

chapter:
12

**>> Perfect Competition and
The Supply Curve**

**Krugman/Wells
Economics**

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WHAT YOU WILL LEARN IN THIS CHAPTER

- What a **perfectly competitive market** is and the characteristics of a **perfectly competitive industry**
- How a **price-taking producer** determines its profit-maximizing quantity of output
- How to assess whether or not a producer is profitable and why an unprofitable producer may continue to operate in the short run
- Why industries behave differently in the short run and the long run
- What determines the **industry supply curve** in both the short run and the long run

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Perfect Competition

- A **price-taking producer** is a producer whose actions have no effect on the market price of the good it sells.
- A **price-taking consumer** is a consumer whose actions have no effect on the market price of the good he or she buys.
- A **perfectly competitive market** is a market in which all market participants are price-takers.
- A **perfectly competitive industry** is an industry in which producers are price-takers.

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Two Necessary Conditions for Perfect Competition

- 1) For an industry to be perfectly competitive, it must contain many producers, none of whom have a large **market share**.
 - A producer's **market share** is the fraction of the total industry output accounted for by that producer's output.
- 2) An industry can be perfectly competitive only if consumers regard the products of all producers as equivalent.
 - A good is a **standardized product**, also known as a **commodity**, when consumers regard the products of different producers as the same good.

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Free Entry and Exit

- There is **free entry and exit** into and from an industry when new producers can easily enter into or leave that industry.
- Free entry and exit ensure:
 - that the number of producers in an industry can adjust to changing market conditions, and,
 - that producers in an industry cannot artificially keep other firms out.

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Production and Profits

Profit for Jennifer and Jason's Farm When Market Price Is \$18

Quantity of tomatoes Q (bushels)	Total revenue of output TR	Total cost of output TC	Profit $TR - TC$
0	\$0	\$14	\$-14
1	18	30	-12
2	36	36	0
3	54	44	10
4	72	56	16
5	90	72	18
6	108	92	16
7	126	116	10

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Using Marginal Analysis to Choose the Profit-Maximizing Quantity of Output

- **Marginal revenue** is the change in total revenue generated by an additional unit of output.

$$\text{Marginal revenue} = \frac{\text{Change in total revenue}}{\text{Change in output}} = \frac{\text{Change in total revenue generated by one additional unit of output}}{\text{Change in output}}$$

$$\mathbf{MR = \Delta TR / \Delta Q}$$

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The Optimal Output Rule

- The **optimal output rule** says that profit is maximized by producing the quantity of output at which the marginal cost of the last unit produced is equal to its marginal revenue.

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Short-Run Costs for Jennifer and Jason's Farm

Quantity of tomatoes Q (bushels)	Variable cost of output VC	Total cost of output TC	Marginal cost of bushel $MC = \Delta TC / \Delta Q$	Marginal revenue of bushel	Net gain of bushel = $MR - MC$
0	\$0	\$14			
1	16	30	\$16	\$18	\$2
2	22	36	6	18	12
3	30	44	8	18	10
4	42	56	12	18	6
5	58	72	16	18	2
6	78	92	20	18	-2
7	102	116	24	18	-6

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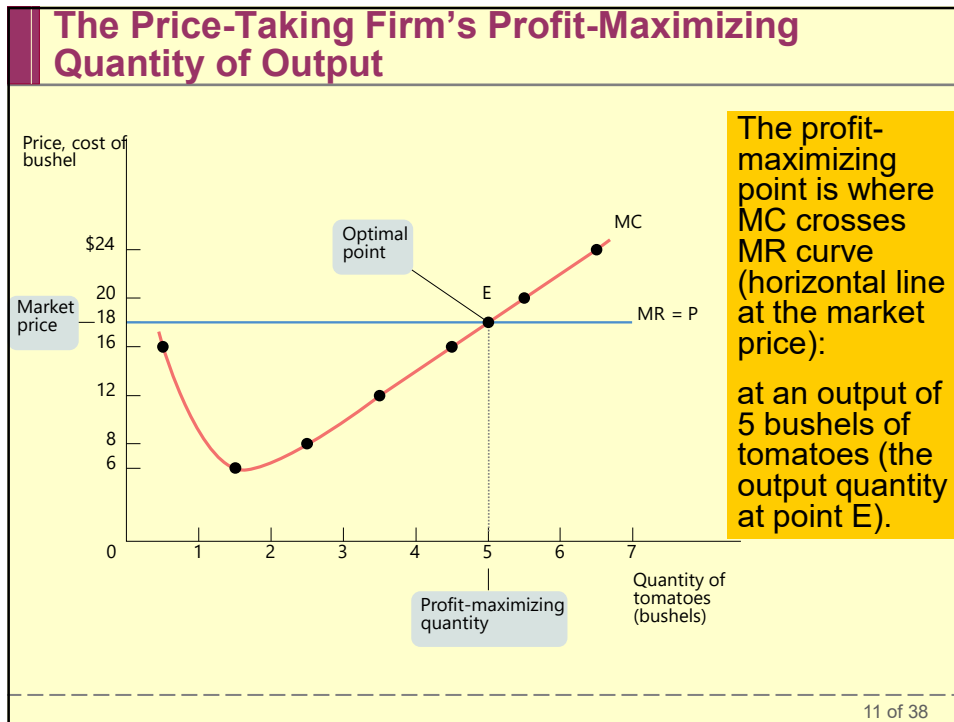
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Marginal Analysis Leads to Profit-Maximizing Quantity of Output

- The **price-taking firm's optimal output rule** says that a price-taking firm's profit is maximized by producing the quantity of output at which the marginal cost of the last unit produced is equal to the market price.
- The **marginal revenue curve** shows how marginal revenue varies as output varies.

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When Is Production Profitable?

- If $TR > TC$, the firm is **profitable**.
- If $TR = TC$, the firm **breaks even**.
- If $TR < TC$, the firm **incurs a loss**.

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Short-Run Average Costs

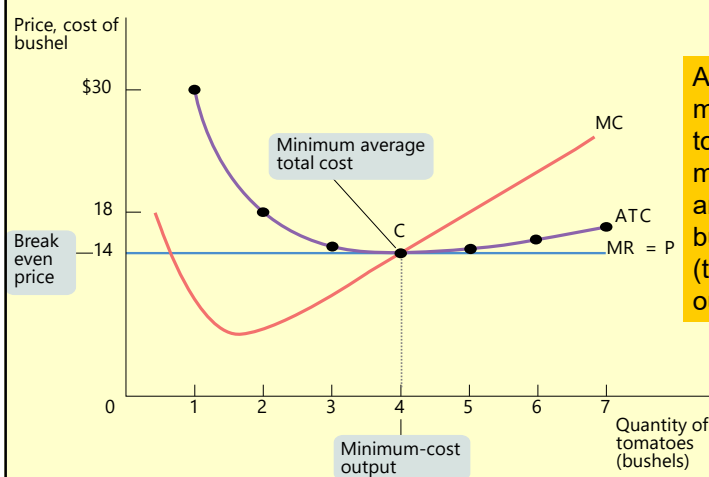
Short-Run Average Costs for Jennifer and Jason's Farm

Quantity of tomatoes Q (bushels)	Variable cost VC	Total cost TC	Short-run average variable cost of bushel $AVC = VC/Q$	Short-run average total cost of bushel $ATC = TC/Q$
1	\$16.00	\$30.00	\$16.00	\$30.00
2	22.00	36.00	11.00	18.00
3	30.00	44.00	10.00	14.67
4	42.00	56.00	10.50	14.00
5	58.00	72.00	11.60	14.40
6	78.00	92.00	13.00	15.33
7	102.00	116.00	14.57	16.57

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Costs and Production in the Short Run

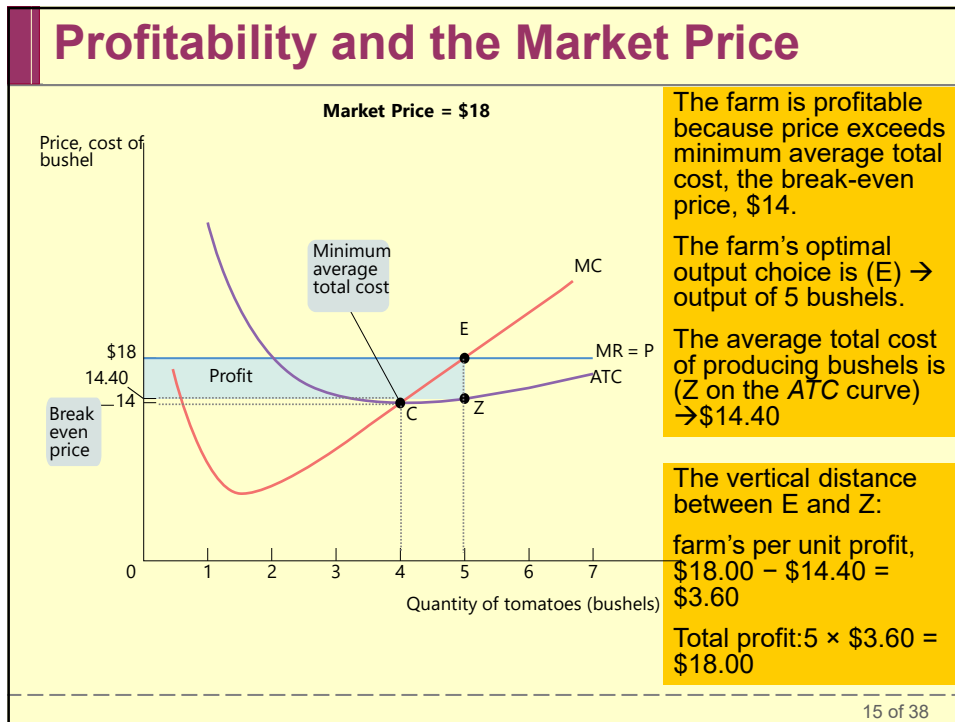


At point C (the minimum average total cost), the market price is \$14 and output is 4 bushels of tomatoes (the minimum-cost output).

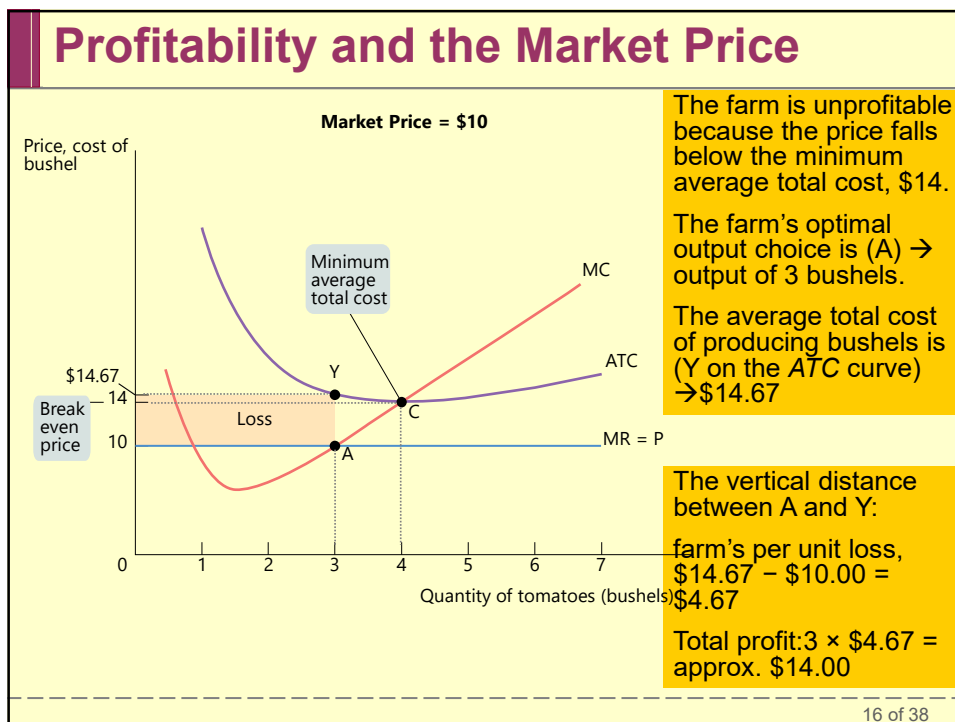
This is where MC cuts the ATC curve at its minimum. Minimum average total cost is equal to the firm's *break-even price*.

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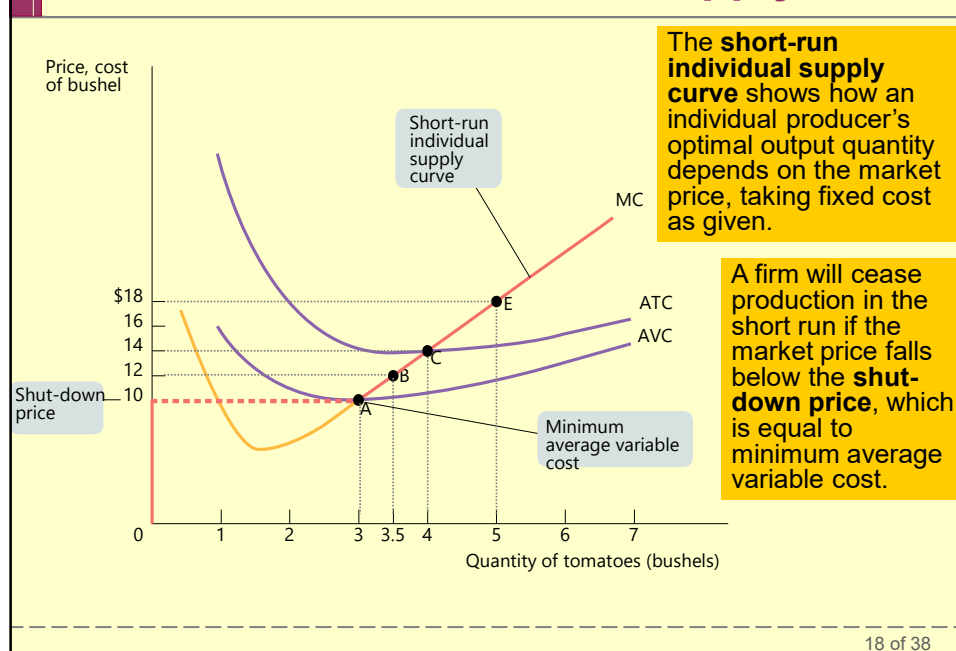
Profit, Break-Even or Loss

- The **break-even price** of a price-taking firm is the market price at which it earns zero profits.
- Whenever market price exceeds minimum average total cost, the producer is profitable.
- Whenever the market price equals minimum average total cost, the producer breaks even.
- Whenever market price is less than minimum average total cost, the producer is unprofitable.

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The Short-Run Individual Supply Curve



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Summary of the Competitive Firm's Profitability and Production Conditions

Profitability Condition (minimum ATC = break-even price)	Result
$P > \text{minimum } ATC$	Firm profitable. Entry into industry in the long run.
$P = \text{minimum } ATC$	Firm breaks even. No entry into or exit from industry in the long run.
$P < \text{minimum } ATC$	Firm unprofitable. Exit from industry in the long run.
Production Condition (minimum AVC = shut-down price)	Result
$P > \text{minimum } AVC$	Firm produces in the short run. If $P < \text{minimum } ATC$, firm covers variable cost and some but not all of fixed cost. If $P > \text{minimum } ATC$, firm covers all variable cost and fixed cost.
$P = \text{minimum } AVC$	Firm indifferent between producing in the short run or not. Just covers variable cost.
$P < \text{minimum } AVC$	Firm shuts down in the short run. Does not cover variable cost.

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Industry Supply Curve

- The **industry supply curve** shows the relationship between the price of a good and the total output of the industry as a whole.
- The short-run industry supply curve shows how the quantity supplied by an industry depends on the market price given a fixed number of producers.
- There is a **short-run market equilibrium** when the quantity supplied equals the quantity demanded, taking the number of producers as given.

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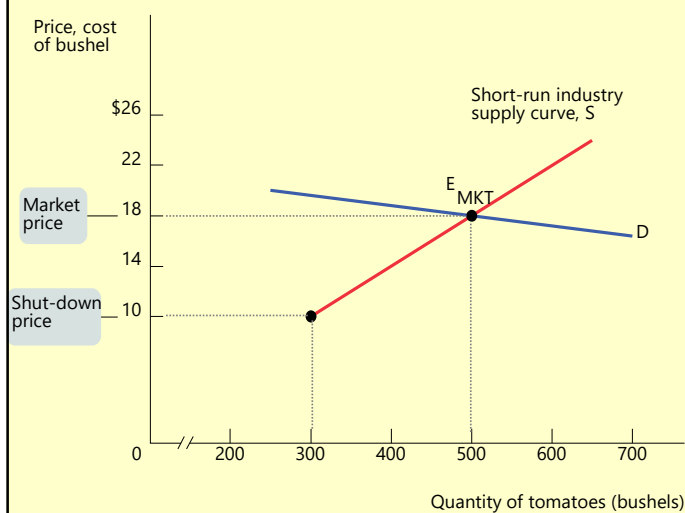
The Long-Run Industry Supply Curve

- A market is in **long-run market equilibrium** when the quantity supplied equals the quantity demanded, given that sufficient time has elapsed for entry into and exit from the industry to occur.

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The Short-Run Market Equilibrium

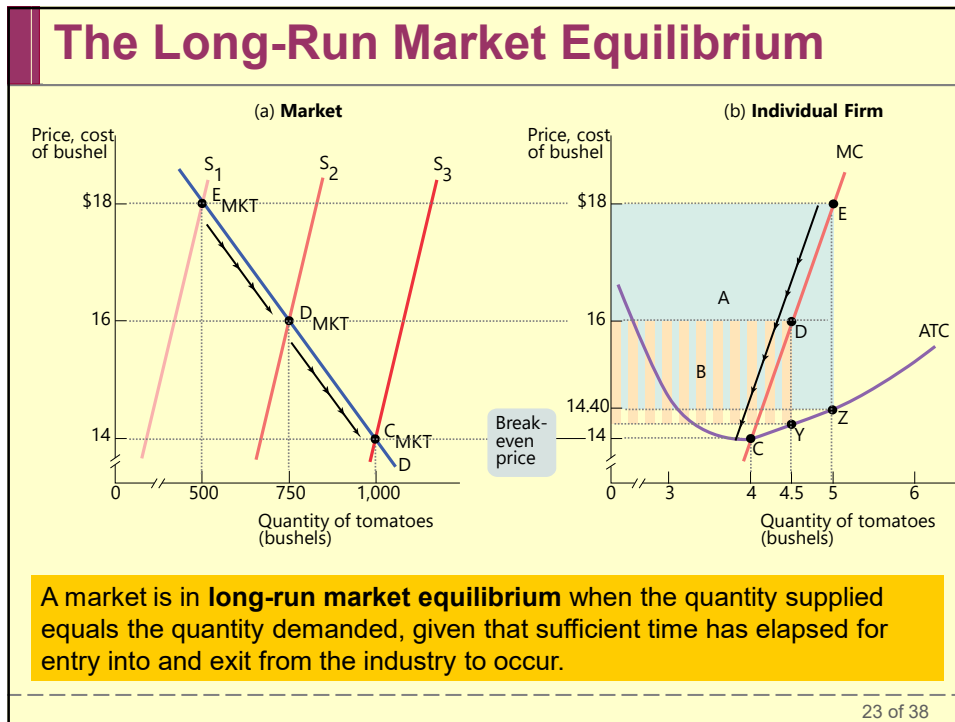


The **short-run industry supply curve** shows how the quantity supplied by an industry depends on the market price given a fixed number of producers.

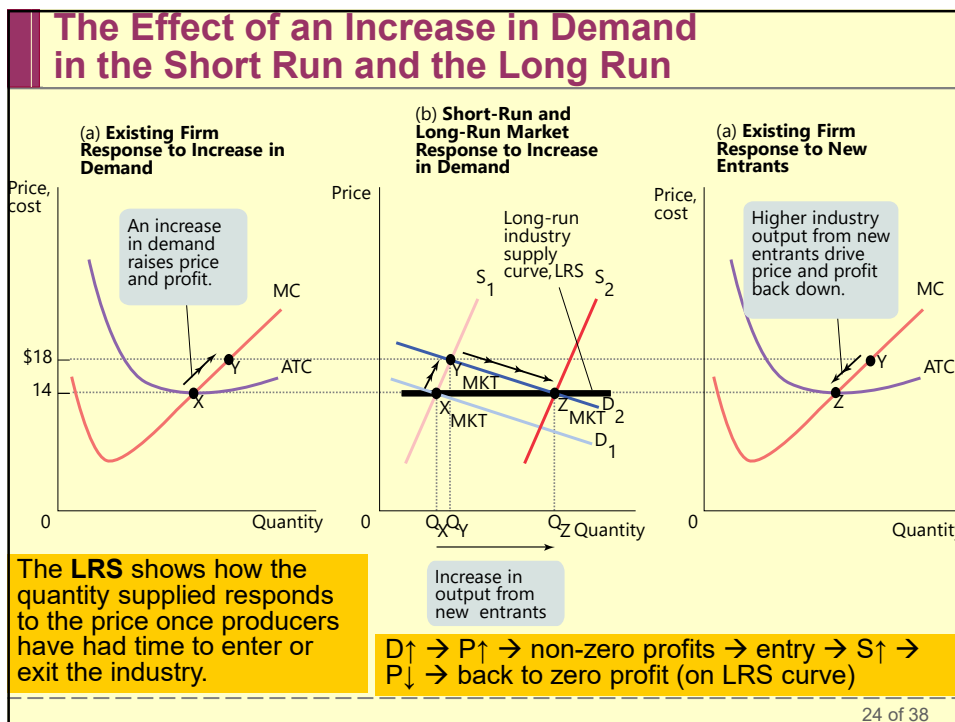
There is a **short-run market equilibrium** when the quantity supplied equals the quantity demanded, taking the number of producers as given.

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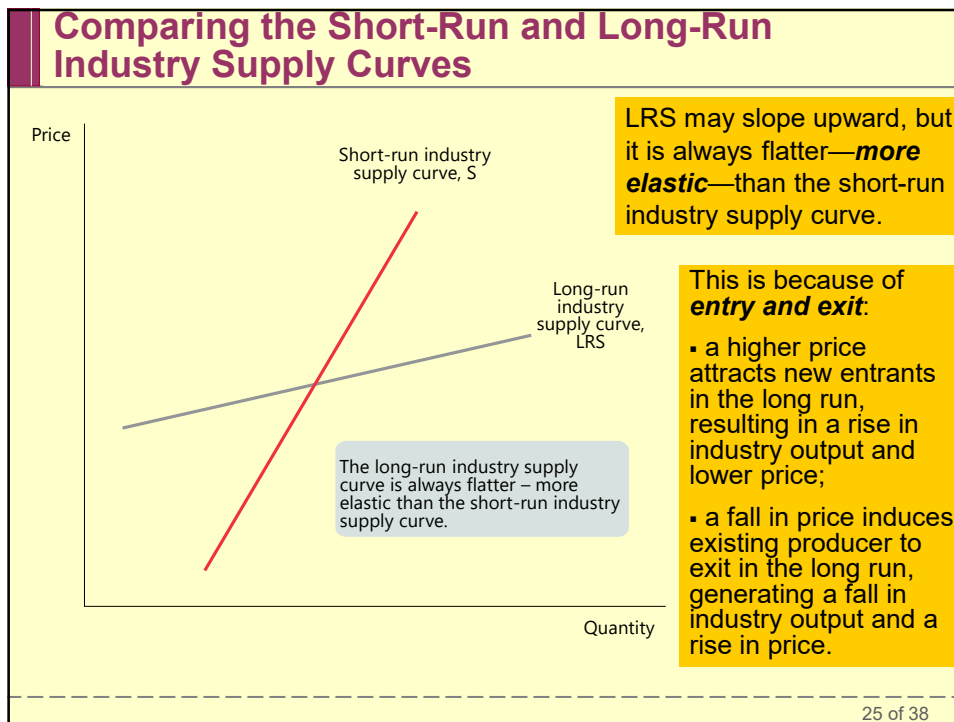
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Conclusions

- Three conclusions about the cost of production and efficiency in the long-run equilibrium of a perfectly competitive industry:
 - In a perfectly competitive industry in equilibrium, the value of marginal cost is the same for all firms.
 - In a perfectly competitive industry with free entry and exit, each firm will have zero economic profits in long-run equilibrium.
 - The long-run market equilibrium of a perfectly competitive industry is efficient: no mutually beneficial transactions go unexploited.

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The End of Chapter 12

coming attraction:
Chapter 13:
Monopoly

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