




Perfect Competition


Chapter
12

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CHAPTER CHECKLIST

1. Explain a perfectly competitive firm's profit maximizing choices and derive its supply curve.
2. Explain how output, price, and profit are determined in the short run.
3. Explain how output, price, and profit are determined in the long run.



LECTURE TOPICS

- Firm's Profit-Maximizing Choices
- Output, Price, and Profit in the Short Run
- Output, Price, and Profit in the Long Run



MARKET TYPES

The four market types are:

- Perfect competition
- Monopoly
- Monopolistic competition
- Oligopoly



MARKET TYPES

■ Perfect Competition

Perfect competition exists when:

- Many firms sell an identical product to many buyers
- There are no restrictions on entry into (or exit from) the market.
- Established firms have no advantage over new firms.
- Sellers and buyers are well informed about prices.



MARKET TYPES

■ Other Market Types

Monopoly is a market for a good or service that has no close substitutes and in which there is one supplier that is protected from competition by a barrier preventing the entry of new firms.

Monopolistic competition is a market in which a large number of firms compete by making similar but slightly different products.

Oligopoly is a market in which a small number of firms compete.



12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

■ Price Taker

A **price taker** is a firm that cannot influence the price of the good or service that it produces.

The firm in perfect competition is a price taker.



12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

■ Revenue Concepts

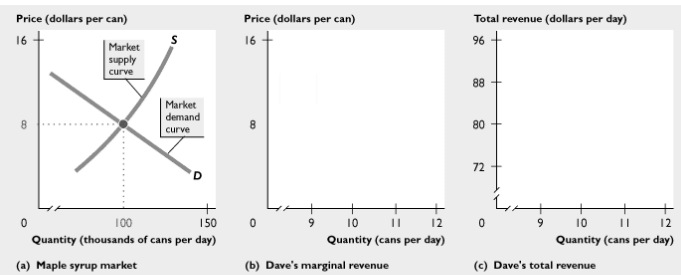
In perfect competition, market demand and market supply determine price.

A firm's total revenue equals the market price multiplied by the quantity sold.

A firm's **marginal revenue** is the change in total revenue that results from a one-unit increase in the quantity sold.

Figure 12.1 on the next slide illustrates the revenue concepts.

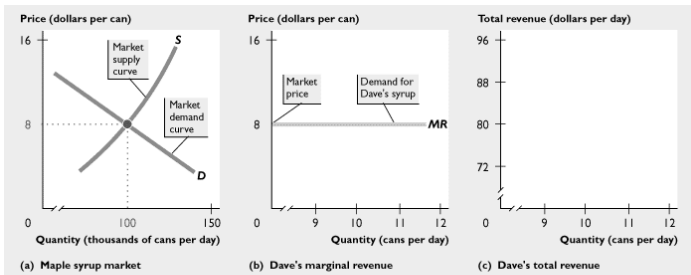
12.1 FIRM'S PROFIT-MAXIMIZING CHOICES



In part (a), market demand and market supply determine the price at which each firm can sell its output.

Quantity sold (cans per day)	9	10	11
Price (dollars per can)	8	8	8
Total revenue (dollars per day)	72	80	88
Marginal revenue (dollars per can)	8	8	8

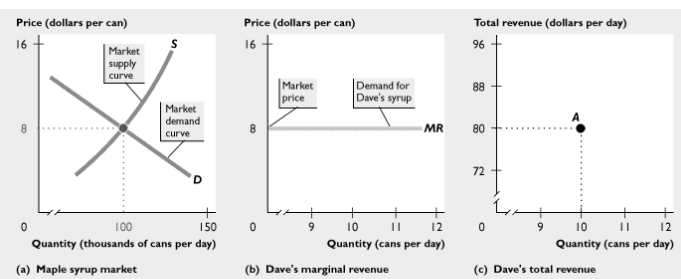
12.1 FIRM'S PROFIT-MAXIMIZING CHOICES



In part (b), the market price determines the firm's marginal revenue and the demand curve for its output.

Quantity sold (cans per day)	9	10	11
Price (dollars per can)	8	8	8
Total revenue (dollars per day)	72	80	88
Marginal revenue (dollars per can)	8	8	8

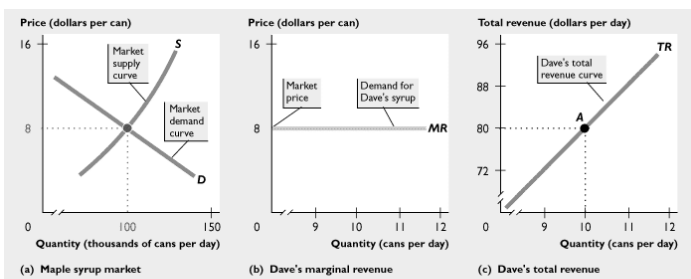
12.1 FIRM'S PROFIT-MAXIMIZING CHOICES



In part (c), if Dave sells 10 cans of syrup a day, his total revenue is \$80 a day at point A.

Quantity sold (cans per day)	9	10	11
Price (dollars per can)	8	8	8
Total revenue (dollars per day)	72	80	88
Marginal revenue (dollars per can)	8	8	8

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES



Dave's total revenue curve is *TR*.

The table shows the calculations of *TR* and *MR*.

Quantity sold (cans per day)	9	10	11
Price (dollars per can)	8	8	8
Total revenue (dollars per day)	72	80	88
Marginal revenue (dollars per can)	8	8	8

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

Profit-Maximizing Output

As output increases, total revenue increases.

But total cost also increases.

Because of decreasing marginal returns, total cost eventually increases faster than total revenue.

There is one output level that maximizes economic profit, and a perfectly competitive firm chooses this output level.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

One way to find the profit-maximizing output is to use a firm's total revenue and total cost curves.

Profit is maximized at the output level at which total revenue exceeds total cost by the largest amount.

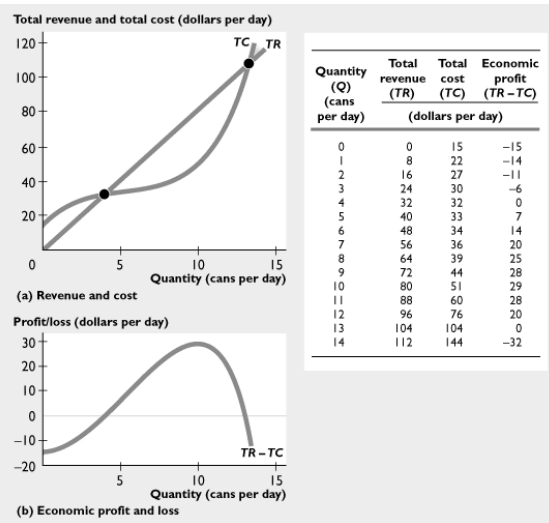
Figure 12.2 on the next slide illustrates this approach.



Total revenue increases as the quantity increases—shown by the TR curve.

Total cost increases as the quantity increases—shown by the TC curve.

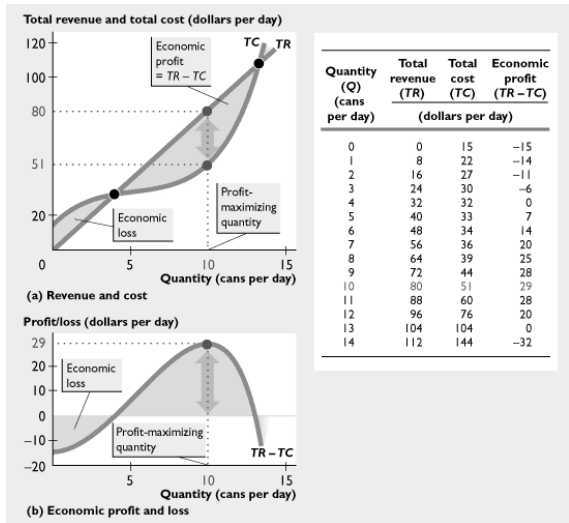
Economic profit, $TR - TC$ increases, reaches a maximum, and then decreases.



At low output levels, the firm incurs an economic loss.

When total revenue exceeds total cost, the firm earns an economic profit.

Profit is maximized when the gap between total revenue and total cost is the largest, at 10 cans per day.



12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

■ Marginal Analysis and the Supply Decision

Marginal analysis compares marginal revenue, MR , with marginal cost, MC .

As output increases, marginal revenue remains constant but marginal cost increases.

If marginal revenue exceeds marginal cost (if $MR > MC$), the extra revenue from selling one more unit exceeds the extra cost incurred to produce it.

Economic profit increases if output increases.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

If marginal revenue is less than marginal cost (if $MR < MC$), the extra revenue from selling one more unit is less than the extra cost incurred to produce it.

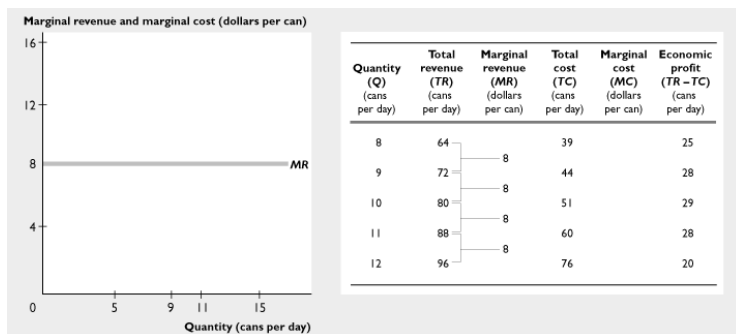
Economic profit increases if output *decreases*.

If marginal revenue equals marginal cost (if $MR = MC$), the extra revenue from selling one more unit is equal to the extra cost incurred to produce it.

Economic profit *decreases* if output *increases* or *decreases*, so economic profit is maximized.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

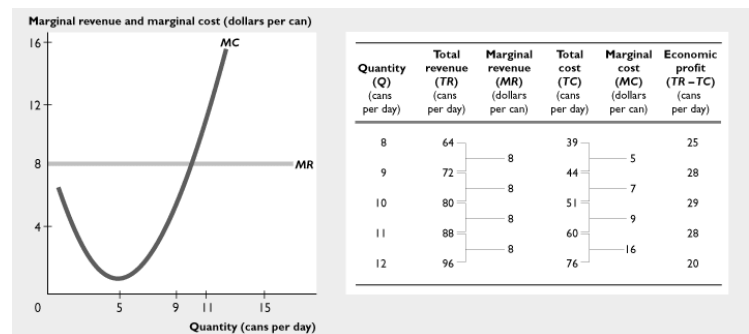
Figure 12.3 shows the profit-maximizing output.



Marginal revenue is a constant \$8 per can.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

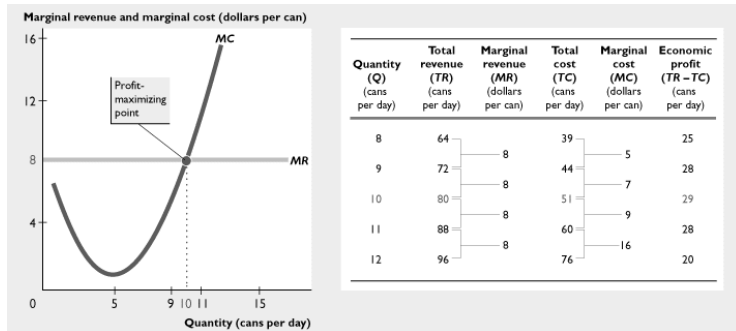
Figure 12.3 shows the profit-maximizing output.



Marginal cost decreases at low outputs but then increases.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

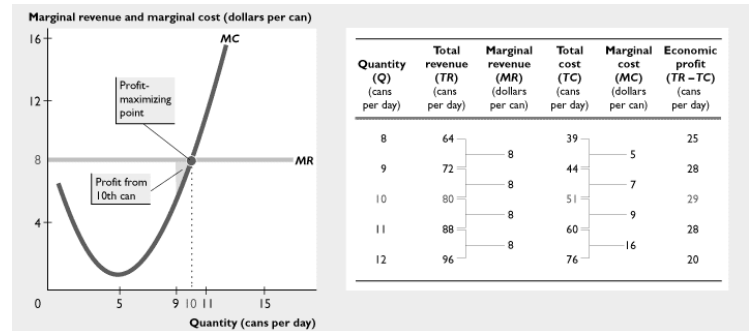
Figure 12.3 shows the profit-maximizing output.



Profit is maximized when marginal revenue equals marginal cost at 10 cans a day.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

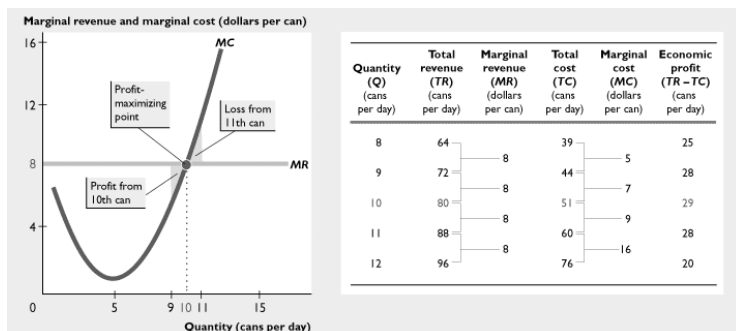
Figure 12.3 shows the profit-maximizing output.



If output increases from 9 to 10 cans a day, marginal cost is \$7, which is less than the marginal revenue of \$8 and profit increases.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

Figure 12.3 shows the profit-maximizing output.



If output increases from 10 to 11 cans a day, marginal cost is \$9, which exceeds the marginal revenue of \$8 and profit decreases.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

Exit and Temporary Shutdown Decisions

If a firm is incurring an economic loss that it believes is permanent and sees no prospect of ending, the firm exits the market.

If a firm is incurring an economic loss that it believes is temporary, it will remain in the market, and it might produce some output or temporarily shut down.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

If the firm shuts down, it incurs an economic loss equal to total fixed cost.

If the firm produces some output, it incurs an economic loss equal to total fixed cost plus total variable cost minus total revenue.

If total revenue exceeds total variable cost, the firm's economic loss is less than total fixed cost. So it pays the firm to produce and incur an economic loss.

12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

If total revenue were less than total variable cost, the firm's economic loss would exceed total fixed cost. So the firm would shut down temporarily.

Total fixed cost is the largest economic loss that the firm will incur.

The firm's economic loss equals total fixed cost when price equals average variable cost.

So the firm produces if price exceeds average variable cost and shuts down if average variable cost exceeds price.

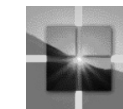
12.1 FIRM'S PROFIT-MAXIMIZING CHOICES

■ The Firm's Short-Run Supply Curve

A perfectly competitive firm's short-run supply curve shows how the firm's profit-maximizing output varies as the price varies, other things remaining the same.

The firm's **shutdown point** is the output and price at which price equals minimum average variable cost.

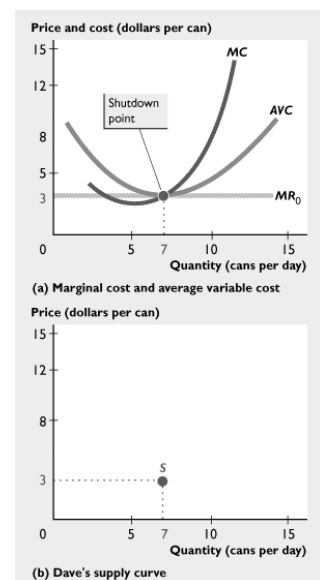
Figure 12.4 on the next slide illustrates a firm's supply curve and its relationship to the firm's cost curves.

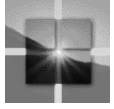


The firm's marginal cost curve is *MC*. Its average variable cost curve is *AVC*, and its marginal revenue curve is *MR₀*.

With a price (and *MR₀*) of \$3 a can, the firm maximizes profit by producing 7 cans a day—at its shutdown point.

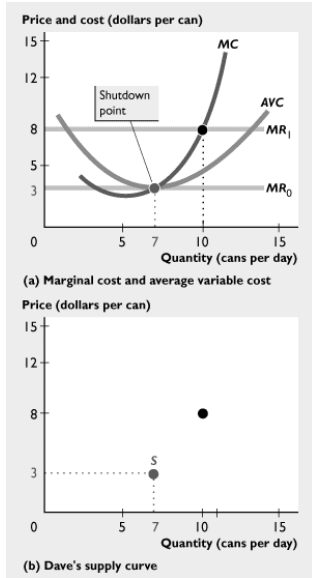
Point *S* is one point on the firm's supply curve.





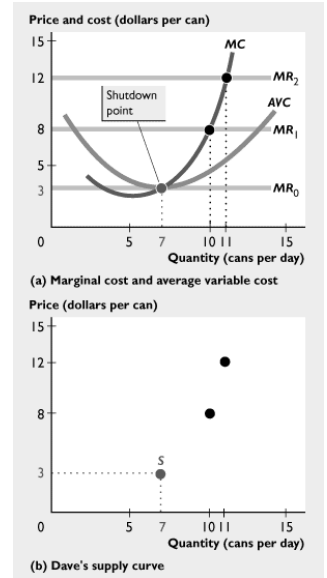
If the price rises to \$8 a can, the marginal revenue curve shifts upward to MR_1 .

Profit maximizing output increases to 10 cans per day and the black dot in part (b) is another point of the firm's supply curve.



If the price rises to \$12 a can, the marginal revenue curve shifts upward to MR_2 .

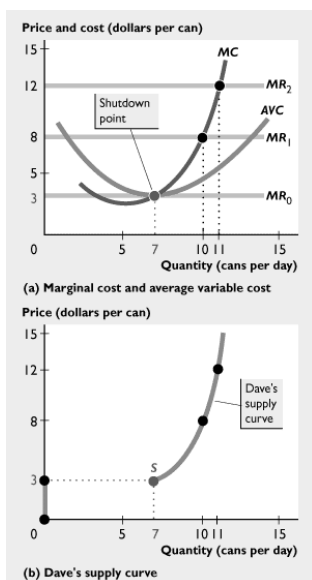
Profit maximizing output increases to 11 cans per day and the new black dot in part (b) is another point of the firm's supply curve.



The blue curve in part (b) is the firm's supply curve.

At prices below \$3 a can, the firm shuts down and output is zero.

At prices above \$3 a can, the firm produces along its MC curve. The supply curve is the same as the MC curve above the point of minimum AVC .



12.2 IN THE SHORT RUN

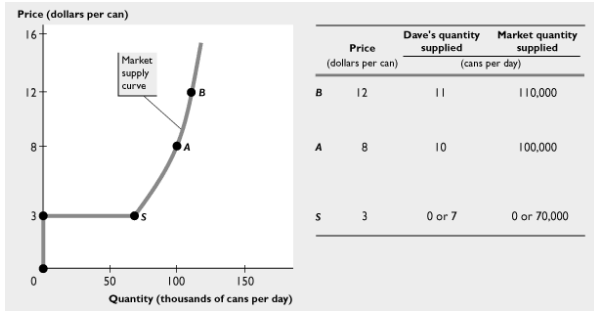
Market Supply in the Short Run

The market supply curve in the short run shows the quantity supplied at each price by a fixed number of firms.

The quantity supplied at a given price is the sum of the quantities supplied by all firms at that price.

12.2 IN THE SHORT RUN

Figure 12.5 shows the market supply curve in a market with 10,000 identical firms.



At the shutdown price of \$3, each firm produces either 0 or 7 cans a day. The market supply curve is perfectly elastic at the shutdown price.

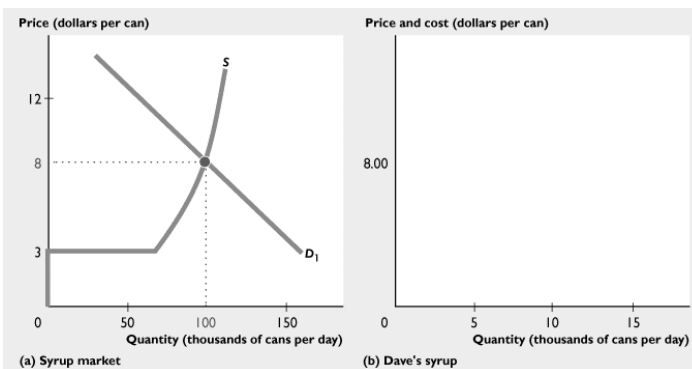
12.2 IN THE SHORT RUN

Short-Run Equilibrium in Good Times

Market demand and market supply determine the price and quantity bought and sold.

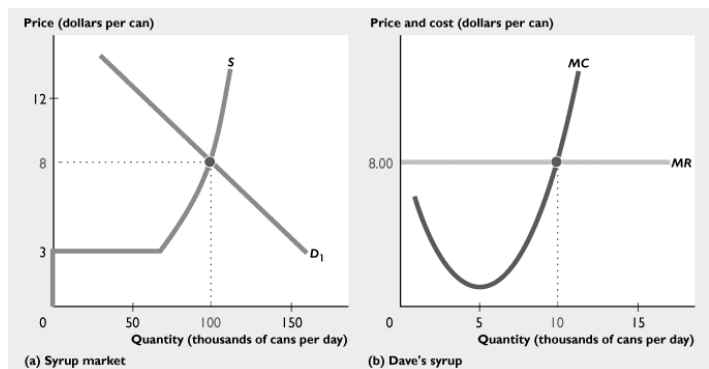
Figure 12.6 on the next slide illustrates short-run equilibrium when the firm makes an economic profit.

12.2 IN THE SHORT RUN



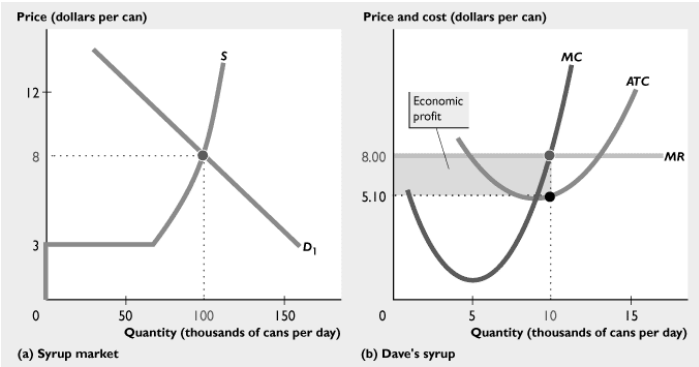
In part (a), with market demand curve D_1 and market supply curve S , the price is \$8 a can.

12.2 IN THE SHORT RUN



In part (b), Dave's marginal revenue is \$8 a can, so he produces 10 cans a day, where marginal cost equals marginal revenue.

12.2 IN THE SHORT RUN



At this quantity, price (\$8) exceeds average total cost (\$5.10), so Dave makes an economic profit shown by the blue rectangle.

12.2 IN THE SHORT RUN

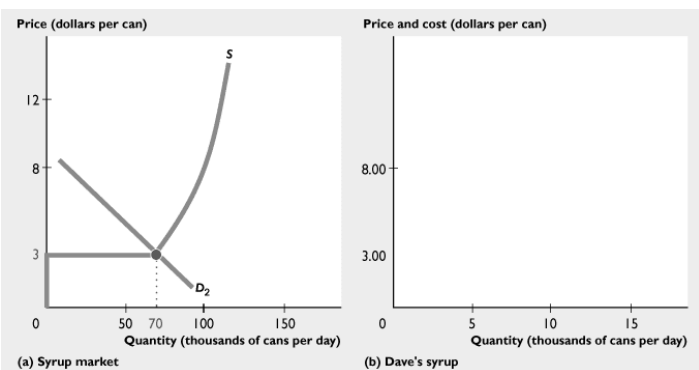
■ Short-Run Equilibrium in Bad Times

In the short-run equilibrium that we've just examined, Dave is enjoying an economic profit.

But such an outcome is not inevitable.

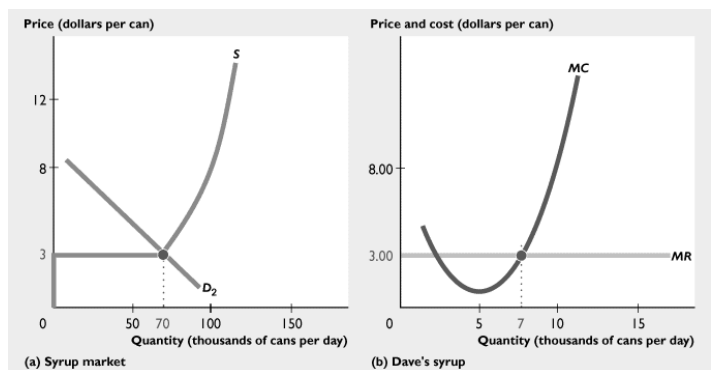
Figure 12.7 on the next slide illustrates short-run equilibrium when the firm incurs an economic loss.

12.2 IN THE SHORT RUN



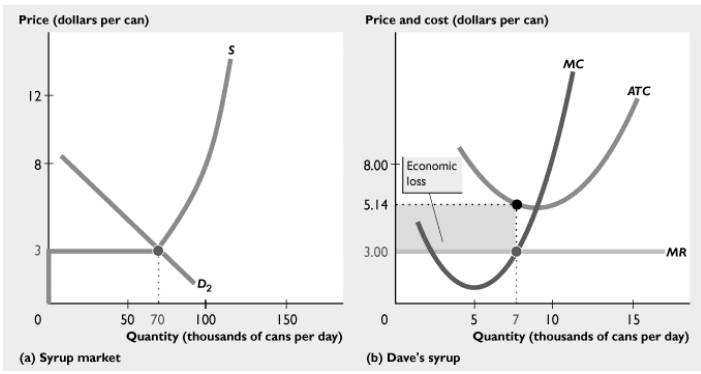
In part (a), with market demand curve D_2 and market supply curve S , the price is \$3 a can.

12.2 IN THE SHORT RUN



In part (b), Dave's marginal revenue is \$3 a can, so he produces 7 cans a day, where marginal cost equals marginal revenue.

12.2 IN THE SHORT RUN



At this quantity, price (\$3) is less than average total cost (\$5.14), so Dave incurs an economic loss shown by the red rectangle.

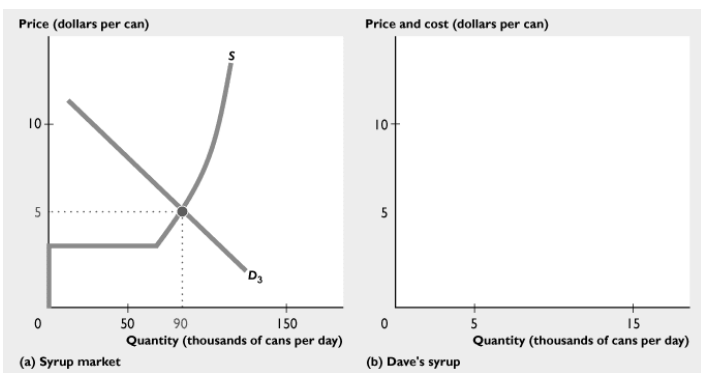
12.3 IN THE LONG RUN

Neither good times nor bad times last forever in perfect competition.

In the long run, a firm in perfect competition earns normal profit. It earns zero economic profit and incurs no economic loss.

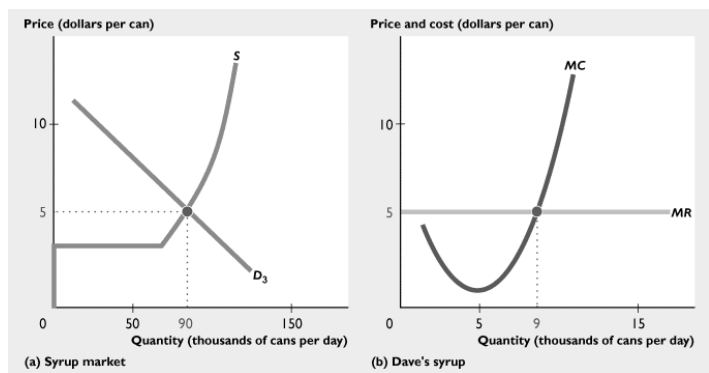
Figure 12.8 on the next slide illustrates an equilibrium when the firm earns a normal profit—and zero economic profit.

12.3 IN THE LONG RUN



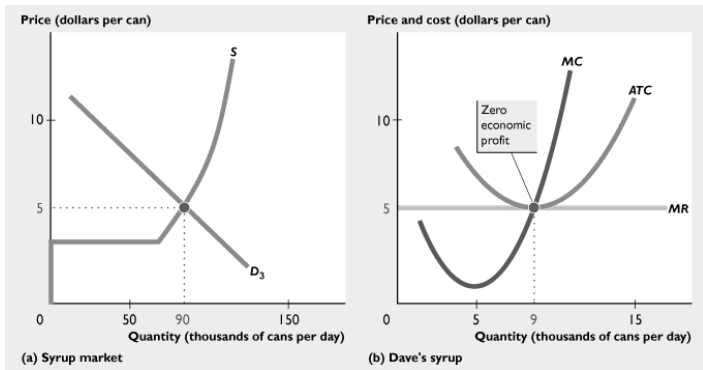
In part (a), with market demand curve D_3 and market supply curve S , the price is \$5 a can.

12.3 IN THE LONG RUN



In part (b), Dave's marginal revenue is \$5 a can, so he produces 9 cans a day, where marginal cost equals marginal revenue.

12.3 IN THE LONG RUN



At this profit-maximizing quantity, price equals average total cost (\$5), so Dave earns no economic profit. He earns normal profit.

12.3 IN THE LONG RUN

■ Entry and Exit

In the long run, firms respond to economic profit and economic loss by either entering or exiting a market. New firms enter a market in which the existing firms are earning an economic profit. Firms exit a market in which firms are earning an economic loss.

Entry and exit influence price, the quantity produced, and economic profit.

12.3 IN THE LONG RUN

The immediate effect of the decision to enter or exit is to shift the market supply curve.

If more firms enter a market, supply increases and the market supply curve shifts rightward.

If firms exit a market, supply decreases and the market supply curve shifts leftward.

12.3 IN THE LONG RUN

The Effects of Entry

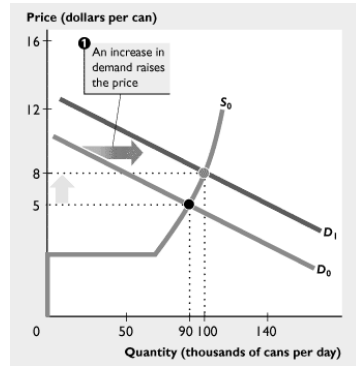
Economic profit is an incentive for new firms to enter a market, but as they do so, the price falls and the economic profit of each existing firm decreases.

12.3 IN THE LONG RUN

Figure 12.9 shows the effects of entry.

Starting in long-run equilibrium,

1. Demand increases from D_0 to D_1 and the price rises from \$5 to \$8 a can.

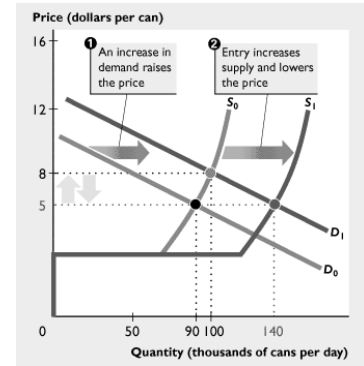


12.3 IN THE LONG RUN

Economic profit brings entry.

2. As firms enter the market, the supply curve shifts rightward, from S_0 to S_1 .

The equilibrium price falls from \$8 to \$5 a can, and the quantity produced increases from 100,000 to 140,000 cans a day.



12.3 IN THE LONG RUN

■ The Effects of Exit

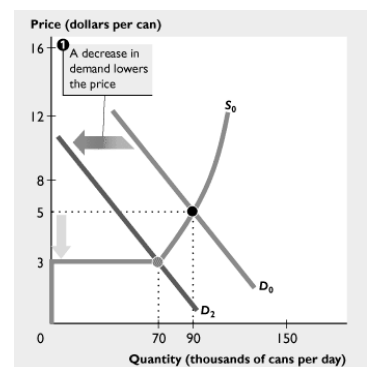
Economic loss is an incentive for firms to exit a market, but as they do so, the price rises and the economic loss of each remaining firm decreases.

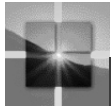
12.3 IN THE LONG RUN

Figure 12.10 shows The effects of exit.

Starting in long-run equilibrium,

1. Demand decreases from D_0 to D_2 and the price falls from \$5 to \$3 a can.



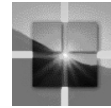
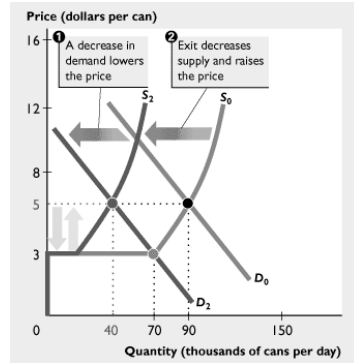


12.3 IN THE LONG RUN

Economic loss brings exit.

2. As firms exit the market, the supply curve shifts leftward, from S_0 to S_2 .

The equilibrium price rises from \$3 to \$5 a can, and the quantity produced decreases from 70,000 to 40,000 cans a day.



12.3 IN THE LONG RUN

■ A Permanent Change in Demand

The difference between the initial long-run equilibrium and the final long-run equilibrium is the number of firms in the market.

A permanent increase in demand increases the number of firms. Each firm produces the same output in the new long-run equilibrium as initially and earns a normal profit.

In the process of moving from the initial equilibrium to the new one, firms make economic profits.



12.3 IN THE LONG RUN

A permanent decrease in demand triggers a similar response, except in the opposite direction.

The decrease in demand brings a lower price, economic loss, and exit.

Exit decreases market supply and eventually raises the price to its original level.



The End

Chapter
12

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12.3 IN THE LONG RUN

In the long run, regardless of whether demand increases or decreases, the price returns to its original level.

Is this outcome inevitable?

In fact, it is not.

It is possible for the long-run equilibrium price to remain the same, rise, or fall.

12.3 IN THE LONG RUN

External Economies and Diseconomies

The change in the long-run equilibrium price depends on external economies and external diseconomies.

External economies

Factors beyond the control of an individual firm that lower its costs as the market output increases.

External diseconomies

Factors beyond the control of an individual firm that raise its costs as the market output increases.

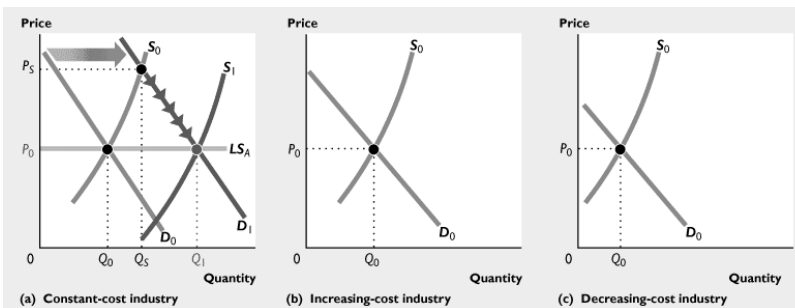
12.3 IN THE LONG RUN

Long-run market supply curve

A curve that shows how the quantity supplied by a market varies as the price varies and the number of firms in the market varies to achieve zero economic profit.

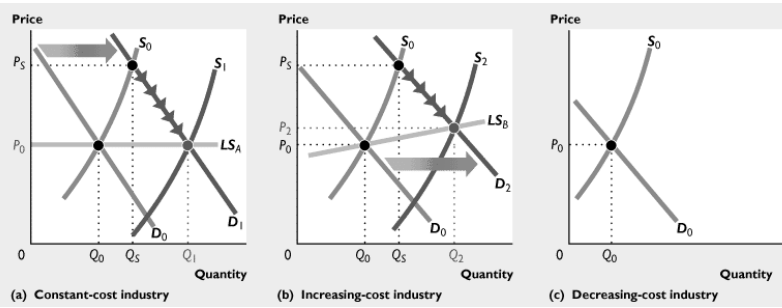
Figure 12.11 on the next slide illustrates the three cases of the long-run market supply curve.

12.3 IN THE LONG RUN



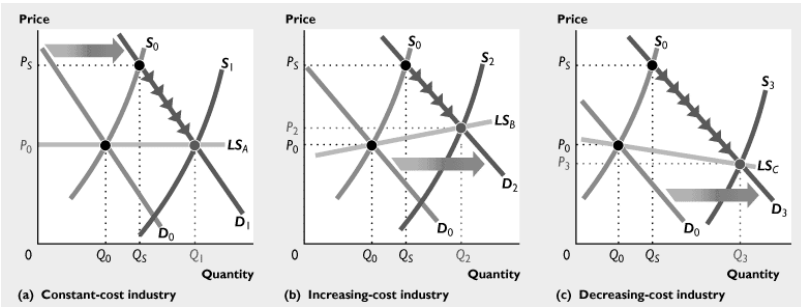
When demand increases from D_0 to D_1 , entry occurs and the market supply curve shifts from S_0 to S_1 . The long-run market supply curve, LS_A , is horizontal.

12.3 IN THE LONG RUN



When demand increases from D_0 to D_2 , entry occurs and the market supply curve shifts from S_0 to S_2 . The long-run market supply curve, LS_B , is upward sloping—external diseconomies.

12.3 IN THE LONG RUN



When demand increases from D_0 to D_3 , entry occurs and the market supply curve shifts from S_0 to S_3 . The long-run market supply curve, LS_C , is downward sloping—external economies.

12.3 IN THE LONG RUN

■ Technological Change

New technology allows firms to produce at a lower cost. As a result, as firms adopt a new technology, their cost curves shift downward.

Market supply increases, and the market supply curve shifts rightward.

With a given demand, the quantity produced increases and the price falls.

12.3 IN THE LONG RUN

Two forces are at work in a market undergoing technological change.

Firms that adopt the new technology make an economic profit.

So new-technology firms have an incentive to enter.

Firms that stick with the old technology incur economic losses.

They either exit the market or switch to the new technology.