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Firms in Competitive Markets



WHAT IS A COMPETITIVE MARKET?

- A *competitive market* has many buyers and sellers trading identical products so that each buyer and seller is a price taker.
 - Buyers and sellers must accept the price determined by the market.

The Meaning of Competition

- A *perfectly competitive market* has the following characteristics:
 - There are many buyers and sellers in the market.
 - The goods offered by the various sellers are largely the same.
 - Firms can freely enter or exit the market.

The Meaning of Competition

- As a result of its characteristics, the perfectly competitive market has the following outcomes:
 - The actions of any single buyer or seller in the market have a negligible impact on the market price.
 - Each buyer and seller takes the market price as given.

The Revenue of a Competitive Firm

- Total revenue for a firm is the selling price times the quantity sold.
- $TR = (P \times Q)$
- Total revenue is proportional to the amount of output.

The Revenue of a Competitive Firm

- *Average revenue* tells us how much revenue a firm receives for the typical unit sold.
- Average revenue is total revenue divided by the quantity sold.

The Revenue of a Competitive Firm

- In perfect competition, average revenue equals the price of the good.

$$\begin{aligned}\text{Average Revenue} &= \frac{\text{Total revenue}}{\text{Quantity}} \\ &= \frac{\text{Price} \times \text{Quantity}}{\text{Quantity}} \\ &= \text{Price}\end{aligned}$$

The Revenue of a Competitive Firm

- *Marginal revenue* is the change in total revenue from an additional unit sold.
- $MR = \Delta TR / \Delta Q$
- For competitive firms, marginal revenue equals the price of the good.

Table 1 Total, Average, and Marginal Revenue for a Competitive Firm

Quantity (Q)	Price (P)	Total Revenue ($TR = P \times Q$)	Average Revenue ($AR = TR / Q$)	Marginal Revenue ($MR = \Delta TR / \Delta Q$)
1 gallon	\$6	\$ 6	\$6	\$6
2	6	12	6	6
3	6	18	6	6
4	6	24	6	6
5	6	30	6	6
6	6	36	6	6
7	6	42	6	6
8	6	48	6	6



PROFIT MAXIMIZATION AND THE COMPETITIVE FIRM'S SUPPLY CURVE

- The goal of a competitive firm is to maximize profit.
- This means that the firm will want to produce the quantity that maximizes the *difference between total revenue and total cost*.

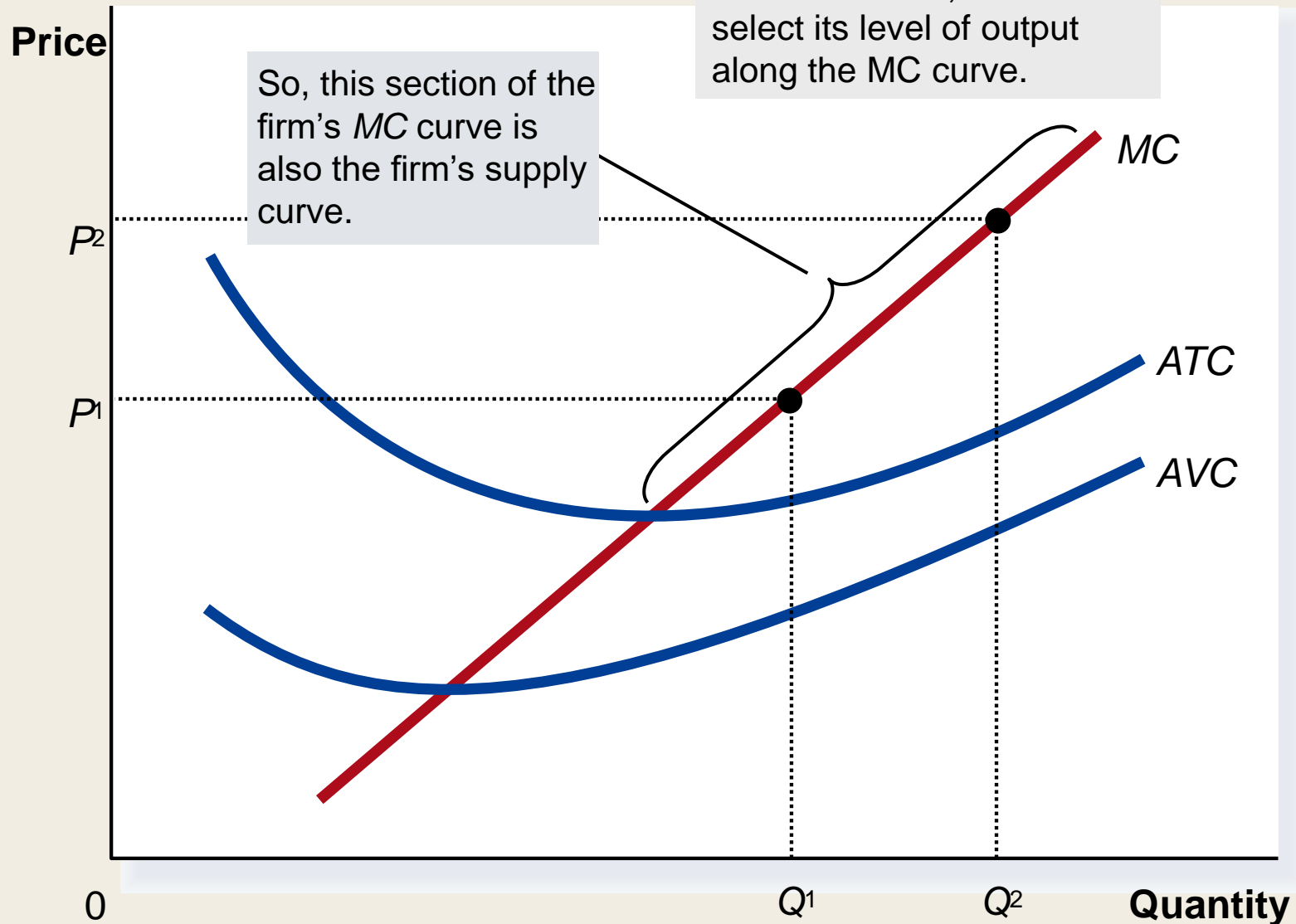
Table 2 Profit Maximization: A Numerical Example

Quantity (Q)	Total Revenue (TR)	Total Cost (TC)	Profit (TR – TC)	Marginal Revenue (MR = $\Delta TR / \Delta Q$)	Marginal Cost (MC = $\Delta TC / \Delta Q$)	Change in Profit (MR – MC)
0 gallons	\$ 0	\$ 3	–\$3			
1	6	5	1	\$6	\$2	\$4
2	12	8	4	6	3	3
3	18	12	6	6	4	2
4	24	17	7	6	5	1
5	30	23	7	6	6	0
6	36	30	6	6	7	–1
7	42	38	4	6	8	–2
8	48	47	1	6	9	–3

The Marginal Cost-Curve and the Firm's Supply Decision

- Profit maximization occurs at the quantity where *marginal revenue equals marginal cost*.
 - When $MR > MC$, increase Q
 - When $MR < MC$, decrease Q
 - When $MR = MC$, profit is maximized.
 - *Under perfect competition, $P=MR=AR$*

Figure 2 Marginal Cost as the Competitive Firm's Supply Curve



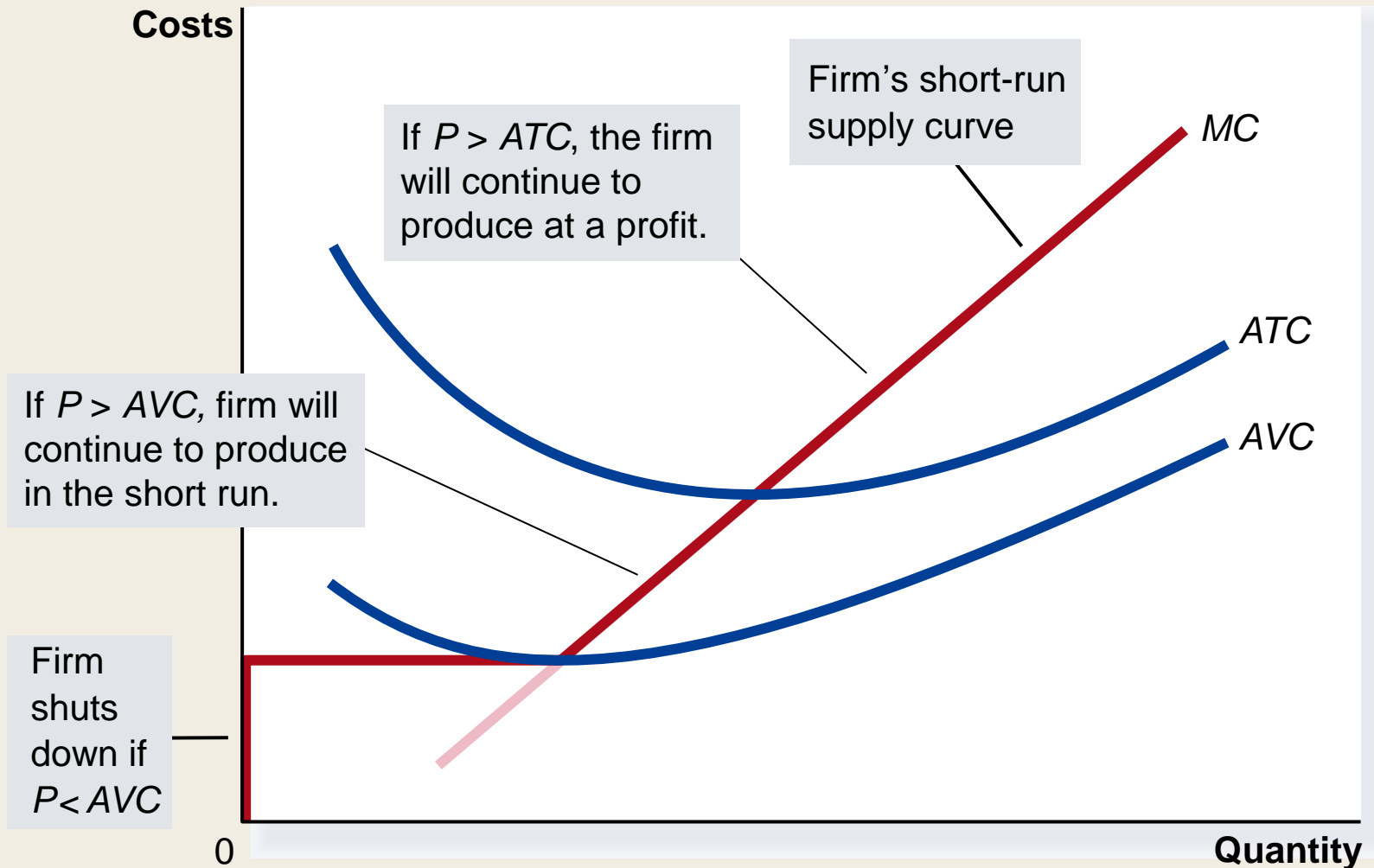
The Firm's Short-Run Decision to Shut Down

- A shutdown refers to a short-run decision not to produce anything during a specific period of time because of current market conditions.
- Exit refers to a long-run decision to leave the market.

The Firm's Short-Run Decision to Shut Down

- The firm shuts down if the revenue it gets from producing is less than the variable cost of production.
 - Shut down if $TR < VC$
 - Shut down if $TR/Q < VC/Q$
 - Shut down if $P < AVC$

Figure 3 The Competitive Firm's Short-Run Supply Curve



The Firm's Short-Run Decision to Shut Down

- The portion of the marginal-cost curve that lies above average variable cost is the competitive firm's short-run supply curve.

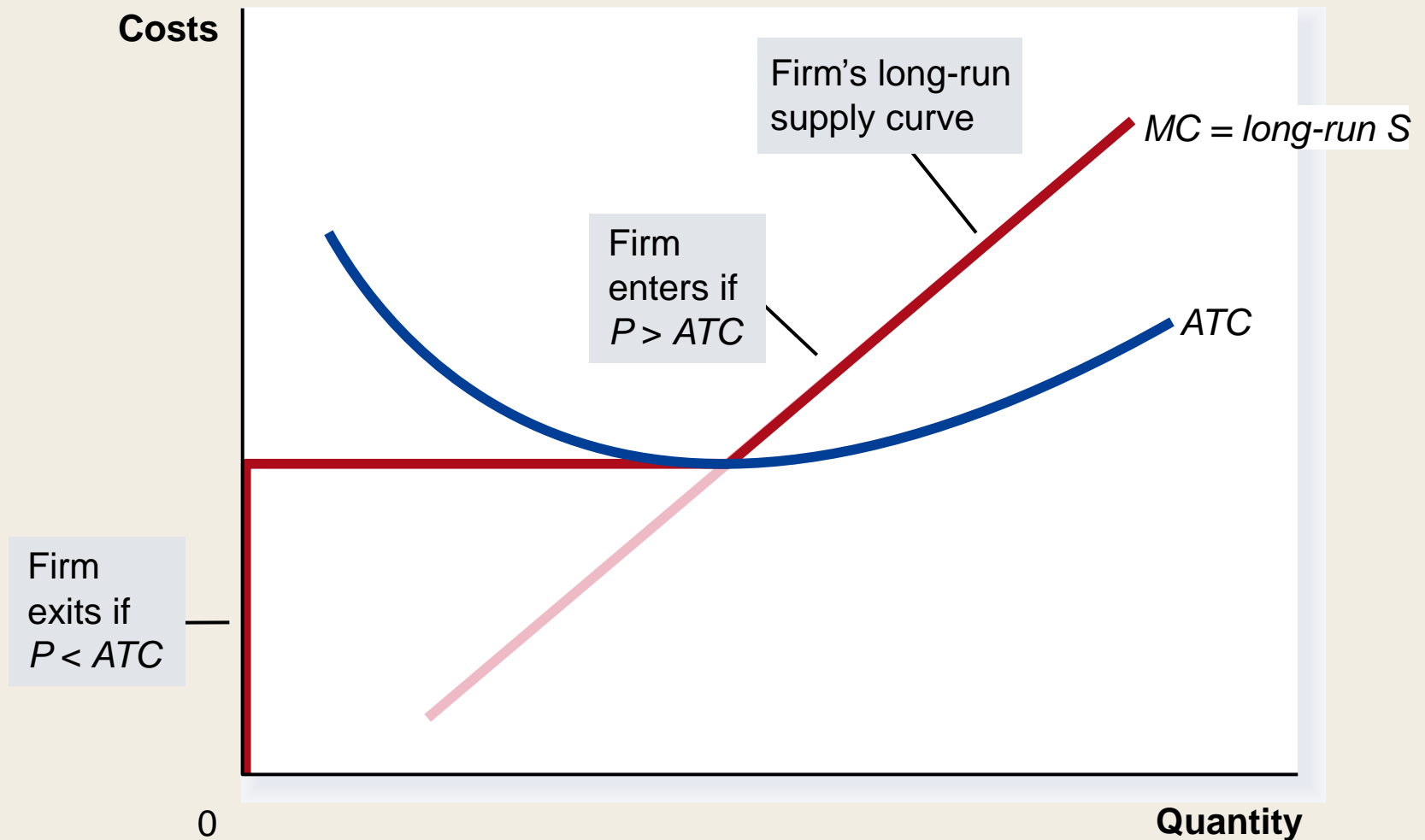
The Firm's Long-Run Decision to Exit or Enter a Market

- In the long run, the firm exits if the revenue it would get from producing is less than its total cost.
 - Exit if $TR < TC$
 - Exit if $TR/Q < TC/Q$
 - Exit if $P < ATC$

The Firm's Long-Run Decision to Exit or Enter a Market

- A firm will enter the industry if such an action would be profitable.
 - Enter if $TR > TC$
 - Enter if $TR/Q > TC/Q$
 - Enter if $P > ATC$

Figure 4 The Competitive Firm's Long-Run Supply Curve



Measuring Profit in Our Graph for the Competitive Firm

- Profit = $TR - TC$
- Profit = $(TR/Q - TC/Q) \times Q$
- Profit = $(P - ATC) \times Q$

Figure 5 Profit as the Area between Price and Average Total Cost

(a) A Firm with Profits

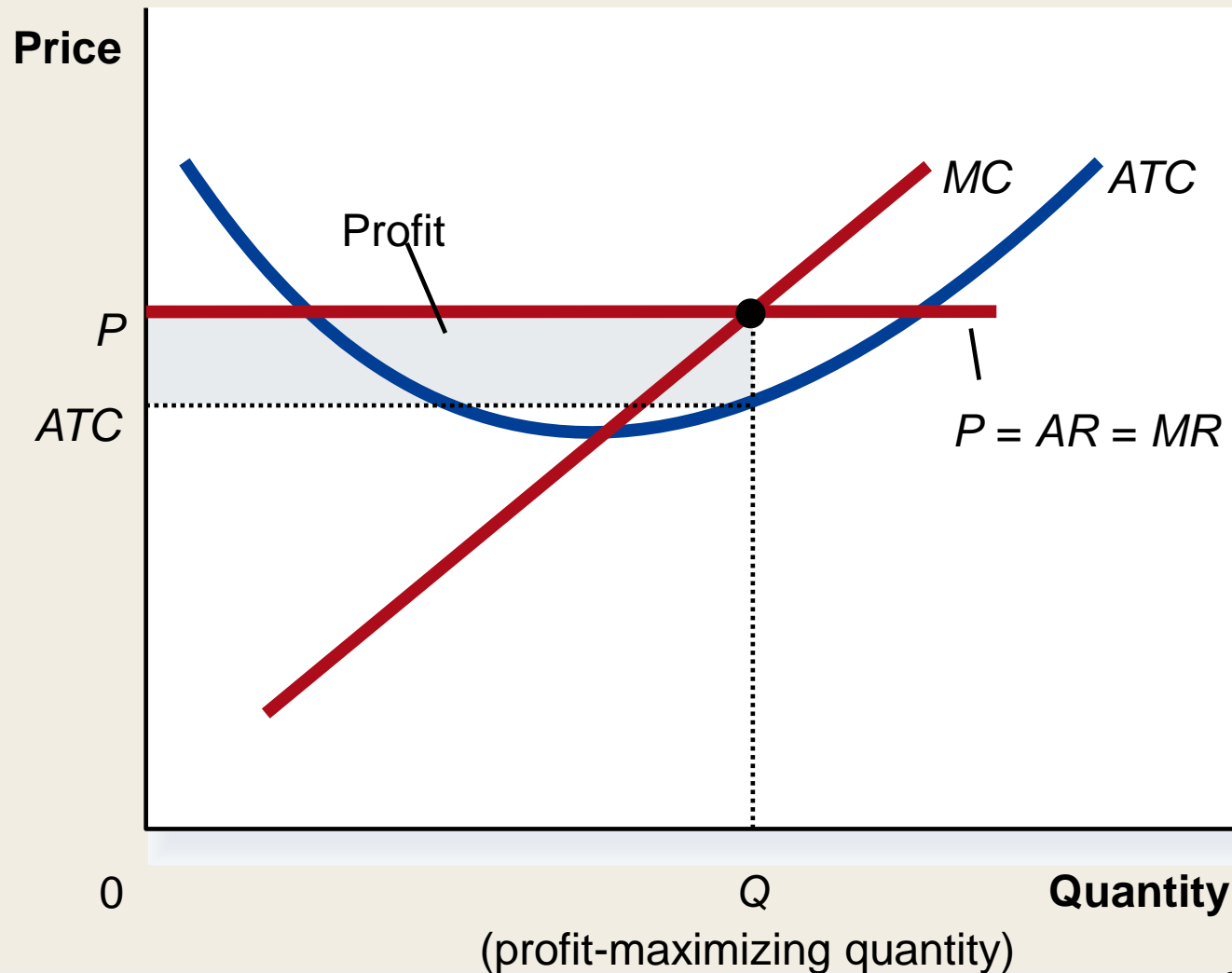
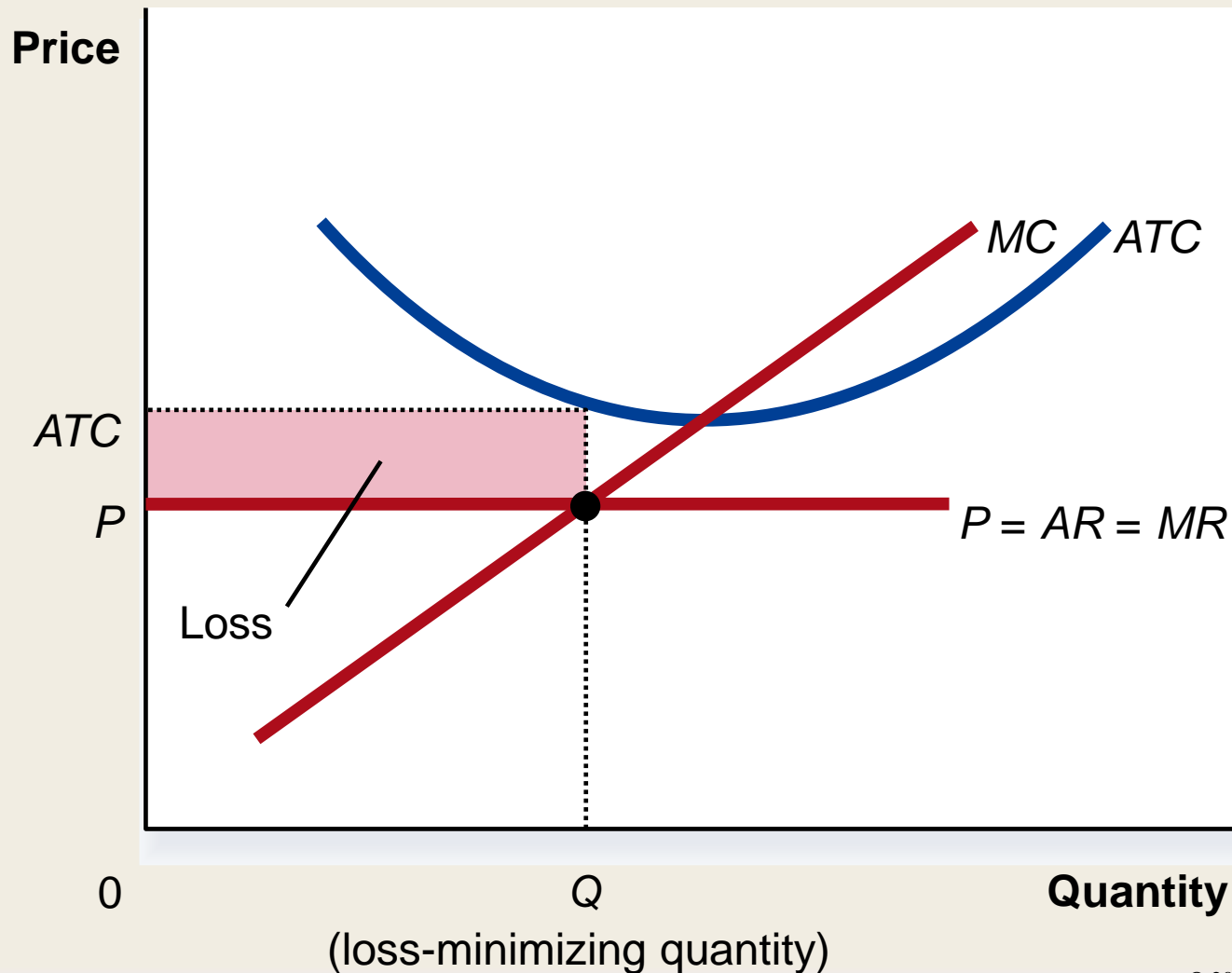


Figure 5 Profit as the Area between Price and Average Total Cost

(b) A Firm with Losses





THE SUPPLY CURVE IN A COMPETITIVE MARKET

- The competitive firm's *long-run supply curve* is the portion of its marginal-cost curve that lies above average total cost.



THE SUPPLY CURVE IN A COMPETITIVE MARKET

- Short-Run Supply Curve
 - The portion of its marginal cost curve that lies above average variable cost.
- Long-Run Supply Curve
 - The marginal cost curve above the minimum point of its average total cost curve.



THE SUPPLY CURVE IN A COMPETITIVE MARKET

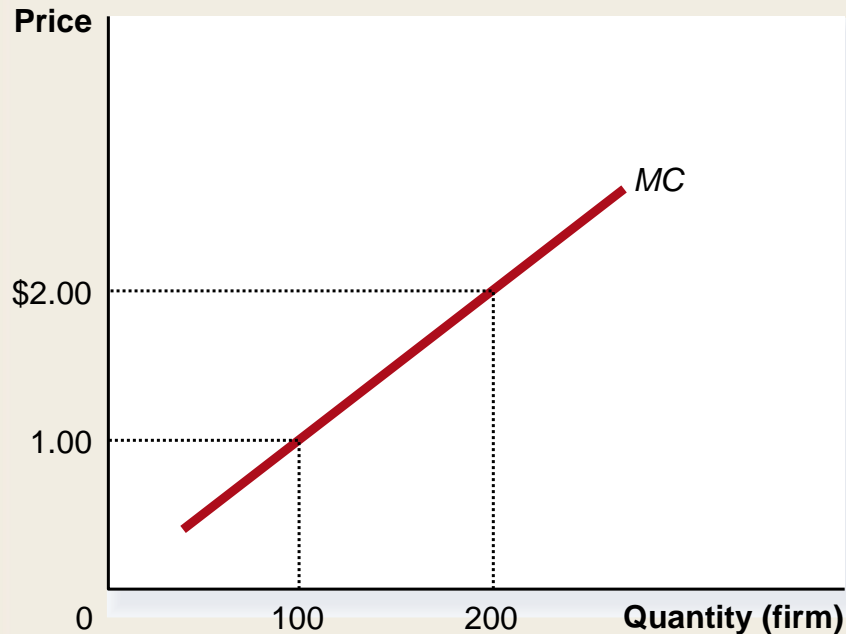
- Market supply equals the sum of the quantities supplied by the individual firms in the market.

The Short Run: Market Supply with a Fixed Number of Firms

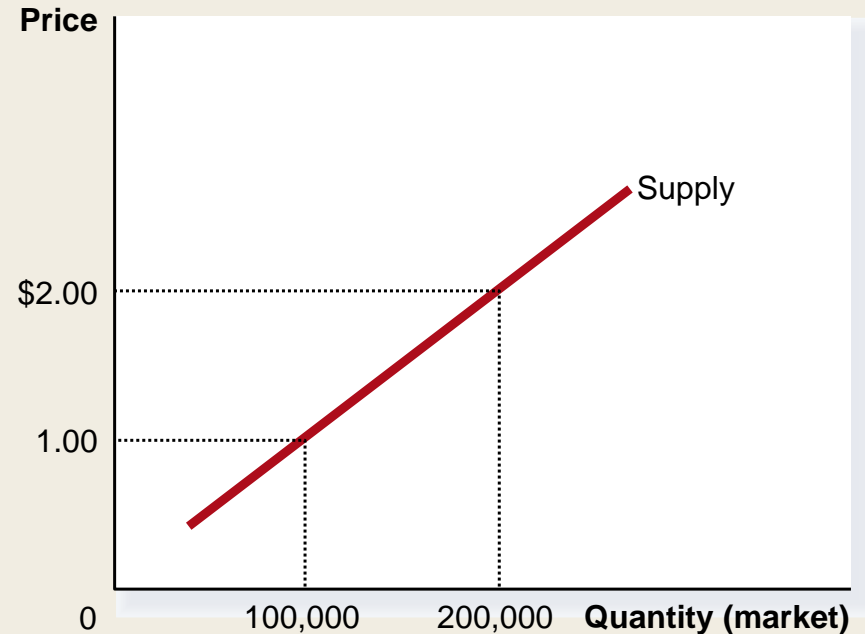
- For any given price, each firm supplies a quantity of output so that its marginal cost equals price.
- The market supply curve reflects the individual firms' marginal cost curves.

Figure 6 Short-Run Market Supply

(a) Individual Firm Supply



(b) Market Supply



If the industry has 1000 identical firms, then at each market price, industry output will be 1000 times larger than the representative firm's output.