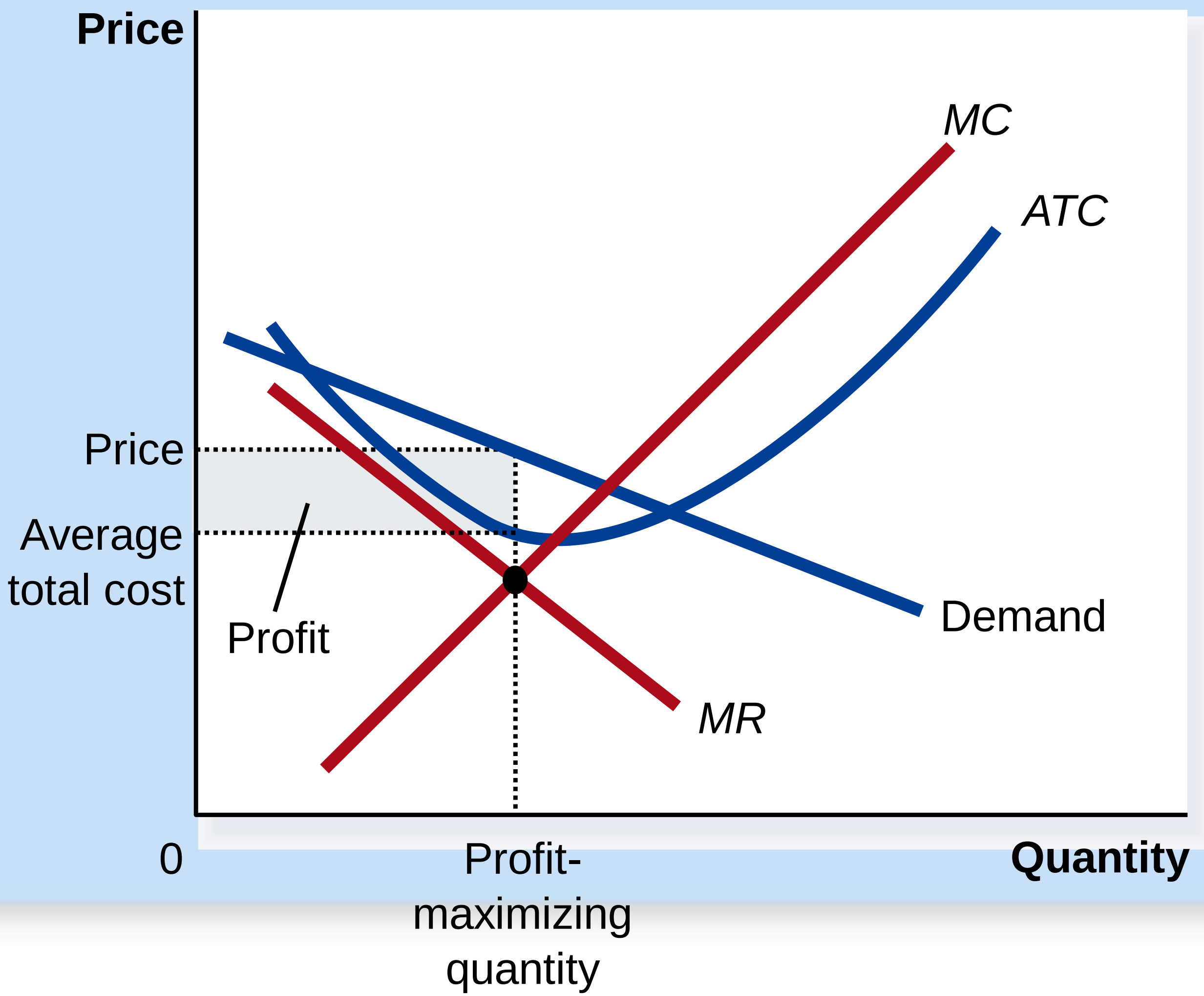


COMPETITION WITH DIFFERENTIATED PRODUCTS

- The Monopolistically Competitive Firm in the Short Run
  - Short-run economic profits encourage new firms to enter the market. This:
    - Increases the number of products offered.
    - Reduces demand faced by firms already in the market.
    - Incumbent firms' demand curves shift to the left.
    - Demand for the incumbent firms' products fall, and their profits decline.

Figure 1 Monopolistic Competition in the Short Run

(a) Firm Makes Profit

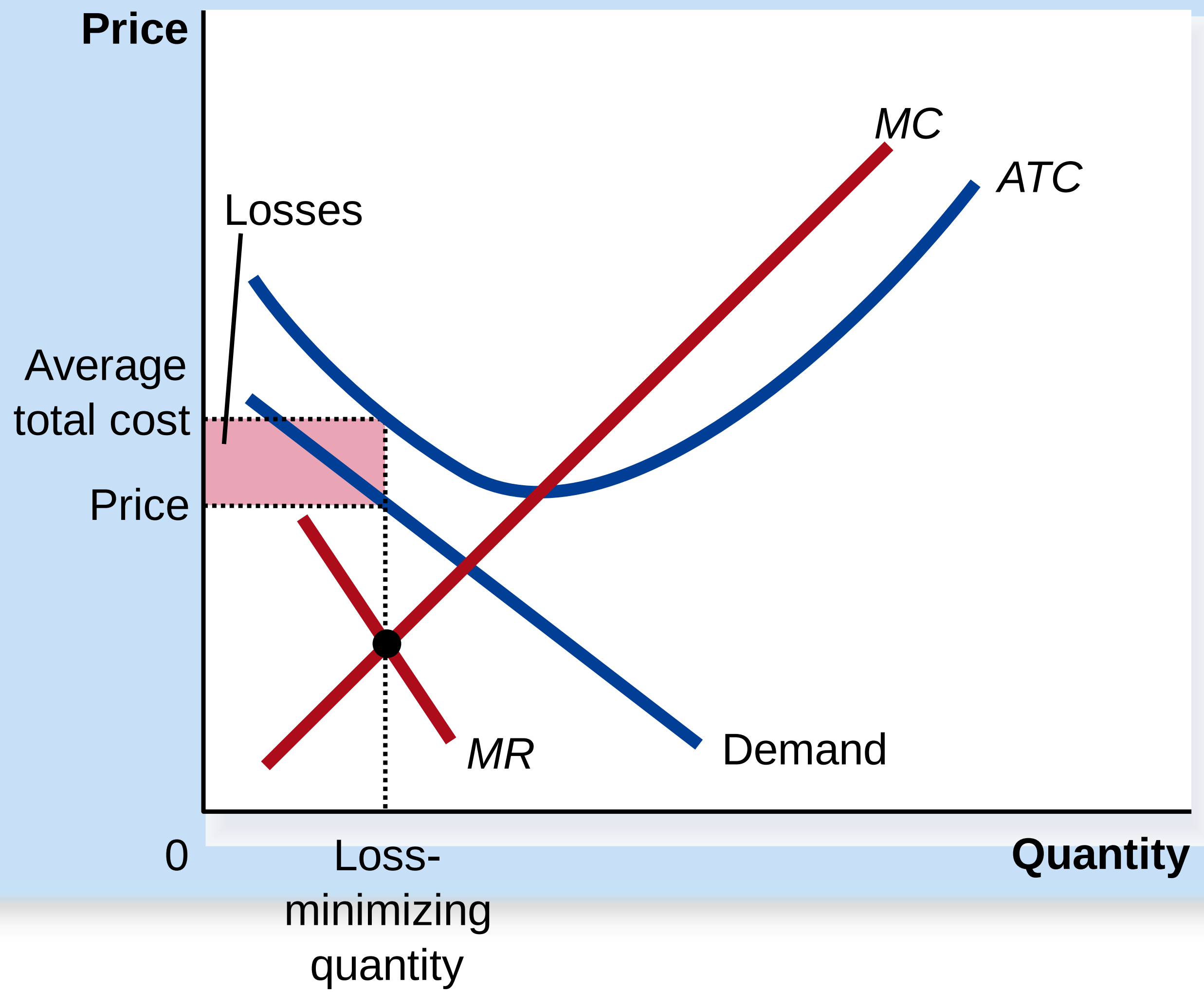


The Monopolistically Competitive Firm in the Short Run

- Short-run economic losses encourage firms to *exit the market*.
  - Decreases the number of products offered.
  - Increases demand faced by the remaining firms.
  - Shifts the remaining firms' demand curves to the right.
  - Increases the remaining firms' profits.

Figure 1 Monopolistic Competitors in the Short Run

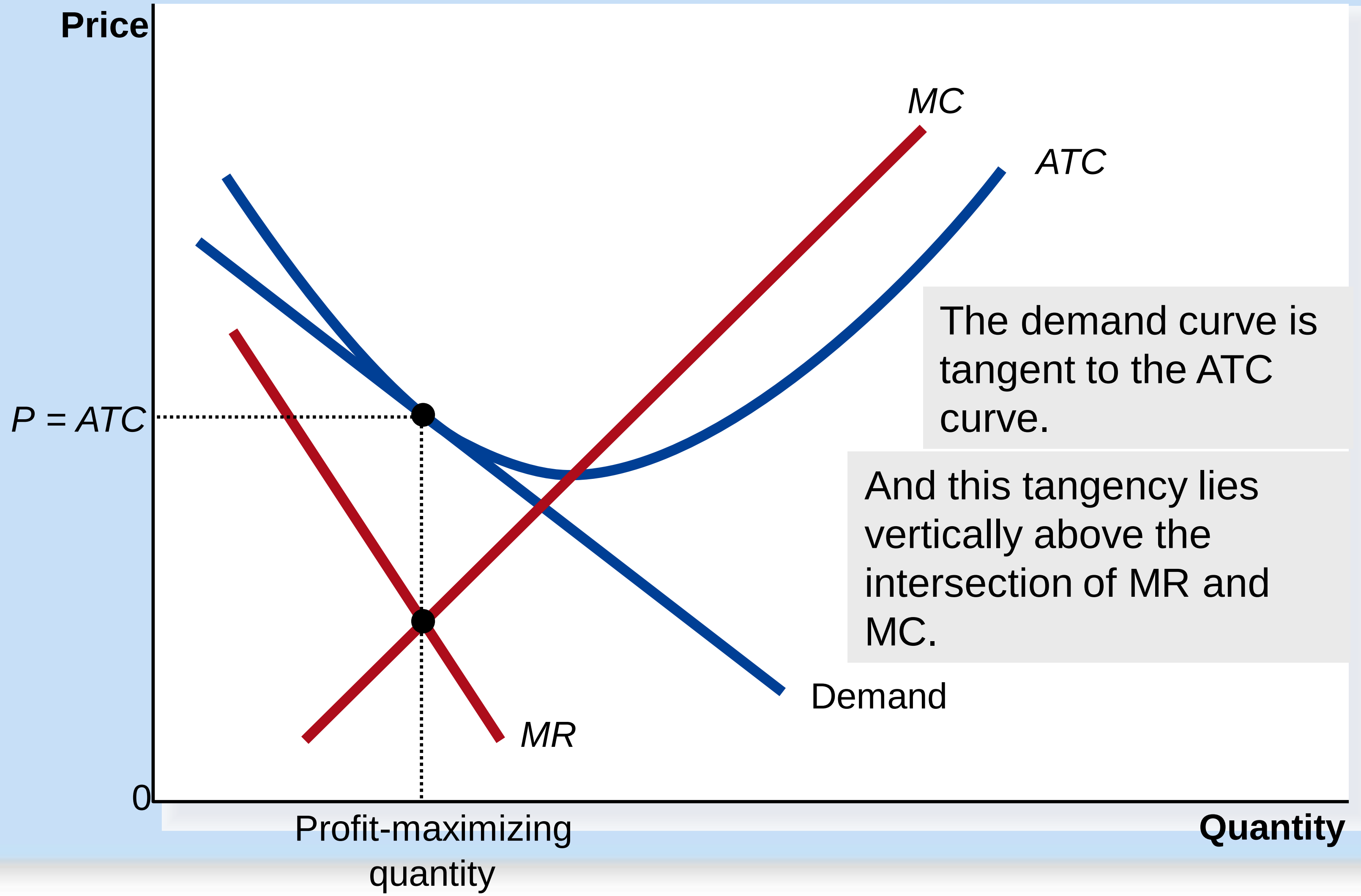
(b) Firm Makes Losses



The Long-Run Equilibrium

- Firms will enter and exit until the firms are making exactly zero economic profits.

Figure 2 A Monopolistic Competitor in the Long Run



The Long-Run Equilibrium

- Two Characteristics
  - As in a monopoly, price exceeds marginal cost.
    - Profit maximization requires marginal revenue to equal marginal cost.
    - The downward-sloping demand curve makes marginal revenue less than price.
  - As in a competitive market, price equals average total cost.
    - Free entry and exit drive economic profit to zero.

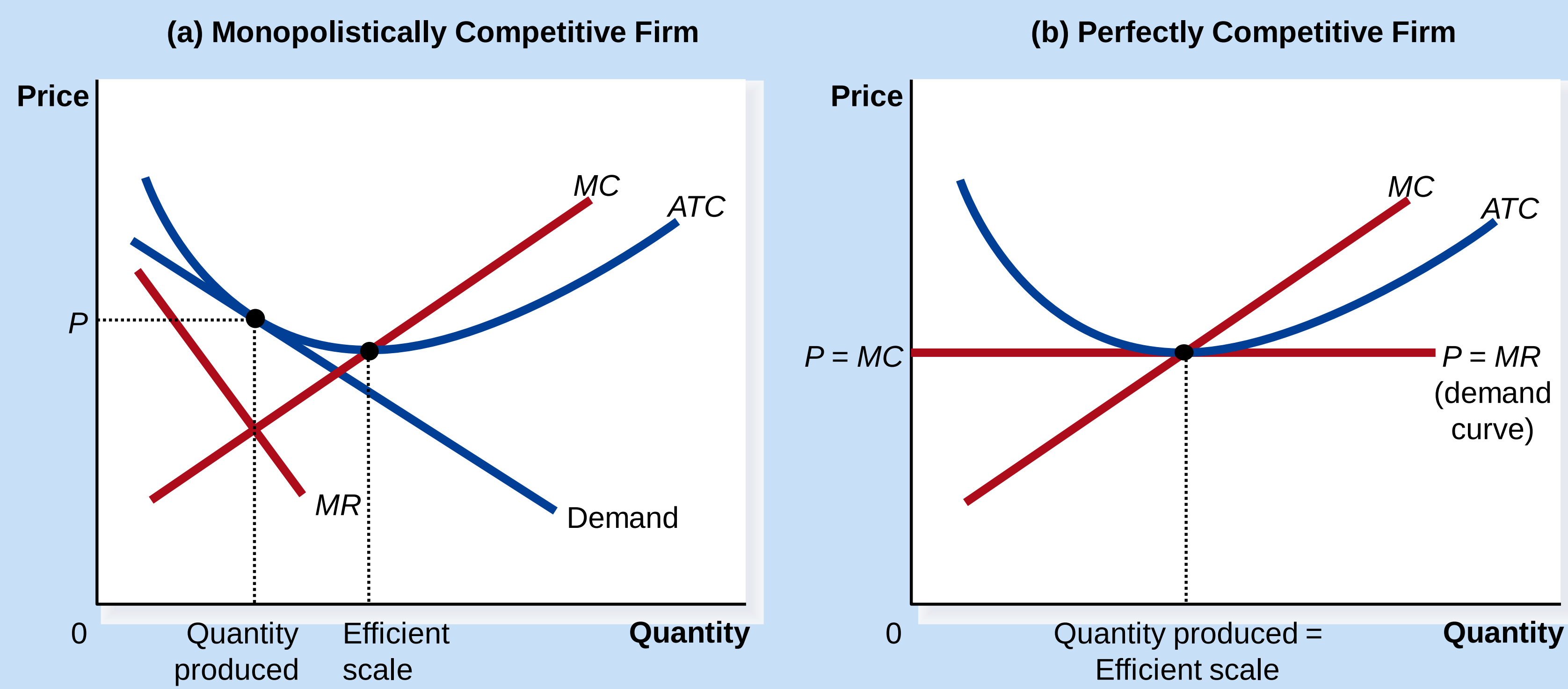
Monopolistic versus Perfect Competition

- There are two noteworthy differences between monopolistic and perfect competition:
  - Excess capacity
  - Markup over marginal cost

Monopolistic versus Perfect Competition

- Excess Capacity
  - There is no excess capacity in perfect competition in the long run.
  - Free entry results in competitive firms producing at the point where average total cost is minimized, which is the efficient scale of the firm.
  - There is excess capacity in monopolistic competition in the long run.
  - In monopolistic competition, output is less than the efficient scale of perfect competition.

Figure 3 Monopolistic versus Perfect Competition



Monopolistic versus Perfect Competition

- Markup over Marginal Cost
  - For a competitive firm, price equals marginal cost.
  - For a monopolistically competitive firm, price exceeds marginal cost.
  - Because price exceeds marginal cost, an extra unit sold at the posted price means more profit for the monopolistically competitive firm.

Figure 3 Monopolistic versus Perfect Competition

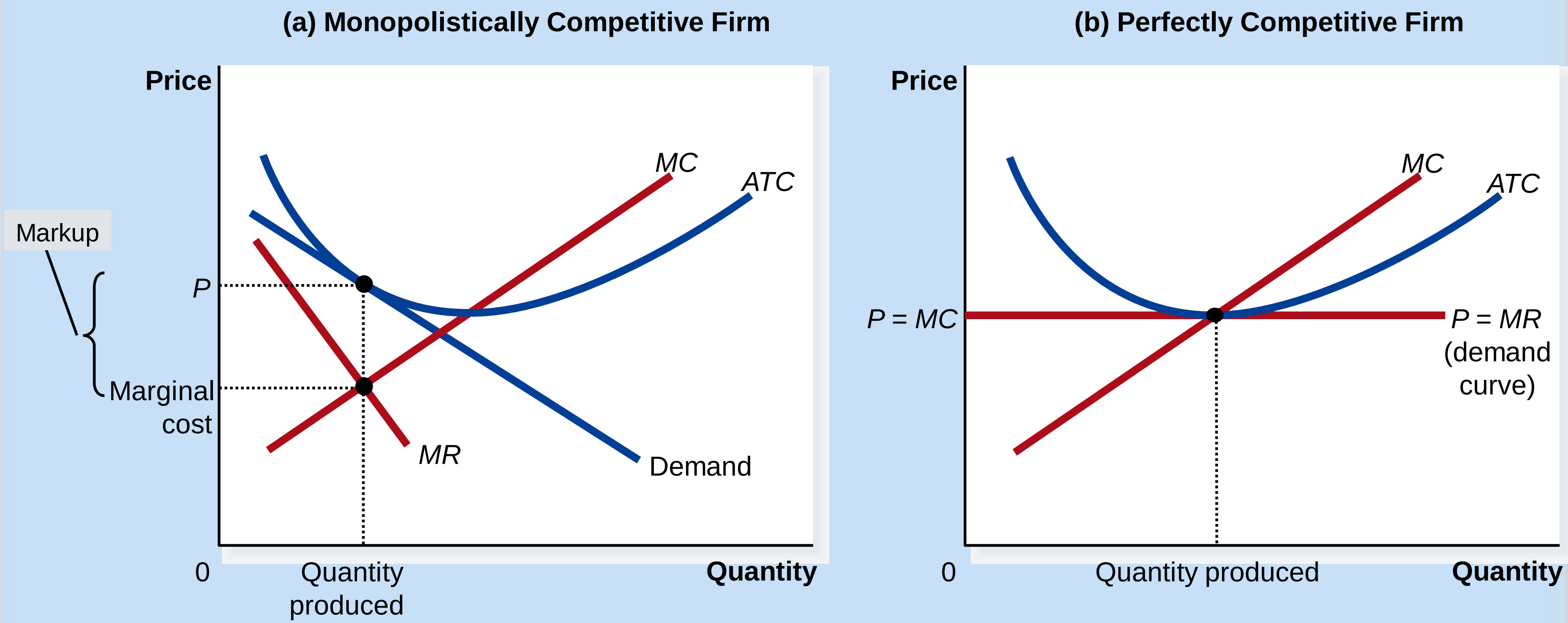
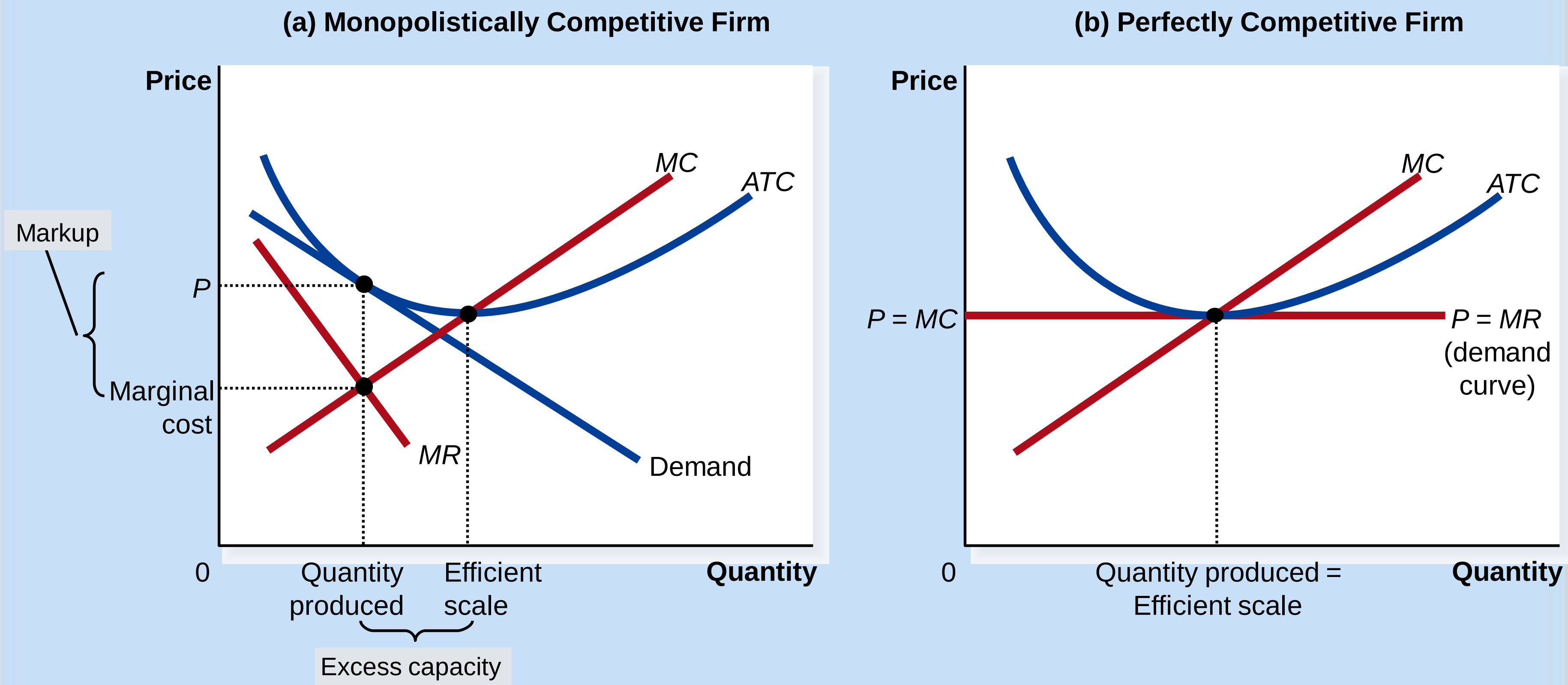


Figure 3 Monopolistic versus Perfect Competition



Monopolistic Competition and the Welfare of Society

- Monopolistic competition does not have all the desirable properties of perfect competition.

Monopolistic Competition and the Welfare of Society

- There is the normal deadweight loss of monopoly pricing in monopolistic competition caused by the markup of price over marginal cost.
- However, the administrative burden of regulating the pricing of all firms that produce differentiated products would be overwhelming.

Monopolistic Competition and the Welfare of Society

- Another way in which monopolistic competition may be socially inefficient is that the number of firms in the market may not be the “ideal” one. There may be too much or too little entry.

Monopolistic Competition and the Welfare of Society

- Externalities of entry include:
  - Product-variety externalities.
    - Because consumers get some consumer surplus from the introduction of a new product, entry of a new firm conveys a positive externality on consumers.
  - Business-stealing externalities.
    - Because other firms lose customers and profits from the entry of a new competitor, entry of a new firm imposes a negative externality on existing firms.

ADVERTISING

- When firms sell differentiated products and charge prices above marginal cost, each firm has an incentive to advertise in order to attract more buyers to its particular product.

ADVERTISING

- Firms that sell highly differentiated consumer goods typically spend between 10 and 20 percent of revenue on advertising.
- Overall, about 2 percent of total revenue, or over $200 billion a year, is spent on advertising.

The Debate over Advertising

- Critics of advertising argue that firms advertise in order to manipulate people’s tastes.
- They also argue that it impedes competition by implying that products are more different than they truly are.

The Debate over Advertising

- Defenders argue that advertising provides information to consumers
- They also argue that advertising increases competition by offering a greater variety of products and prices.

Advertising as a Signal of Quality

- The willingness of a firm to spend advertising dollars can be a *signal* to consumers about the quality of the product being offered.

Brand Names

- Critics argue that brand names cause consumers to perceive differences that do not really exist.

Brand Names

- Economists have argued that brand names may be a useful way for consumers to ensure that the goods they are buying are of high quality.
  - providing information about quality.
  - giving firms incentive to maintain high quality.

Table 1 Monopolistic Competition: Between Perfect Competition and Monopoly

	Market Structure		
	Perfect Competition	Monopolistic Competition	Monopoly
Features that all three market structures share			
Goal of firms	Maximize profits	Maximize profits	Maximize profits
Rule for maximizing	$MR = MC$	$MR = MC$	$MR = MC$
Can earn economic profits in the short run?	Yes	Yes	Yes
Features that monopolistic competition shares with monopoly			
Price taker?	Yes	No	No
Price	$P = MC$	$P > MC$	$P > MC$
Produces welfare-maximizing level of output?	Yes	No	No
Features that monopolistic competition shares with competition			
Number of firms	Many	Many	One
Entry in long run?	Yes	Yes	No
Can earn economic profits in long run?	No	No	Yes

BETWEEN MONOPOLY AND PERFECT COMPETITION

- Imperfect competition refers to those market structures that fall between perfect competition and pure monopoly.
- Imperfect competition includes industries in which firms have competitors but do not face so much competition that they are price takers.

BETWEEN MONOPOLY AND PERFECT COMPETITION

- Types of Imperfectly Competitive Markets
  - *Oligopoly*
    - Only a few sellers, each offering a similar or identical product to the others.
  - *Monopolistic Competition*
    - Many firms selling products that are similar but not identical.

MARKETS WITH ONLY A FEW SELLERS

- Because of the few sellers, the key feature of oligopoly is the tension between cooperation and self-interest.
- Characteristics of an Oligopoly Market
  - Few sellers offering similar or identical products
  - Interdependent firms
  - Best off cooperating and acting like a monopolist by producing a small quantity of output and charging a price above marginal cost

A Duopoly Example

- A duopoly is an oligopoly with only two members. It is the simplest type of oligopoly.

Table 1 The Demand Schedule for Water

Quantity (in gallons)	Price	Total Revenue (and total profit)
0	$120	$ 0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0

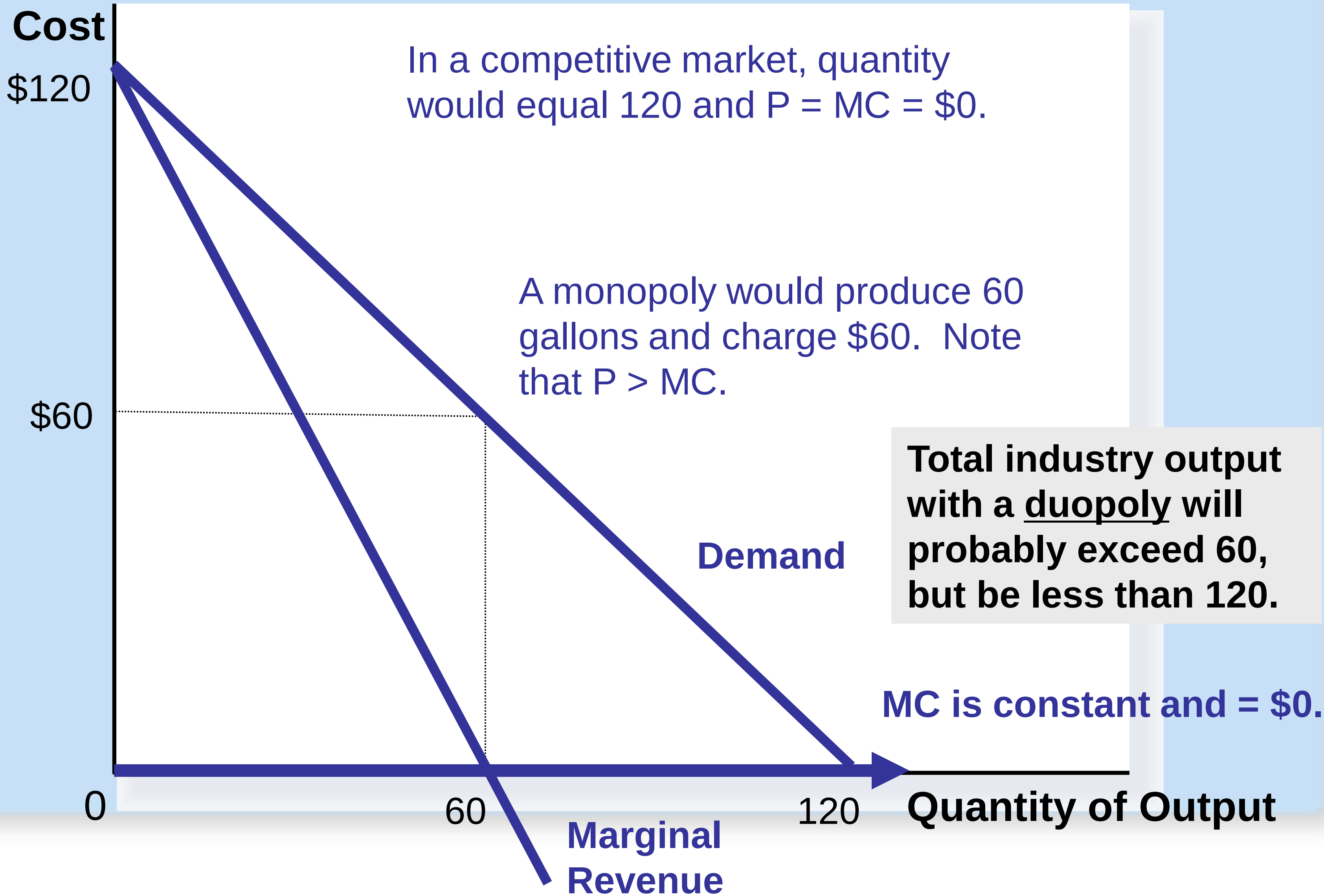
A Duopoly Example

- Price and Quantity Supplied
  - The price of water in a perfectly competitive market would be driven to where the marginal cost is zero:
    - $P = MC = \$0$
    - $Q = 120$ gallons
  - The price and quantity in a monopoly market would be where total profit is maximized:
    - $P = \$60$
    - $Q = 60$ gallons

A Duopoly Example

- Price and Quantity Supplied
  - The socially efficient quantity of water is 120 gallons, but a monopolist would produce only 60 gallons of water.
  - So what outcome then could be expected from duopolists?

The Market for Water



Competition, Monopolies, and Cartels

- The duopolists may agree on a monopoly outcome.
  - *Collusion*
    - An agreement among firms in a market about quantities to produce or prices to charge.
  - *Cartel*
    - A group of firms acting in unison.

Competition, Monopolies, and Cartels

- Although oligopolists would like to form cartels and earn monopoly profits, often that is not possible. Antitrust laws prohibit explicit agreements among oligopolists as a matter of public policy.

The Equilibrium for an Oligopoly

- A *Nash equilibrium* is a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the others have chosen.

The Equilibrium for an Oligopoly

- When firms in an oligopoly individually choose production to maximize profit, they produce quantity of output greater than the level produced by monopoly and less than the level produced by competition.
- The oligopoly price is less than the monopoly price but greater than the competitive price (which equals marginal cost).

Equilibrium for an Oligopoly

- Summary
  - Possible outcome if oligopoly firms pursue their own self-interests:
    - Joint output is greater than the monopoly quantity but less than the competitive industry quantity.
    - Market prices are lower than monopoly price but greater than competitive price.
    - Total profits are less than the monopoly profit.

How the Size of an Oligopoly Affects the Market Outcome

- How increasing the number of sellers affects the price and quantity:
  - The output effect: Because price is above marginal cost, selling more at the going price raises profits.
  - The price effect: Raising production will increase the amount sold, which will lower the price and the profit per unit on all units sold.

How the Size of an Oligopoly Affects the Market Outcome

- As the number of sellers in an oligopoly grows larger, an oligopolistic market looks more and more like a competitive market.
- The price approaches marginal cost, and the quantity produced approaches the socially efficient level.

Thank you

For your attention