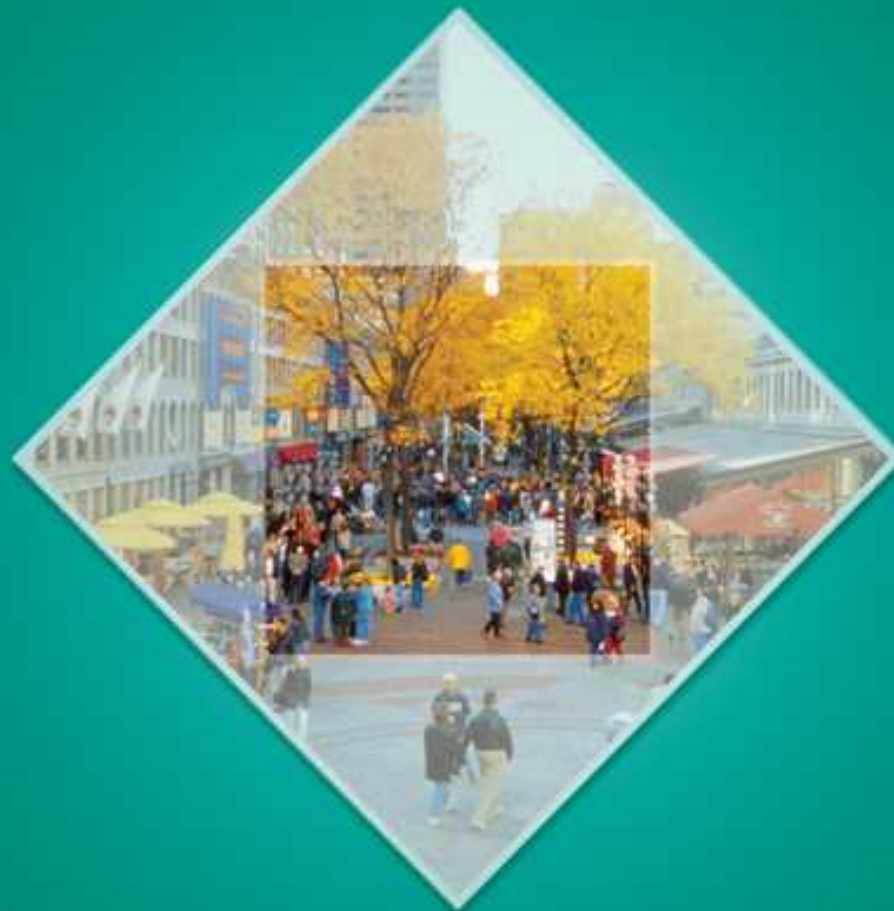


PARKIN  
MICROECONOMICS  
TENTH EDITION



13

MONOPOLY

A large white sign with the Google logo and directional information. The sign is outdoors, with a blue sky and green trees in the background. The Google logo is partially visible, showing the letters 'G', 'O', 'O', and 'g' in their characteristic colors. Below the logo, there is a grey square with a white upward-pointing arrow, followed by the text 'B40 & B43' and 'B41 & B42' below it.

Google

After studying this chapter,  
you will be able to:

- ◆ Explain how monopoly arises and distinguish between single-price monopoly and price-discriminating monopoly
- ◆ Explain how a single-price monopoly determines its output and price
- ◆ Compare the performance and efficiency of single-price monopoly and competition
- ◆ Explain how price discrimination increases profit
- ◆ Explain how monopoly regulation influences output, price, economic profit, and efficiency

eBay, Google, and Microsoft are dominant players in the markets they serve.

These firms are not like the firms in perfect competition.

How do firms that dominate their markets behave?

Do they charge prices that are too high and that damage the interest of consumers?

Students get lots of price breaks—at the movie theater and the hairdresser and on the airlines.

Why?

How can it be profit maximizing to offer lower prices to some customers?

# Monopoly and How It Arises

A **monopoly** is a market:

- That produces a good or service for which *no* close substitute exists
- In which there is *one* supplier that is protected from competition by a barrier preventing the entry of new firms.

# Monopoly and How It Arises

## How Monopoly Arises

A monopoly has two key features:

- No close substitutes
- Barriers to entry

### No Close Substitute

If a good has a close substitute, even if it is produced by only one firm, that firm effectively faces competition from the producers of the substitute.

A monopoly sells a good that has no close substitutes.

# Monopoly and How It Arises

## Barriers to Entry

A constraint that protects a firm from potential competitors are called **barriers to entry**.

Three types of barriers to entry are

- Natural
- Ownership
- Legal

# ◆ Monopoly and How It Arises

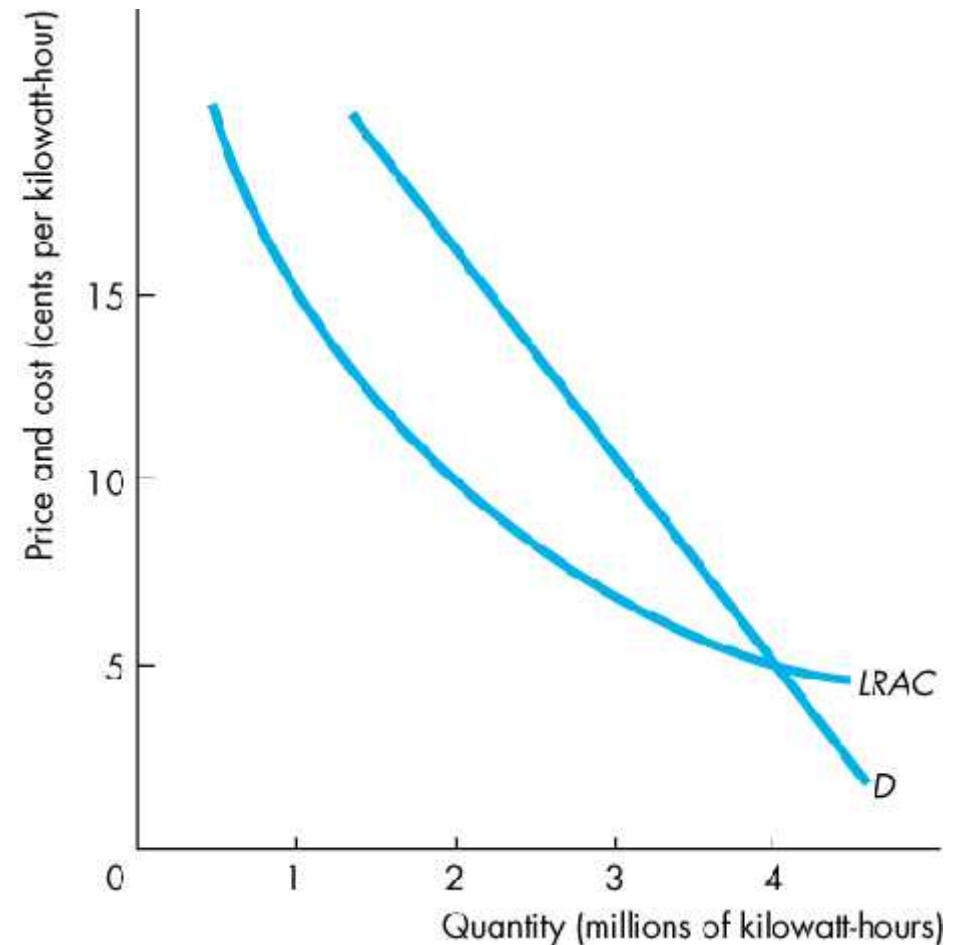


## Natural Barriers to Entry

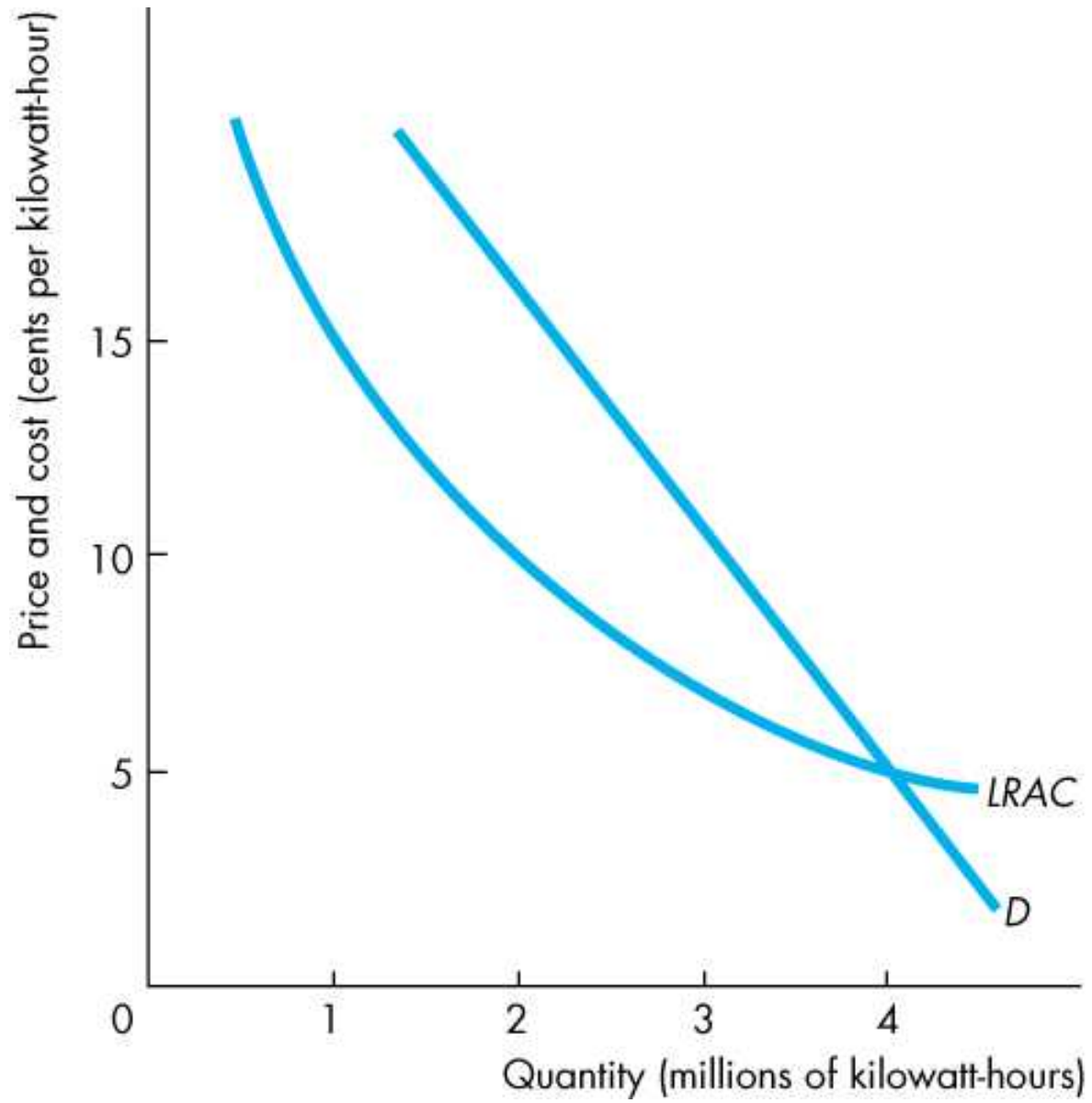
Natural barriers to entry create natural monopoly.

A **natural monopoly** is a market in which economies of scale enable one firm to supply the entire market at the lowest possible cost.

Figure 13.1 illustrates a natural monopoly.



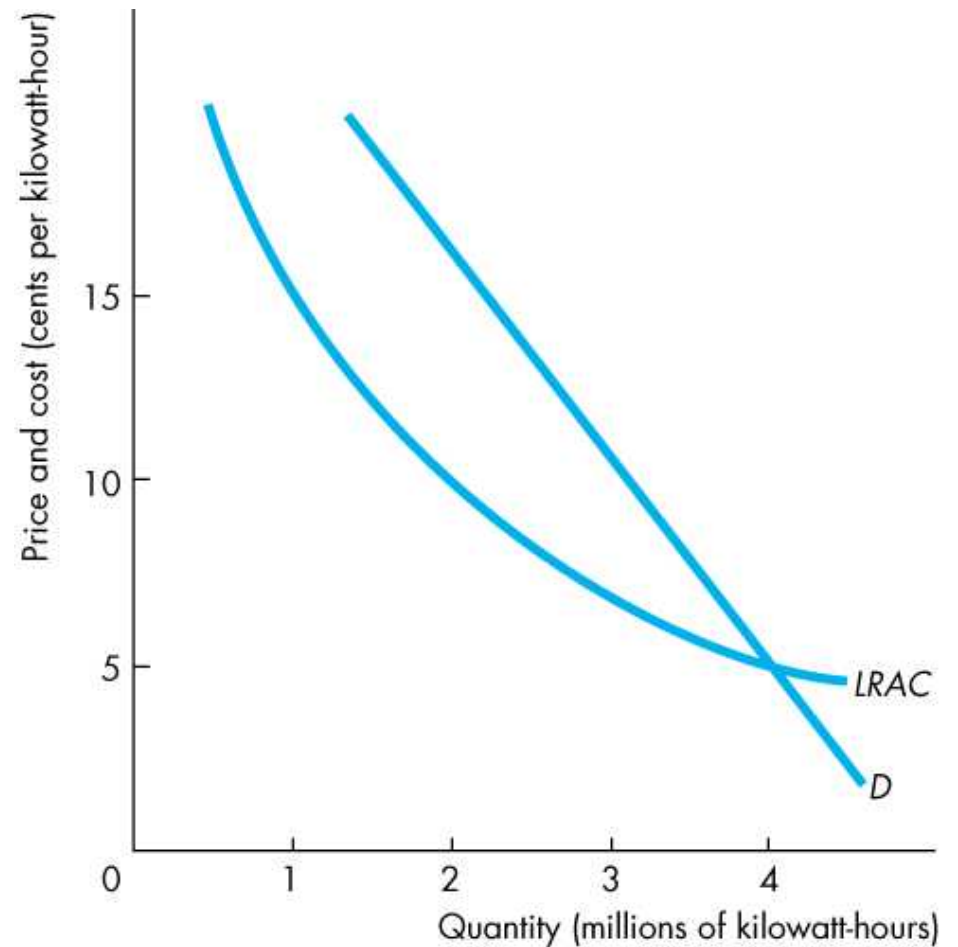




## ◆ Monopoly and How It Arises

One firm can produce 4 millions units of output at 5 cents per unit.

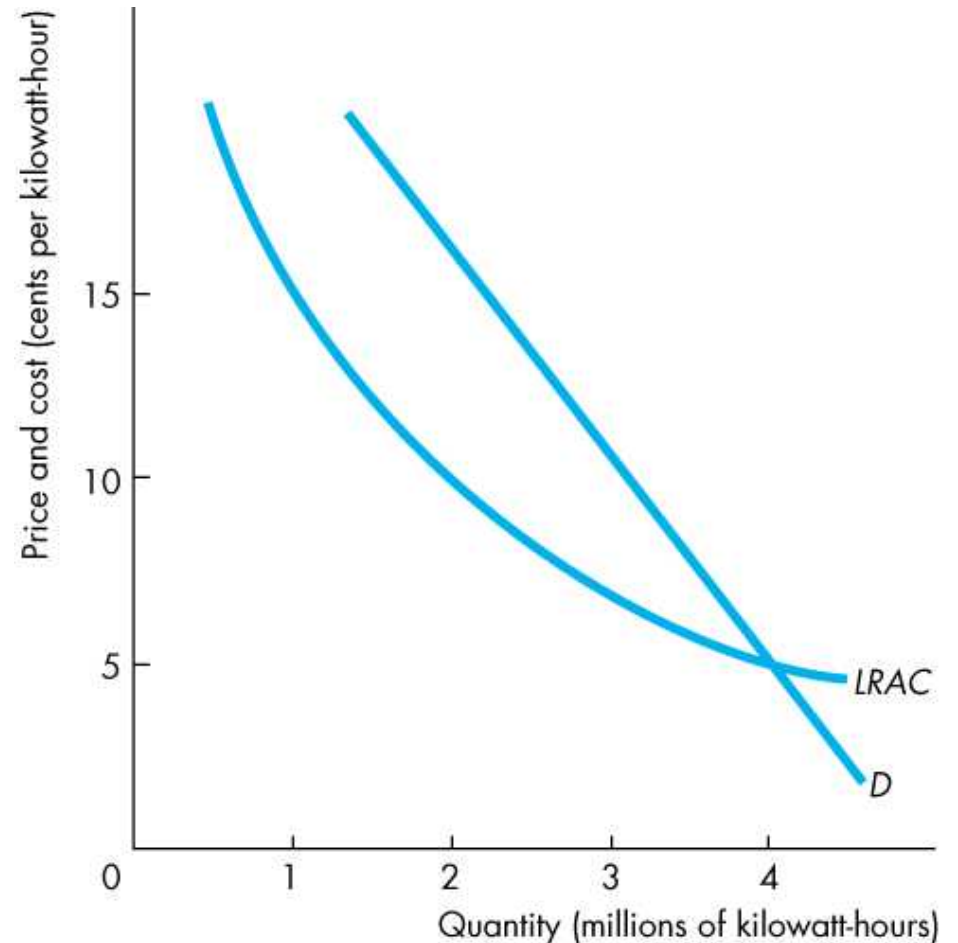
Two firms can produce 4 million units—2 units each—at 10 cents per unit.



## ◆ Monopoly and How It Arises

In a natural monopoly, economies of scale are so powerful that they are still being achieved even when the entire market demand is met.

The *LRAC* curve is still sloping downward when it meets the demand curve.



# Monopoly and How It Arises

## **Ownership Barriers to Entry**

An ownership barrier to entry occurs if one firm owns a significant portion of a key resource.

During the last century, De Beers owns 90 percent of the world's diamonds.

# Monopoly and How It Arises

## Legal Barriers to Entry

Legal barriers to entry create a legal monopoly.

A **legal monopoly** is a market in which competition and entry are restricted by the granting of a

- Public franchise (like the U.S. Postal Service, a public franchise to deliver first-class mail)
- Government license (like a license to practice law or medicine)
- Patent or copyright

# Monopoly and How It Arises

## Monopoly Price-Setting Strategies

For a monopoly firm to determine the quantity it sells, it must choose the appropriate price.

There are two types of monopoly price-setting strategies:

A **single-price monopoly** is a firm that must sell each unit of its output for the same price to all its customers.

**Price discrimination** is the practice of selling different units of a good or service for different prices. Many firms price discriminate, but not all of them are monopoly firms.

# A Single-Price Monopoly's Output and Price Decision

## Price and Marginal Revenue

A monopoly is a price setter, not a price taker like a firm in perfect competition.

The reason is that the demand for the monopoly's output is the market demand.

To sell a larger output, a monopoly must set a lower price.

## A Single-Price Monopoly's Output and Price Decision

Total revenue,  $TR$ , is the price,  $P$ , multiplied by the quantity sold,  $Q$ .

Marginal revenue,  $MR$ , is the change in total revenue that results from a one-unit increase in the quantity sold.

For a single-price monopoly, marginal revenue is less than price at each level of output. That is,

$$MR < P.$$

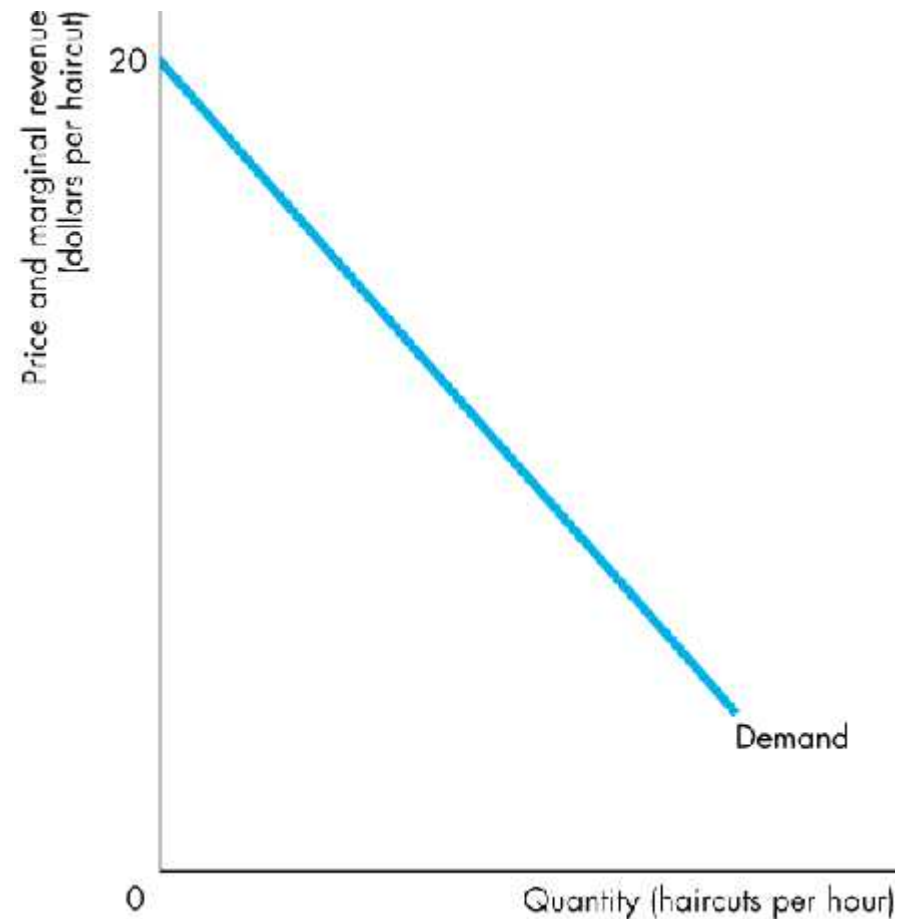


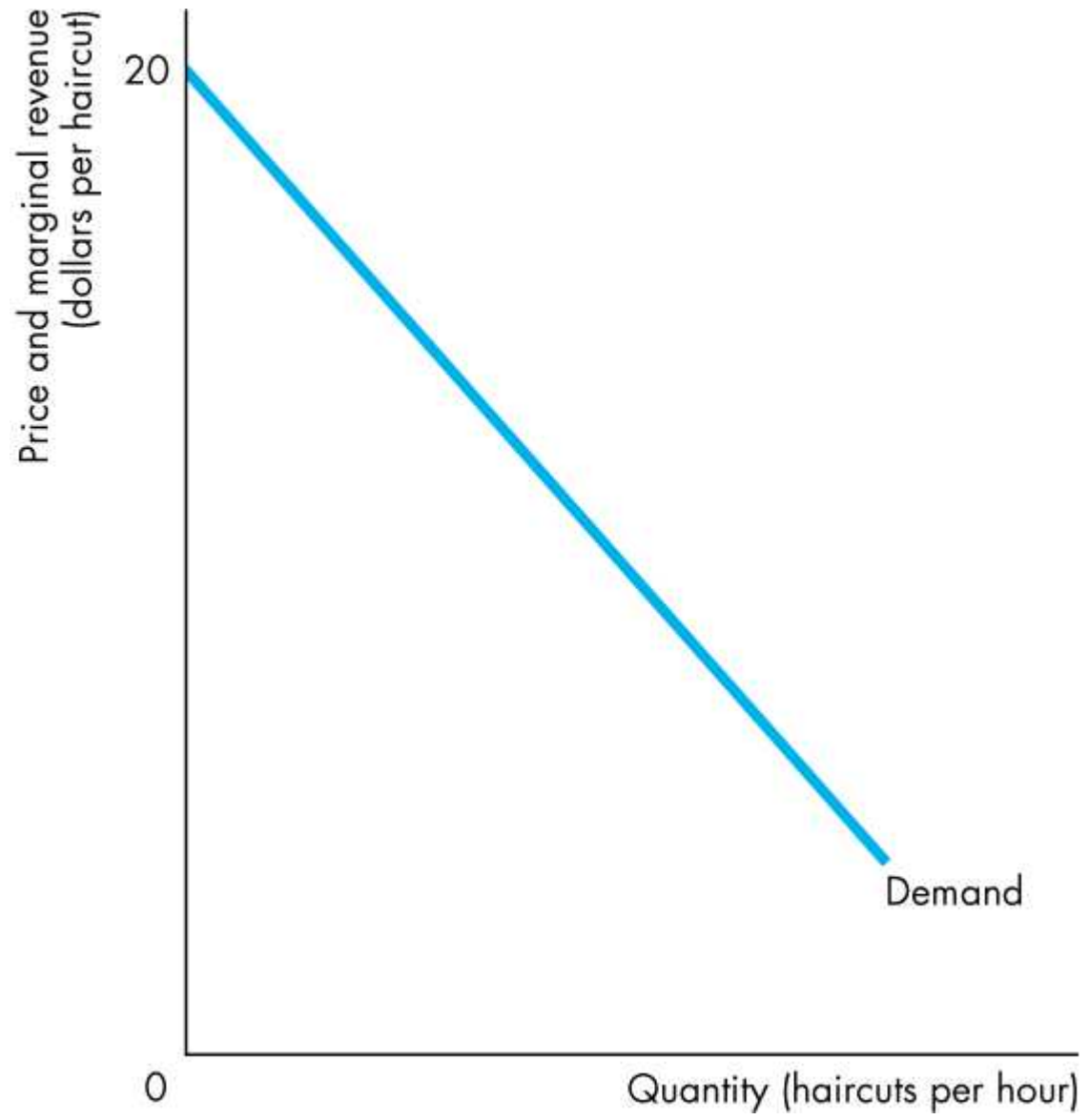
# A Single-Price Monopoly's Output and Price Decision



Figure 13.2 illustrates the relationship between price and marginal revenue and derives the marginal revenue curve.

Suppose the monopoly sets a price of \$16 and sells 2 units.







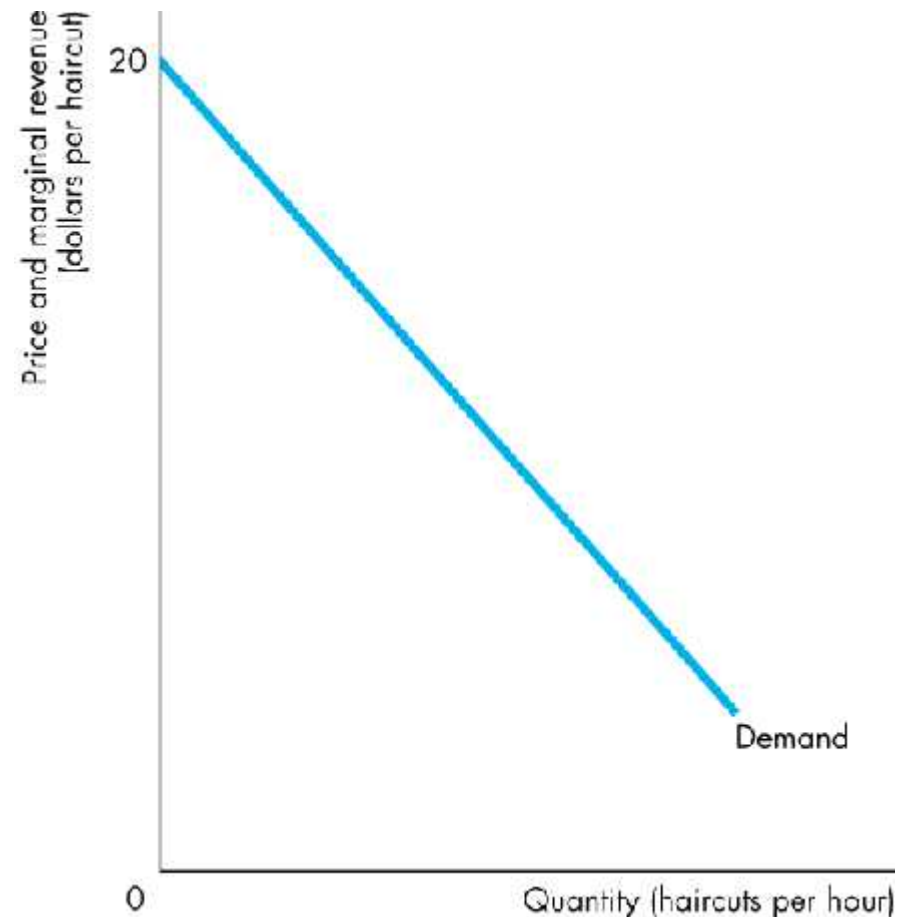
## A Single-Price Monopoly's Output and Price Decision

Now suppose the firm cuts the price to \$14 to sell 3 units.

It loses \$4 of total revenue on the 2 units it was selling at \$16 each.

And it gains \$14 of total revenue on the 3rd unit.

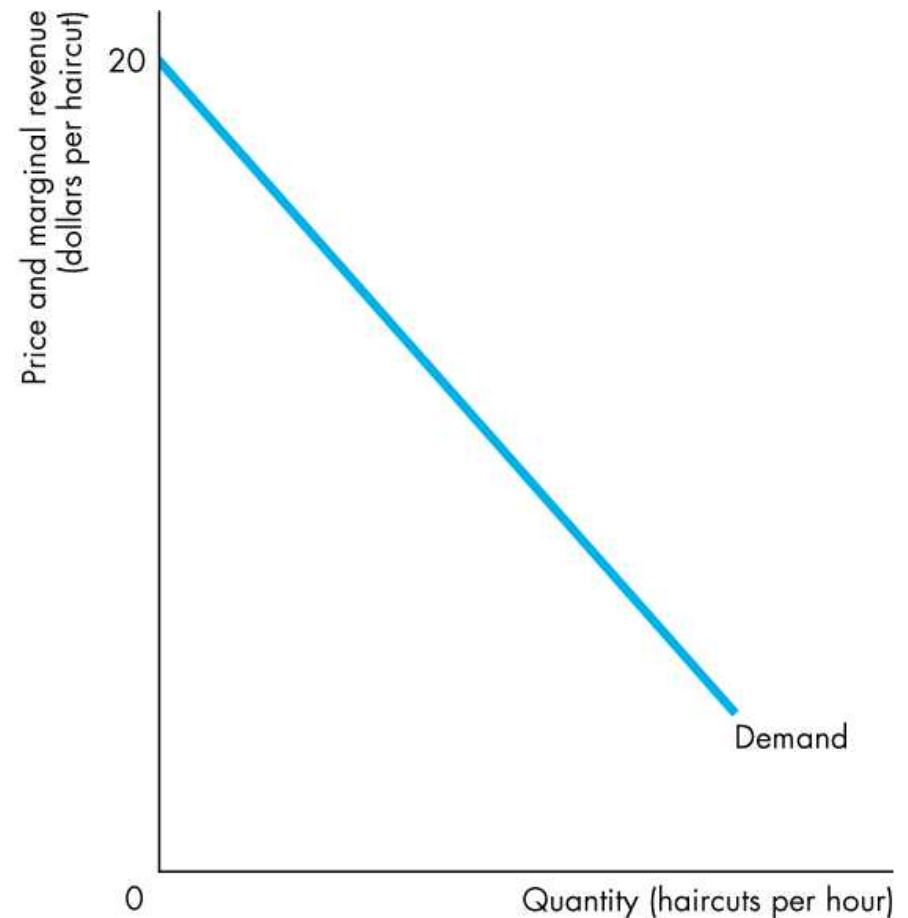
So total revenue increases by \$10, which is marginal revenue.



## A Single-Price Monopoly's Output and Price Decision

The marginal revenue curve,  $MR$ , passes through the red dot midway between 2 and 3 units and at \$10.

You can see that  $MR < P$  at each quantity.



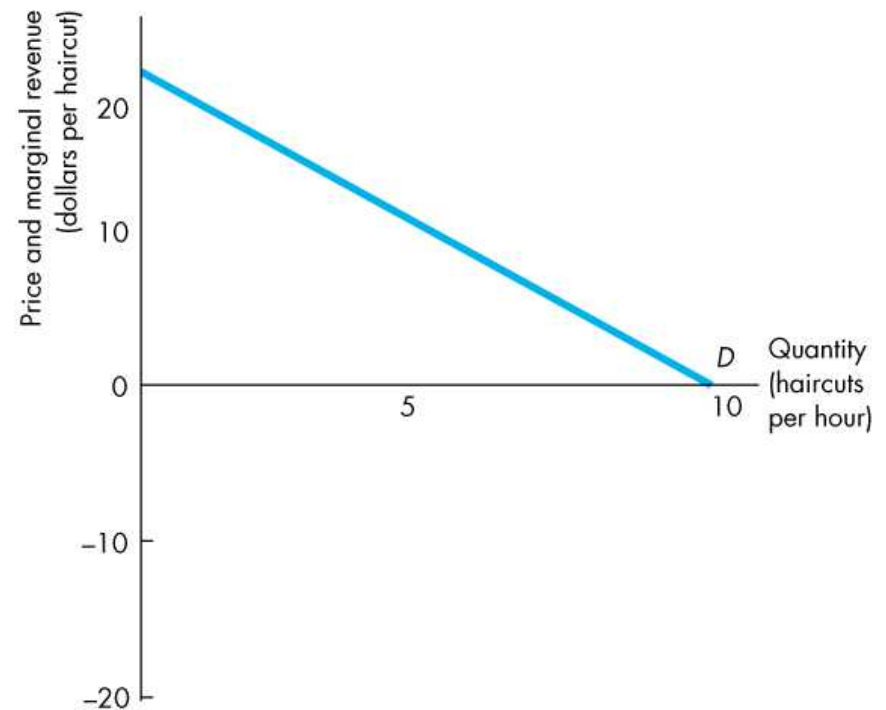
# A Single-Price Monopoly's Output and Price Decision



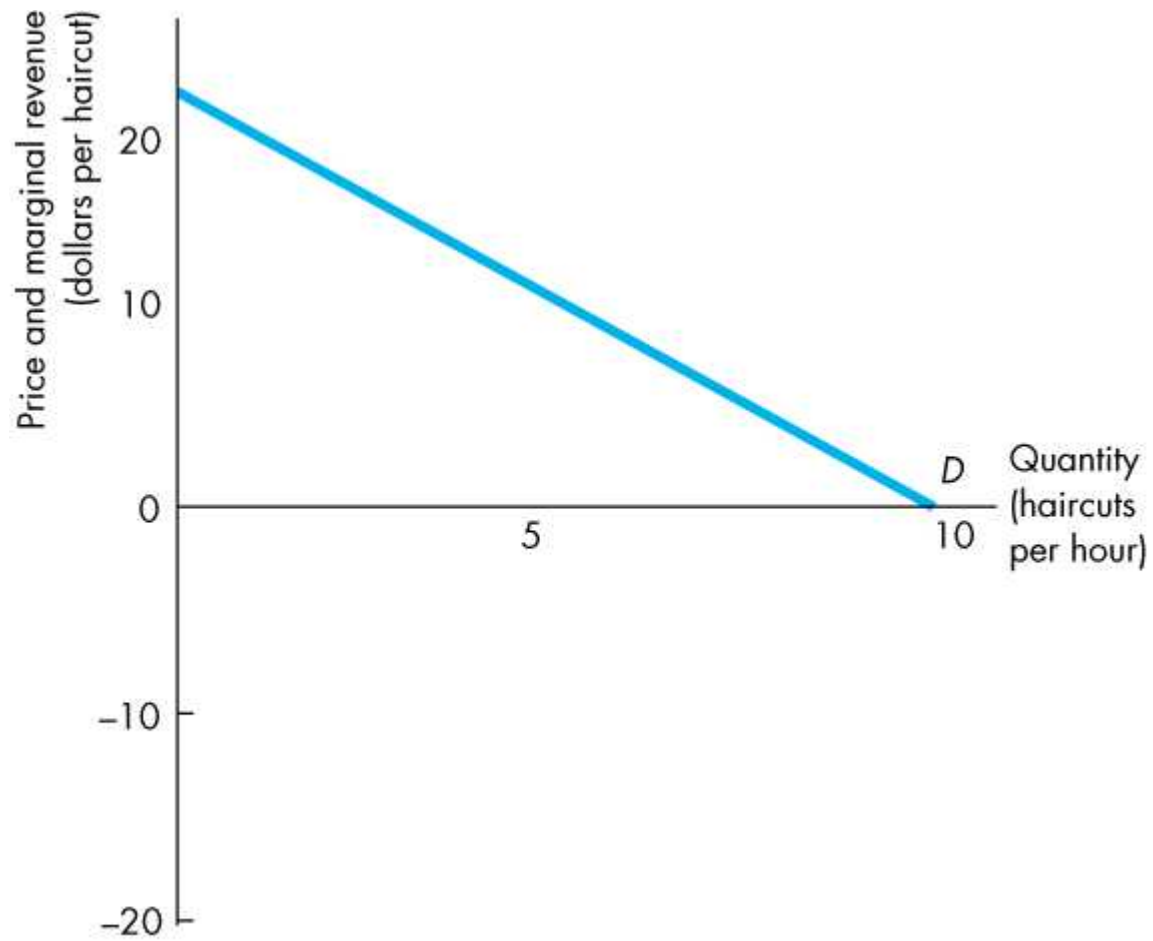
## Marginal Revenue and Elasticity

A single-price monopoly's marginal revenue is related to the elasticity of demand for its good:

If demand is elastic, a fall in price brings an increase in total revenue.



(a) Demand and marginal revenue curves



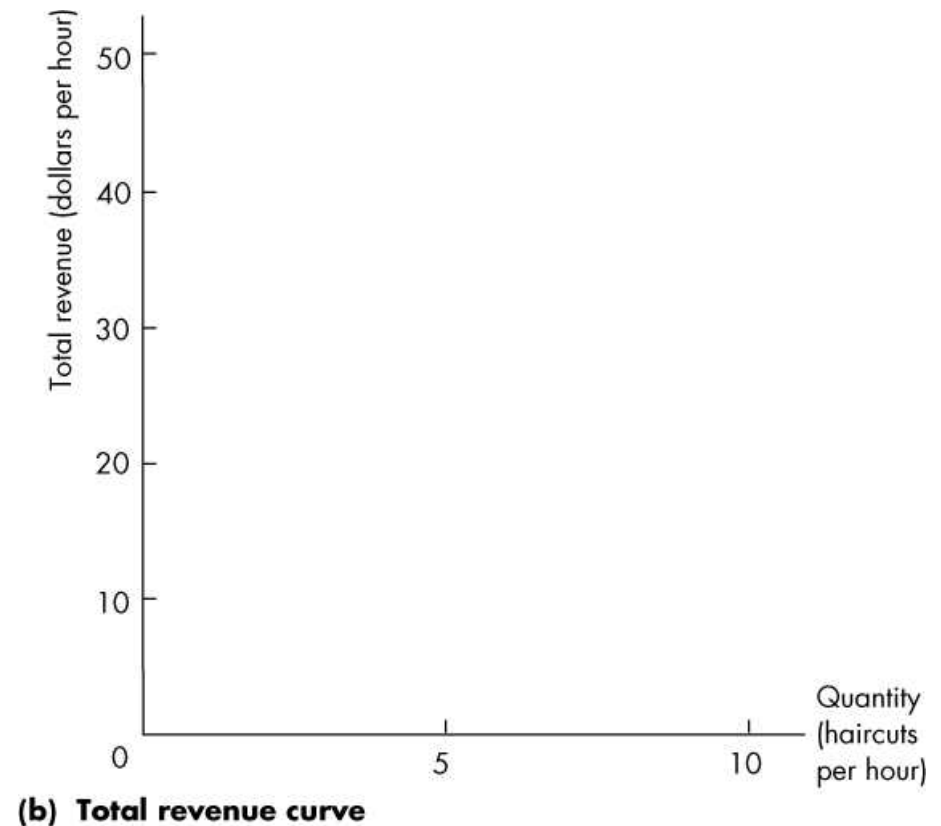
**(a) Demand and marginal revenue curves**

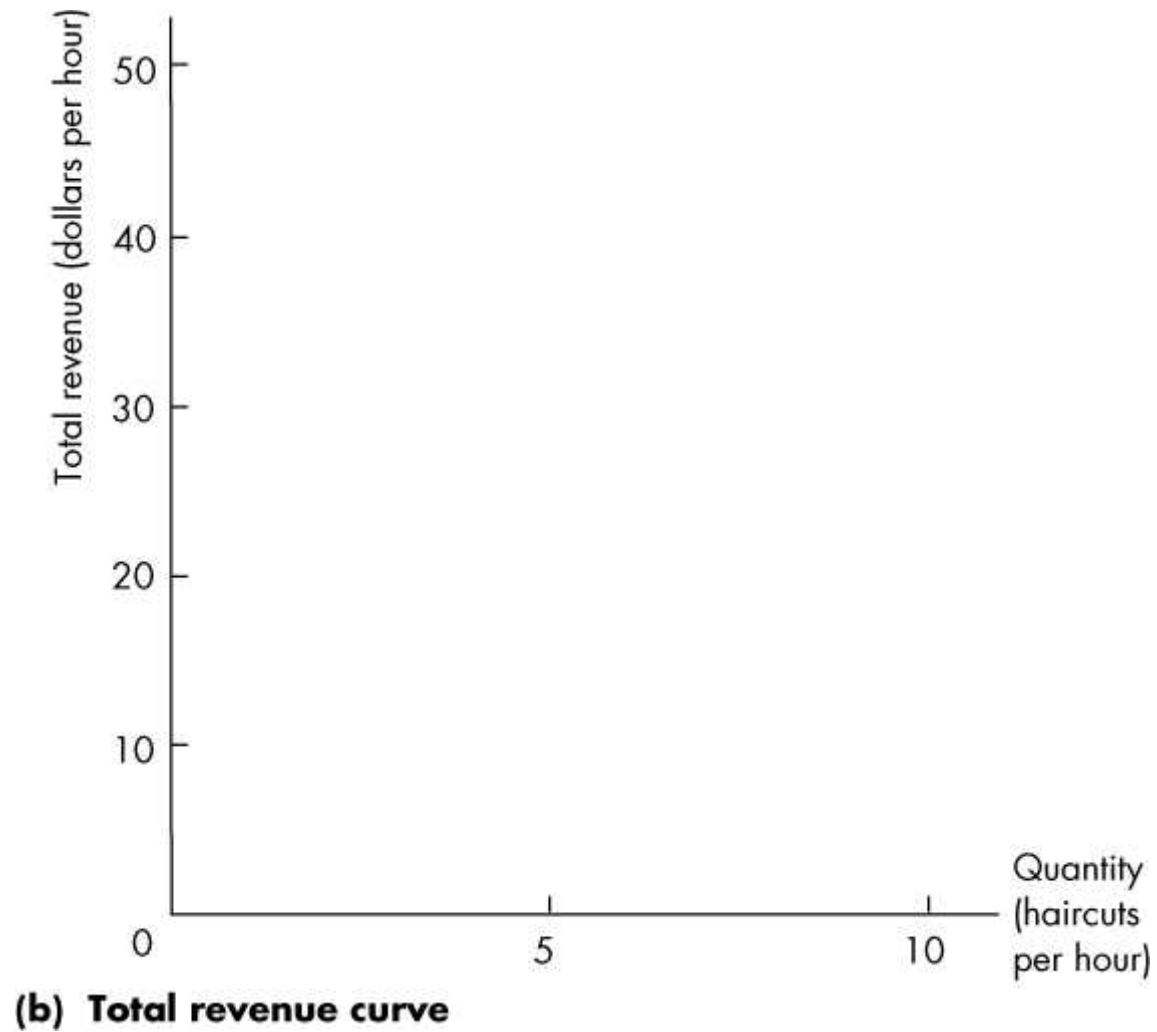
# A Single-Price Monopoly's Output and Price Decision



The increase in revenue from the greater quantity sold outweighs the decrease in revenue from the lower price per unit, and  $MR$  is positive.

As the price falls, total revenue increases.





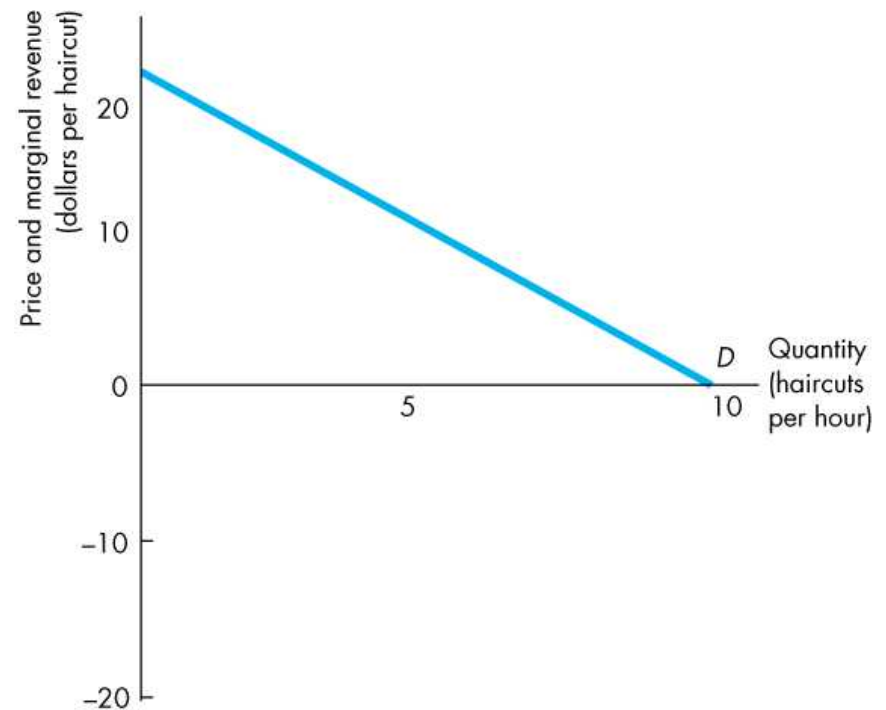


# A Single-Price Monopoly's Output and Price Decision

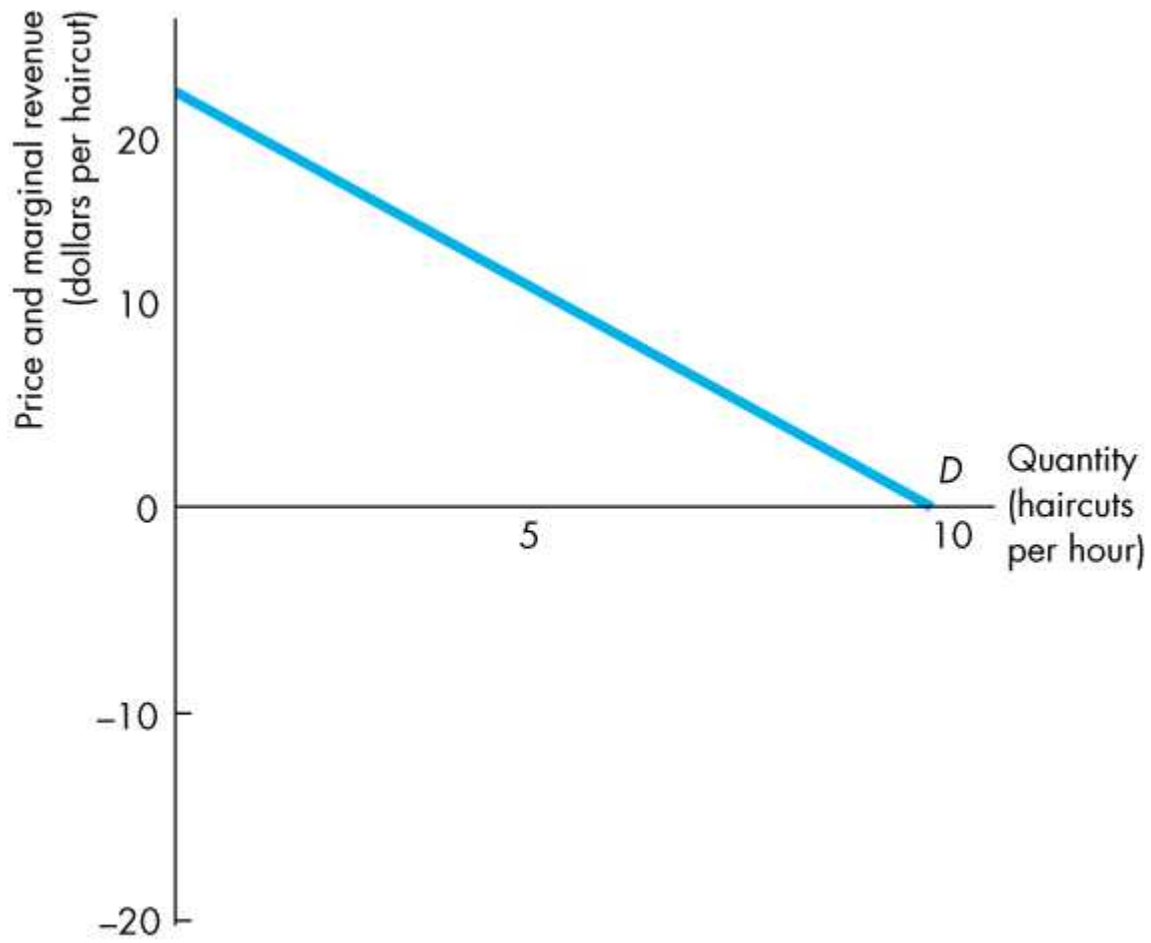


If demand is inelastic, a fall in price brings a decrease in total revenue.

The rise in revenue from the increase in quantity sold is outweighed by the fall in revenue from the lower price per unit, and  $MR$  is negative.



(a) Demand and marginal revenue curves

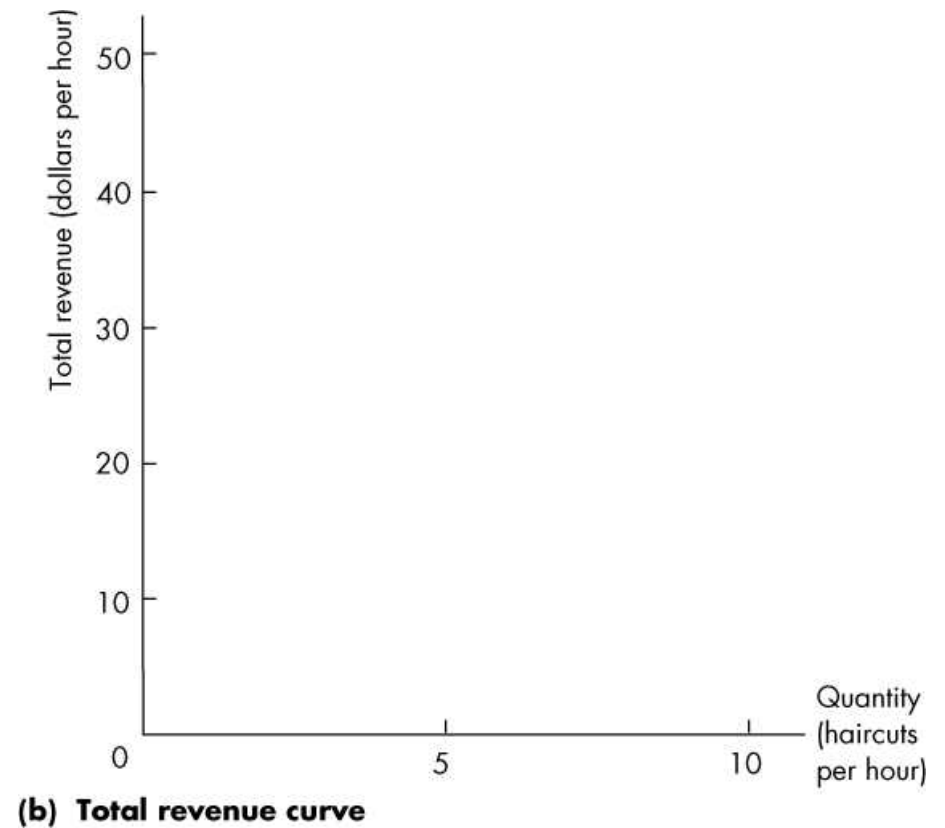


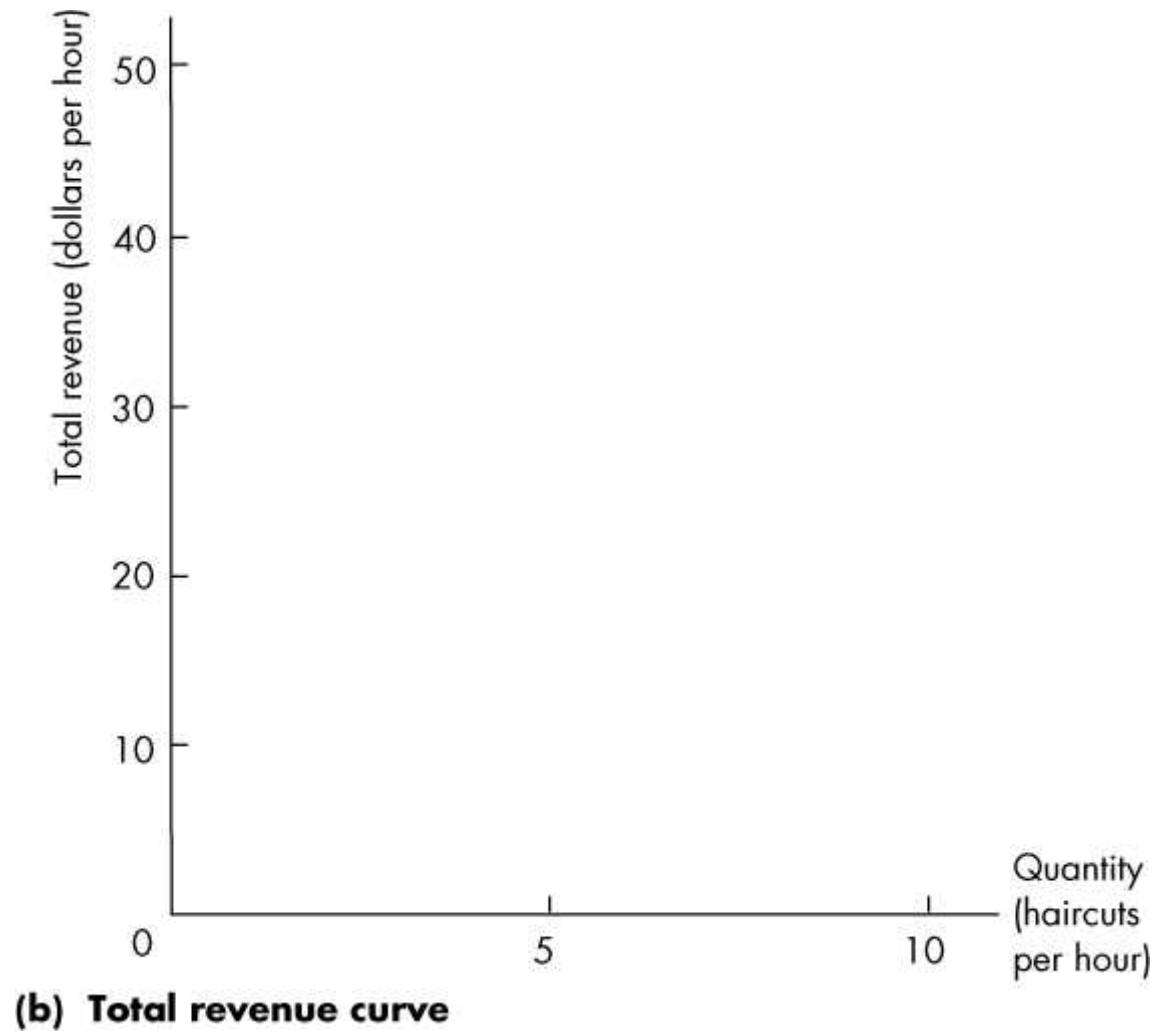
**(a) Demand and marginal revenue curves**

# A Single-Price Monopoly's Output and Price Decision



As the price falls, total revenue decreases.





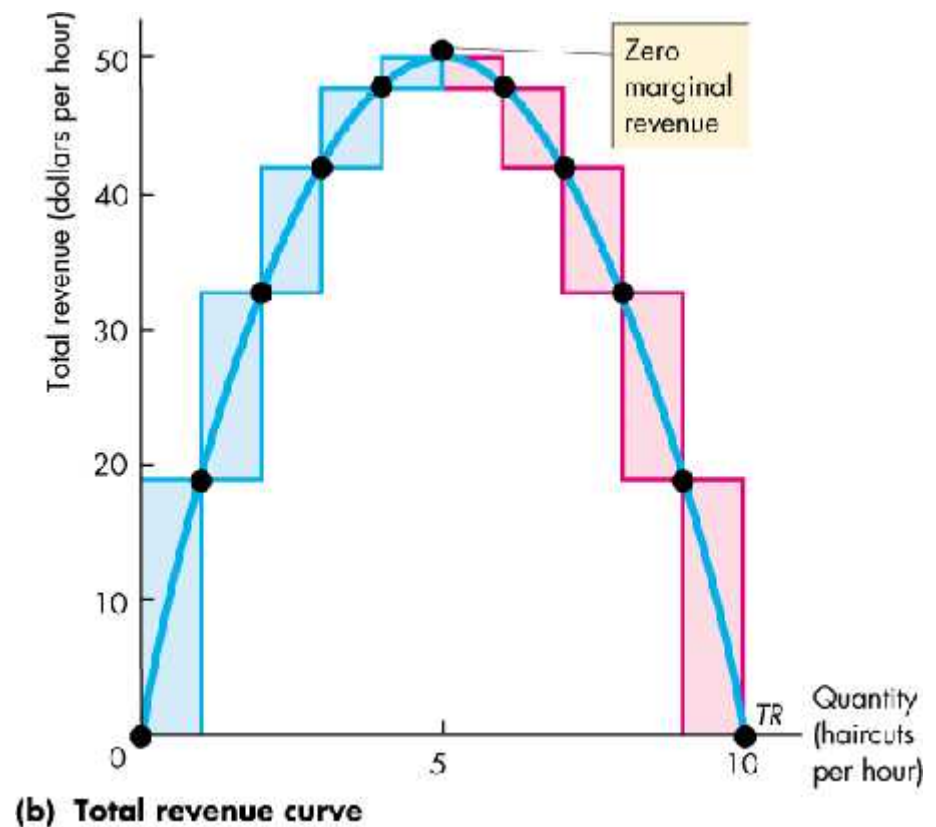
# A Single-Price Monopoly's Output and Price Decision

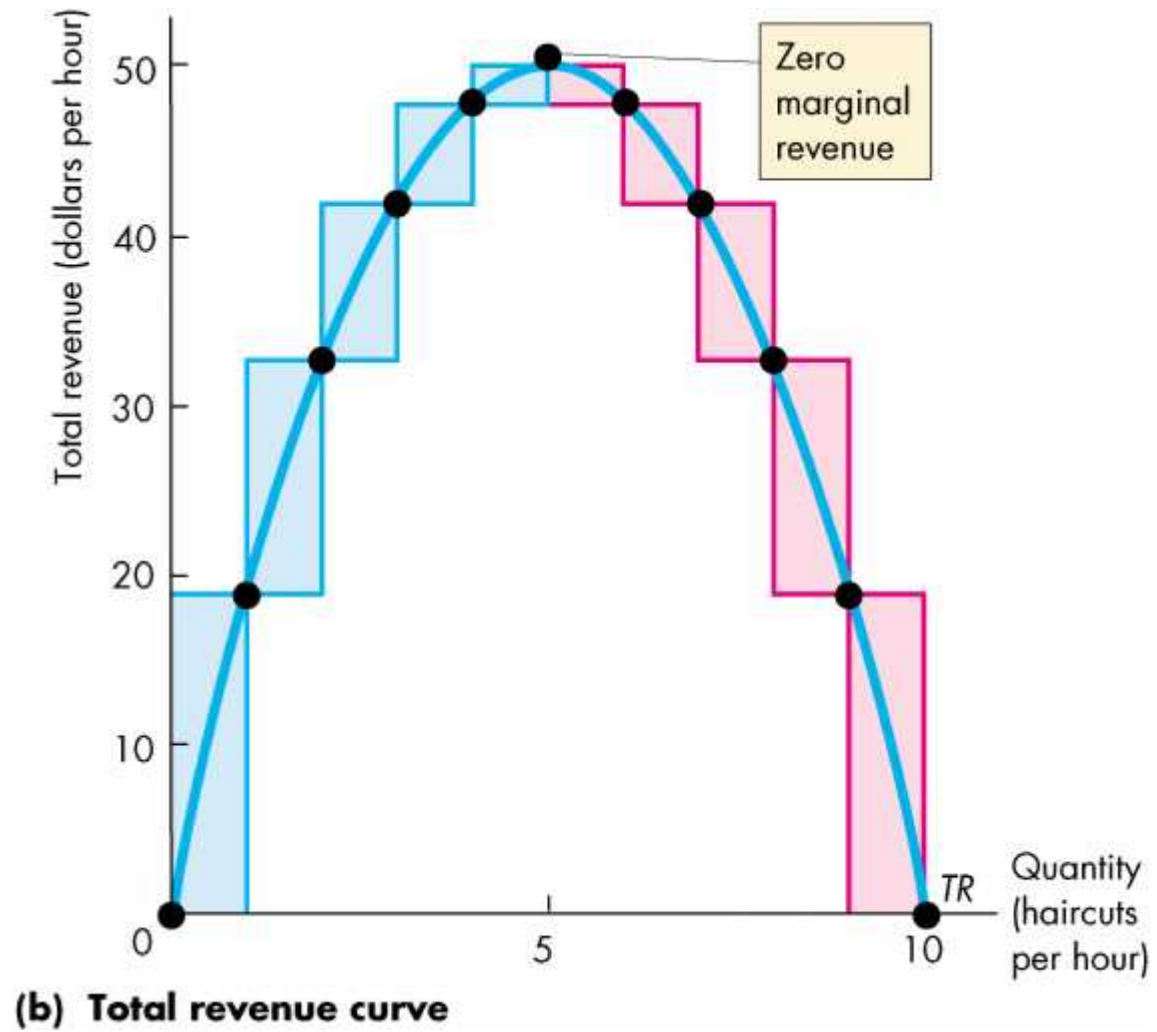


If demand is unit elastic, a fall in price does not change total revenue.

The rise in revenue from the greater quantity sold equals the fall in revenue from the lower price per unit, and  $MR = 0$ .

Total revenue is maximized when  $MR = 0$ .





# A Single-Price Monopoly's Output and Price Decision

## In Monopoly, Demand Is Always Elastic

A single-price monopoly *never* produces an output at which demand is inelastic.

If it did produce such an output, the firm could increase total revenue, decrease total cost, and increase economic profit by decreasing output.

# A Single-Price Monopoly's Output and Price Decision

## Price and Output Decision

The monopoly faces the same types of technology constraints as the competitive firm, but the monopoly faces a different market constraint.

The monopoly selects the profit-maximizing quantity in the same manner as a competitive firm, where  $MR = MC$ .

The monopoly sets its price at the highest level at which it can sell the profit-maximizing quantity.



# A Single-Price Monopoly's Output and Price Decision



**TABLE 13.1** A Monopoly's Output and Price Decision

Price ( $P$ ) (dollars per haircut)	Quantity demanded ( $Q$ ) (haircuts per hour)	Total revenue ( $TR = P \times Q$ ) (dollars)	Marginal revenue ( $MR = \Delta TR / \Delta Q$ ) (dollars per haircut)	Total cost ( $TC$ ) (dollars)	Marginal cost ( $MC = \Delta TC / \Delta Q$ ) (dollars per haircut)	Profit ( $TR - TC$ ) (dollars)
20	0	0	..... 18	20	..... 1	-20
18	1	18	..... 14	21	..... 3	-3
16	2	32	..... 10	24	..... 6	+8
<b>14</b>	<b>3</b>	<b>42</b>	..... 6	<b>30</b>	..... 10	<b>+12</b>
12	4	48	..... 2	40	..... 15	+8
10	5	50		55		-5



**TABLE 13.1** A Monopoly's Output and Price Decision

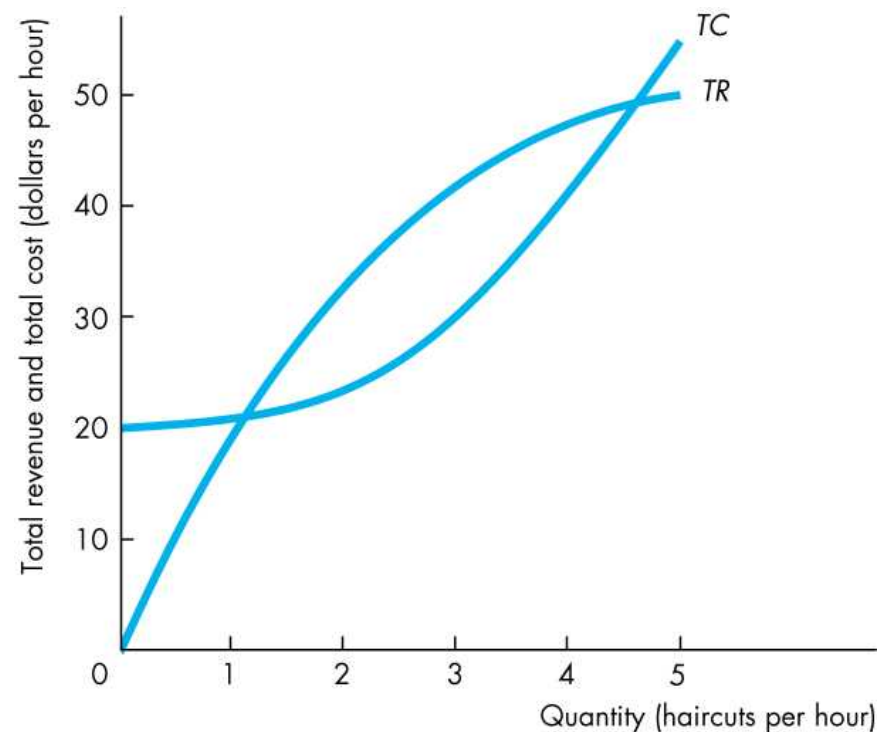
Price ( $P$ ) (dollars per haircut)	Quantity demanded ( $Q$ ) (haircuts per hour)	Total revenue ( $TR = P \times Q$ ) (dollars)	Marginal revenue ( $MR = \Delta TR / \Delta Q$ ) (dollars per haircut)	Total cost ( $TC$ ) (dollars)	Marginal cost ( $MC = \Delta TC / \Delta Q$ ) (dollars per haircut)	Profit ( $TR - TC$ ) (dollars)
20	0	0	..... 18	20	..... 1	-20
18	1	18	..... 14	21	..... 3	-3
16	2	32	..... 10	24	..... 6	+8
<b>14</b>	<b>3</b>	<b>42</b>	..... 6	<b>30</b>	..... 10	<b>+12</b>
12	4	48	..... 2	40	..... 15	+8
10	5	50		55		-5

# A Single-Price Monopoly's Output and Price Decision

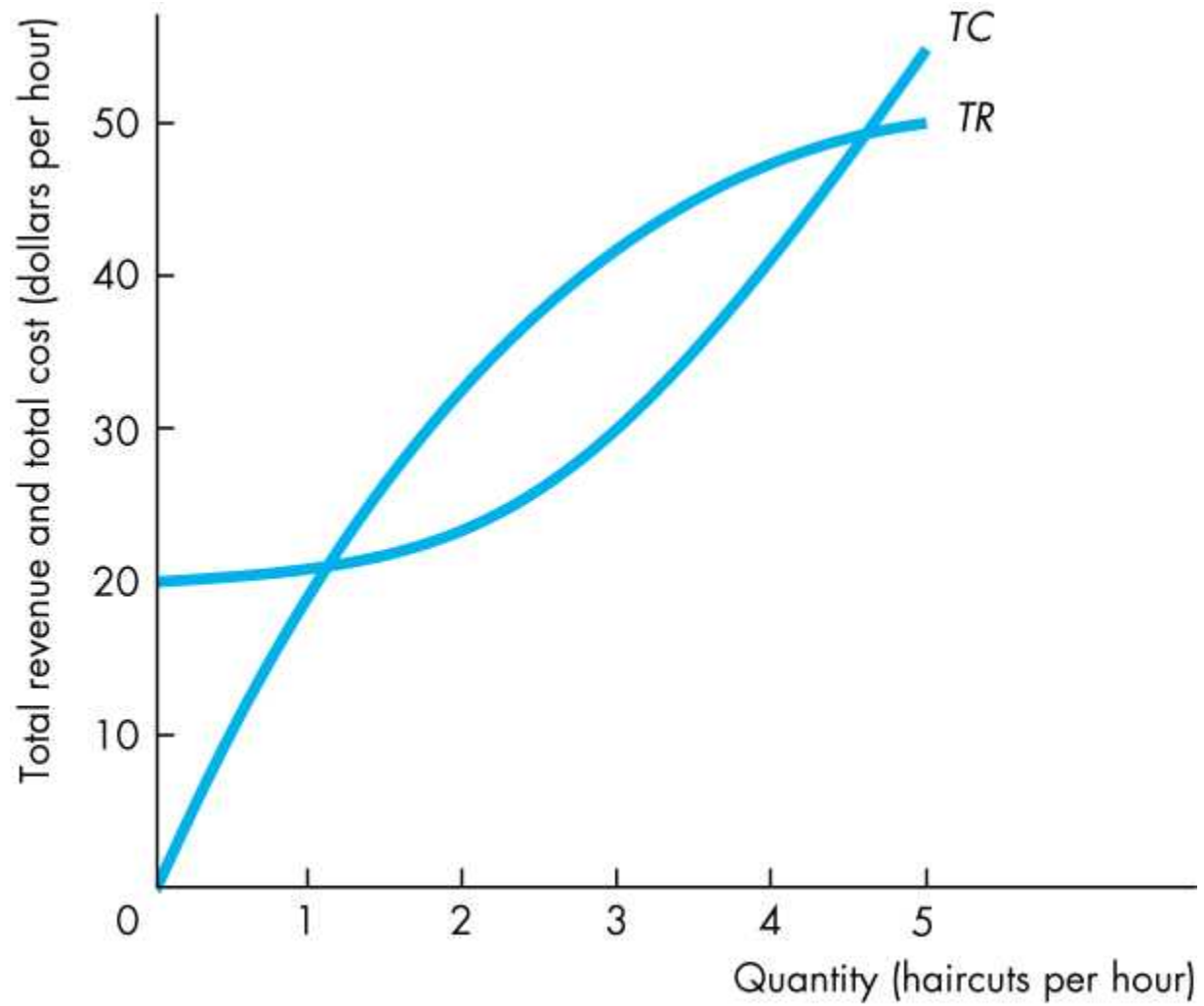


Figure 13.4 illustrates the profit-maximizing choices of a single-price monopoly.

In part (a), the monopoly produces the quantity that maximizes total revenue minus total cost.



(a) Total revenue and total cost curves



**(a) Total revenue and total cost curves**

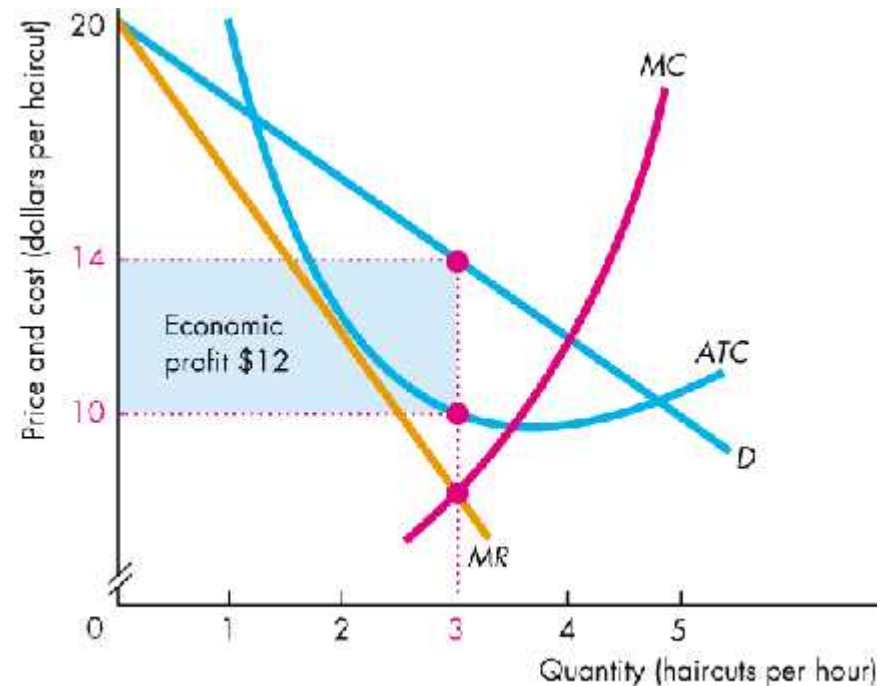
# A Single-Price Monopoly's Output and Price Decision



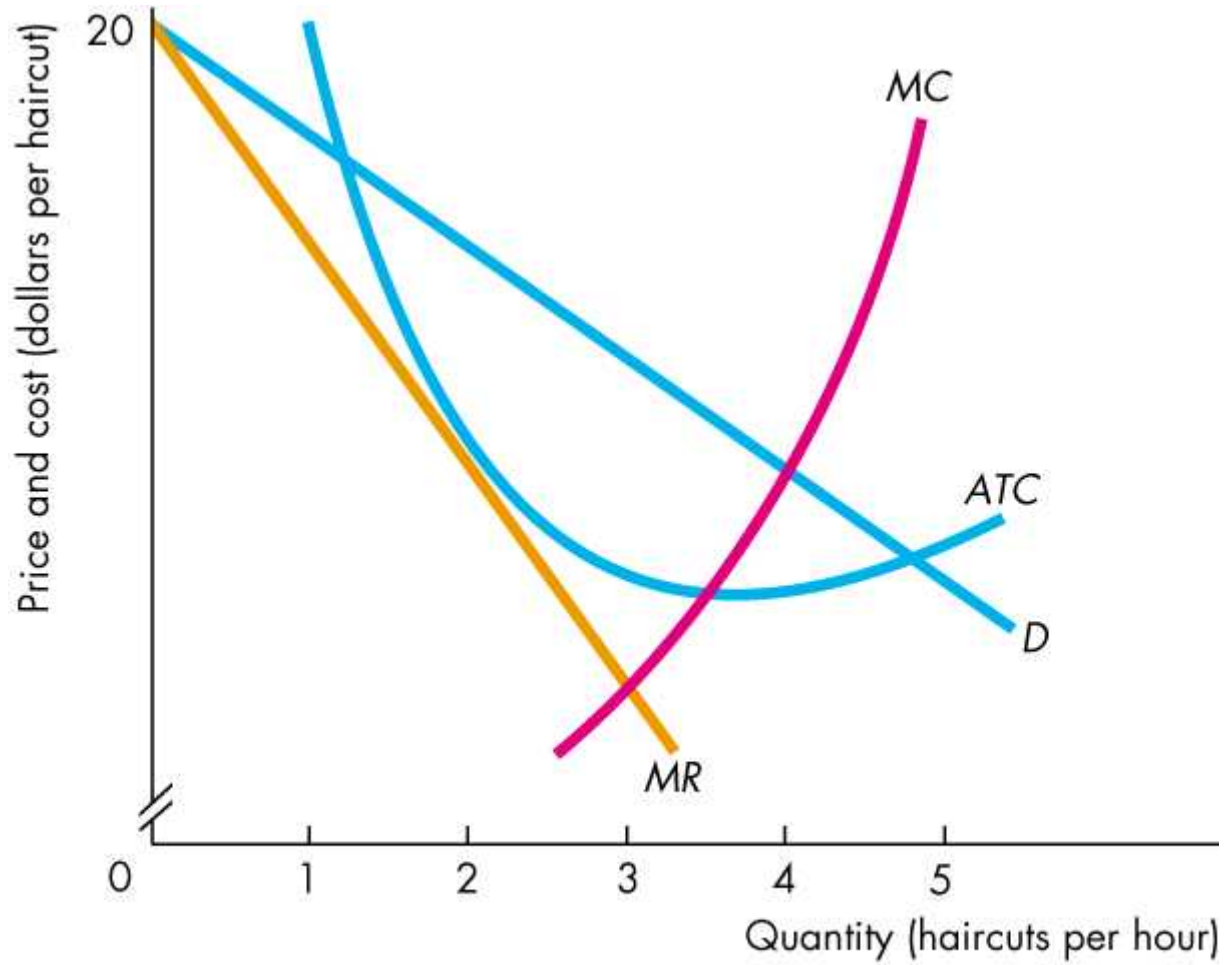
In part (b), the firm produces the output at which  $MR = MC$  and sets the price at which it can sell that quantity.

The  $ATC$  curve tells us the average total cost.

Economic profit is the profit per unit multiplied by the quantity produced—the blue rectangle.



(b) Demand and marginal revenue and cost curves



**(b) Demand and marginal revenue and cost curves**

## A Single-Price Monopoly's Output and Price Decision

The monopoly might make an economic profit, even in the long run, because the barriers to entry protect the firm from market entry by competitor firms.

The monopoly might make an economic profit in the long run.

But a monopoly that incurs an economic loss might shut down temporarily in the short run or exit the market in the long run.

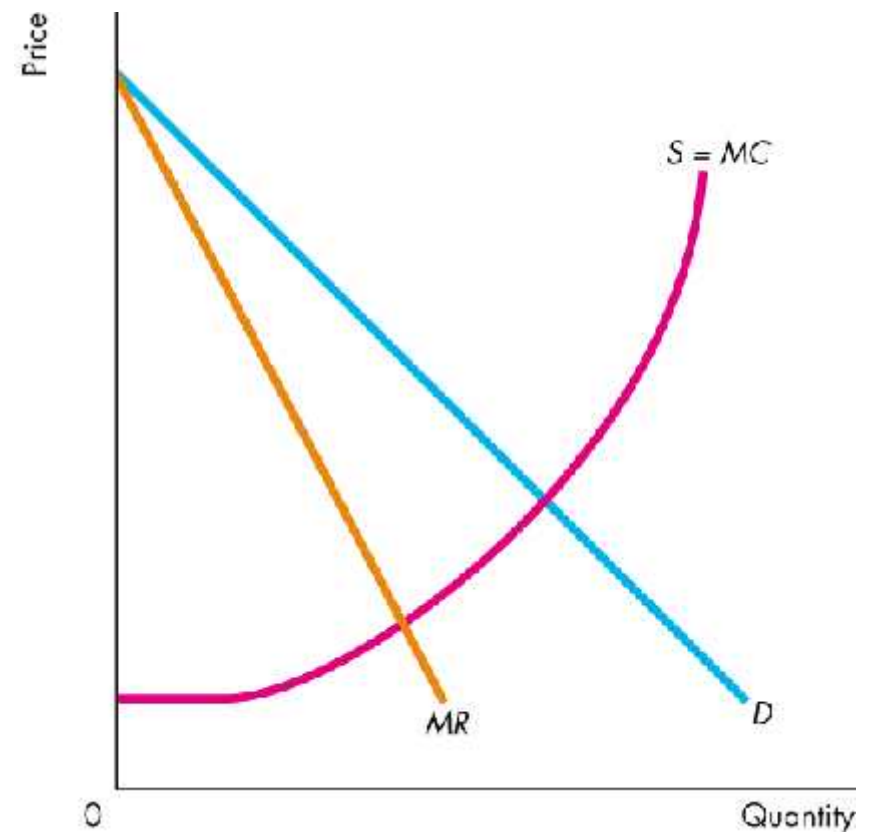
# Single-Price Monopoly and Competition Compared



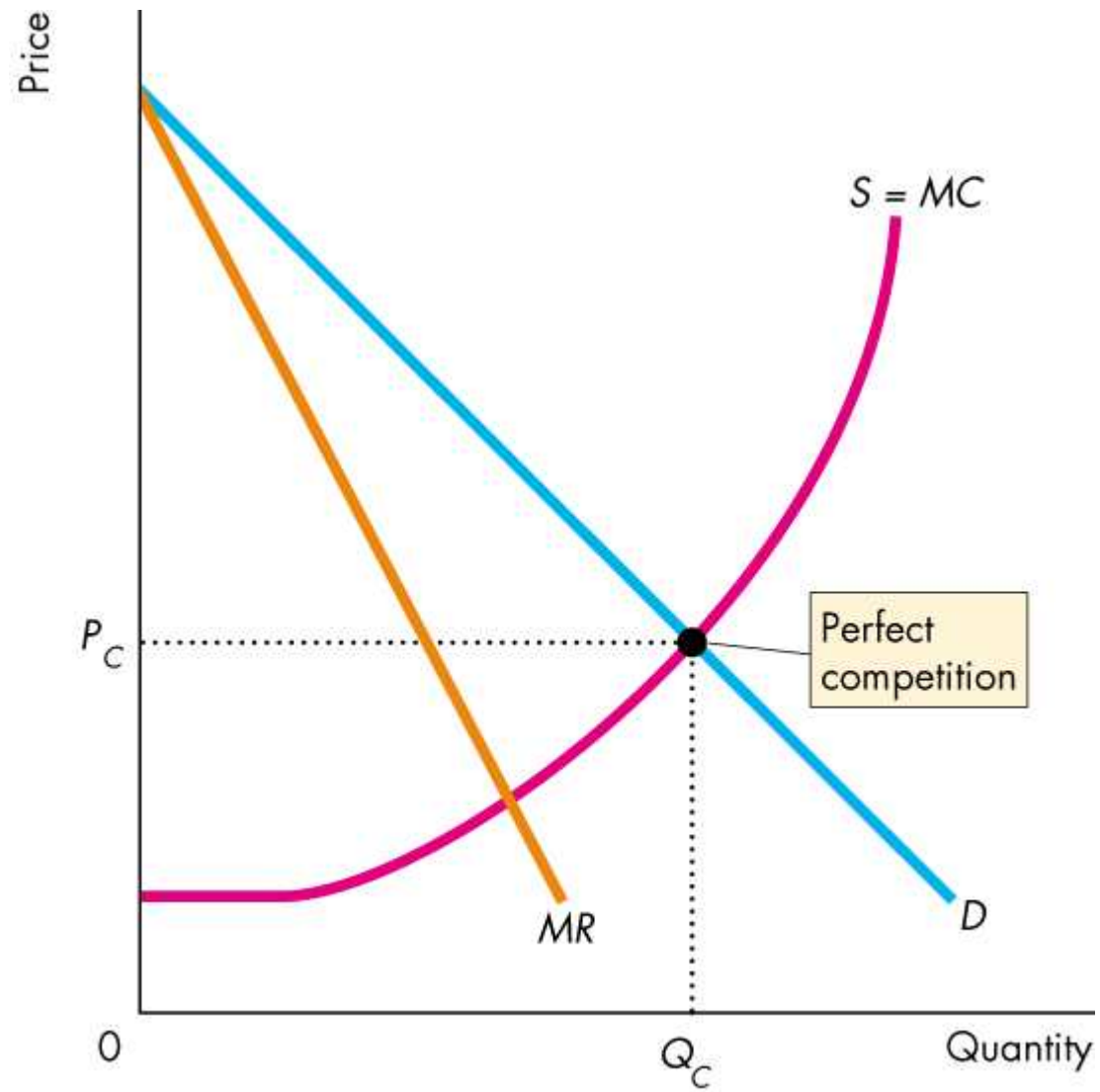
## Comparing Price and Output

Figure 13.5 compares the price and quantity in perfect competition and monopoly.

The market demand curve,  $D$ , in perfect competition is the demand curve that the firm in monopoly faces.



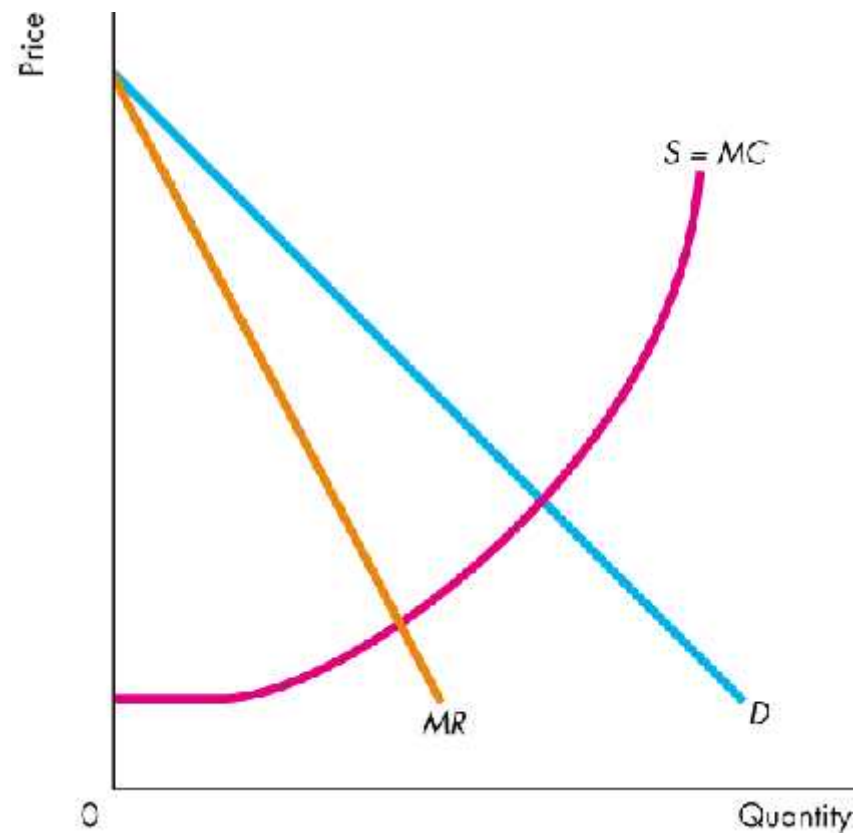




# Single-Price Monopoly and Competition Compared

The market supply curve in perfect competition is the horizontal sum of the individual firm's marginal cost curves,  $S = MC$ .

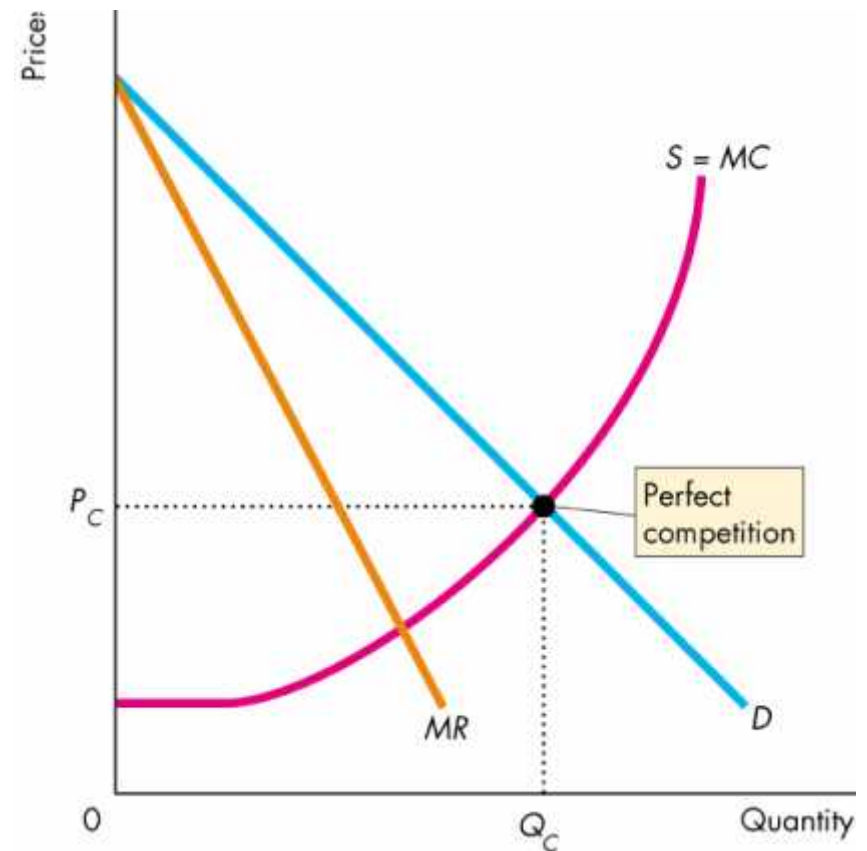
This curve is the monopoly's marginal cost curve.



# Single-Price Monopoly and Competition Compared

## Perfect Competition

Equilibrium occurs where the quantity demanded equals the quantity supplied at quantity  $Q_C$  and price  $P_C$ .

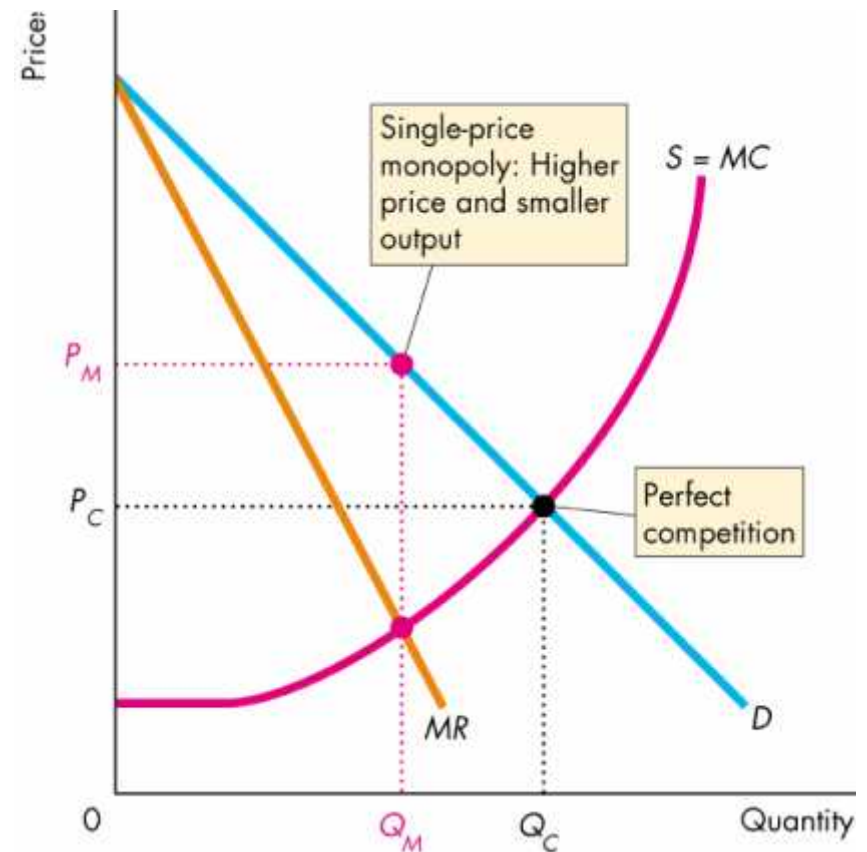


# Single-Price Monopoly and Competition Compared

## Monopoly

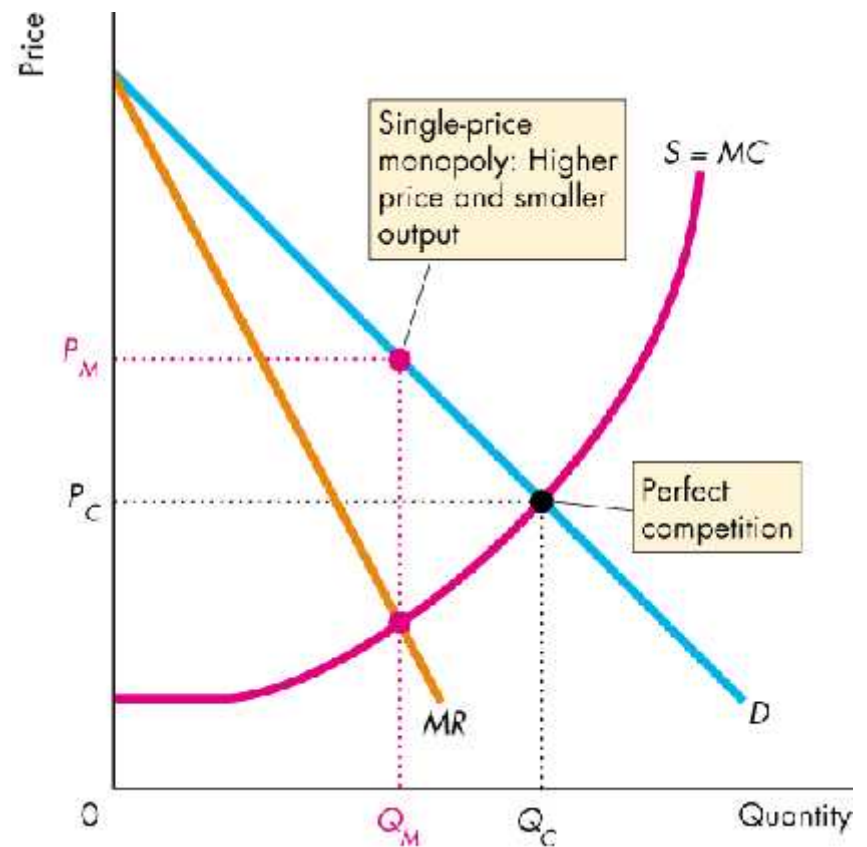
Equilibrium output,  $Q_M$ , occurs where marginal revenue equals marginal cost,  $MR = MC$ .

Equilibrium price,  $P_M$ , occurs on the demand curve at the profit-maximizing quantity.



# Single-Price Monopoly and Competition Compared

Compared to perfect competition, monopoly produces a smaller output and charges a higher price.



# Single-Price Monopoly and Competition Compared



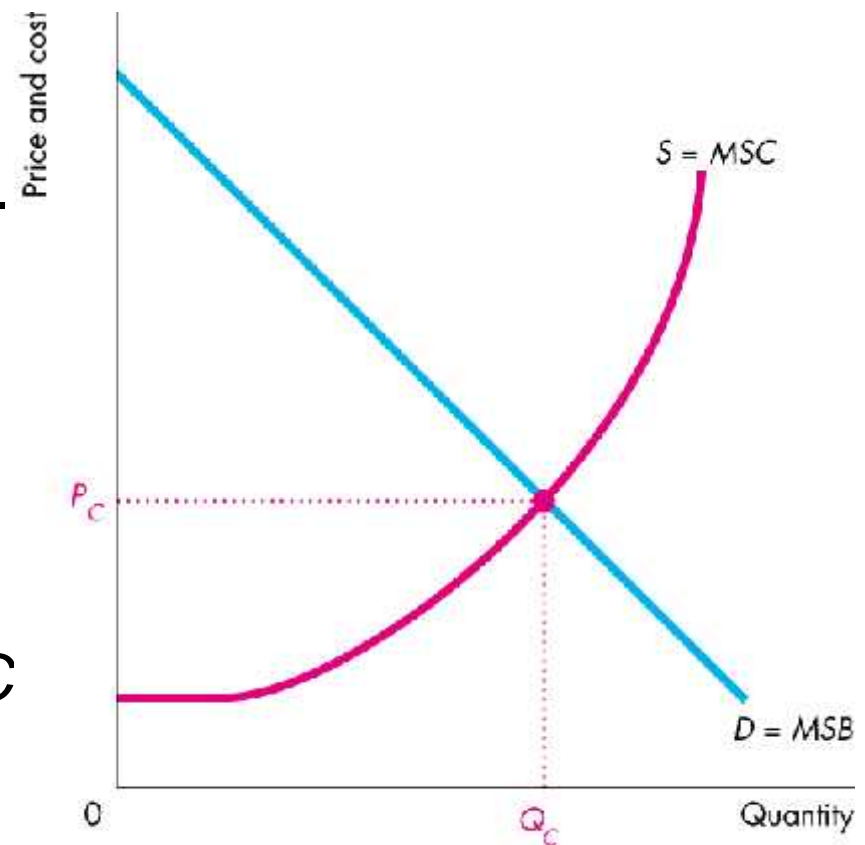
## Efficiency Comparison

Figure 13.6(a) shows the efficiency of perfect competition.

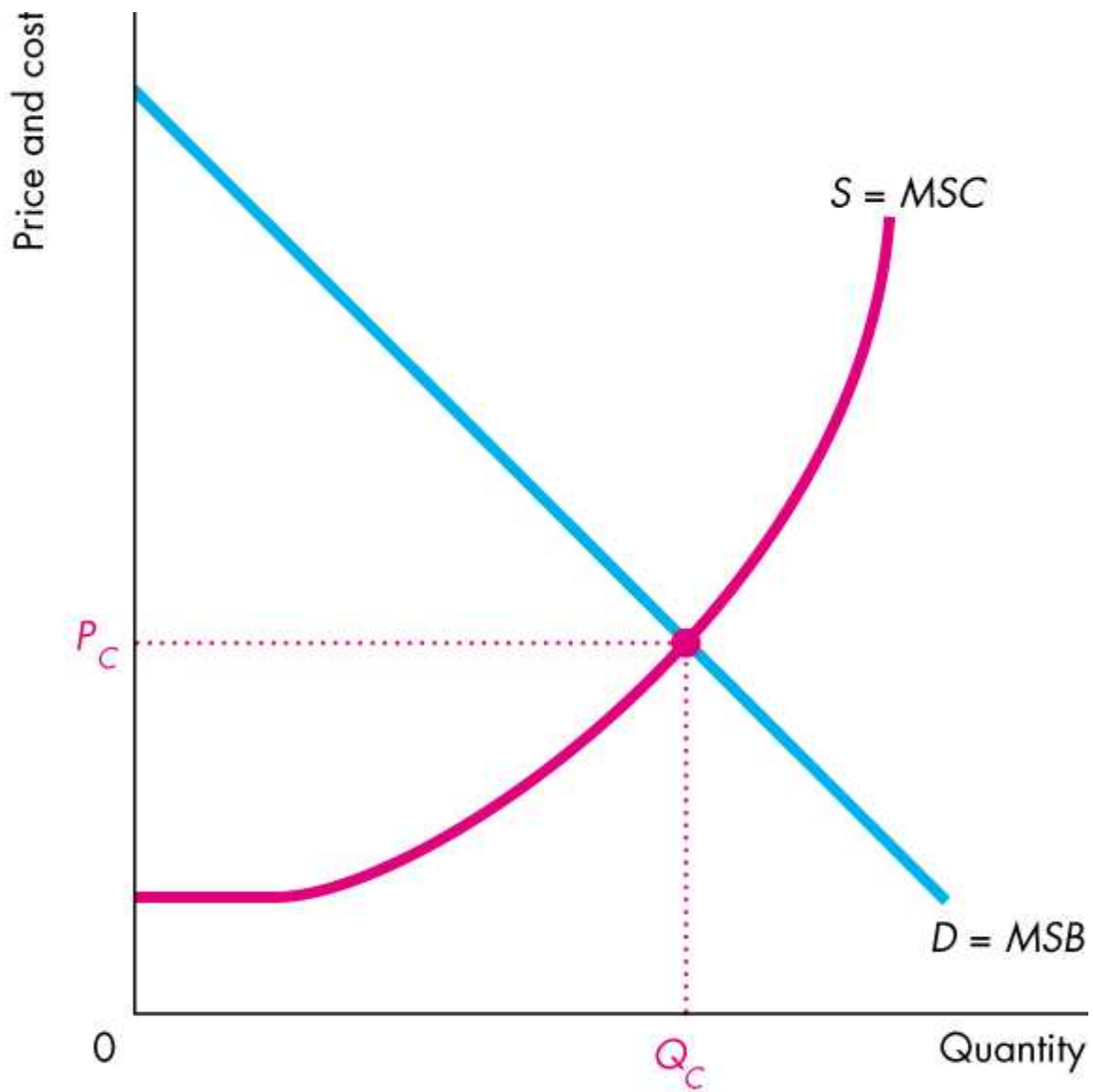
The market demand curve is the marginal social benefit curve, *MSB*.

The market supply curve is the marginal social cost curve, *MSC*.

So competitive equilibrium is efficient:  $MSB = MSC$ .



(a) Perfect competition

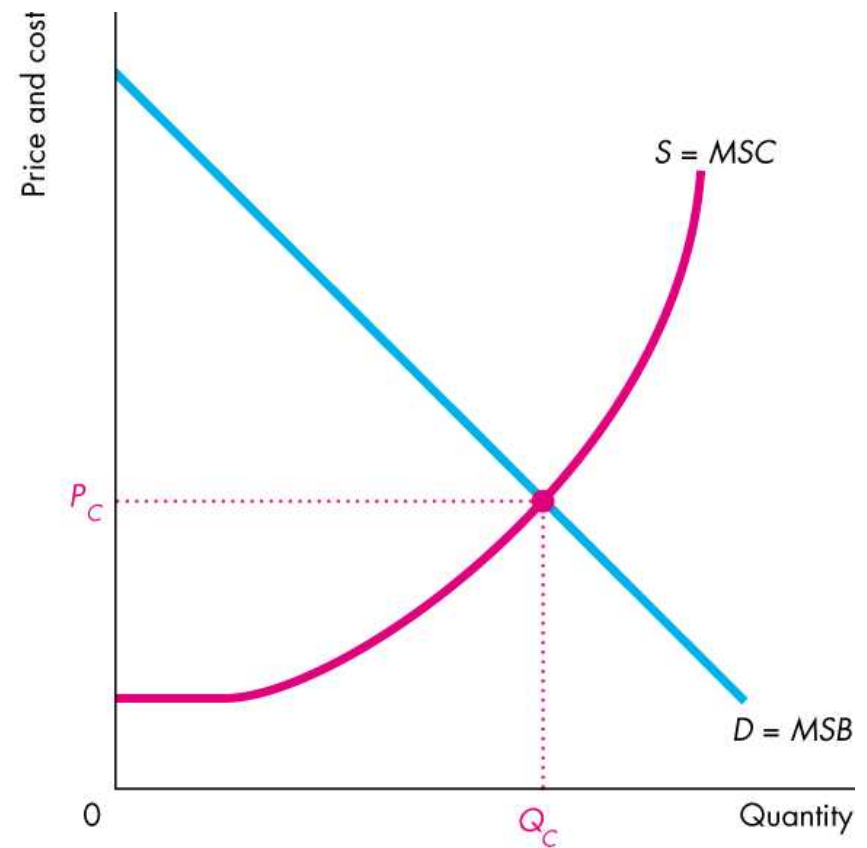


**(a) Perfect competition**

# Single-Price Monopoly and Competition Compared

Total surplus, the sum of consumer surplus and producer surplus, is maximized.

The quantity produced is efficient.



(a) Perfect competition

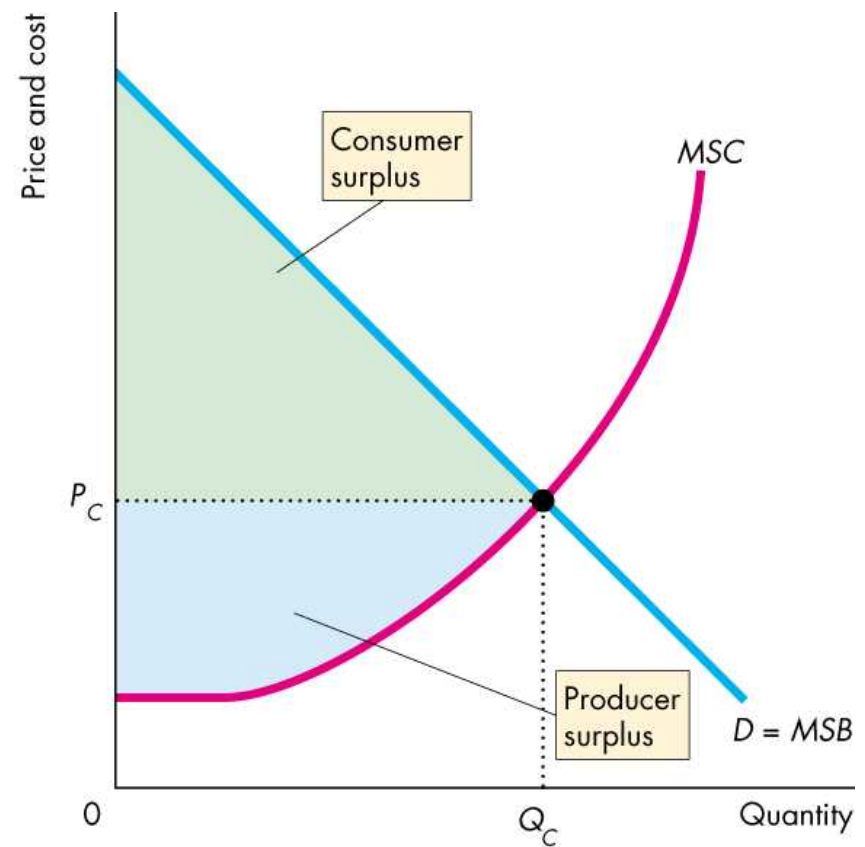


# Single-Price Monopoly and Competition Compared

Figure 13.6(b) shows the inefficiency of monopoly.

Because price exceeds marginal social cost, marginal social benefit exceeds marginal social cost,

and a deadweight loss arises.



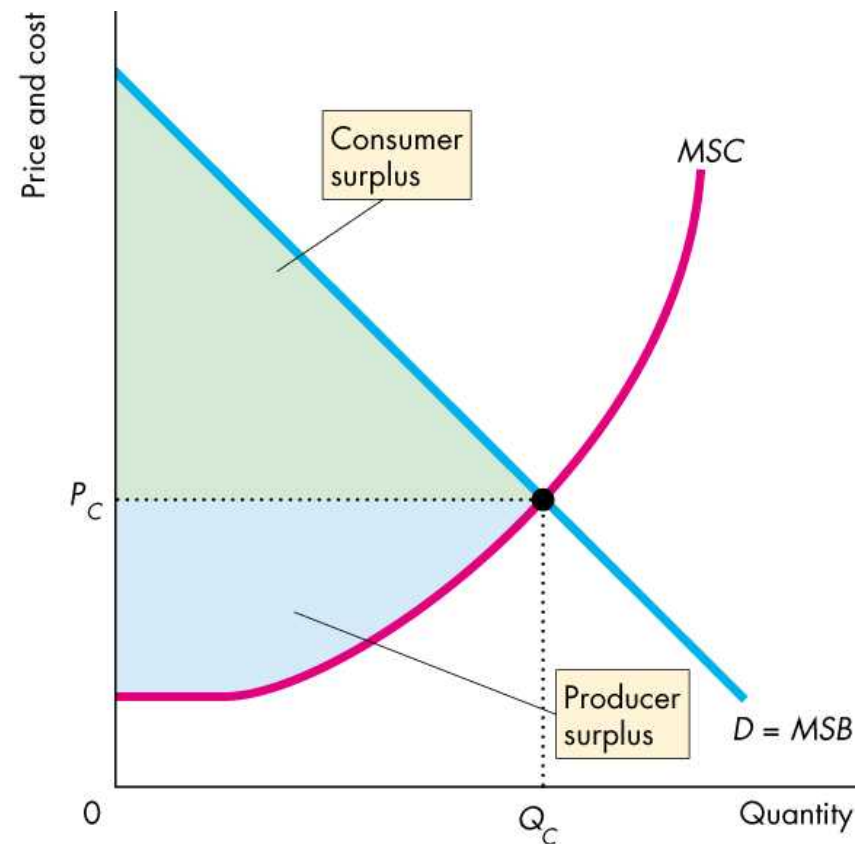
(b) Monopoly

# Single-Price Monopoly and Competition Compared

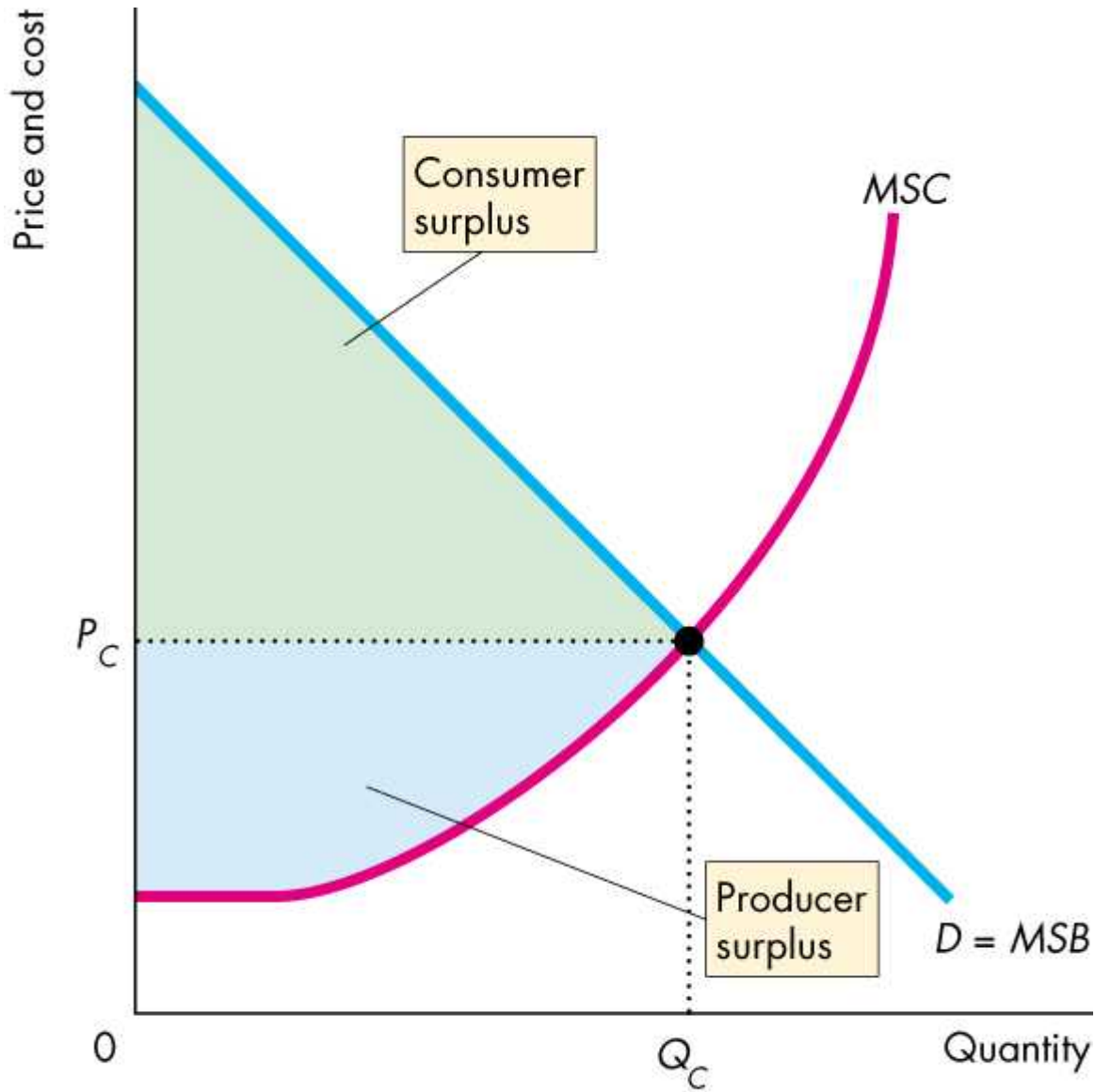


## Redistribution of Surpluses

Some of the lost consumer surplus goes to the monopoly as producer surplus.



(b) Monopoly



**(b) Monopoly**

# ◆ Single-Price Monopoly and Competition Compared

## Rent Seeking

Any surplus—consumer surplus, producer surplus, or economic profit—is called **economic rent**.

**Rent seeking** is the pursuit of wealth by capturing economic rent.

Rent seekers pursue their goals in two main ways:

- Buy a monopoly—transfers rent to creator of monopoly.
- Create a monopoly—uses resources in political activity.

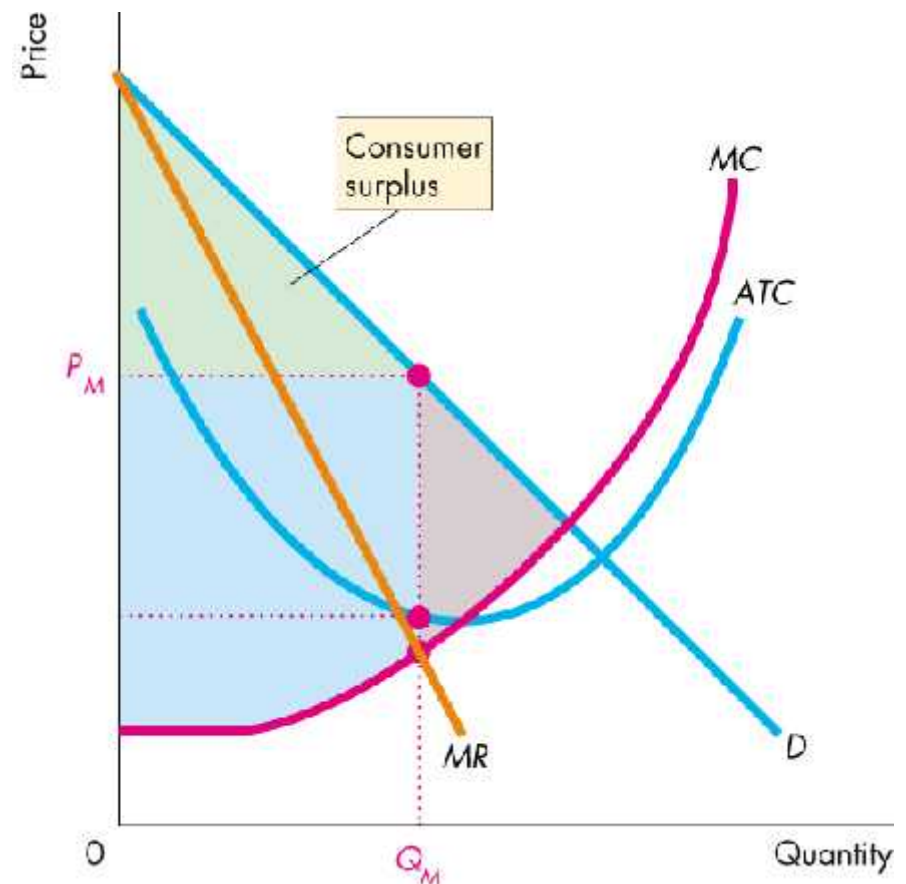
# Single-Price Monopoly and Competition Compared

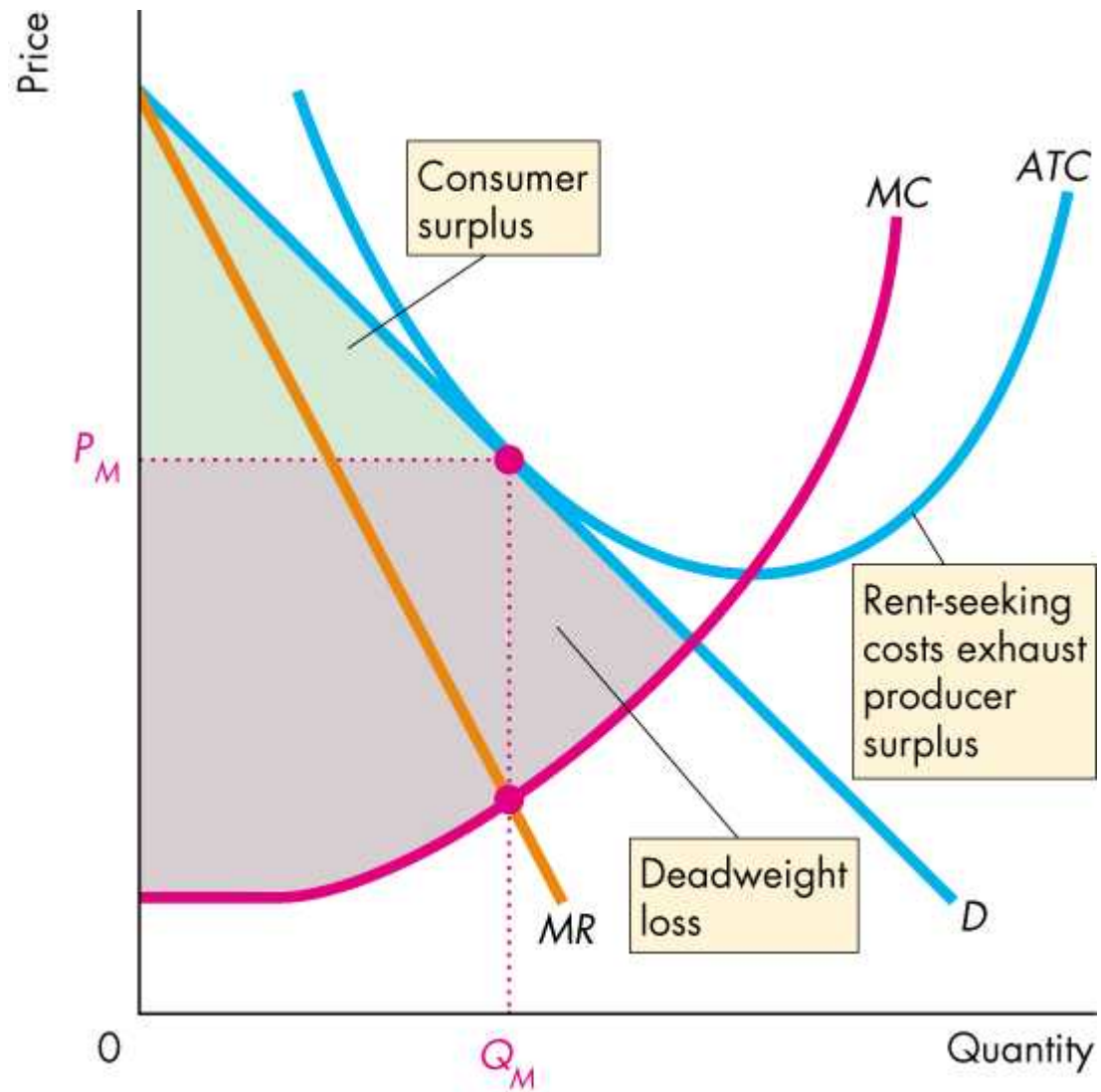


## Rent-Seeking Equilibrium

The resources used in rent seeking can exhaust the monopoly's economic profit and the monopoly breaks even.

Figure 13.7 shows the rent seeking equilibrium.

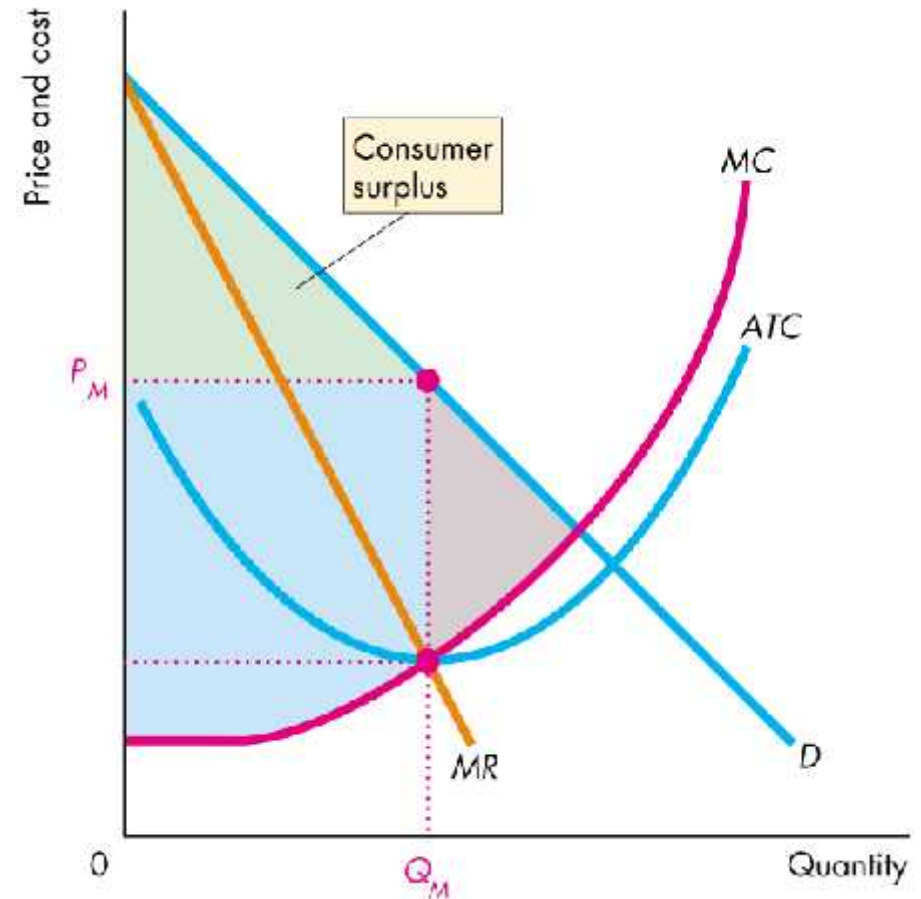




# Single-Price Monopoly and Competition Compared

A potential profit shown by the blue area gets used up in rent seeking.

Average total cost increases and the profits disappear to become part of the enlarged deadweight loss from rent seeking.



## Price Discrimination

Price discrimination is the practice of selling different units of a good or service for different prices.

To be able to price discriminate, a monopoly must:

1. Identify and separate different buyer types.
2. Sell a product that cannot be resold.

Price differences that arise from cost differences are not price discrimination.



# Price Discrimination

## Capturing Consumer Surplus

Price discrimination captures consumer surplus and converts it into economic profit.

A monopoly can discriminate

- Among groups of buyers. (Advance purchase and other restrictions on airline tickets are an example.)
- Among units of a good. Quantity discounts are an example. (But quantity discounts that reflect lower costs at higher volumes are not price discrimination.)

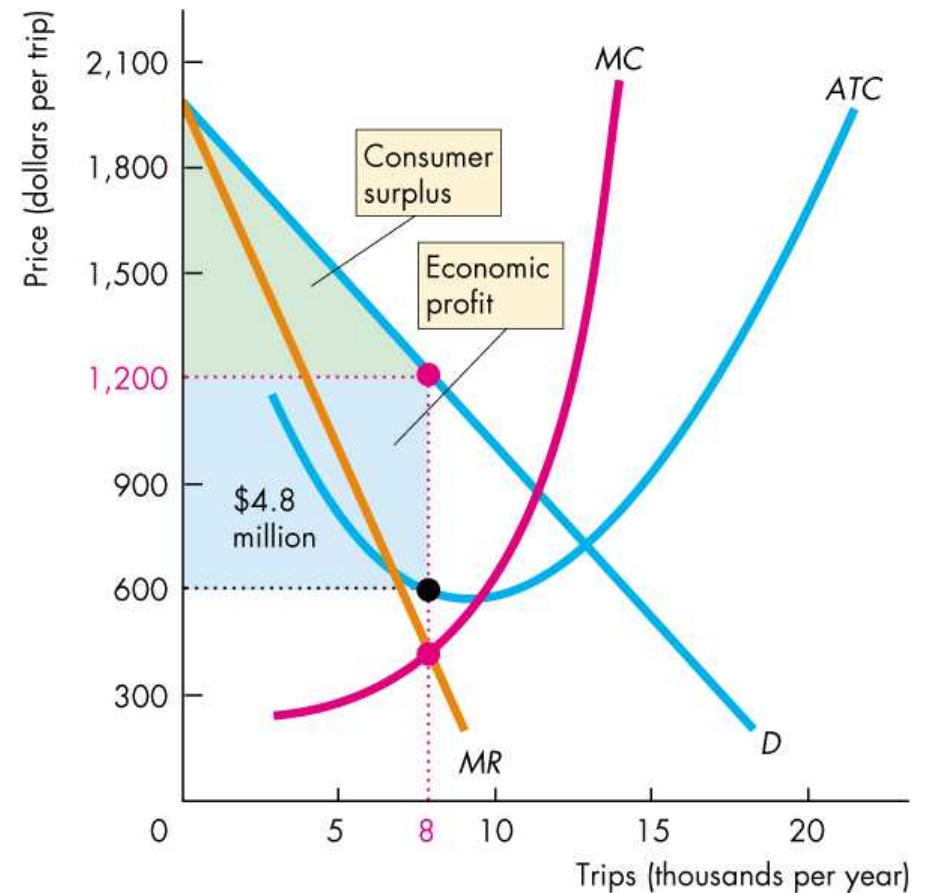
# Price Discrimination

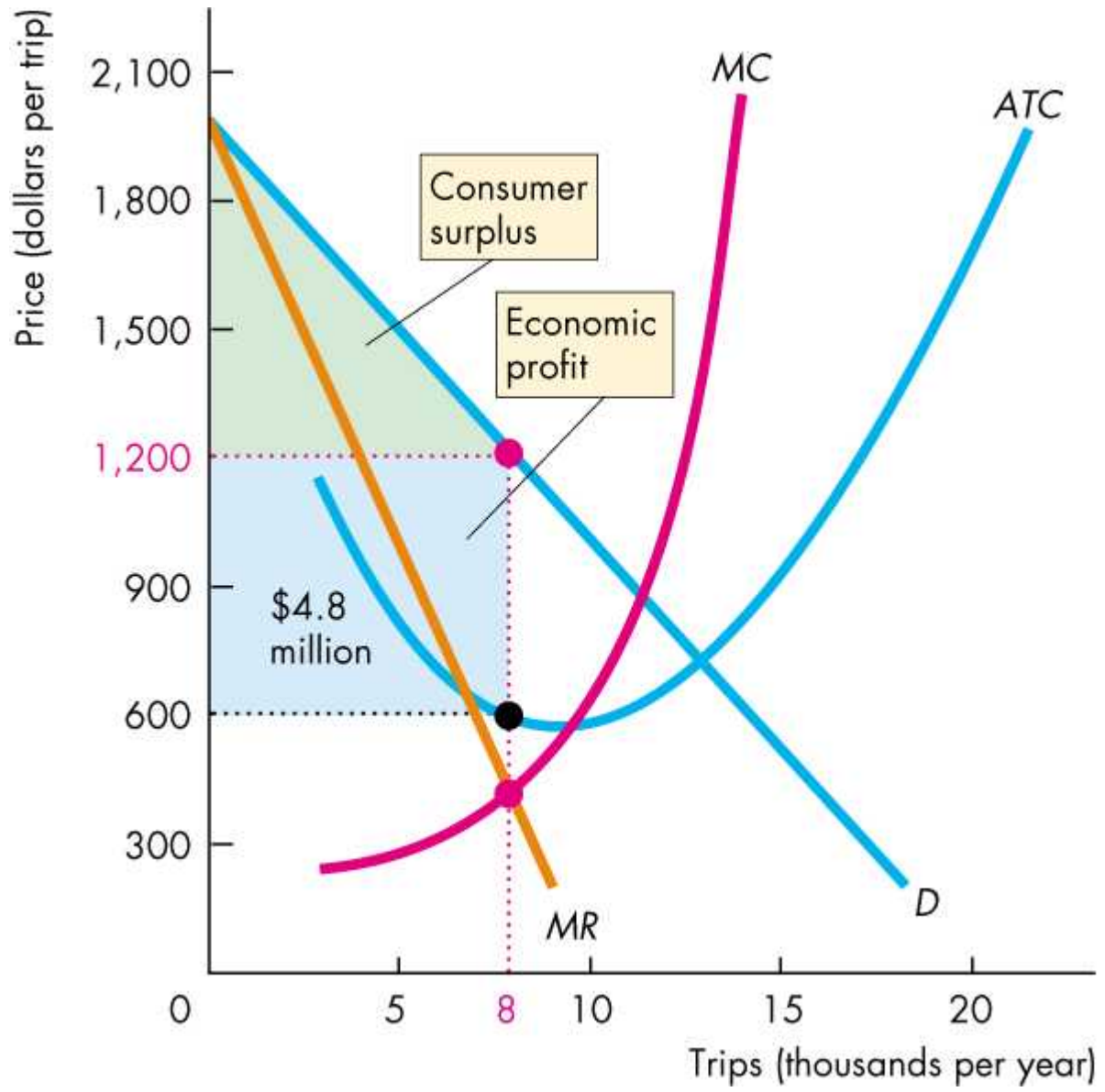


## Profiting by Price Discriminating

Figures 13.8 and 13.9 show the same market with a single price and price discrimination.

As a single-price monopoly, this firm maximizes profit by producing 8 trips a year and selling them for \$1,200 each.



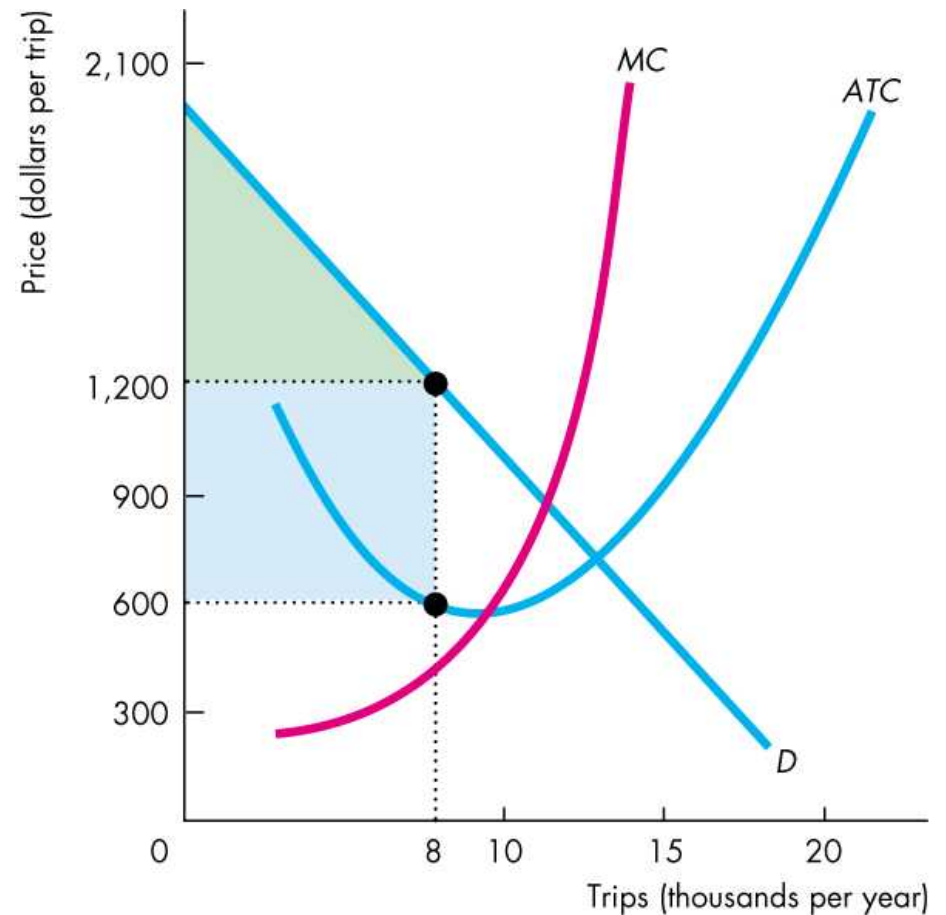


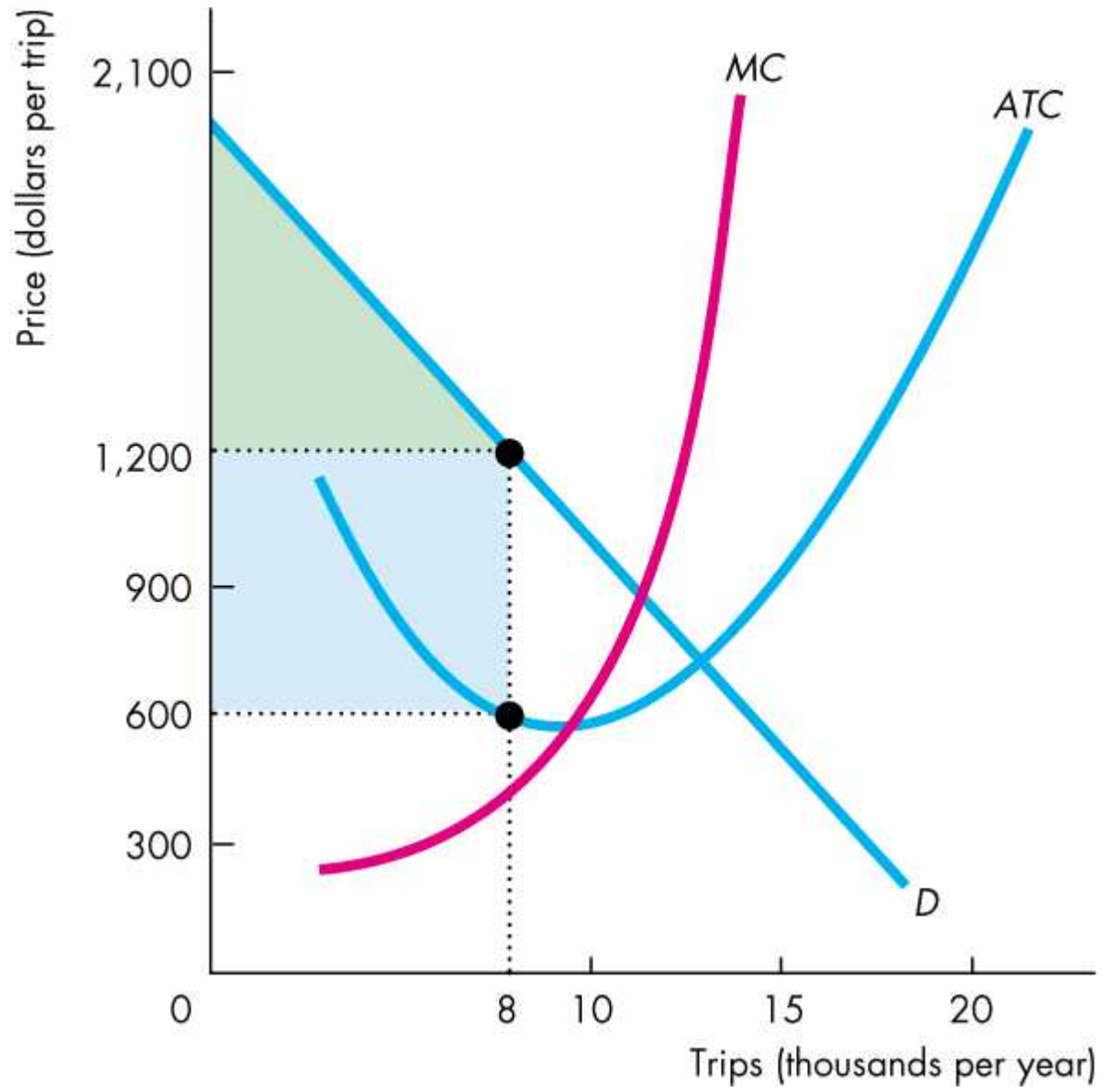
# Price Discrimination



By price discriminating, the firm can increase its profit.

In doing so, it converts consumer surplus into economic profit.





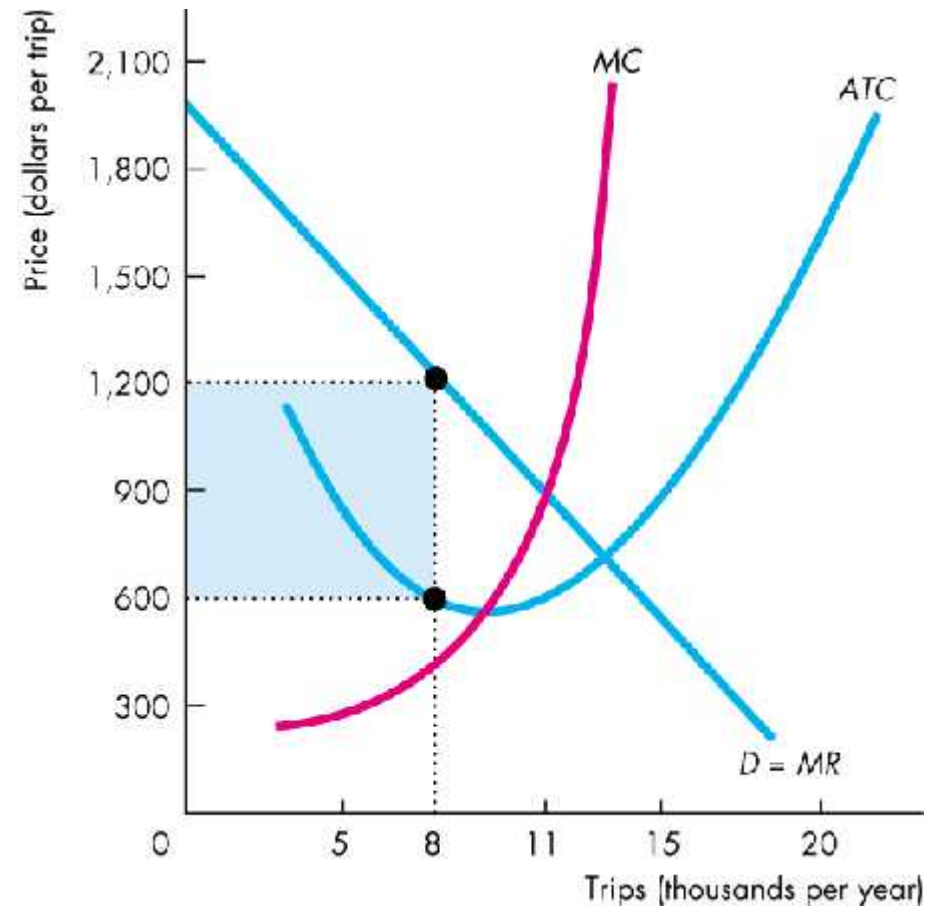
# Price Discrimination

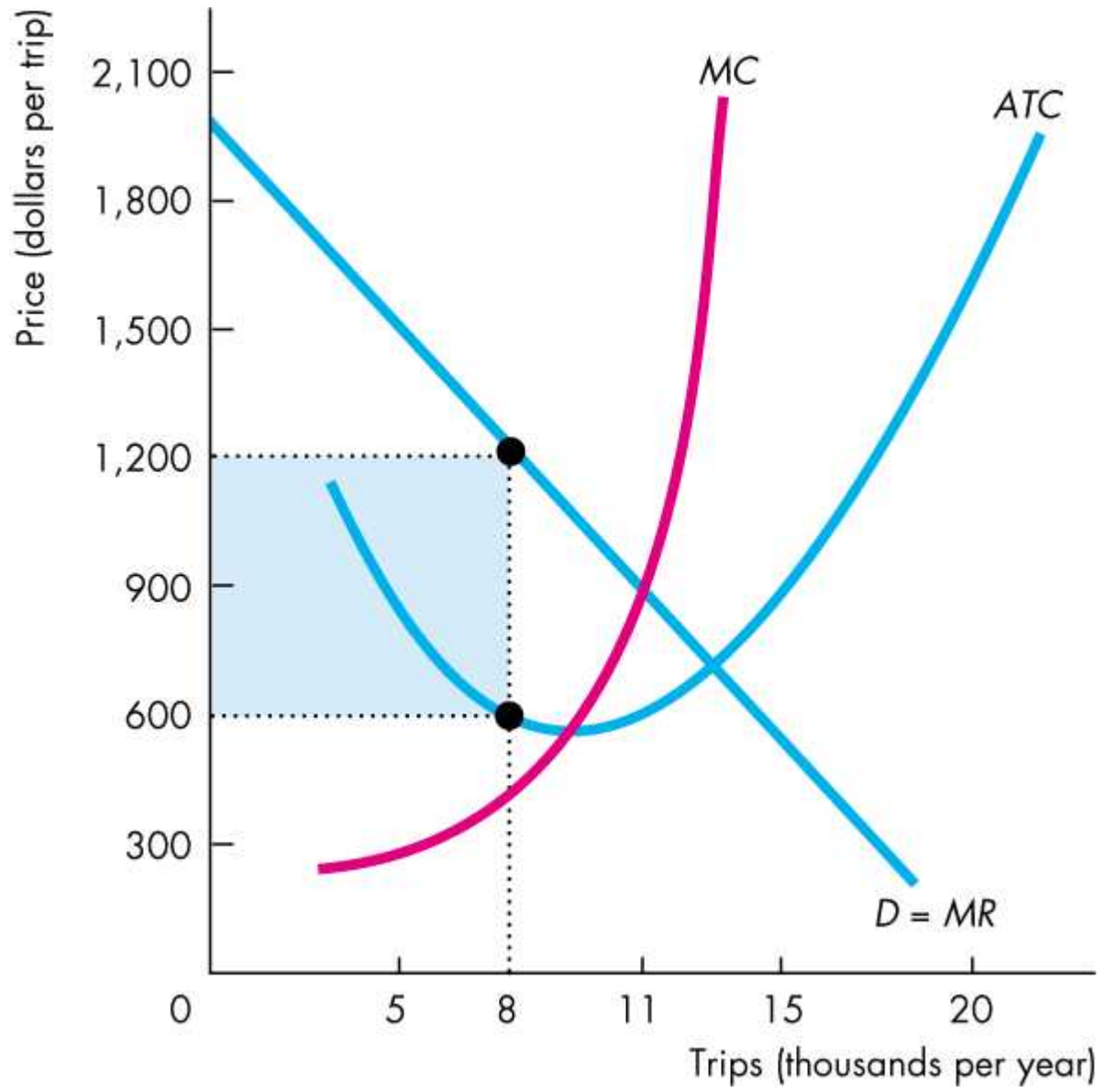


## Perfect Price Discrimination

**Perfect price discrimination** occurs if a firm is able to sell each unit of output for the highest price anyone is willing to pay.

Marginal revenue now equals price and the demand curve is also the marginal revenue curve.





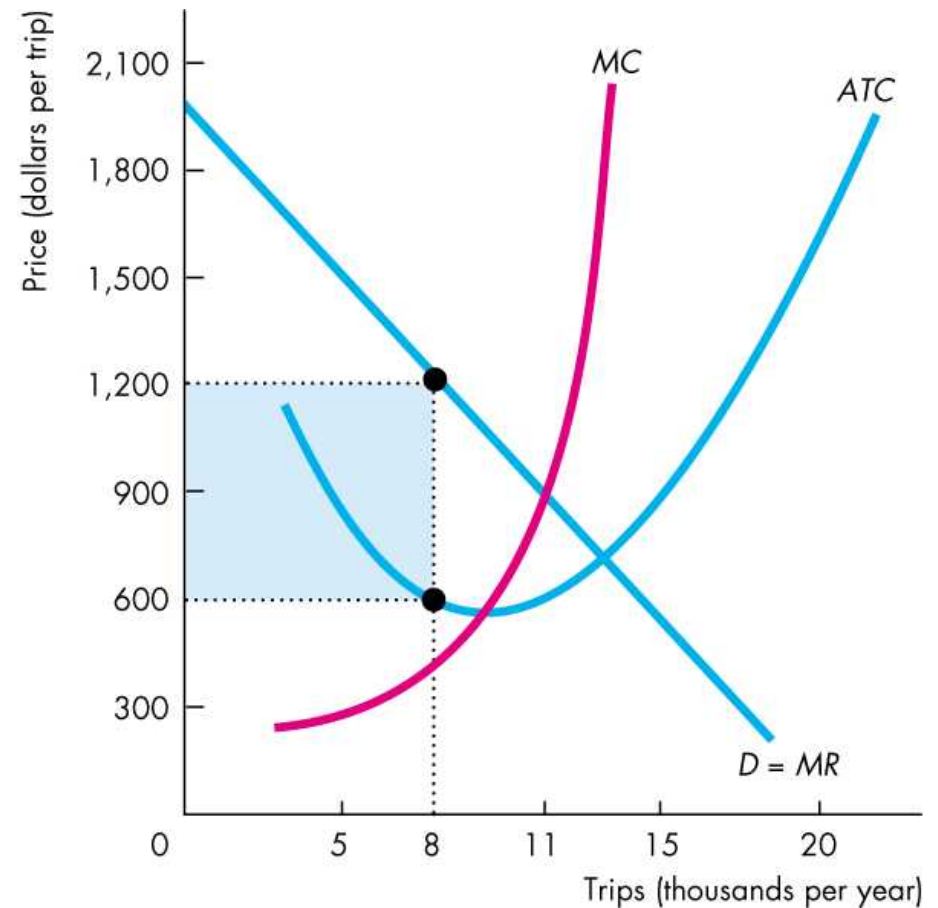
## ◆ Price Discrimination

With perfect price discrimination:

The profit-maximizing output increases to the quantity at which price equals marginal cost.

Economic profit increases above that made by a single-price monopoly.

Deadweight loss is eliminated.





# Price Discrimination

## Efficiency and Rent Seeking with Price Discrimination

The more perfectly a monopoly can price discriminate, the closer its output is to the competitive output ( $P = MC$ ) and the more efficient is the outcome.

But this outcome differs from the outcome of perfect competition in two ways:

1. The monopoly captures the entire consumer surplus.
2. The increase in economic profit attracts even more rent-seeking activity that leads to inefficiency.

## Monopoly Regulation

**Regulation:** rules administrated by a government agency to influence prices, quantities, entry, and other aspects of economic activity.

Two theories about how regulation works are

**Social interest theory:** the political and regulatory process relentlessly seeks out inefficiency and regulates to eliminate deadweight loss.

**Capture theory:** regulation serves the self-interest of the producer, who captures the regulator.

# Monopoly Regulation

## Efficient Regulation of a Natural Monopoly

When demand and cost conditions create natural monopoly, the quantity produced is less than the efficient quantity.

How can government regulate natural monopoly so that it produces the efficient quantity?

**Marginal cost pricing rule** is a regulation that sets the price equal to the monopoly's marginal cost.

The quantity demanded at a price equal to marginal cost is the efficient quantity.

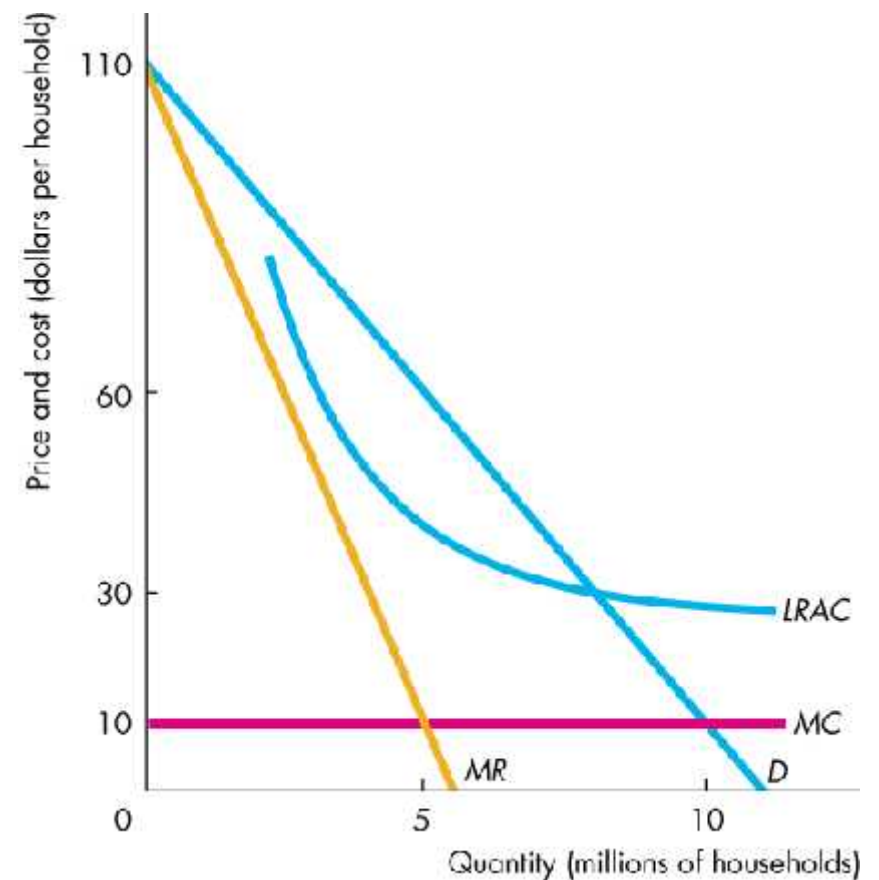
# Monopoly Regulation



Figure 13.11 illustrates the marginal cost pricing rule.

Unregulated, the natural monopoly maximizes economic profit by producing the quantity at which marginal revenue equals marginal cost ...

and charging the highest price at which that quantity will be bought.



# ◆ Monopoly Regulation

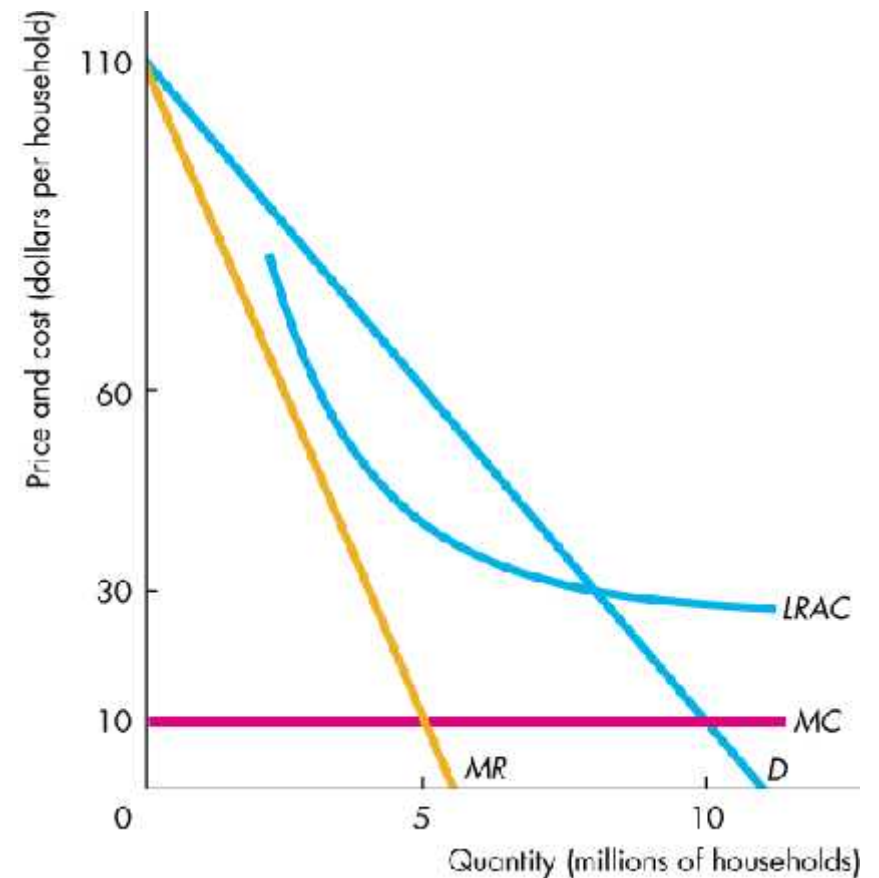


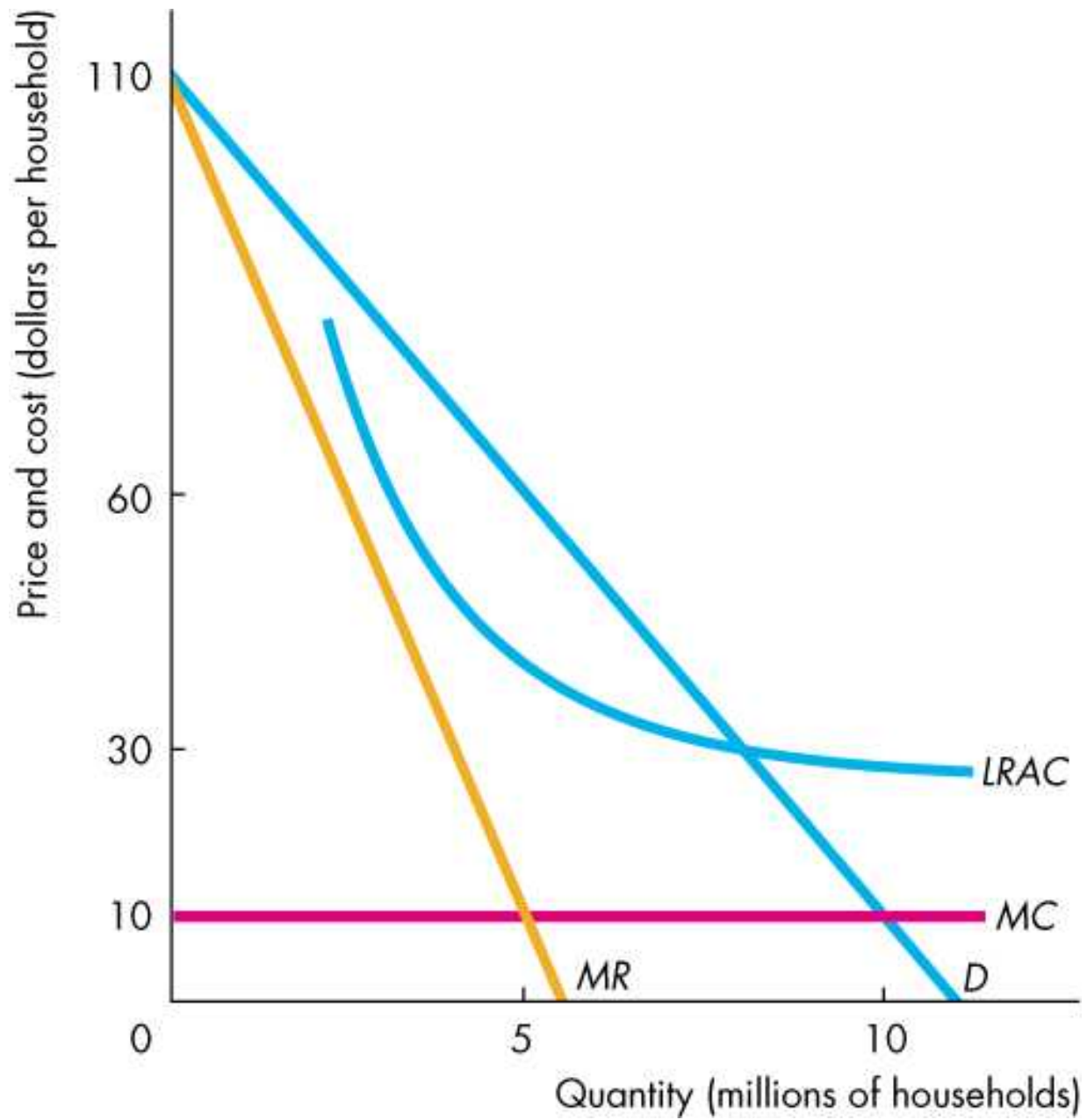
Regulating a natural monopoly in the social interest sets the quantity where  $MSB = MSC$ .

The demand curve is the  $MSB$  curve.

The marginal cost curve is the  $MSC$  curve.

Efficient regulation sets the price equal to marginal cost.



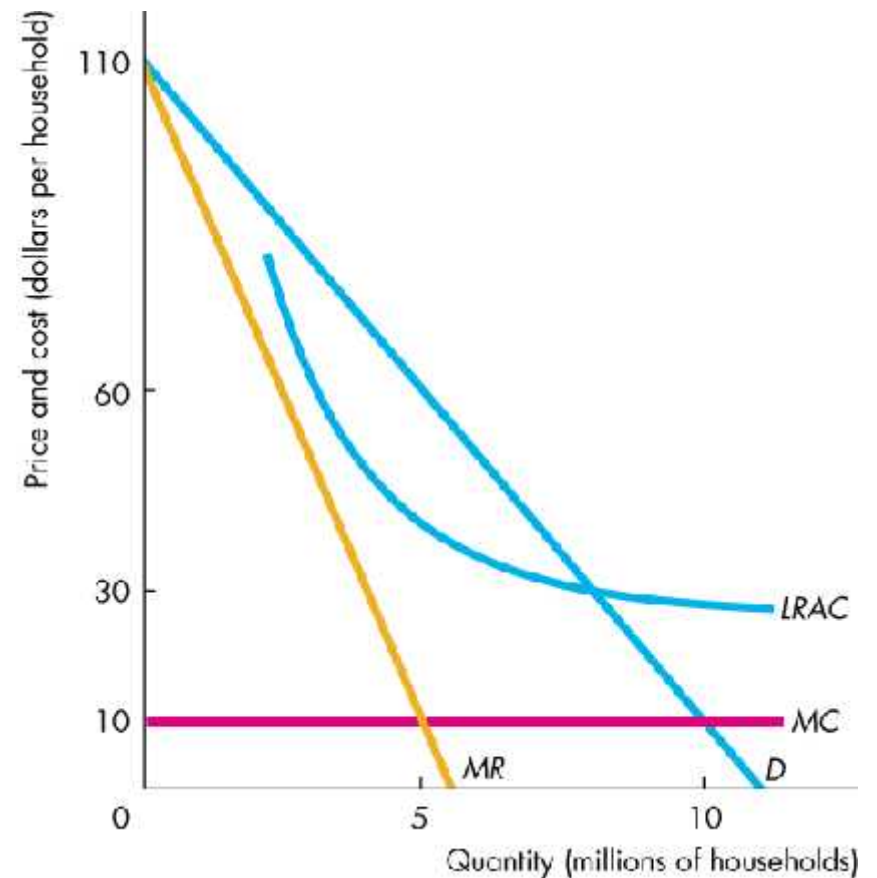


# ◆ Monopoly Regulation

With marginal cost pricing rule, the quantity produced is efficient,

but the average cost exceeds price, so the firm incurs an economic loss.

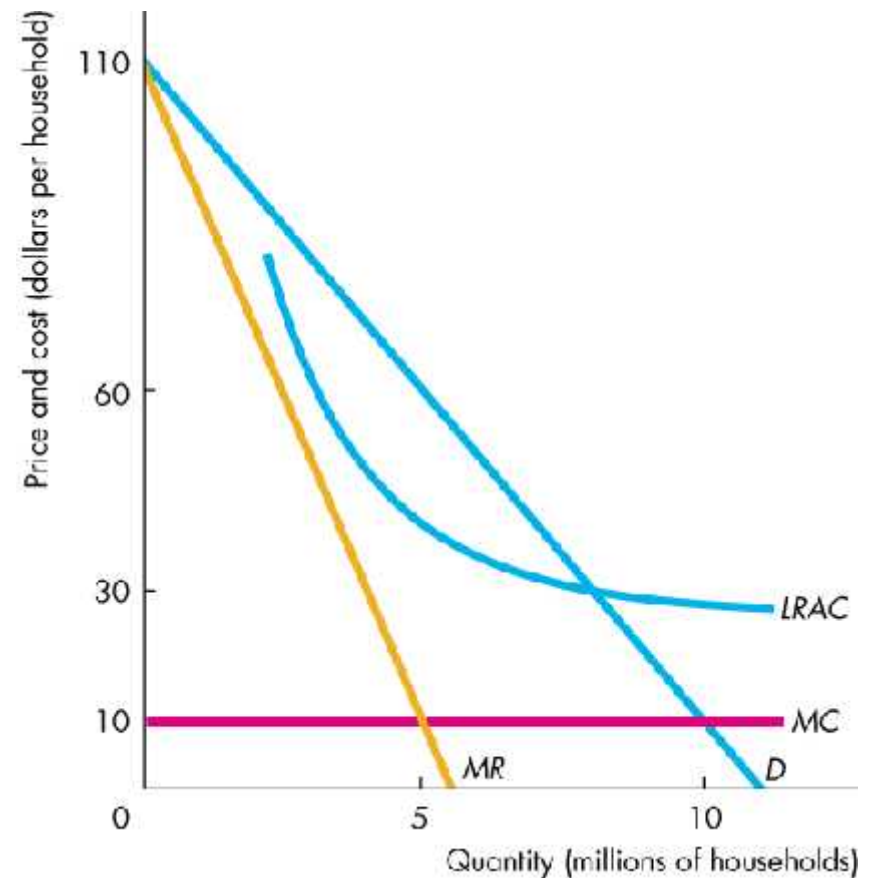
How can the firm cover its costs and at the same time obey the marginal cost pricing rule?



## ◆ Monopoly Regulation

Where possible, a regulated natural monopoly might be permitted to price discriminate to cover the loss from marginal cost pricing.

Or the natural monopoly might charge a one-time fee to cover its fixed costs and then charge a price equal to marginal cost.



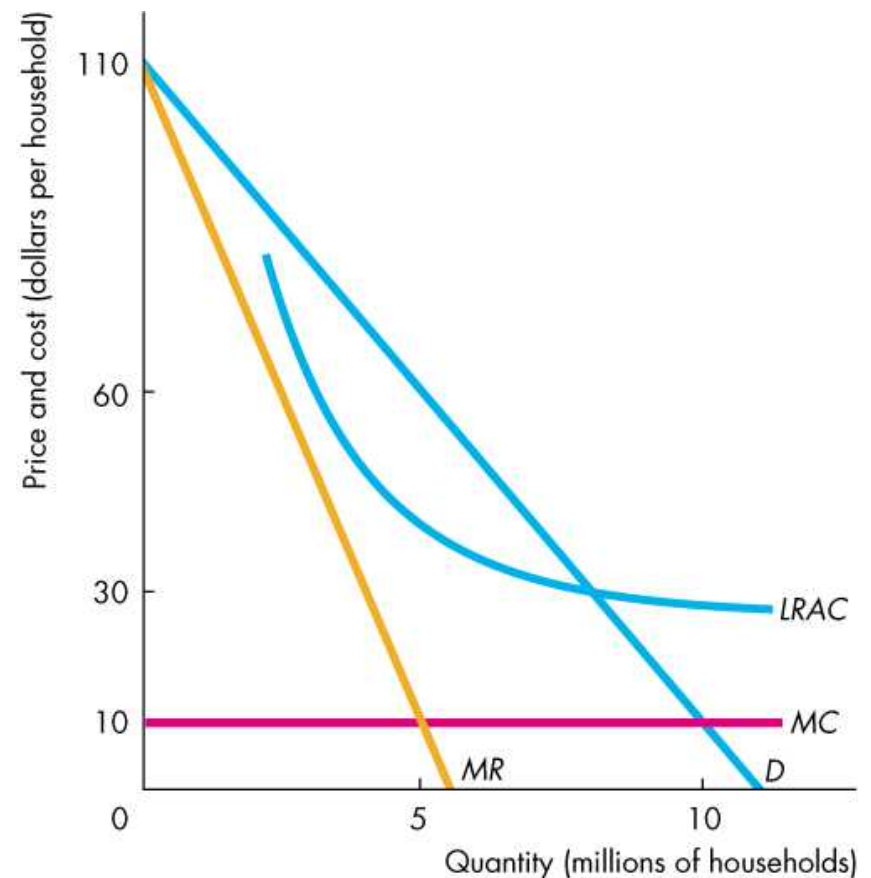


# Monopoly Regulation

## Second-Best Regulation of a Natural Monopoly

Another alternative is to permit the firm to produce the quantity at which price equals average cost and to set the price equal to average cost—the **average cost pricing rule**.

Or the government might pay a subsidy equal to the monopoly's loss.



## Monopoly Regulation

Implementing average cost pricing can be a problem because it is not possible for the regulator to be sure what the firm's costs are.

Regulators use one of two practical rules:

- Rate of return regulation
- Price cap regulation

# Monopoly Regulation

## Rate of Return Regulation

Under **rate of return regulation**, a firm must justify its price by showing that its return on capital doesn't exceed a specified target rate.

This type of regulation can end up serving the self-interest of the firm rather than the social interest because ...

the firm's managers have an incentive to inflate costs and use more capital than the efficient amount.

# Monopoly Regulation

## Price Cap Regulation

A **price cap regulation** is a price ceiling.

The rule specifies the highest price that the firm is permitted to charge.

This type of regulation gives the firm an incentive to operate efficiently and keep costs under control.

Figure 13.12 shows how a price cap works.

# Monopoly Regulation



Unregulated, a natural monopoly profit-maximizes.

A price cap sets the maximum price.

The firm has an incentive to minimize cost and produce the quantity on the demand curve at the price cap.

The price cap regulation lowers the price and increases the quantity.

