OBJECTIVES

- Explain how managers should respond to different competitive environments (or market structures) in terms of pricing and output decisions

OBJECTIVES

- Market Power
  - A firm's pricing market power depends on its competitive environment.
  - In perfectly competitive markets, firms have no market power. They are "price takers." They make decisions based on the market price, which they are powerless to influence.
  - In markets that are not perfectly competitive (which describes most markets), most firms have some degree of market power.

OBJECTIVES

- Strategy in the absence of market power
  - Firms cannot influence price and, because products are not unique, they cannot influence demand by advertising or product differentiation.
  - Managers in this environment maximize profit by minimizing cost, through the efficient use of resources, and by determining the quantity to produce.

Perfect Competition Characteristics

Large number of buyers and sellers- Each firm in the industry produces a small portion of industry output, and each customer buys only a small part of the total

Product Homogeneity- The output of each firm is perceived by customers to be essentially the same as the output of any other firm in the industry.

Free entry and exit- Firms are not restricted from entering or leaving the industry

Perfect dissemination of information- Cost, price, and product quality information is known by all buyers and all sellers in the market.

MARKET STRUCTURE

- Perfect competition: When there are many firms that are small relative to the entire market and produce similar products
  - Firms are price takers.
  - Products are standardized (identical).
  - There are no barriers to entry.
  - There is no nonprice competition.

MARKET STRUCTURE

- Imperfect competition
  - Firms have some degree of market power and can determine prices strategically.
  - Products may not be standardized.
  - Firms employ non price competition.
    - Product differentiation
    - Advertising
    - Branding
    - Public relations

MARKET STRUCTURE

- Barriers to entry
  - Barriers that determine how easily firms can enter an industry, depending on the market structure

Lets concentrate on Perfect Competition for now

MARKET PRICE IN PERFECT COMPETITION

- Market price is determined by the intersection of the market demand curve and the market supply curve.

MARKET PRICE IN PERFECT COMPETITION

- Example
  - Demand: $P = 22 - 0.5Q_D$
  - Supply: $P = 4 + 0.25Q_S$
  - Equilibrium: P = $10 and Q = 24 thousand units
  - If there are 1,000 firms in the market, each produces twenty-four units. If one firm alters output, there will be virtually no effect on market price, so each firm faces a nearly horizontal demand curve.

Perfectly Competitive Industry.

In a perfectly competitive Industry the price is determined by supply and demand.

Supply=Demand.
Hypothetical Demand function P =$40 - $0.0001Q
Hypothetical Supply function P= -0.254 + $0.000025Q

Solving for quantity by setting the Supply=Demand.
$P^D=P^S$

40 - 0.0001Q = -0.254 + 0.000025Q
$\Rightarrow$ Q = 322,032

We then solve for price by plugging Q into the demand or supply function.
P= $7.80

If we draw a hypothetical supply and demand curve the price will be determined where they meet.

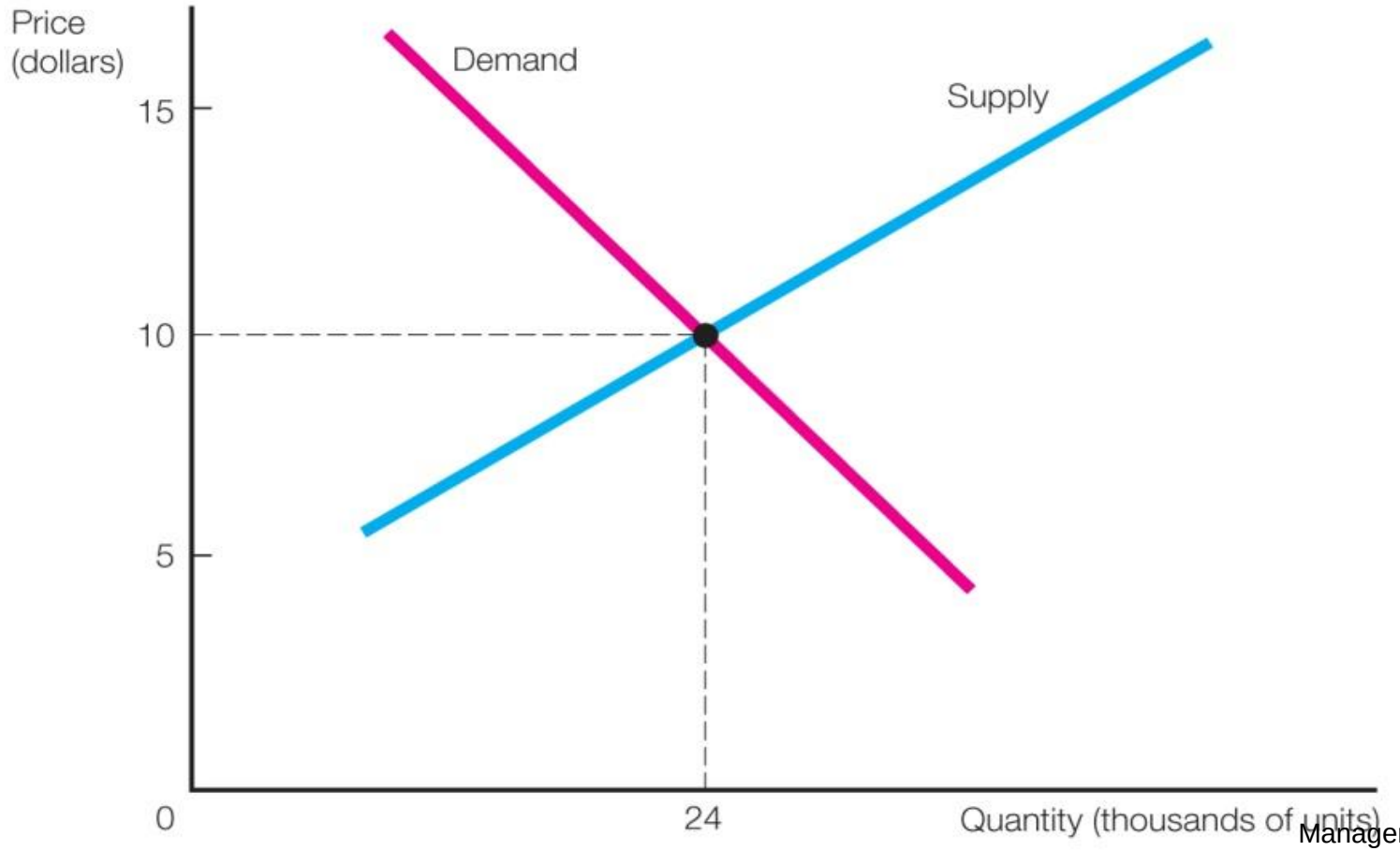
In a perfectly competitive environment all firms are **price takers**. Each one is unable to affect the price simply because they cannot produce enough to do so.

On the other hand the firm since the firm can produce as much as it without affecting the price then the individuals firms demand curve is a flat line. The receive the same price.

DETERMINATION OF PRICE IN A PERFECTLY COMPETITIVE MARKET

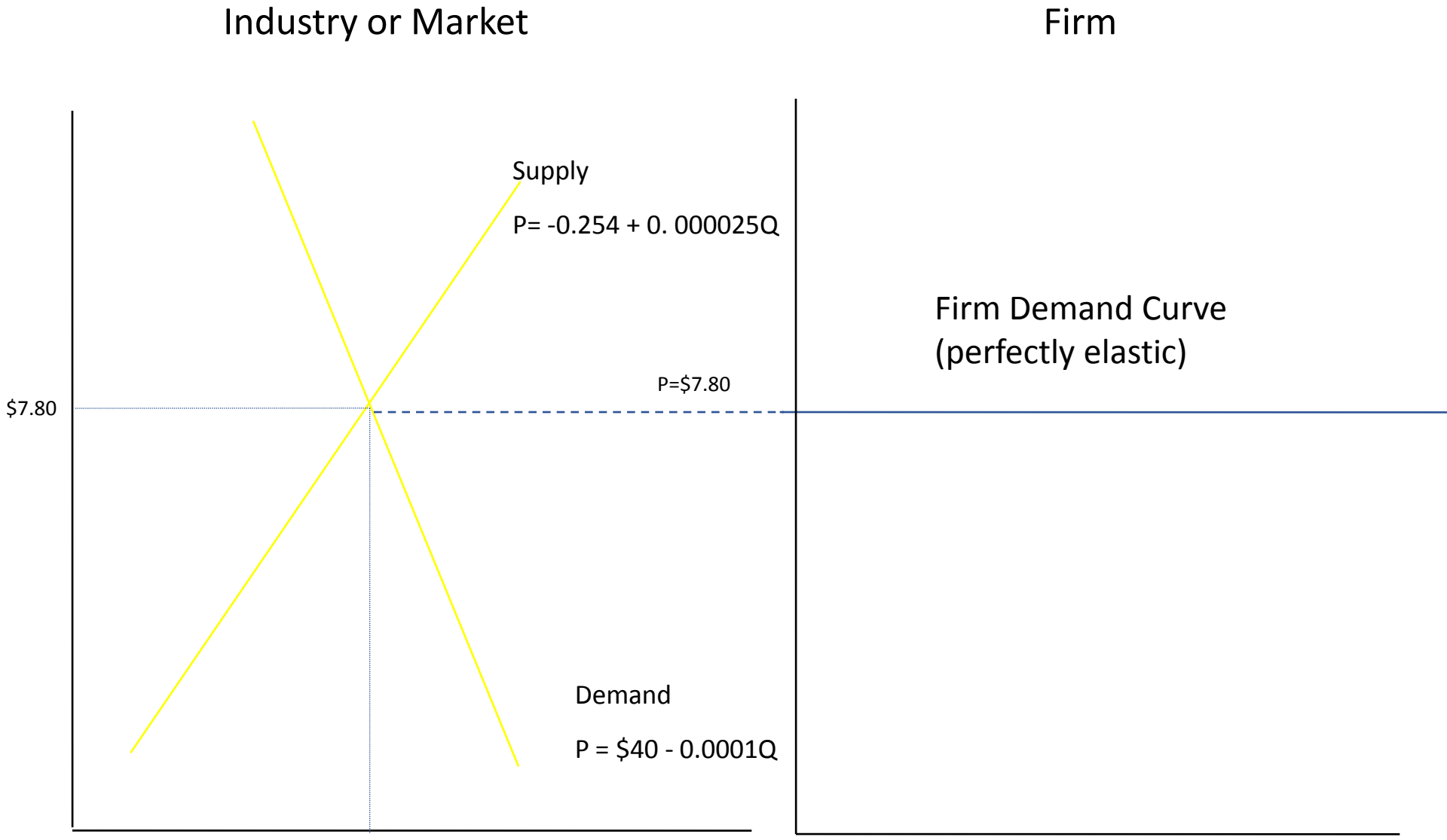
FIGURE 7.1

Determination of Price in a Perfectly Competitive Market



SHIFTS IN SUPPLY AND DEMAND CURVES

- It is important for managers to understand the factors that cause supply and demand curves to shift.
  - Advances in technology cause supply to increase.
  - Increasing input prices cause supply to decrease.


Industry or Market
Firm
Supply
P= -0.254 + 0. 000025Q
Firm Demand Curve
(perfectly elastic)
P=$7.80
$7.80
Demand
P = $40 - 0.0001Q

As we know the firm will produce until its Marginal Revenue equals it Marginal Cost. Since the demand curve is flat (fixed Price) the firm's marginal revenue is fixed at the market price.

Therefore the firm will produce until its marginal cost equals its price.

P=MR=MC

Example of the firm's production decision in a Perfectly Competitive industry.

$P=MR=MC$

$MR=MC$

$7.80 = +0.000049Q^2-0.02114Q + 7.6$

$0.000049Q^2-0.02114Q - 0.2=0$

$\Rightarrow Q=440$

THE OUTPUT DECISION OF A PERFECTLY COMPETITIVE FIRM

- Profit maximization example
  - Market price (P) = $10
  - Total revenue (TR) = PQ
  - Total cost (TC) = $1 + 2Q + Q^2$
  - Profit (π) = PQ – TC = $10Q – (1 + 2Q + Q^2)$
  - Table 7.2: Cost and Revenues of a Perfectly Competitive Firm
  - Figure 7.2: Relationship between Total Cost and Total Revenue of a Perfectly Competitive Firm
  - Figure 7.3: Relationship of Profit and Output of a Perfectly Competitive Firm

TABLE 7.2

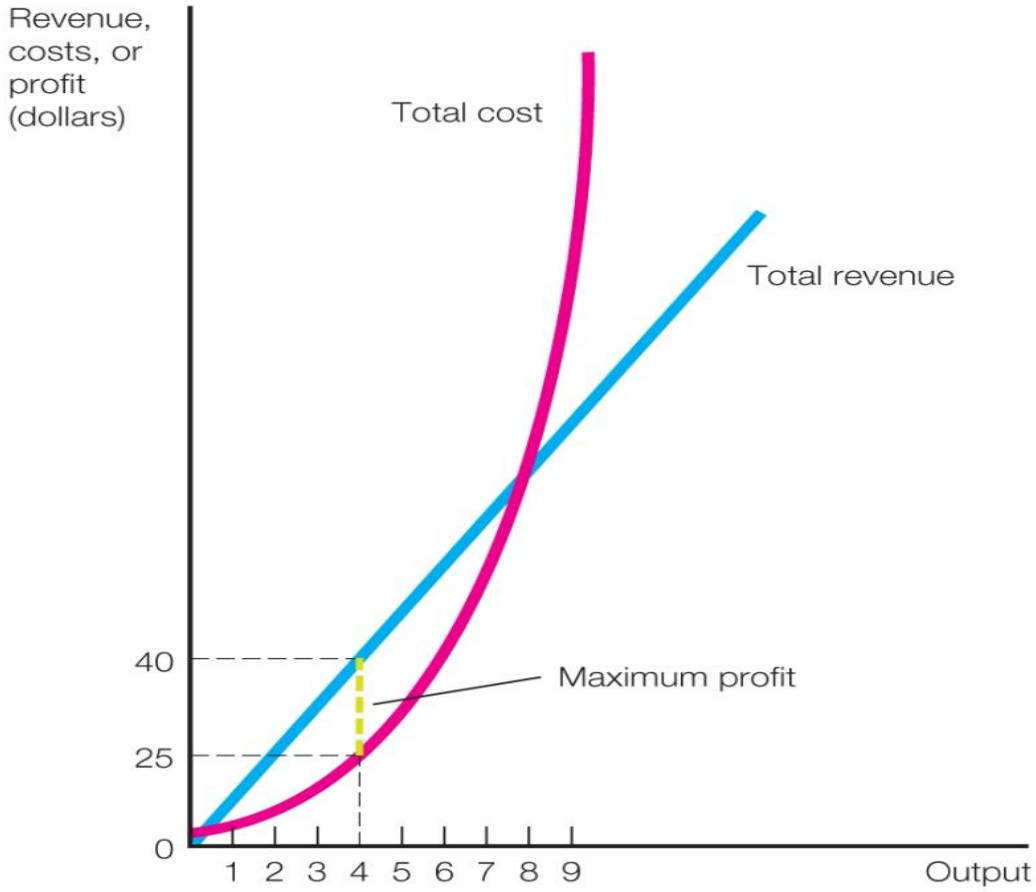
Cost and Revenues of a Perfectly Competitive Firm

Units of Output Period	Price (Dollars)	Total Revenue (Dollars)	Total Fixed Costs (Dollars)	Total Variable Costs (Dollars)	Total Cost (Dollars)	Total Profit (Dollars)
0	10	0	1	0	1	−1
1	10	10	1	3	4	6
2	10	20	1	8	9	11
3	10	30	1	15	16	14
4	10	40	1	24	25	15
5	10	50	1	35	36	14
6	10	60	1	48	49	11
7	10	70	1	63	64	6
8	10	80	1	80	81	−1
9	10	90	1	99	100	−10

RELATIONSHIP BETWEEN TOTAL COST AND TOTAL REVENUE OF A PERFECTLY COMPETITIVE FIRM

FIGURE 7.2

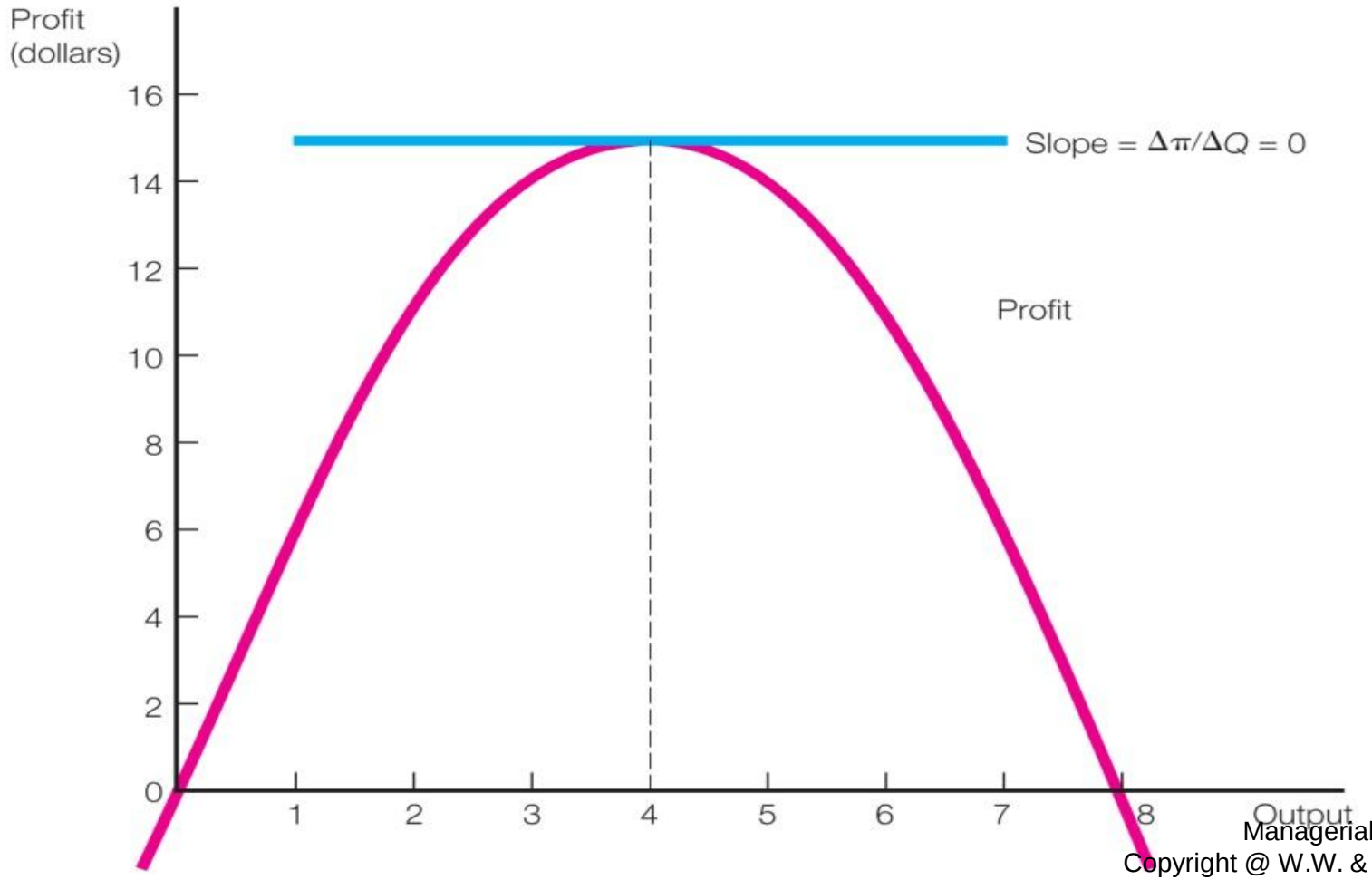
Relationship between Total Cost and Total Revenue of a Perfectly Competitive Firm



RELATIONSHIP OF PROFIT AND OUTPUT OF A PERFECTLY COMPETITIVE FIRM

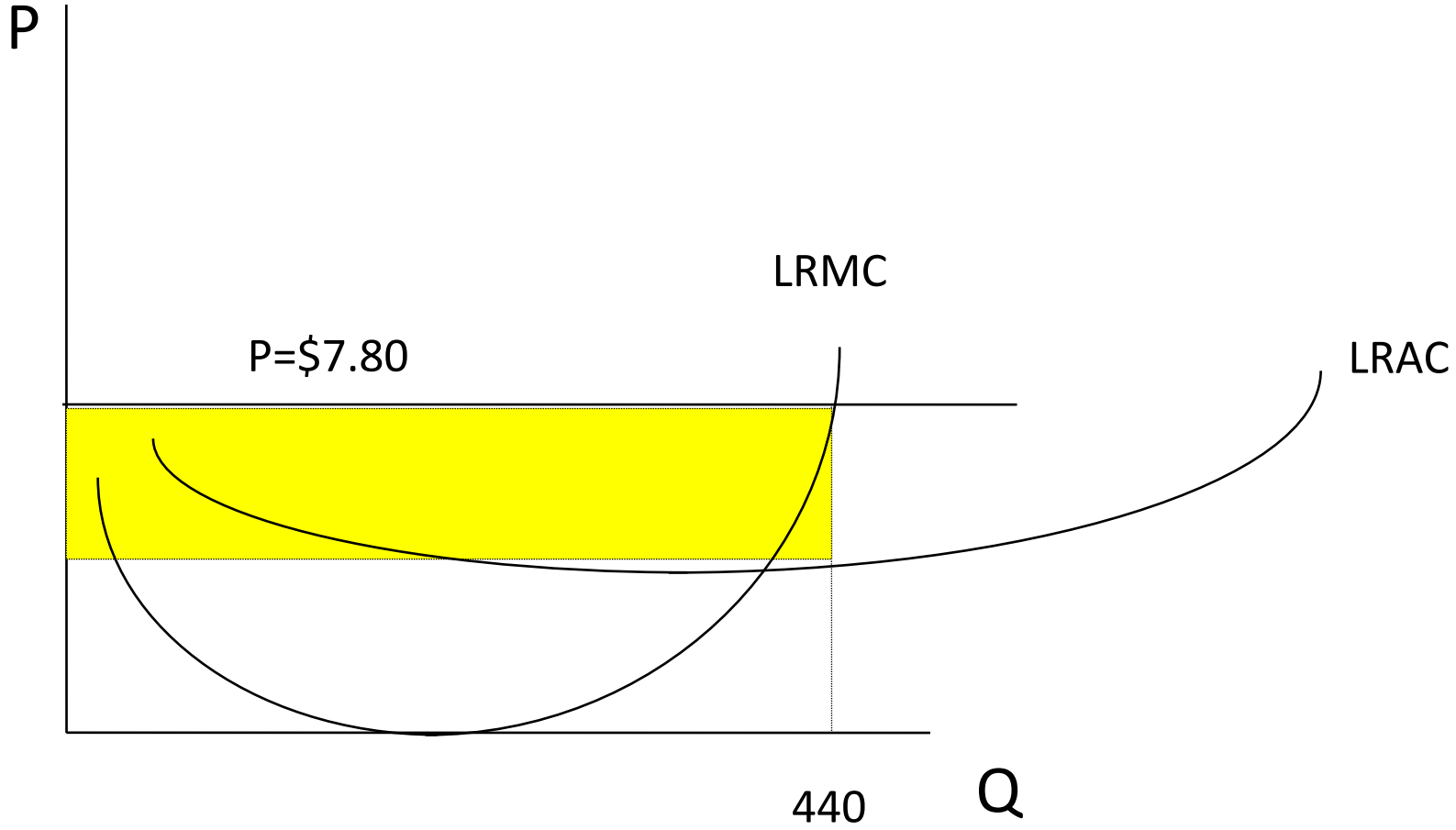
FIGURE 7.3

Relationship of Profit and Output of a Perfectly Competitive Firm



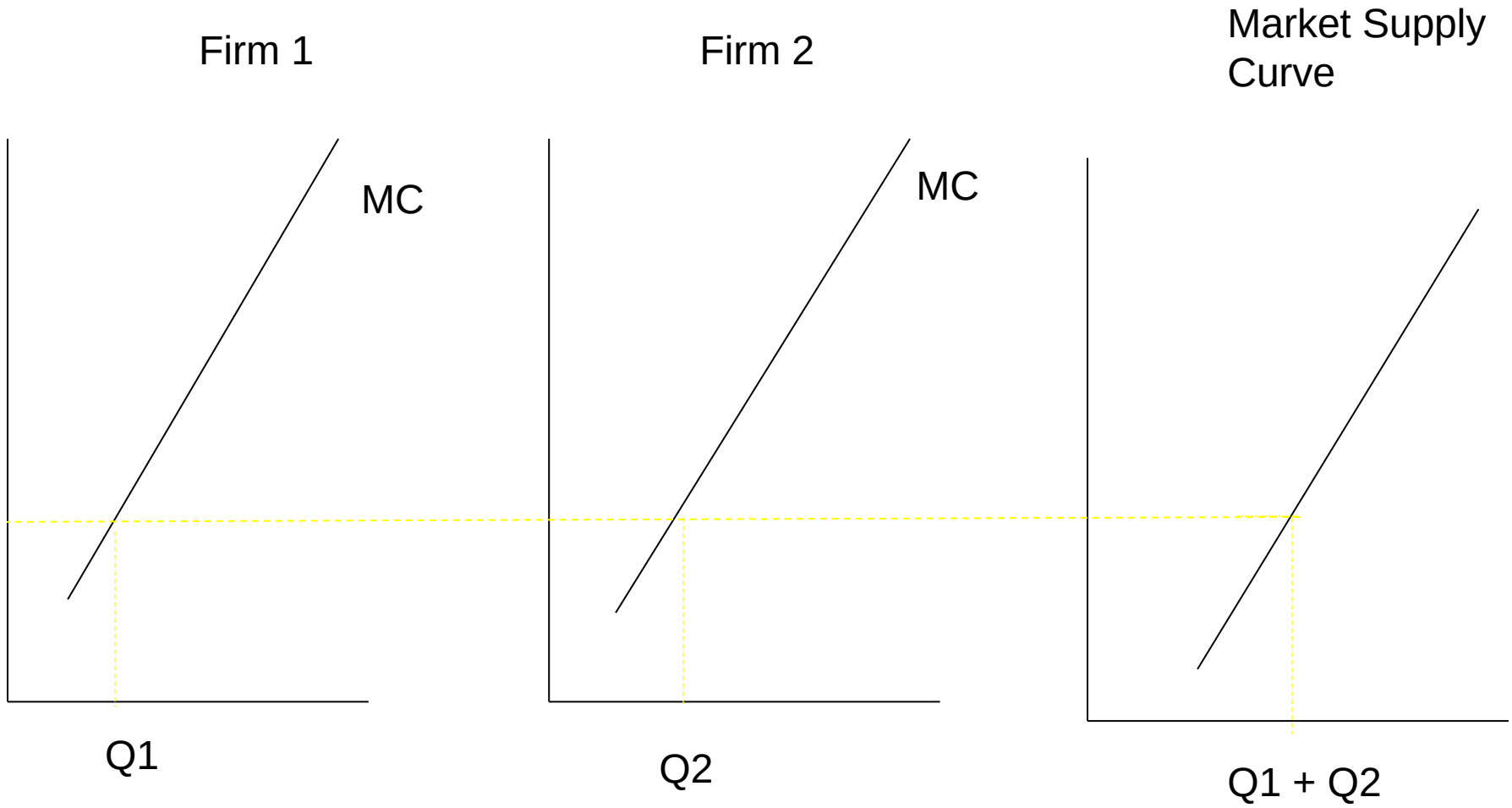
Perfectly Competitive Firm (other example graph)

Profit Maximizing Level



The Firm in the above graph is making an economic profit. The profit is equal to the shaded rectangle.

The Industry supply is just the sum of the supply of each firm in the industry. Since each firm produces where MC=P then the industry supply curve is the summation of the individual marginal cost curves.


Firm 1
Firm 2
Market Supply Curve
MC
MC
Q1
Q2
Q1 + Q2

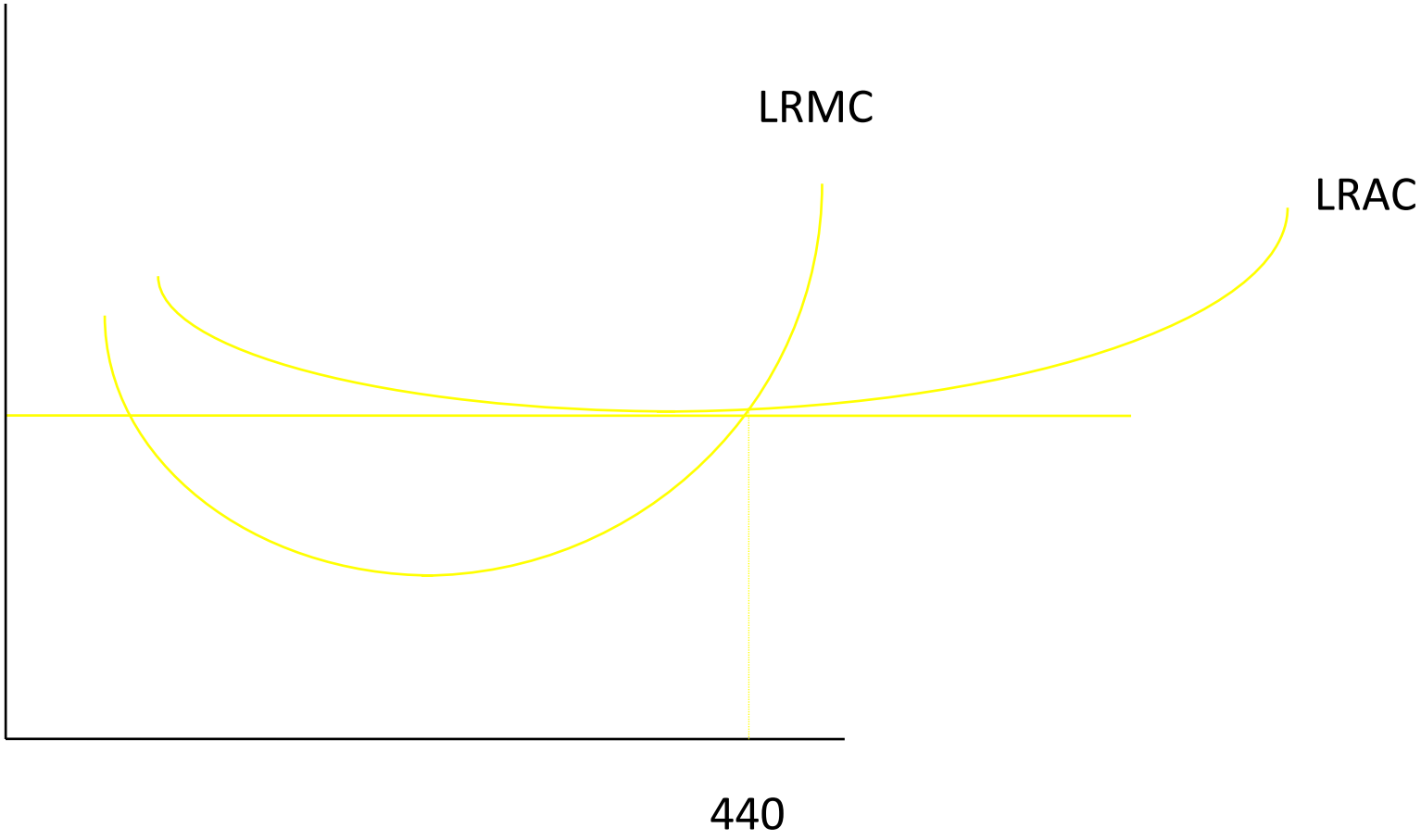
Since there are not barrier to entry in a perfectly competitive environment firm will enter seeking earn this profit.

In the above case the firm makes an economic profit. Since there is no barriers firms will enter seeking these excess profits. This will tend to increase industry supply and lower the price.

The price will be lowered until there is not long excess profit (economic profit zero).

This will be where LRAC=P=LRMC.

PC firm in Long Run
zero economic profit



THE OUTPUT DECISION OF A PERFECTLY COMPETITIVE FIRM

- Profit is maximized at the quantity of output (Q) where marginal revenue equals marginal cost and marginal cost is increasing
  - $\Delta\pi/\Delta Q = \Delta TR/\Delta Q - \Delta TC/\Delta Q = 0$
  - Marginal revenue (MR) = $\Delta TR/\Delta Q = P$
  - Marginal cost (MC) = $\Delta TC/\Delta Q$

THE OUTPUT DECISION OF A PERFECTLY COMPETITIVE FIRM

- Profit maximization example (cont'd)
  - MR = 10
  - MC = 2 + 2Q
  - MR = MC => Q = 4
  - Table 7.3: Marginal Revenue and Marginal Cost: Perfectly Competitive Firm
  - Figure 7.4: Marginal Revenue and Marginal Cost of a Perfectly Competitive Firm

TABLE 7.3

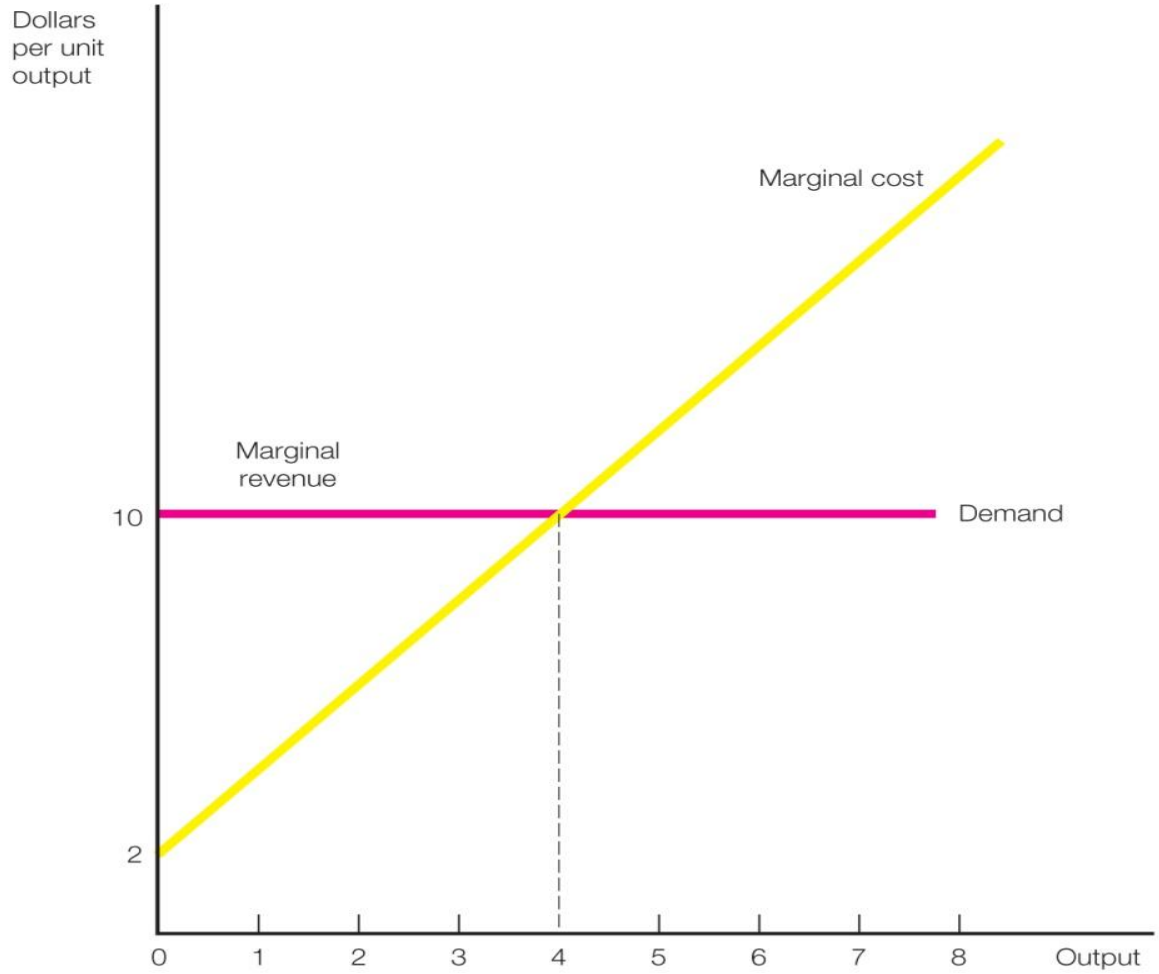
Marginal Revenue and Marginal Cost: Perfectly Competitive Firm

Output per Period	Marginal Revenue	Marginal Cost[a]
0	10	2
1	10	4
2	10	6
3	10	8
4	10	10
5	10	12
6	10	14
7	10	16
8	10	18

MARGINAL REVENUE AND MARGINAL COST OF A PERFECTLY COMPETITIVE FIRM

FIGURE 7.4

Marginal Revenue and Marginal Cost of a Perfectly Competitive Firm



THE OUTPUT DECISION OF A PERFECTLY COMPETITIVE FIRM

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THE OUTPUT DECISION OF A PERFECTLY COMPETITIVE FIRM

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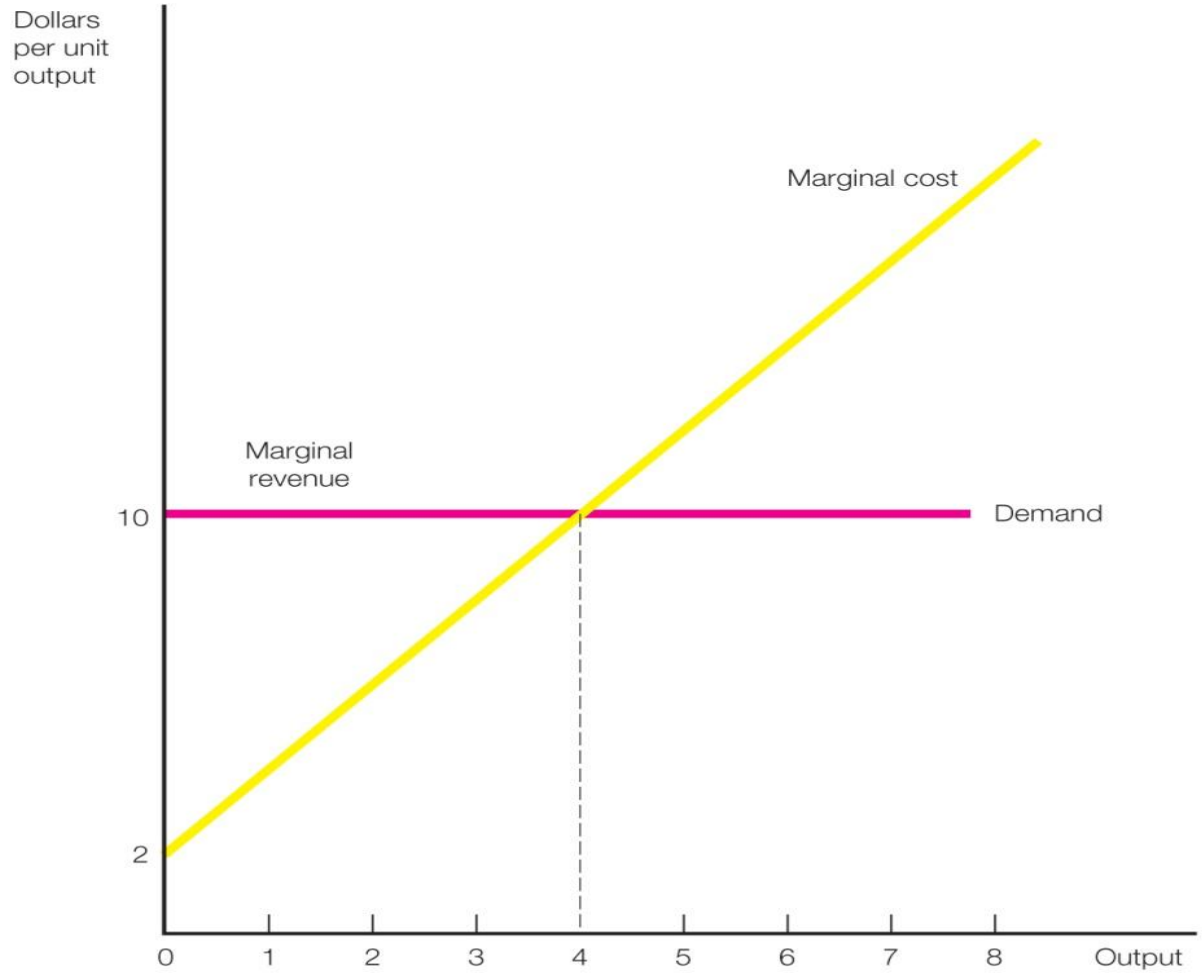
8	10	18

MARGINAL REVENUE AND MARGINAL COST OF A PERFECTLY COMPETITIVE FIRM

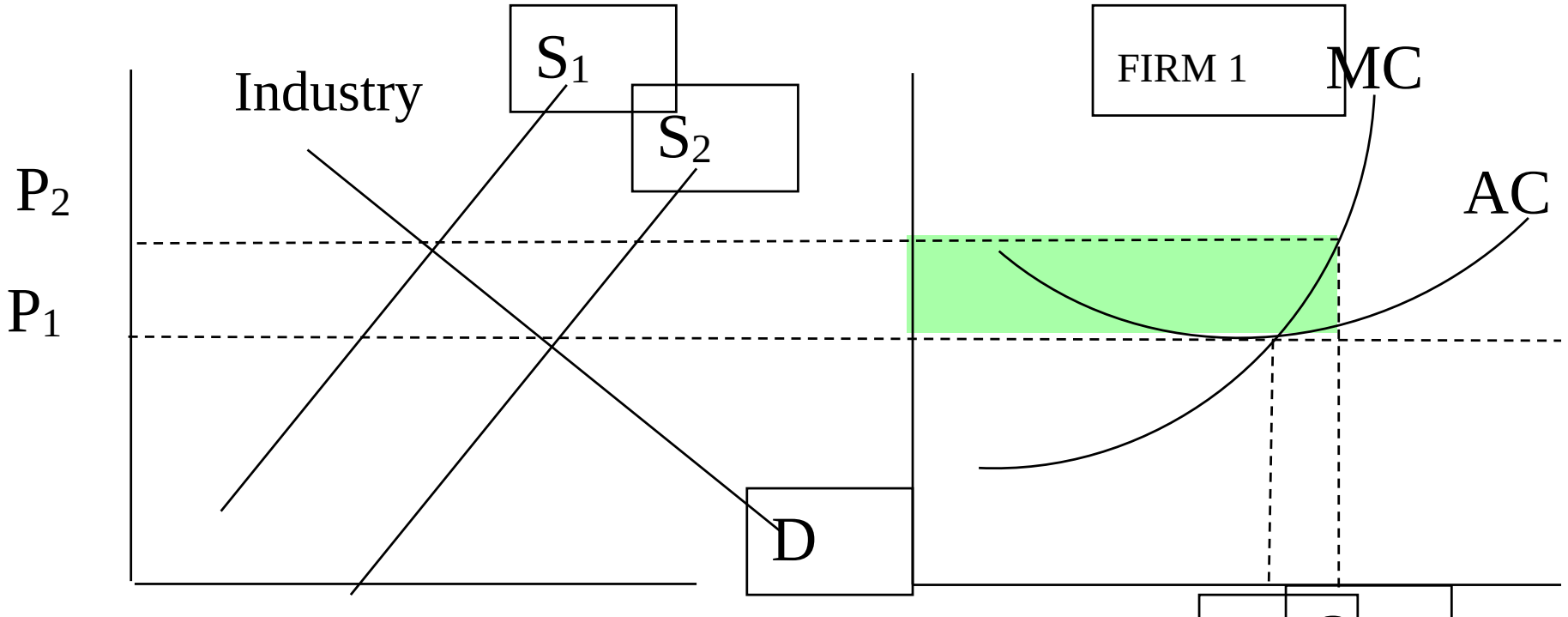
FIGURE 7.4

Marginal Revenue and Marginal Cost of a Perfectly Competitive Firm

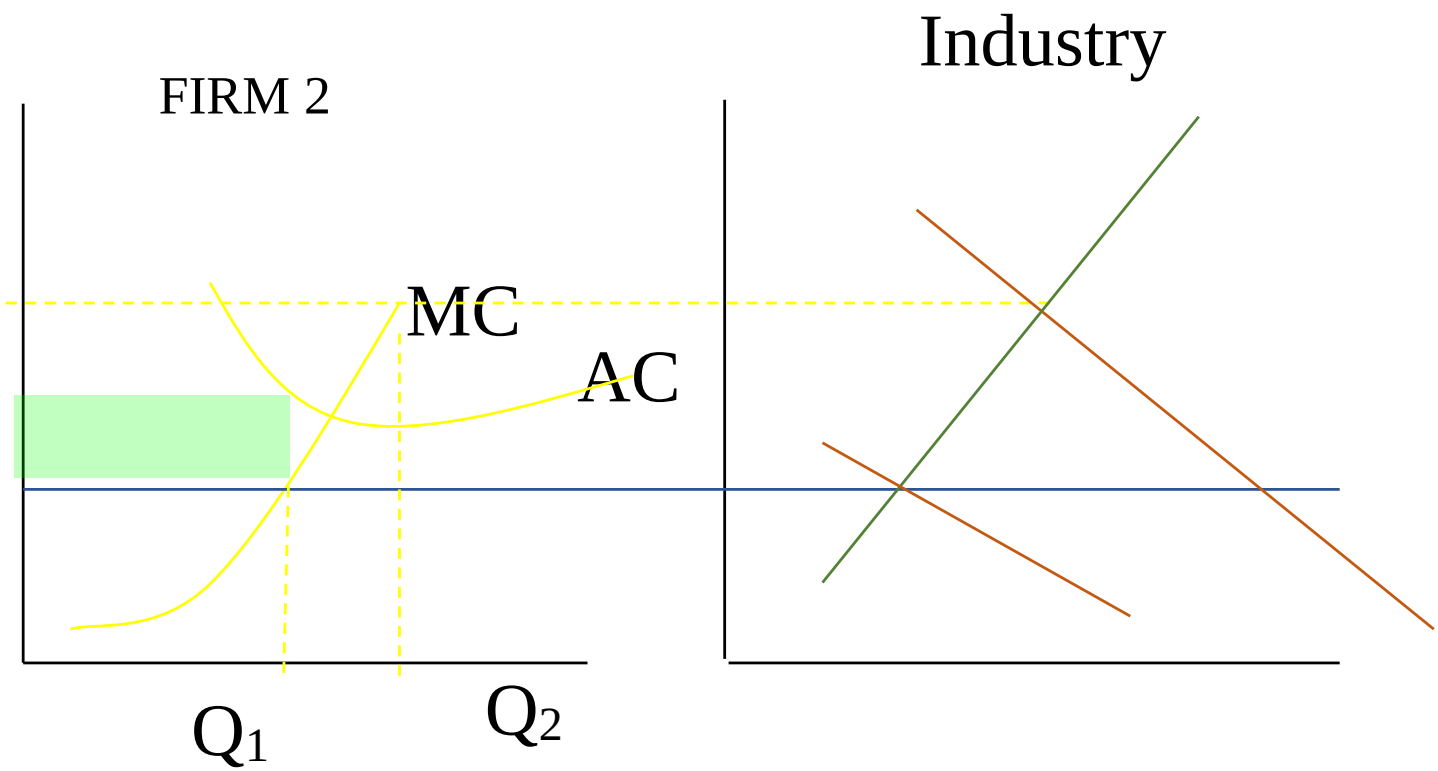


Another Example

Firm 1: At P_2 the firm 1 has positive economic profit denote by the rectangle, that is the difference between the price they sell at and AC multiplied by the quantity sold. At P_1 after S increases, economic profit is zero.



Firm 2 (Economic Loss)



SETTING THE MARGINAL COST EQUAL TO THE PRICE

- Shutdown point: When the price equals the minimum average variable cost
  - If price is greater than average variable cost, produce a level of output in which marginal cost is equal to price, even if this results in negative profit. Profit will exceed that which would result from shutting down.

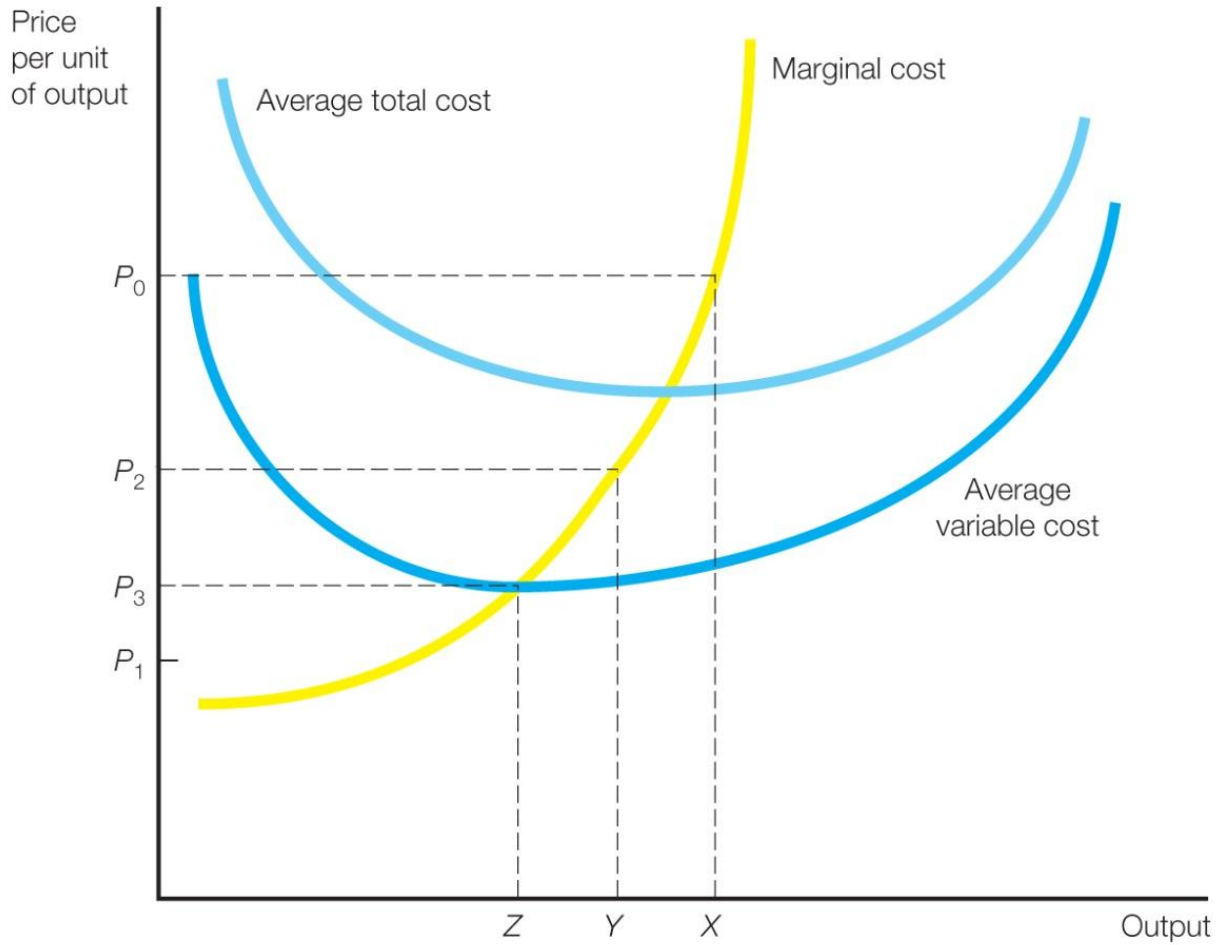
SETTING THE MARGINAL COST EQUAL TO THE PRICE

- Shutdown point: When the price equals the minimum average variable cost (cont'd)
  - If price is less than average variable cost, shut down and produce no output. Negative profit will be equal to total fixed costs.
  - Figure 7.5: Short-Run Average and Marginal Cost Curves
  - Since fixed costs are incurred whether the company operate or not, it should not shut in the short run at price P2

SHORT-RUN AVERAGE AND MARGINAL COST CURVES

FIGURE 7.5

Short-Run Average and Marginal Cost Curves



ANOTHER WAY OF VIEWING THE PRICE EQUALS MARGINAL COST PROFIT-MAXIMIZING RULE

- If a firm has one fixed input (say capital) and one variable input (say labor, L), how much of its variable input should it utilize?
- Marginal revenue product (MRP): Amount an additional unit of the variable input adds to the firm's total revenue
  - Marginal revenue product of labor = MRP_L
  - $MRP_L = \Delta TR/\Delta L = (\Delta TR/\Delta Q)(\Delta Q/\Delta L) = (MR)(MP_L)$

ANOTHER WAY OF VIEWING THE PRICE EQUALS MARGINAL COST PROFIT-MAXIMIZING RULE

- Marginal expenditure on labor (ME_L): amount an additional unit of labor adds to the firm's total costs
  - $ME_L = \Delta TC/\Delta L = (\Delta TC/\Delta Q)(\Delta Q/\Delta L) = (MC)(MP_L)$
- Profit is maximized when the employment of the variable input is such that marginal revenue product is equal to marginal expenditure.
  - Equivalent to MR = MC in terms of output.

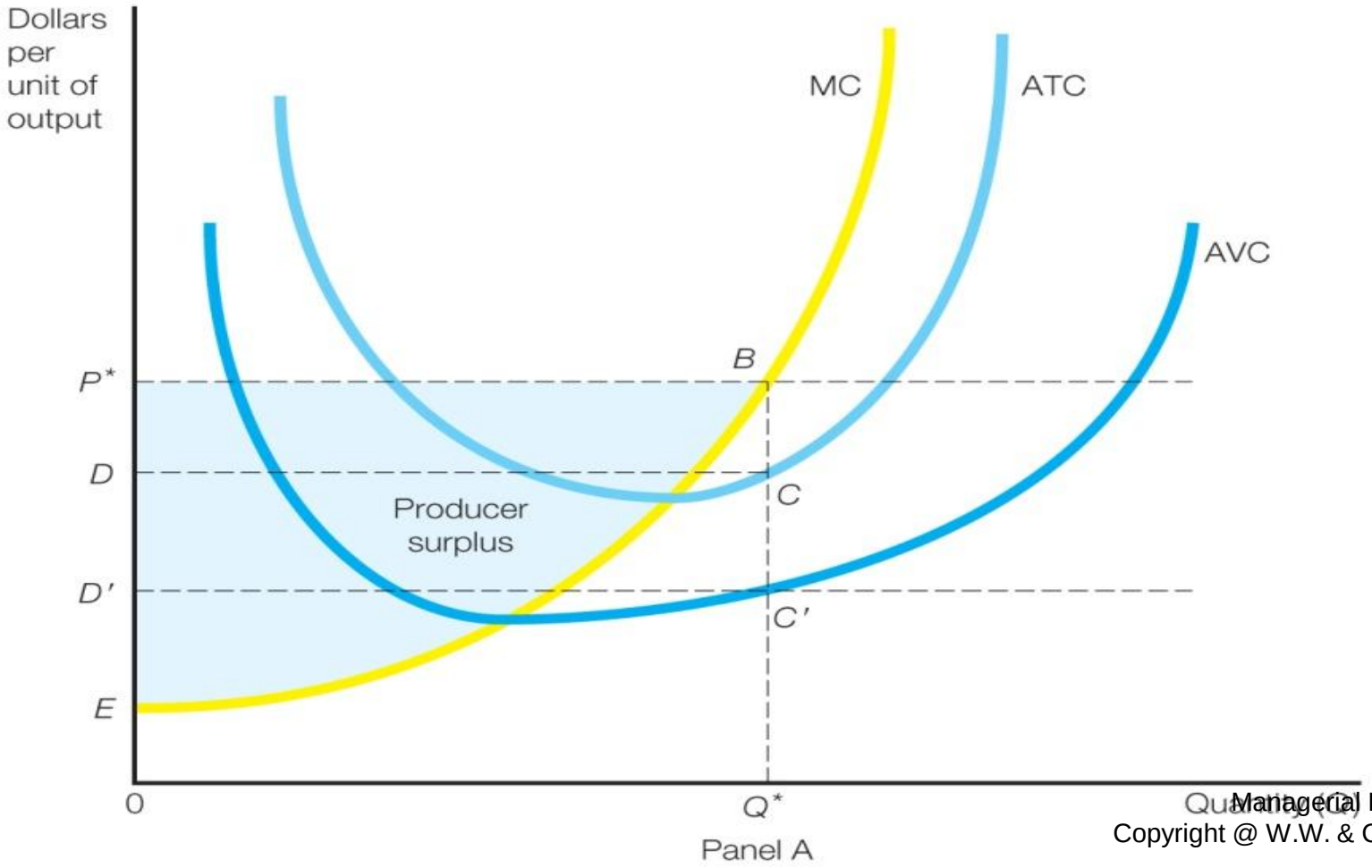
PRODUCER SURPLUS IN THE SHORT RUN

- Producer surplus: Difference between the market price and the price the producer is willing to receive for a good or service (the producer's reservation price)
  - A firm's reservation price is the marginal cost of production above the shutdown point.
  - Producer surplus is a firm's variable cost profit: TR – TVC.
  - Producer surplus is the difference between a firm's supply curve and the market price under perfect competition.

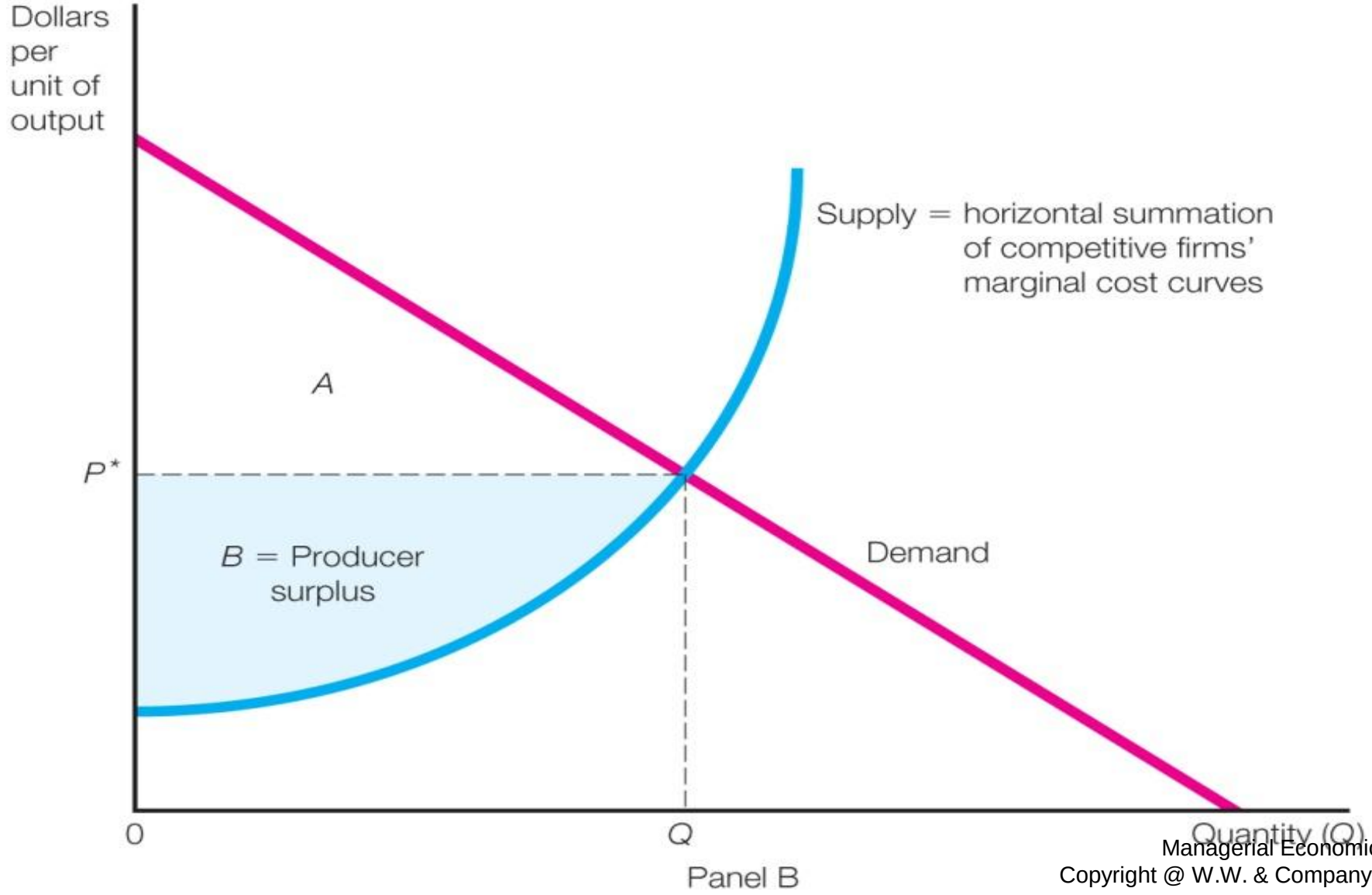
PRODUCER SURPLUS AND VARIABLE-COST PROFIT

FIGURE 7.6

Producer Surplus and Variable-Cost Profit



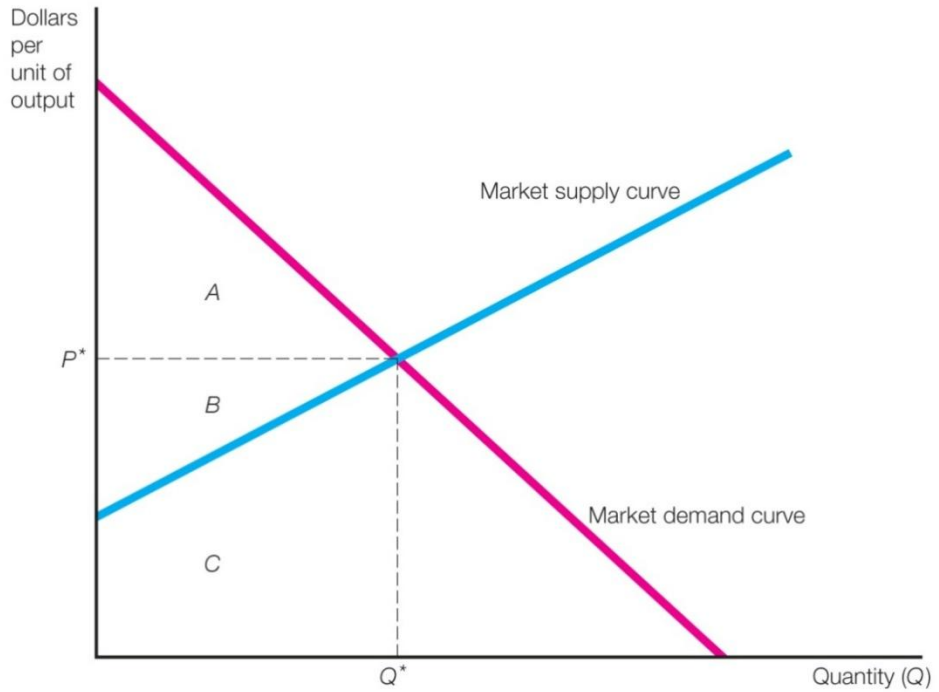
PRODUCER SURPLUS AND VARIABLE-COST PROFIT



MARKET SOCIAL WELFARE (A + B) OF A PERFECTLY COMPETITIVE PRICE POLICY, P*

FIGURE 7.7

Market Social Welfare ($A + B$) of a Perfectly Competitive Price Policy, P^*



LONG-RUN EQUILIBRIUM OF A PERFECTLY COMPETITIVE FIRM

- Conditions
  - Quantity produced is such that profit is equal to zero and price is equal to
    - The lowest point on the long-run average (total) cost curve and the relevant short-run total cost curve
    - Long-run marginal cost and short-run marginal cost

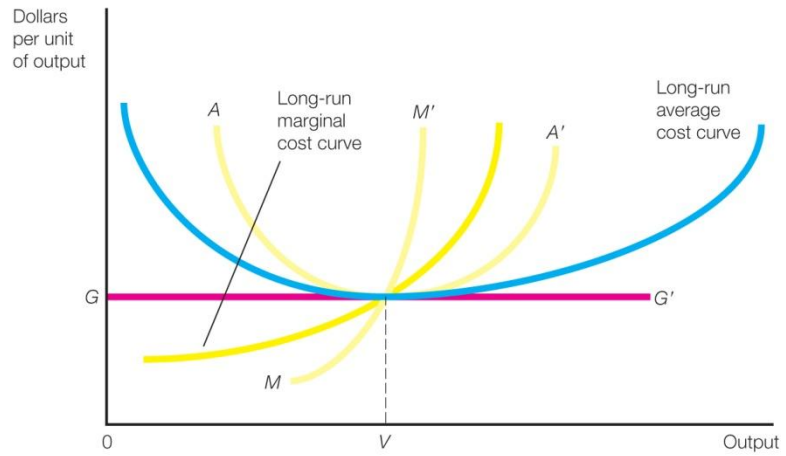
LONG-RUN EQUILIBRIUM OF A PERFECTLY COMPETITIVE FIRM

- Adjustment to equilibrium
  - If firms are earning negative profits, then firms will exit the industry, market supply will decrease, and price will rise to the long-run equilibrium level.
  - If firms are earning positive profits, then firms will enter the industry, market supply will increase, and price will fall to the long-run equilibrium level.

LONG-RUN EQUILIBRIUM OF A PERFECTLY COMPETITIVE FIRM

FIGURE 7.8

Long-Run Equilibrium of a Perfectly Competitive Firm



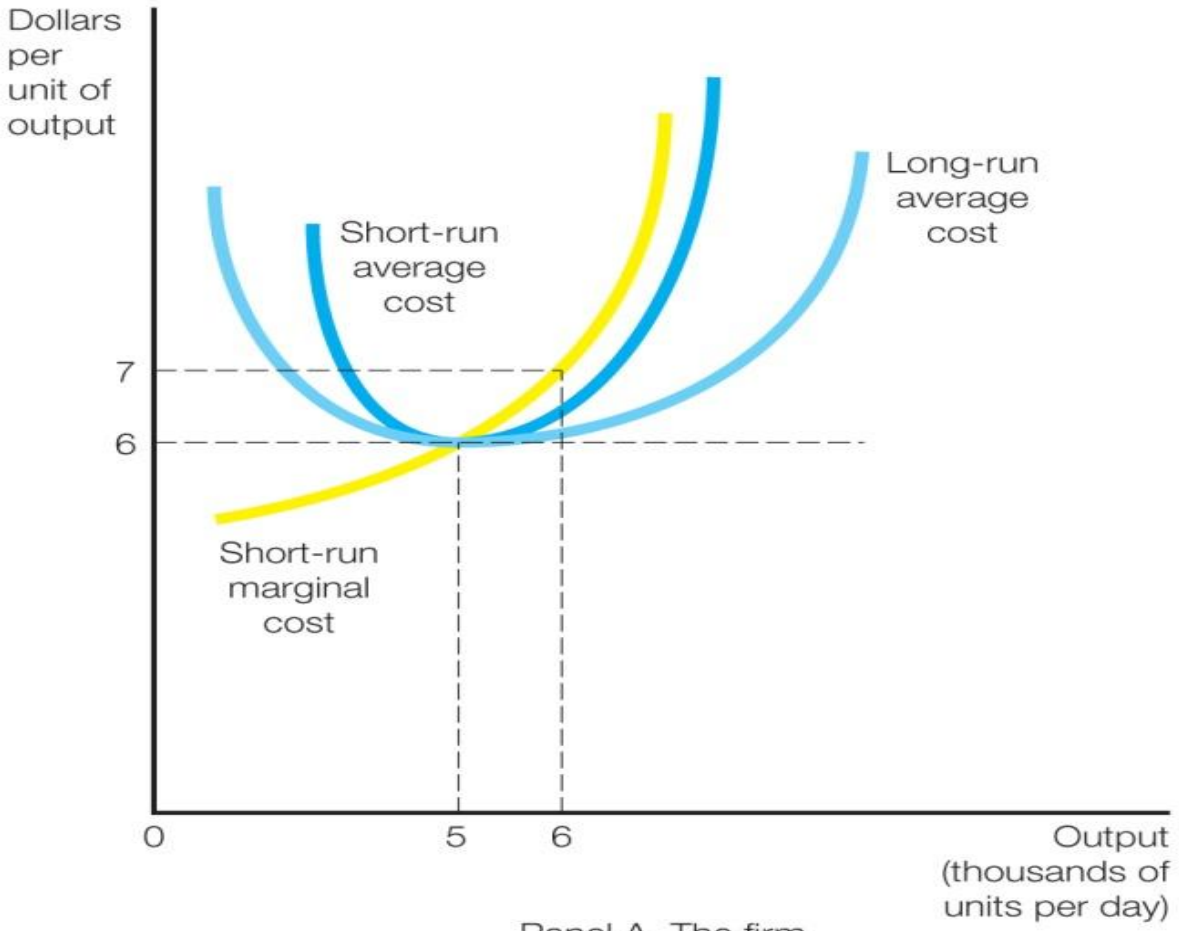
THE LONG-RUN ADJUSTMENT PROCESS: A CONSTANT-COST INDUSTRY

- Constant-cost industry: Industry in which an increase in output does not lead to an increase in input prices
- Horizontal long-run supply curve
- Figure 7.9: Long-Run Equilibrium in a Constant-Cost Industry

LONG-RUN EQUILIBRIUM IN A CONSTANT-COST INDUSTRY

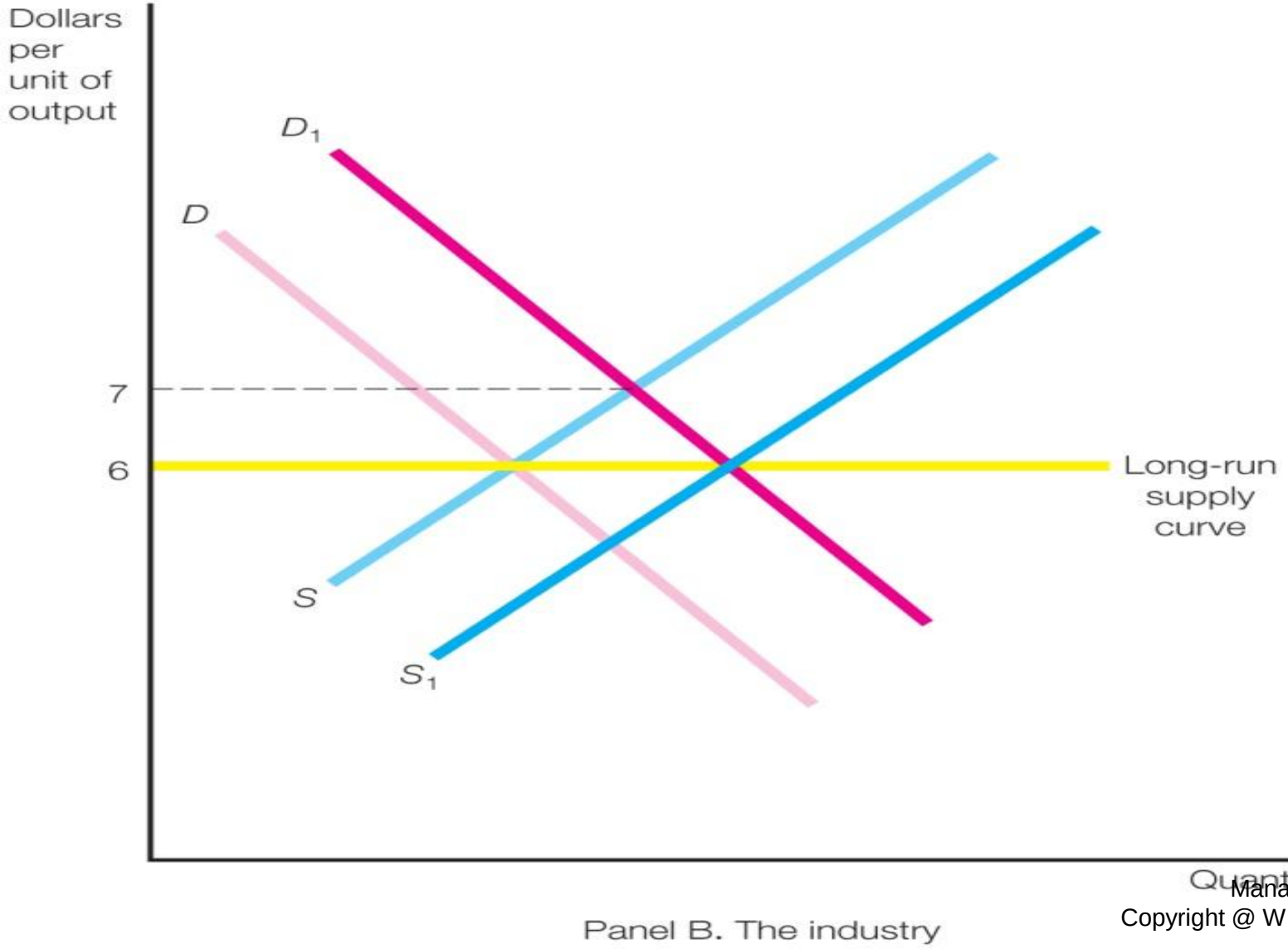
FIGURE 7.9

Long-Run Equilibrium in a Constant-Cost Industry



Panel A. The firm

LONG-RUN EQUILIBRIUM IN A CONSTANT-COST INDUSTRY



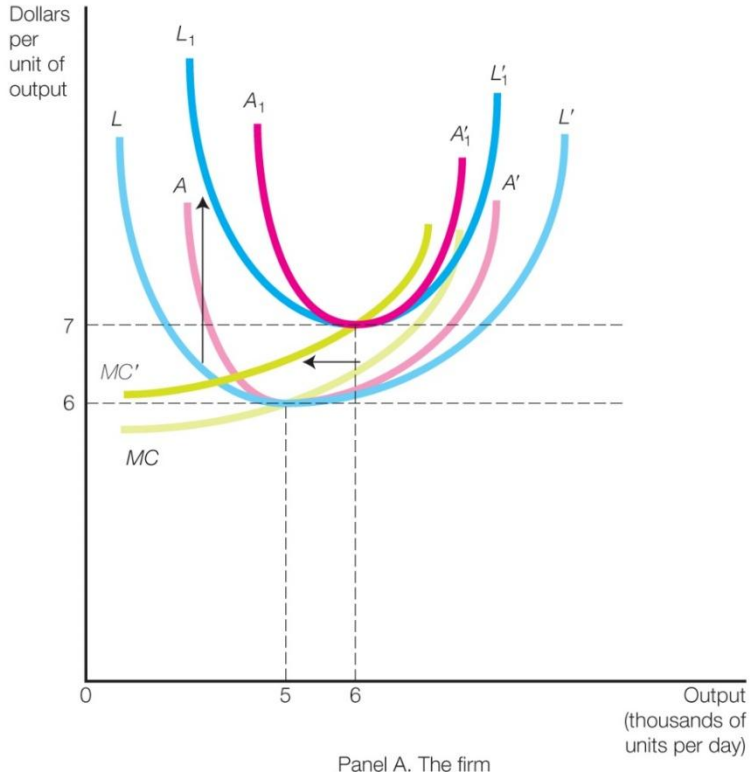
THE LONG-RUN ADJUSTMENT PROCESS: AN INCREASING-COST INDUSTRY

- Increasing-cost industry: Industry in which an increase in output leads to an increase in input prices
  - Upward-sloping long-run supply curve
- Some industries are decreasing-cost industries.
  - Downward-sloping long-run supply curves
- Figure 7.10: Long-Run Equilibrium in an Increasing-Cost Industry

LONG-RUN EQUILIBRIUM IN AN INCREASING-COST INDUSTRY

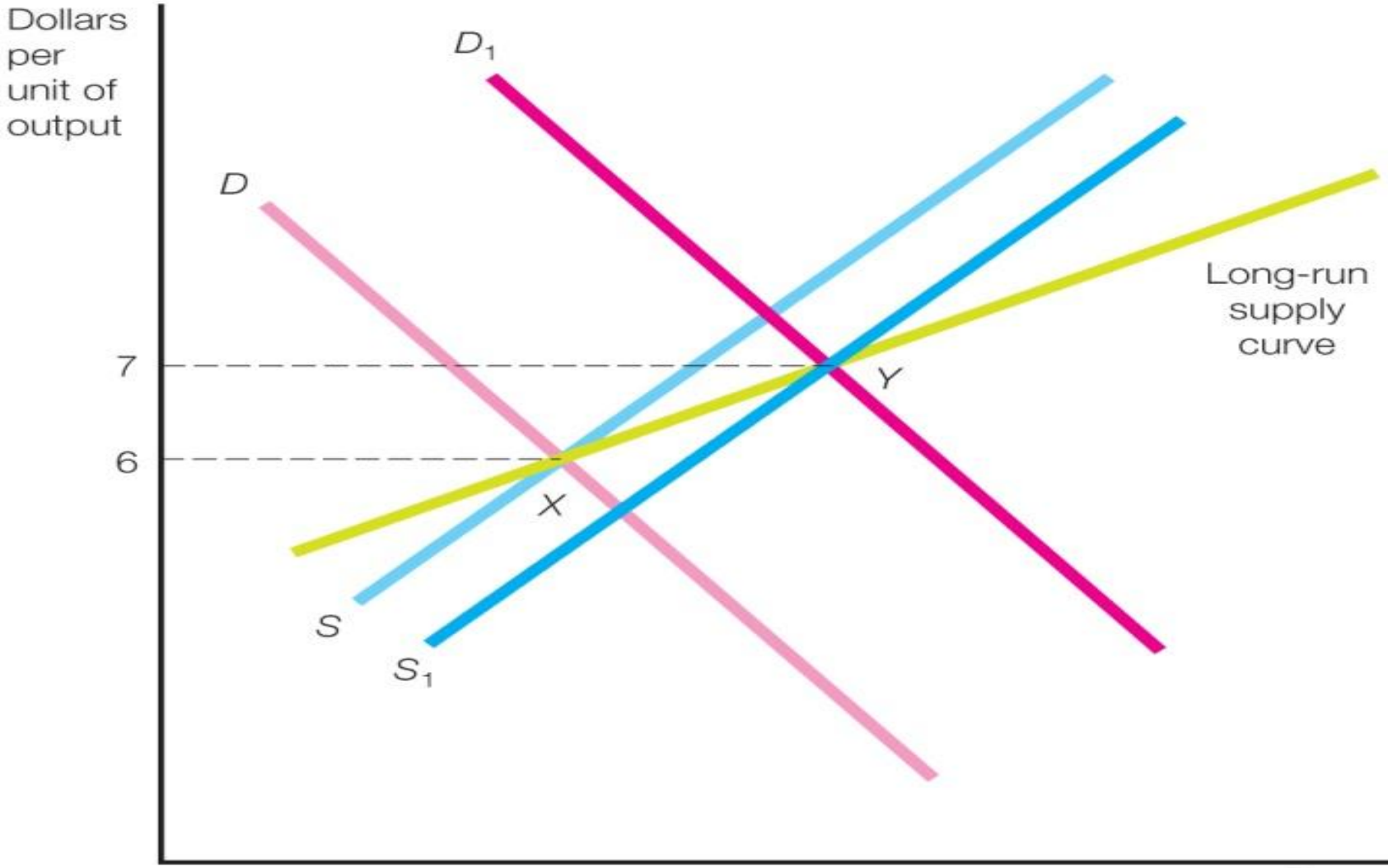
FIGURE 7.10

Long-Run Equilibrium in an Increasing-Cost Industry



Panel A. The firm

LONG-RUN EQUILIBRIUM IN AN INCREASING-COST INDUSTRY



Panel B. The industry

HOW A PERFECTLY COMPETITIVE ECONOMY ALLOCATES RESOURCES

- Example: Demand for corn increases and demand for rice decreases.
  - Short-run equilibrium
    - The price of corn will increase, the quantity of corn produced will increase, and corn producers will earn positive economic profits.
    - The price of rice will decrease, the quantity of rice produced will decrease, and rice producers will earn negative economic profits.

HOW A PERFECTLY COMPETITIVE ECONOMY ALLOCATES RESOURCES

- Example (cont'd)
  - Long-run equilibrium
    - Firms will reallocate resources away from the production of rice and toward the production of corn.
    - The price of corn will decrease from its high, the quantity of corn produced will increase further, and corn producers will find that their economic profits decline to zero.
    - The price of rice will increase from its low, the quantity of rice produced will increase from its low, and rice producers will find that their economic profits rise to zero.