Class Presentation for March 22, & 24, 2016

Chapter #24

"Most of the important things in the world have been accomplished by people who have kept on trying when there seemed to be no hope at all."

» Dale Carnegie

If the planters carry politics into the fields they will find it bad business.

Charles E. Merril
1885 – 1956
In 1915 he and Edmond C. Lynch (1885 – 1938) created Merril Lynch Investing

<u>Looking Forward:</u>

- March 17, 2016 – Test #2
  - Chapters # 20, 21, 22, & 23
- March 22, 2016 – Journal #7 due.
- March 24, 2016 - *Project Paper Outline Due.*
- March 29, 2016 – Journal #8 due.
- April 5, 2016 – Journal #9 due.
- April 7, 2016 – Test #2
  - Chapters # 24, 25, 26, & 27

Chapter 24

Perfect Competition

In the award-winning 2004 movie *Sideways*, the main character raved about pinot noir wine. This review increased the demand for pinot noir wine grown in the Willamette Valley in Oregon.

Prepared By Brock Williams

economics

Principles, Applications, and Tools

EIGHTH EDITION

O'Sullivan | Sheffrin | Perez

PEARSON

Learning Objectives

1. Distinguish between four market structures
2. Explain the short-run output rule and the break-even price
3. Explain the shut-down rule
4. Explain why the short-run supply curve is positively sloped
5. Explain why the long-run industry supply curve may be positively sloped
6. Describe the short-run and long-run effects of changes in demand for an increasing-cost industry
7. Describe the short-run and long-run effects of changes in demand for a constant-cost industry

Perfect Competition

- **perfectly competitive market**
  A market with many sellers and buyers of a homogeneous product and no barriers to entry.

- **price taker**
  A buyer or seller that takes the market price as given.

Perfect Competition

Here are the five features of a perfectly competitive market:

1 There are many sellers.

2 There are many buyers.

3 The product is homogeneous.

4 There are no barriers to market entry.

5 Both buyers and sellers are price takers.

Perfect Competition and the Affordable Care Act

Perfect Competition		Affordable Care Act
There are many sellers.		Open to all private health insurance providers (HIP) in America
There are many buyers.		All citizens who do not have health insurance (employers or other means) must join *exchanges*
The product is homogeneous.		Act establishes minimum standards for policies for all customers
There are no barriers to market entry.		Large barriers for market entry – economies of scale
Both buyers and sellers are price takers.		Act helps to establish market prices for participating HIP's

24.1 PREVIEW OF THE FOUR MARKET STRUCTURES

Perfect Competition: There are many sellers & buyers; homogeneous product; no barriers to entry; price takers are buyers & sellers.

Monopoly: A single firm serves the entire market. A monopoly occurs when the barriers to market entry are very large.

Monopolistic competition: There are no barriers to entering the market, so there are many firms, and each firm sells a slightly different product.

Oligopoly: The market consist of just a few firms because economies of scale or government policies limit the number of firms.
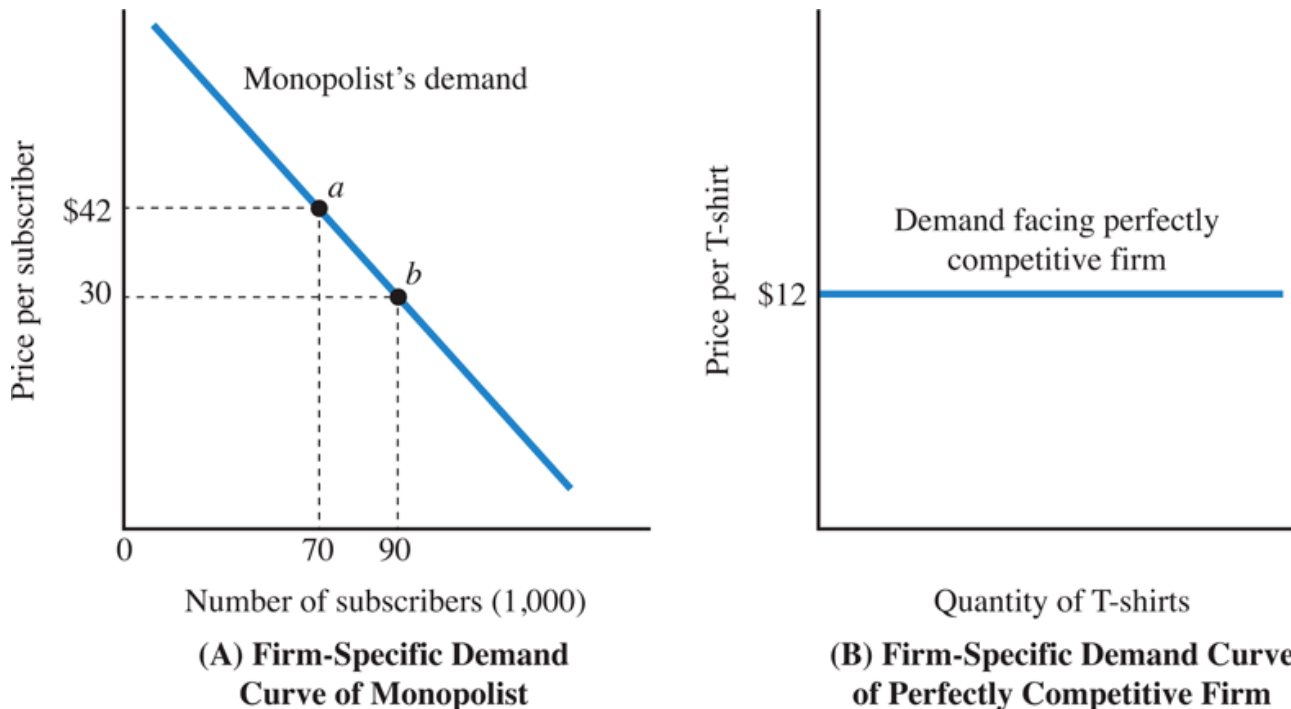
24.1 PREVIEW OF THE FOUR MARKET STRUCTURES (cont.)

▼ **FIGURE 24.1**

Monopoly versus Perfect Competition

In Panel A, the demand curve facing a monopolist is the market demand curve.

In Panel B, a perfectly competitive firm takes the market price as given, so the firm-specific demand curve is horizontal. The firm can sell all it wants at the market price, but would sell nothing if it charged a higher price.

(A) Firm-Specific Demand
Curve of Monopolist

(B) Firm-Specific Demand Curve
of Perfectly Competitive Firm

24.1 PREVIEW OF THE FOUR MARKET STRUCTURES (cont.)

TABLE 24.1 Characteristics of the Four Market Structures

Characteristic	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Number of firms	Many	Many	Few	One
Type of product	Homogeneous	Differentiated	Homogeneous or differentiated	Unique
Firm-specific demand curve	Demand is perfectly elastic	Demand is elastic but not perfectly elastic	Demand is less elastic than demand facing monopolistically competitive firm	Firm faces market demand curve
Entry conditions	No barriers	No barriers	Large barriers from economies of scale or government policies	Large barriers from economies of scale or government policies
Examples	Corn, plain T-shirts	Toothbrushes, music stores, groceries	Air travel, automobiles, beverages, cigarettes, mobile phone service	Local phone service, patented drugs

24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION

The Total Approach: Computing Total Revenue and Total Cost

TABLE 24.2 Deciding How Much to Produce When the Price Is $12

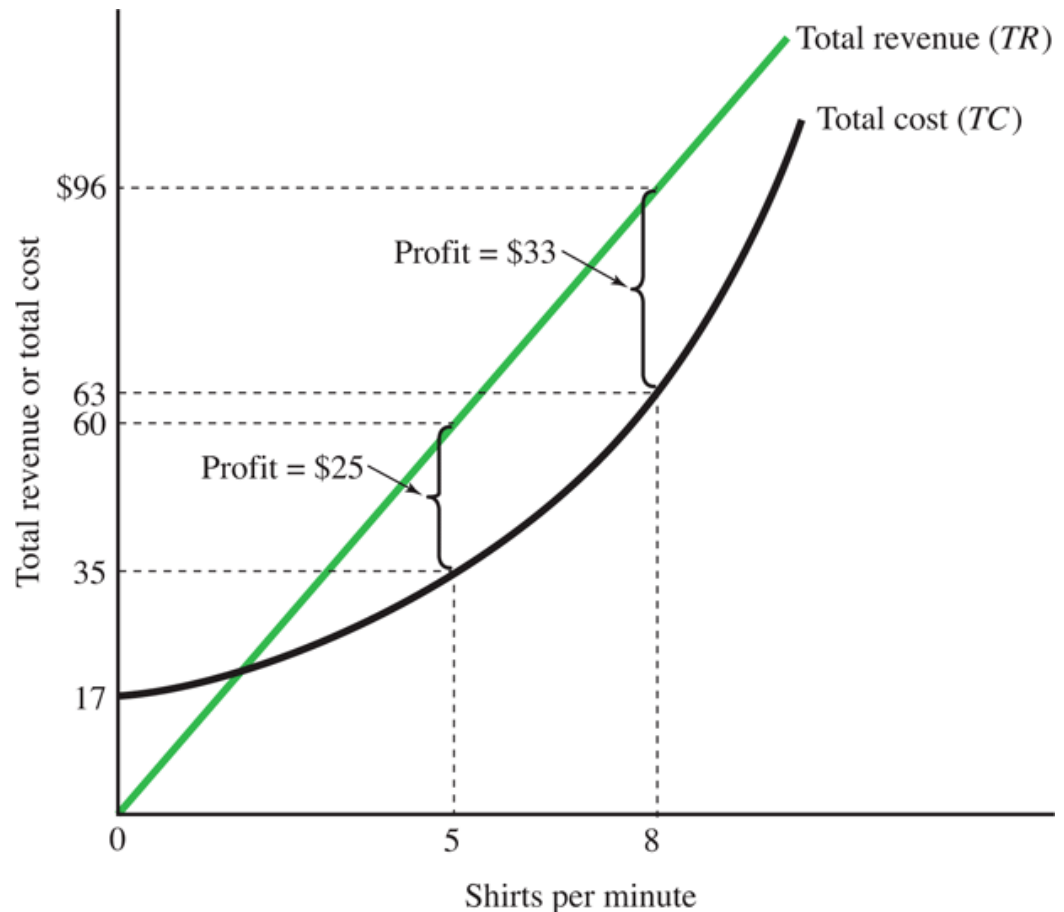| 1 Output: Shirts per Minute (Q)	2 Fixed Cost (FC)	3 Variable Cost (VC)	4 Total Cost (TC)	5 Total Revenue (TR)	6 Profit = TR − TC	7 Marginal Revenue = Price	8 Marginal Cost (MC)
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3	17	9	26	36	10	12	3
4	17	13	30	48	18	12	4
5	17	18	35	60	25	12	5
6	17	25	42	72	30	12	7
7	17	34	51	84	33	12	9
8	17	46	63	96	33	12	12
9	17	62	79	108	29	12	16
10	17	83	100	120	20	12	21

24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION (cont.)

The Total Approach: Computing Total Revenue and Total Cost

▶ **FIGURE 24.2**

Using the Total Approach to Choose an Output Level

Economic profit is shown by the vertical distance between the total-revenue curve and the total-cost curve.

To maximize profit, the firm chooses the quantity of output that generates the largest vertical difference between the two curves.

24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION

TABLE 24.2 Deciding How Much to Produce When Price Is $12

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24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION (cont.)

The Marginal Approach

MARGINAL PRINCIPLE

Increase the level of an activity as long as its marginal benefit exceeds its marginal cost. Choose the level at which the marginal benefit equals the marginal cost.

- **marginal revenue**
  The change in total revenue from selling one more unit of output.

  marginal revenue = price

To maximize profit, produce the quantity where price = marginal cost

24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION (cont.)

The Marginal Approach

▼ **FIGURE 24.3**

The Marginal Approach to Picking an Output Level

A perfectly competitive firm takes the market price as given, so the marginal benefit, or marginal revenue, equals the price.

Using the marginal principle, the typical firm will maximize profit at point *a*, where the $12 market price equals the marginal cost.

Economic profit equals the difference between the price and the average cost ($4.125 = $12 – $7.875) times the quantity produced (eight shirts per minute), or $33 per minute.
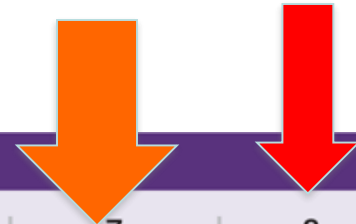
24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION

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Profit
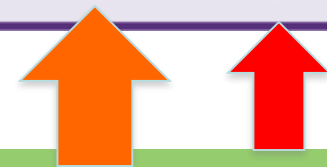
24.2 THE FIRM'S SHORT-RUN OUTPUT DECISION (cont.)

Economic Profit and the Break-Even Price

economic profit = (price − average cost) × quantity produced

- **break-even price**
  The price at which economic profit is zero; price equals average total cost.

THE BREAK-EVEN PRICE FOR SWITCHGRASS, A FEEDSTOCK FOR BIOFUEL

APPLYING THE CONCEPTS #2: What is the break-even price?

To illustrate the notions of break-even price, let's look at these prices for the typical farmer.

Comparing switchgrass to alfalfa:
- The implicit rent on land to grow alfalfa $120 per acre.
- If the switchgrass yield is 3 tons per acre, the opportunity cost is $40 per ton.
- If the explicit cost of a ton of switchgrass is $36
- The breakeven price is $76 = $36 + $40
- To get some farmers to grow switchgrass instead of alfalfa the price must be at least $56 per ton and to get the most fertile land switched the price must be $95 per ton, or $76 on average.

24.3 THE FIRM'S SHUT-DOWN DECISION

Two approaches:

- Revenue;
- Price

24.3 THE FIRM'S SHUT-DOWN DECISION

TABLE 24.3 Deciding How Much to Produce When the Price Is $4

1 Output: Shirts per Minute (Q)	2 Fixed Cost (FC)	3 Variable Cost (VC)	4 Total Cost (TC)	5 Total Revenue (TR)	6 Profit = TR − TC	7 Marginal Revenue = Price	8 Marginal Cost (MC)
0	$17	$ 0	$17	$ 0	−$17		
1	17	5	22	4	−18	$4	$5
2	17	6	23	8	−15	4	1
3	17	9	26	12	−14	4	3
4	17	13	30	16	−14	4	4
5	17	18	35	20	−15	4	5
6	17	25	42	24	−18	4	7

Total Revenue, Variable Cost, and the Shut-Down Decision

operate if *total revenue > variable cost*

shut down if *total revenue < variable cost*

24.3 THE FIRM'S SHUT-DOWN DECISION (cont.)

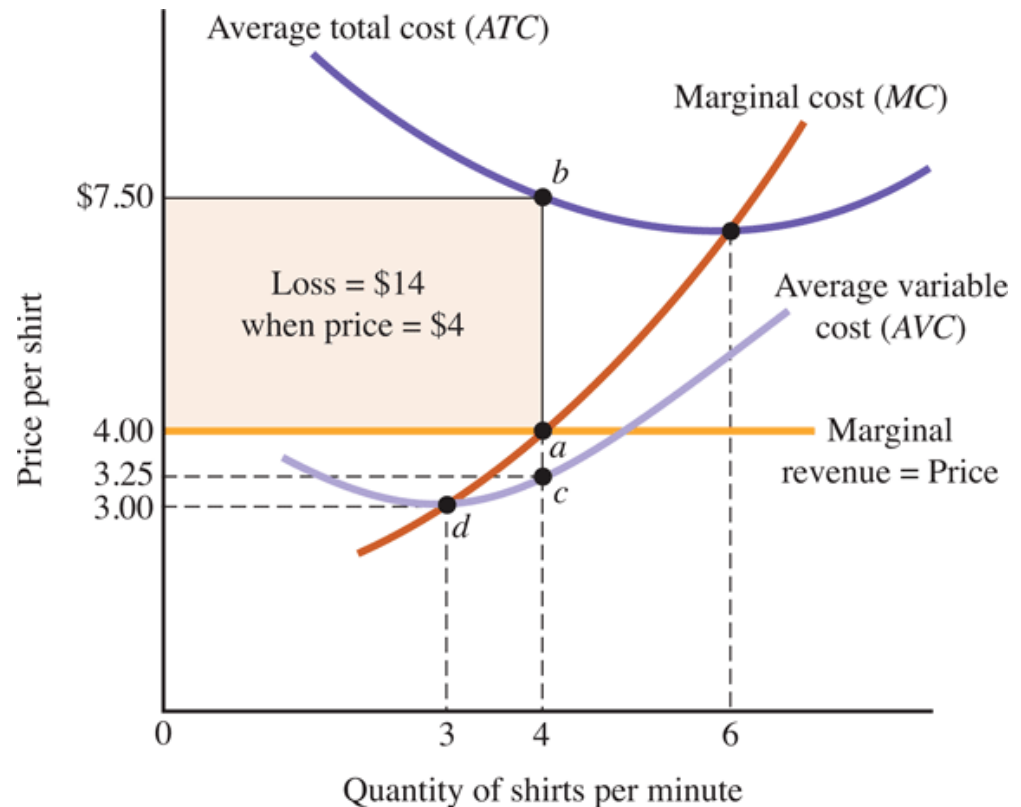## Total Revenue, Variable Cost, and the Shut-Down Decision

▶ **FIGURE 24.4**
The Shut-Down Decision and the Shut-Down Price

When the price is $4, marginal revenue equals marginal cost at four shirts (point *a*).

At this quantity, average cost is $7.50, so the firm loses $3.50 on each shirt, for a total loss of $14.

Total revenue is $16 and the variable cost is only $13, so the firm is better off operating at a loss rather than shutting down and losing its fixed cost of $17.

The shutdown price, shown by the minimum point of the *AVC* curve, is $3.00.

Average total cost (*ATC*)

Marginal cost (*MC*)

$7.50 — *b*

Loss = $14
when price = $4

Average variable
cost (*AVC*)

Price per shirt

4.00 ———— *a* ———— Marginal
revenue = Price

3.25 — *c*
3.00 — *d*

0   3   4   6

Quantity of shirts per minute

24.3 THE FIRM'S SHUT-DOWN DECISION (cont.)

TABLE 24.3 Deciding How Much to Produce When the Price Is $4

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1	17	5	22	4	−18	$4	$5
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4	17	13	30	16	−14	4	4
5	17	18	35	20	−15	4	5
6	17	25	42	24	−18	4	7

operate if total revenue > variable cost

shut down if total revenue < variable cost

24.3 THE FIRM'S SHUT-DOWN DECISION (cont.)

The Shut-Down Price

operate if price > average variable cost

shut down if price < average variable cost

* **shut-down price**
  The price at which the firm is indifferent between operating and shutting down; equal to the minimum average variable cost.

24.3 THE FIRM'S SHUT-DOWN DECISION (cont.)

Fixed Costs and Sunk Costs

- **sunk cost**

  A cost that a firm has already paid

  – *or* -

  committed to pay, so it cannot be recovered.

STRADDLING THE ZINK COST CURVE

APPLYING THE CONCEPTS #3: What is the shut down price?

- Zinc is a vital input to the production of steel. Because the cost of mining zinc varies from one mine to another, the shutdown price varies too. The world price of zinc decreased from roughly $2,300 per ton in 2010-2011 to $1,900 in early 2012.

- The lower price was below the shutdown prices of Alcoa's mines in Italy and Spain: at a price of $1,900, the total revenue from the mines was less than the variable cost of operating the mines.

- The shutdown of Alcoa's mines decreased mining output by 531,000 tons. Although mines with lower production costs continued mining at a price of $1,900, many mines have shutdown prices in the range $1,500 to $1,900, and will shut down if the price continues to drop.

24.4 SHORT-RUN SUPPLY CURVES

The Firm's Short-Run Supply Curve

- **short-run supply curve**
  A curve showing the relationship between the market price of a product and the quantity of output supplied by a firm in the short run.

24.4 SHORT-RUN SUPPLY CURVES (cont.)

The Firm's Short-Run Supply Curve

▼ **FIGURE 24.5**

Short-Run Supply Curves

In Panel A, the firm's short-run supply curve is the part of the marginal-cost curve above the shut-down price.

In Panel B, there are 100 firms in the market, so the market supply at a given price is 100 times the quantity supplied by the typical firm. At a price of $7, each firm supplies 6 shirts per minute (point *b*), so the market supply is 600 shirts per minute (point *f*)
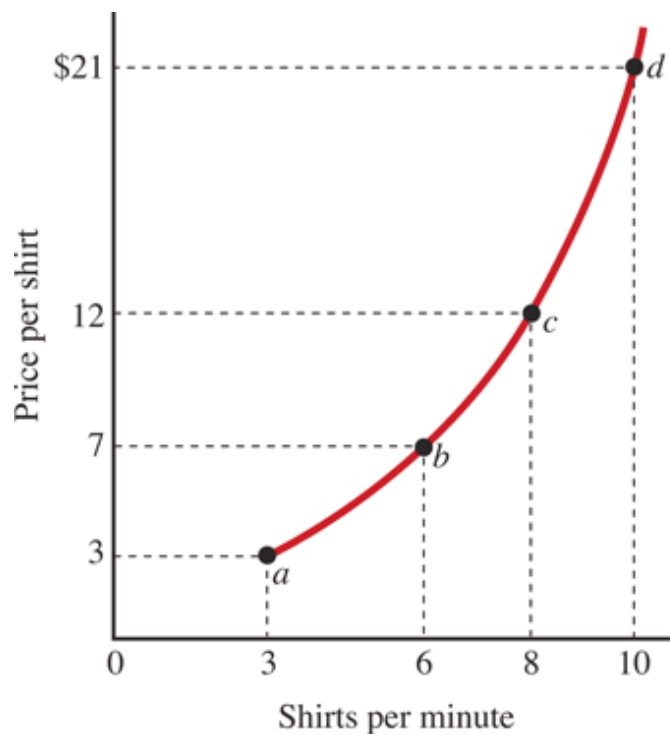
(A) Firm's Supply Curve
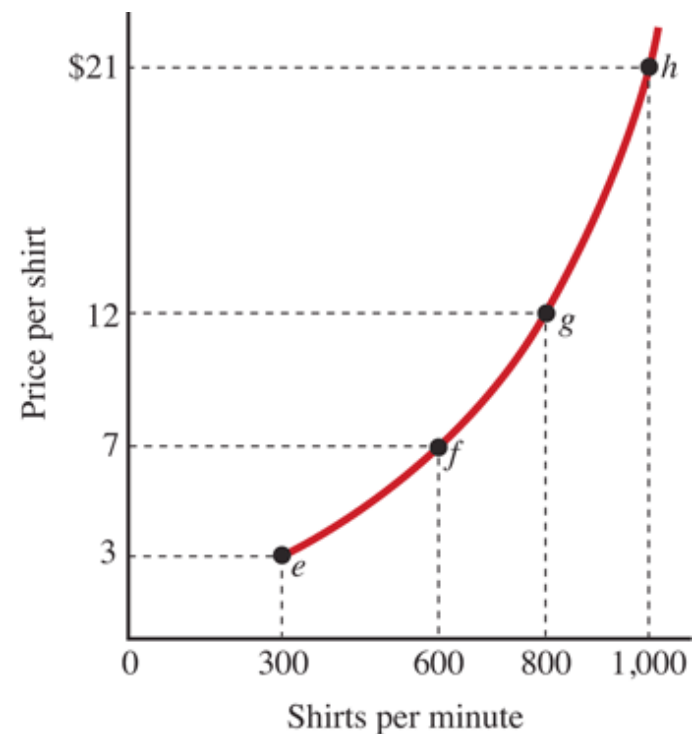
(B) Industry Supply Curve

24.4 SHORT-RUN SUPPLY CURVES (cont.)

The Short-Run Market Supply Curve

- **short-run market supply curve** A curve showing the relationship between market price and the quantity supplied in the short run.

24.4 SHORT-RUN SUPPLY CURVES (cont.)

Market Equilibrium

▼ **FIGURE 24.6**

Market Equilibrium

In Panel A, the market demand curve intersects the short-run market supply curve at a price of $7.

In Panel B, given the market price of $7, the typical firm satisfies the marginal principle at point *b*, producing six shirts per minute. The $7 price equals the average cost at the equilibrium quantity, so economic profit is zero, and no other firms will enter the market.
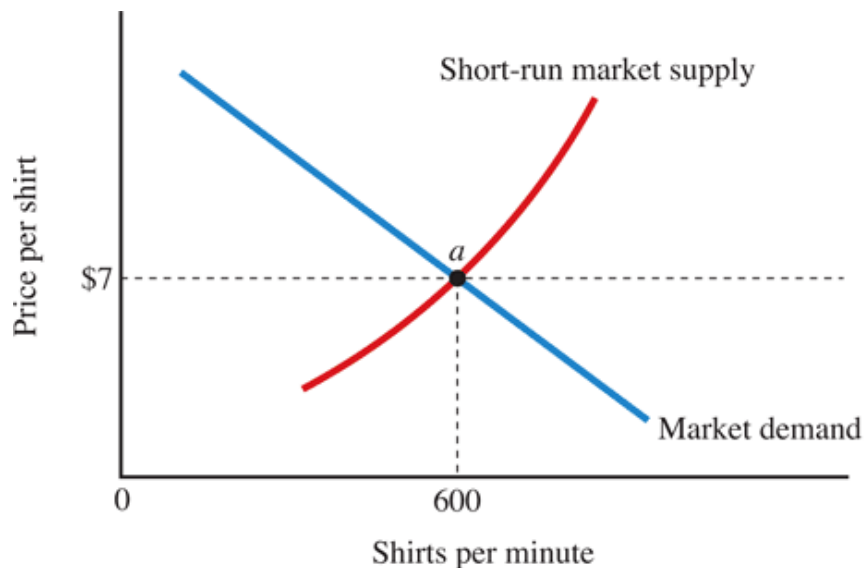
(A) Market
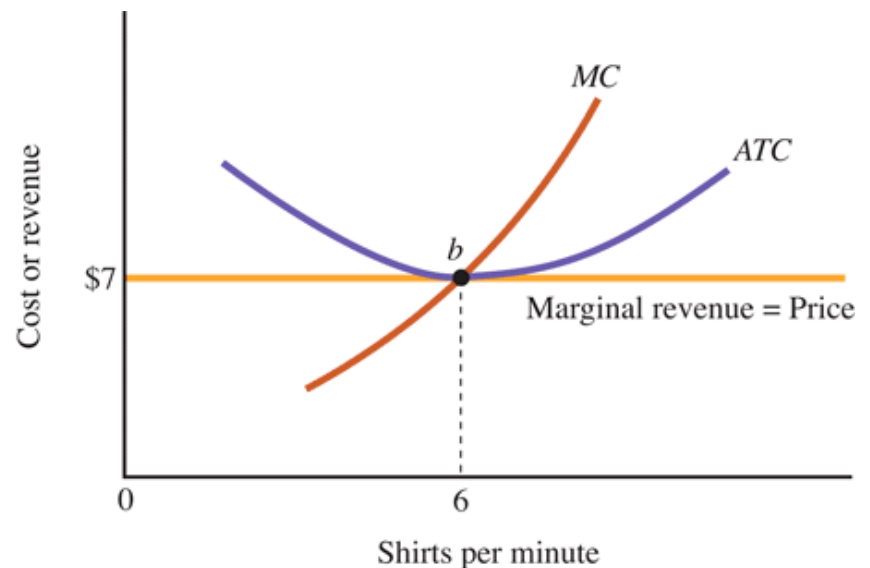
(B) Individual Firm

24.5 THE LONG-RUN SUPPLY CURVE FOR AN INCREASING-COST INDUSTRY

- **long-run market supply curve**
  A curve showing the relationship between the market price and quantity supplied in the long run.

- **increasing-cost industry**
  An industry in which the average cost of production increases as the total output of the industry increases; the long-run supply curve is positively sloped.

24.5 THE LONG-RUN SUPPLY CURVE FOR AN INCREASING-COST INDUSTRY (cont.)

Production Cost and Industry Size

TABLE 24.4 Industry Output and Average Production Cost

Number of Firms	Industry Output	Shirts per Firm	Total Cost for Typical Firm	Average Cost per Shirt
100	600	6	$42	$ 7
200	1,200	6	60	10
300	1,800	6	78	13

[page 532 – 534]

Drawing the Long-Run Market Supply Curve

▶ **FIGURE 24.7**

Long-Run Market Supply Curve

The long-run market supply curve shows the relationship between the price and quantity supplied in the long run, when firms can enter or leave the industry.

At each point on the supply curve, the market price equals the long-run average cost of production. Because this is an increasing-cost industry, the long-run market supply curve is positively sloped.
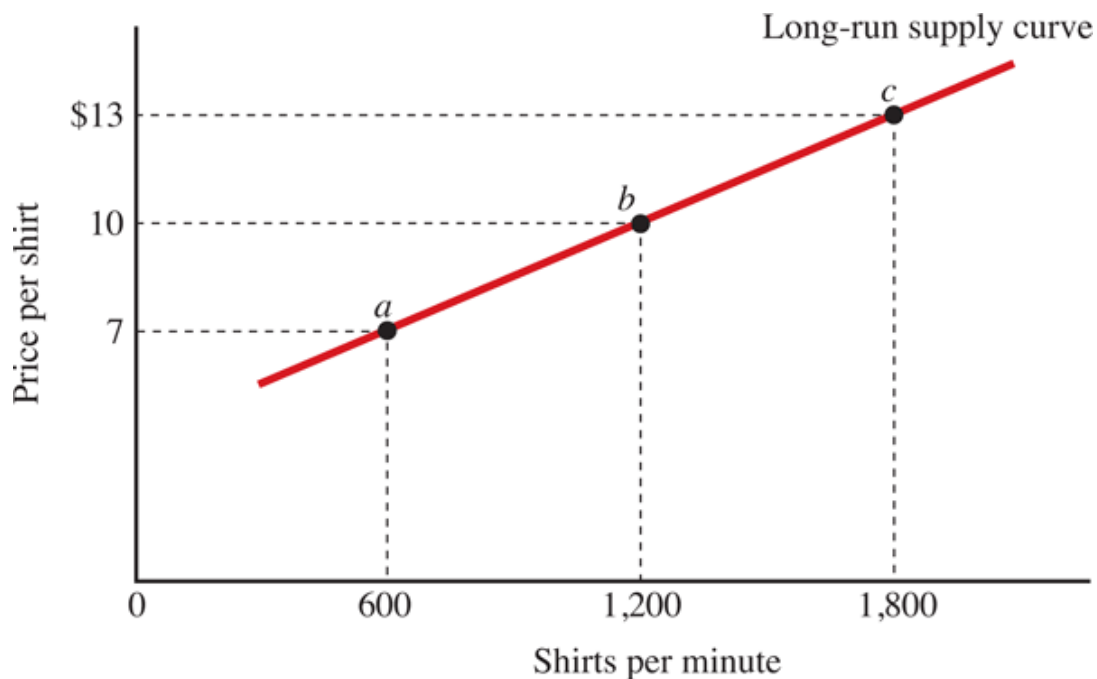
The Short-Run Response to an Increase in Demand

▼ **FIGURE 24.8**

Short-Run Effects of an Increase in Demand

An increase in demand for shirts increases the market price to $12, causing the typical firm to produce eight shirts instead of six.

Price exceeds the average total cost at the eight-shirt quantity, so economic profit is positive. Firms will enter the profitable market.

(A) Market

(B) Individual Firm
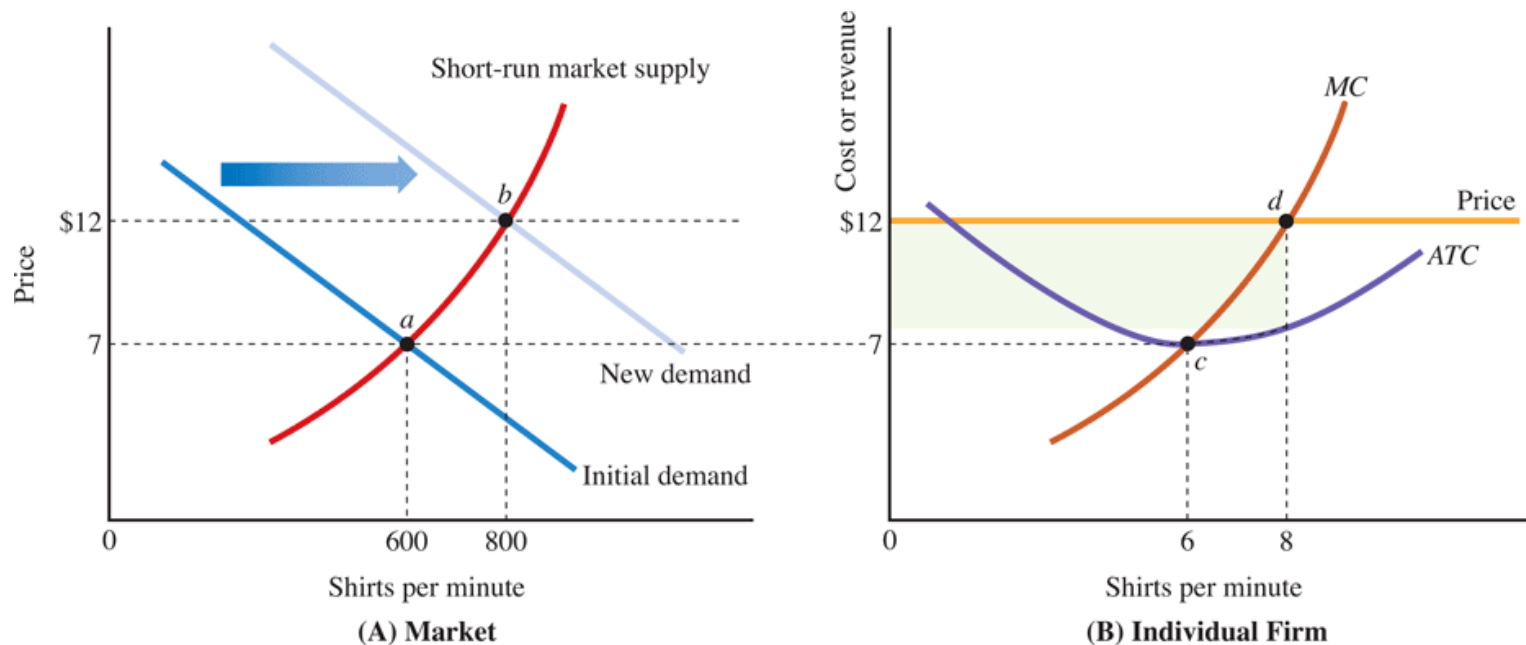
## The Long-Run Response to an Increase in Demand

▶ **FIGURE 24.9**
Short-Run and Long-Run Effects of an Increase in Demand

The short-run supply curve is steeper than the long-run supply curve because of diminishing returns in the short run.

In the short run, an increase in demand increases the price from $7 (point *a*) to $12 (point *b*).

In the long run, firms can enter the industry and build more production facilities, so the price eventually drops to $10 (point *c*).

The large upward jump in price after the increase in demand is followed by a downward slide to the new long-run equilibrium price.
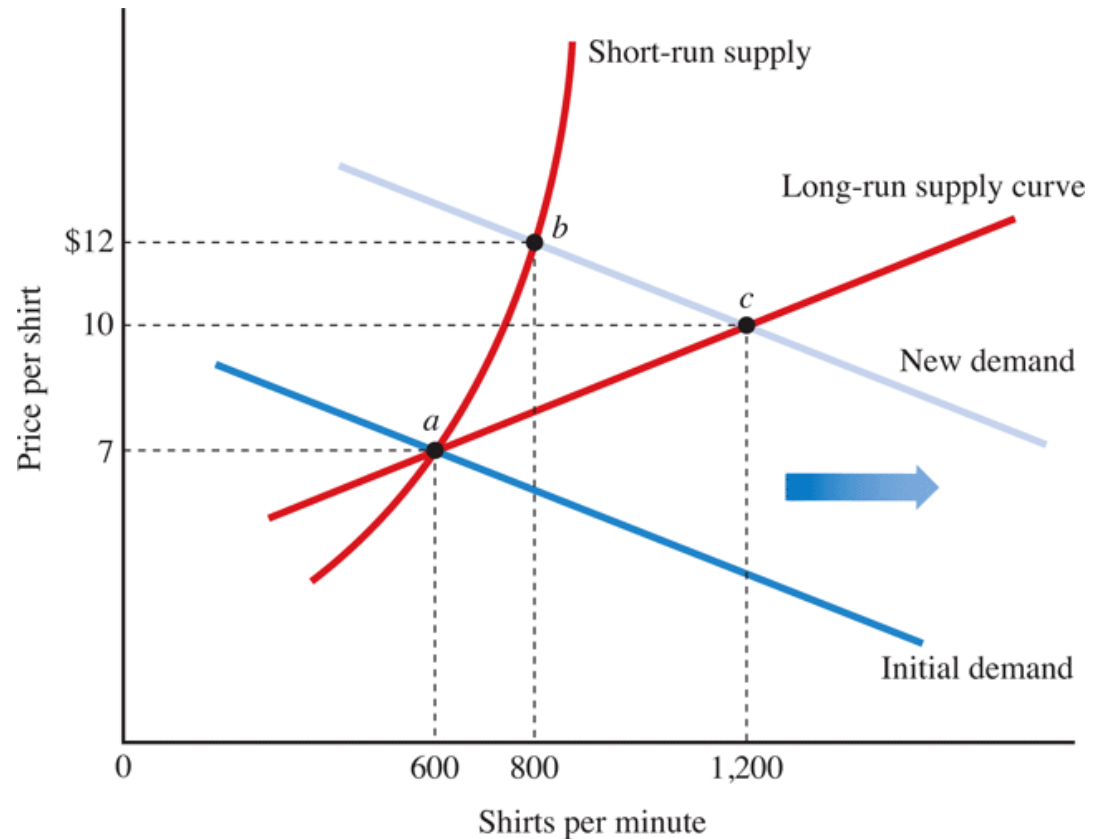
24.7 LONG-RUN SUPPLY FOR A CONSTANT-COST INDUSTRY

- **constant-cost industry**
  An industry in which the average cost of production is constant; *the long-run supply curve is horizontal*.
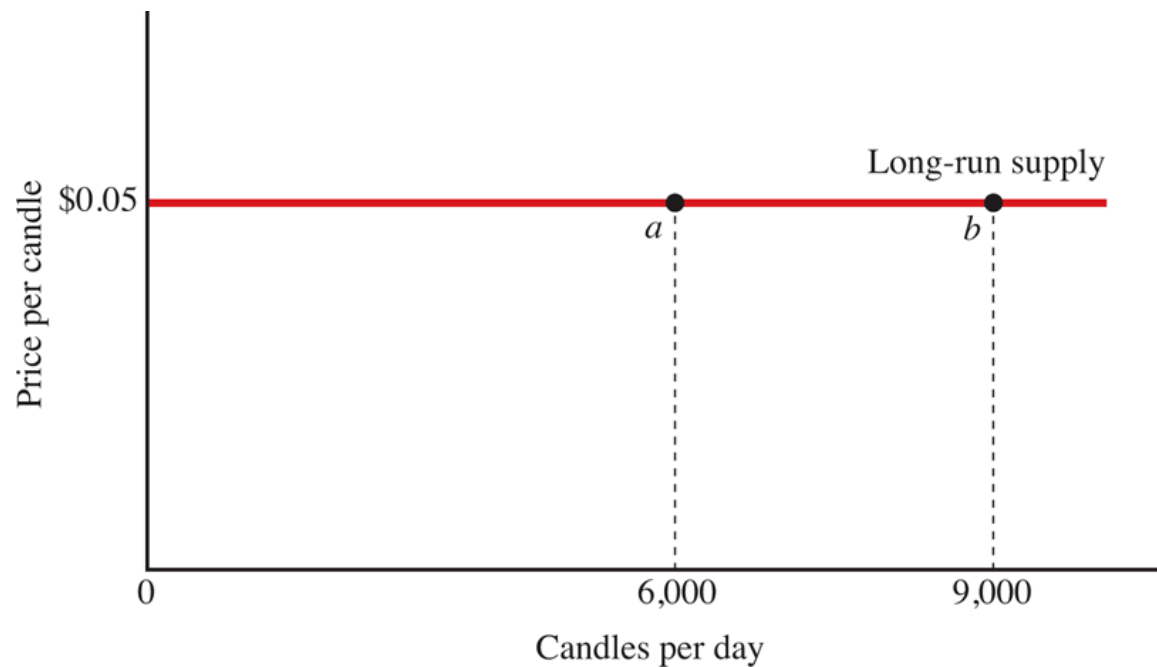
Long-Run Supply Curve for a Constant-Cost Industry

▶ **FIGURE 24.10**
Long-Run Supply Curve for a Constant-Cost Industry

In a constant-cost industry, input prices do not change as the industry grows.

Therefore, the average production cost is constant and the long-run supply curve is horizontal.

For the candle industry, the cost per candle is constant at $0.05, so the supply curve is horizontal at $0.05 per candle.

## Hurricane Andrew and the Price of Ice

▶ **FIGURE 24.11**
Hurricane Andrew and the Price of Ice

A hurricane increases the demand for ice, shifting the demand curve to the right.

In the short run, the supply curve is relatively steep, so the price rises by a large amount—from $1 to $5.

In the long run, firms enter the industry, pulling the price back down.

Because ice production is a constant-cost industry, the supply is horizontal, and the large upward jump in price is followed by a downward slide back to the original price.
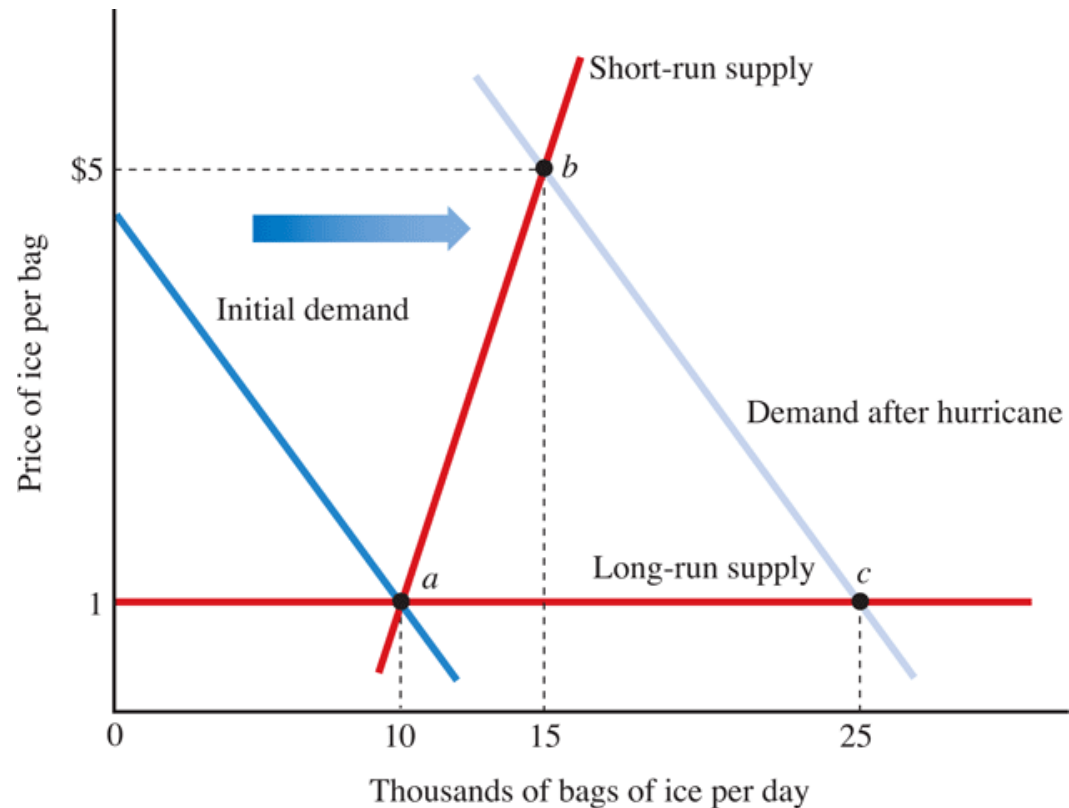
KEY TERMS

break-even price

constant-cost industry

firm-specific demand curve

increasing-cost industry

long-run market supply curve

marginal revenue

perfectly competitive market

price taker

short-run market supply curve

short-run supply curve

shut-down price

sunk cost

"Most of the important things in the world have been accomplished by people who have kept on trying when there seemed to be no hope at all."

» Dale Carnegie