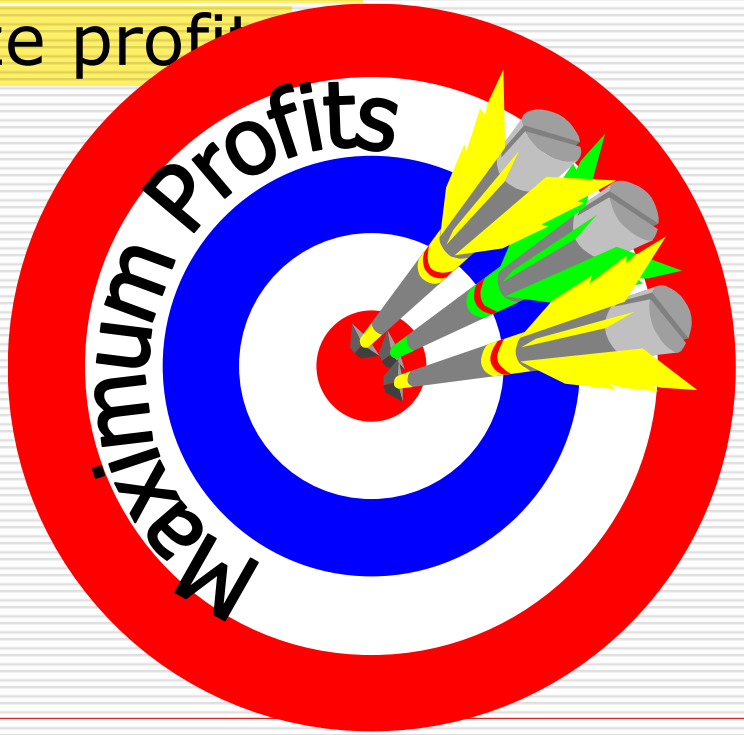
TOPIC 4
Chapter:13

The Costs

The Firm's Objective

- The Firm's Objective
  - The economic goal of the firm is to maximize profit



Total Revenue, Total Cost, and Profit

- *Total Revenue*
  - The amount a firm receives for the sale of its output.
- *Total Cost*
  - The market value of the inputs a firm uses in production.

Total Revenue, Total Cost, and Profit

- *Profit* is the firm's total revenue minus its total cost.

Profit = Total revenue - Total cost

Costs as Opportunity Costs

- A firm's *cost of production* includes all the opportunity costs of making its output of goods and services.
- Explicit and Implicit Costs
  - A firm's cost of production include explicit costs and implicit costs.
    - *Explicit* costs are input costs that require a direct outlay of money by the firm.
    - *Implicit* costs are input costs that do not require an outlay of money by the firm.

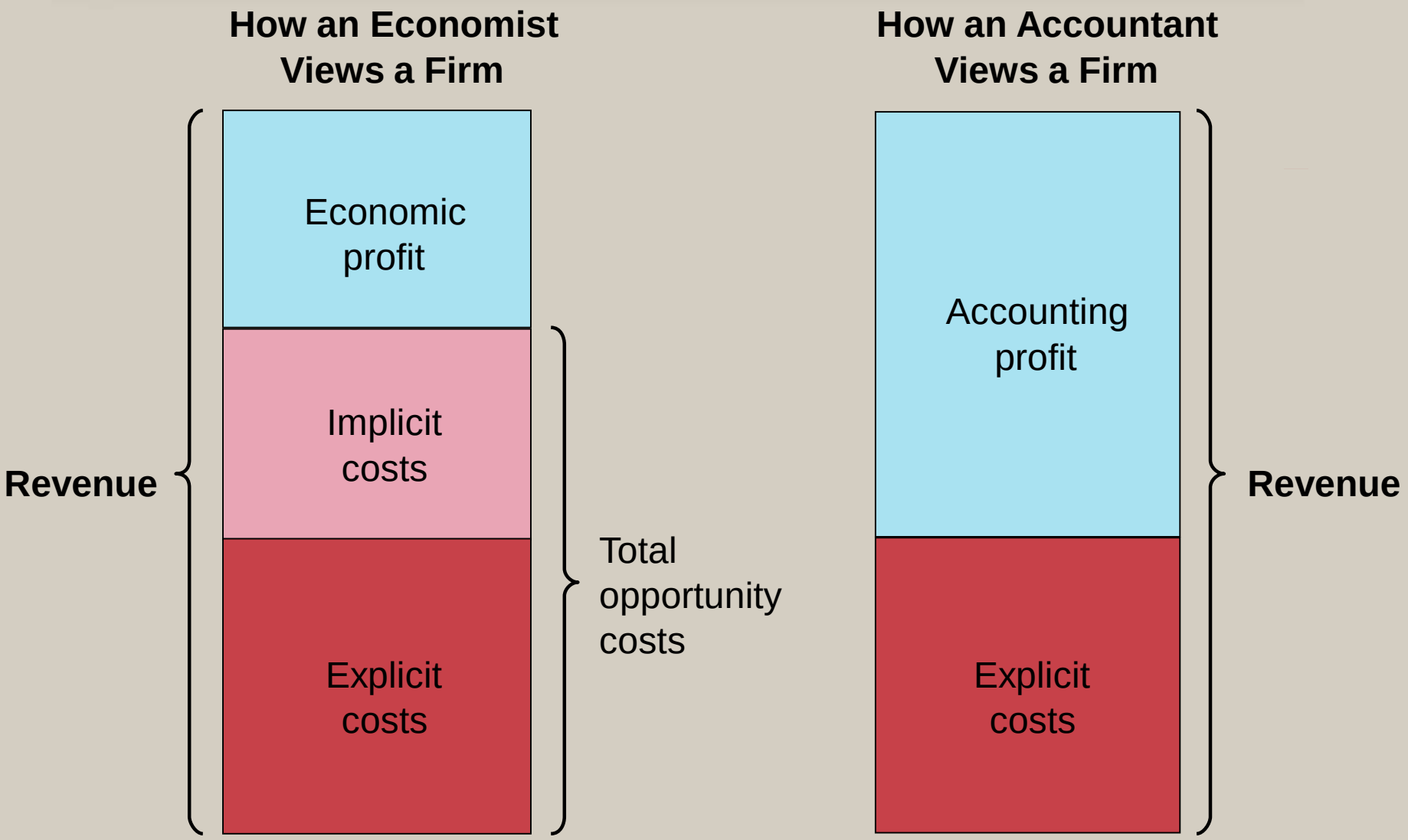
Economic Profit versus Accounting Profit

- Economists measure a firm's *economic profit* as total revenue minus total cost, including both explicit and implicit costs.
- Accountants measure the *accounting profit* as the firm's total revenue minus only the firm's explicit costs.

When total revenue exceeds both explicit and implicit costs, the firm earns economic profit.

Economic profit is smaller than accounting profit.

Figure 1 Economic versus Accountants



The Total-Cost Curve

- The relationship between the quantity a firm can produce and its costs determines pricing decisions.
- The *total-cost curve* shows this relationship graphically.

THE VARIOUS MEASURES OF COST

- Everywhere that production goes, costs follow close behind like a shadow.
- Costs of production may be divided into *fixed costs* and *variable costs*.

Fixed costs are those costs that do *not* vary with the quantity of output produced.

Variable costs are those costs that *do vary* with the quantity of output produced

Fixed Cost & Variable Cost

$C(Q) = FC + VC$

Total Cost
=Fixed Cost + Variable Cost

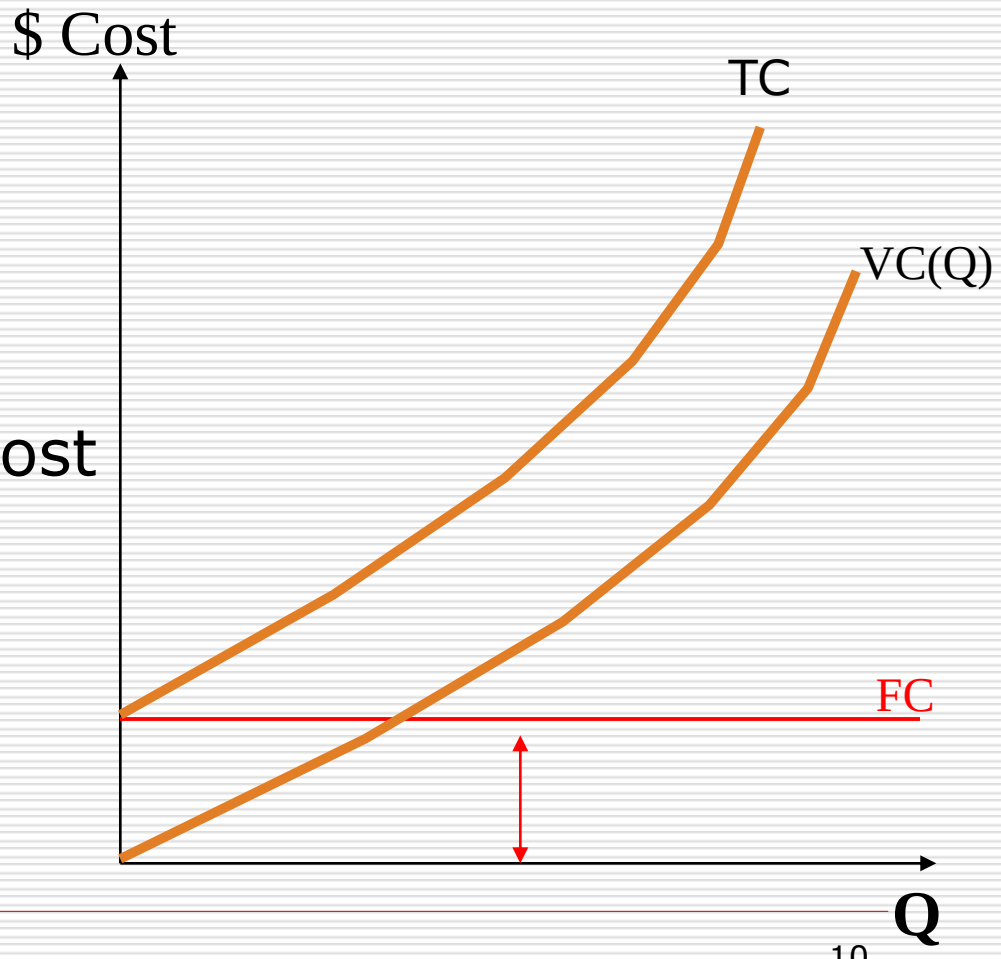
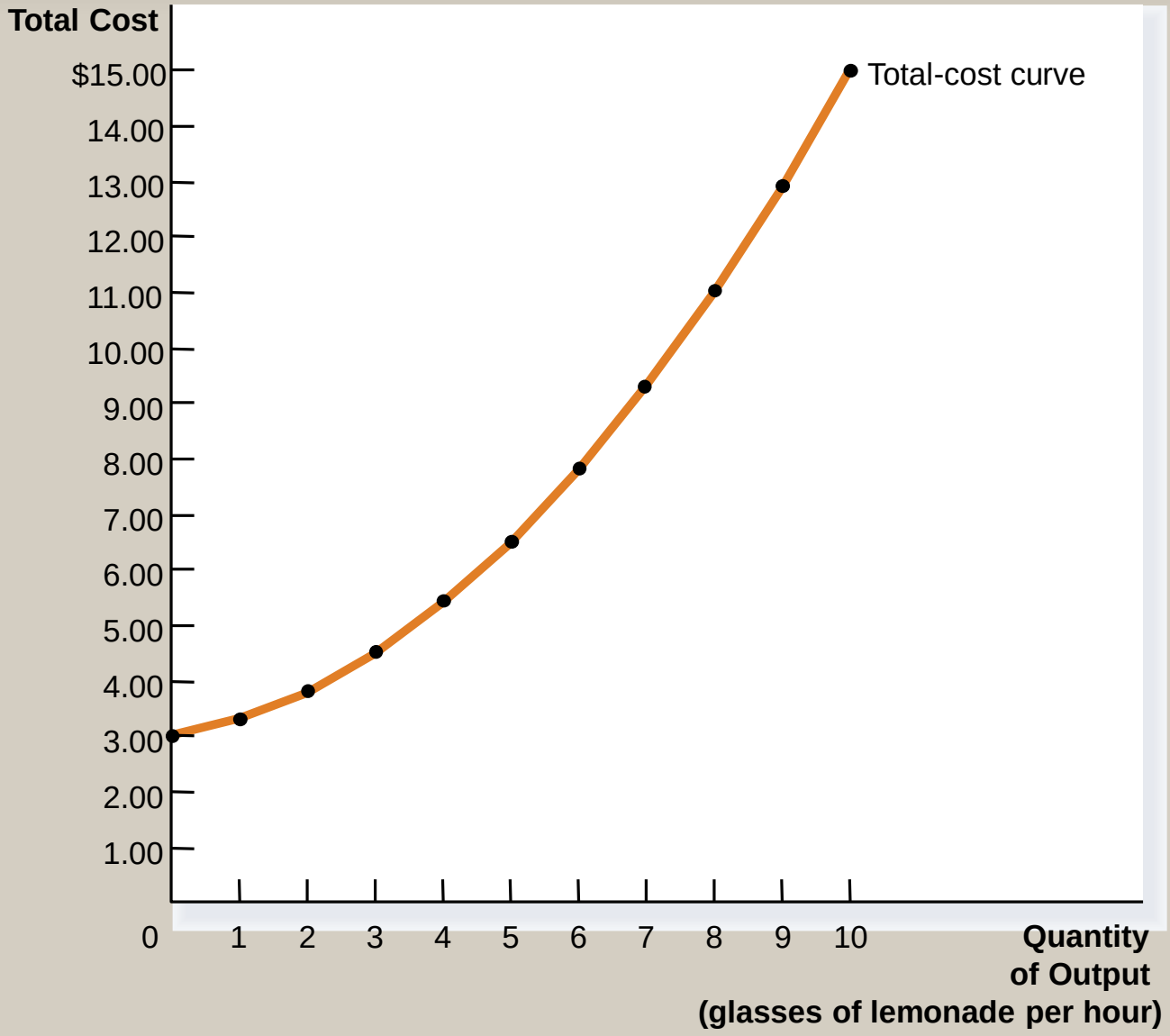


Figure 4 Thirsty Thelma's Total-Cost Curves



Average Costs

Average costs can be determined by dividing the firm's costs by the quantity of output it produces. The average cost is the cost of each typical unit of product.

Average Fixed Costs (*AFC*)
Average Variable Costs (*AVC*)
Average Total Costs (*ATC*)
$ATC = AFC + AVC$

Average Costs

$$AFC = \frac{\text{Fixed cost}}{\text{Quantity}} = \frac{FC}{Q}$$

$$AVC = \frac{\text{Variable cost}}{\text{Quantity}} = \frac{VC}{Q}$$

$$ATC = \frac{\text{Total cost}}{\text{Quantity}} = \frac{TC}{Q}$$

Marginal Cost

- *Marginal cost* (*MC*) measures the increase in total cost that arises from an extra unit of production.
- Marginal cost helps answer the following question:
  - How much does it cost to produce an additional unit of output?

$$MC = \frac{(\text{change in total cost})}{(\text{change in quantity})} = \frac{\Delta TC}{\Delta Q}$$

Marginal Cost

Quantity	Total Cost	Marginal Cost	Quantity	Total Cost	Marginal Cost
0	$3.00	—			
1	3.30	$0.30	6	$7.80	$1.30
2	3.80	0.50	7	9.30	1.50
3	4.50	0.70	8	11.00	1.70
4	5.40	0.90	9	12.90	1.90
5	6.50	1.10	10	15.00	2.10

Figure 5 Thirsty Thelma's Average-Cost and Marginal-Cost Curves

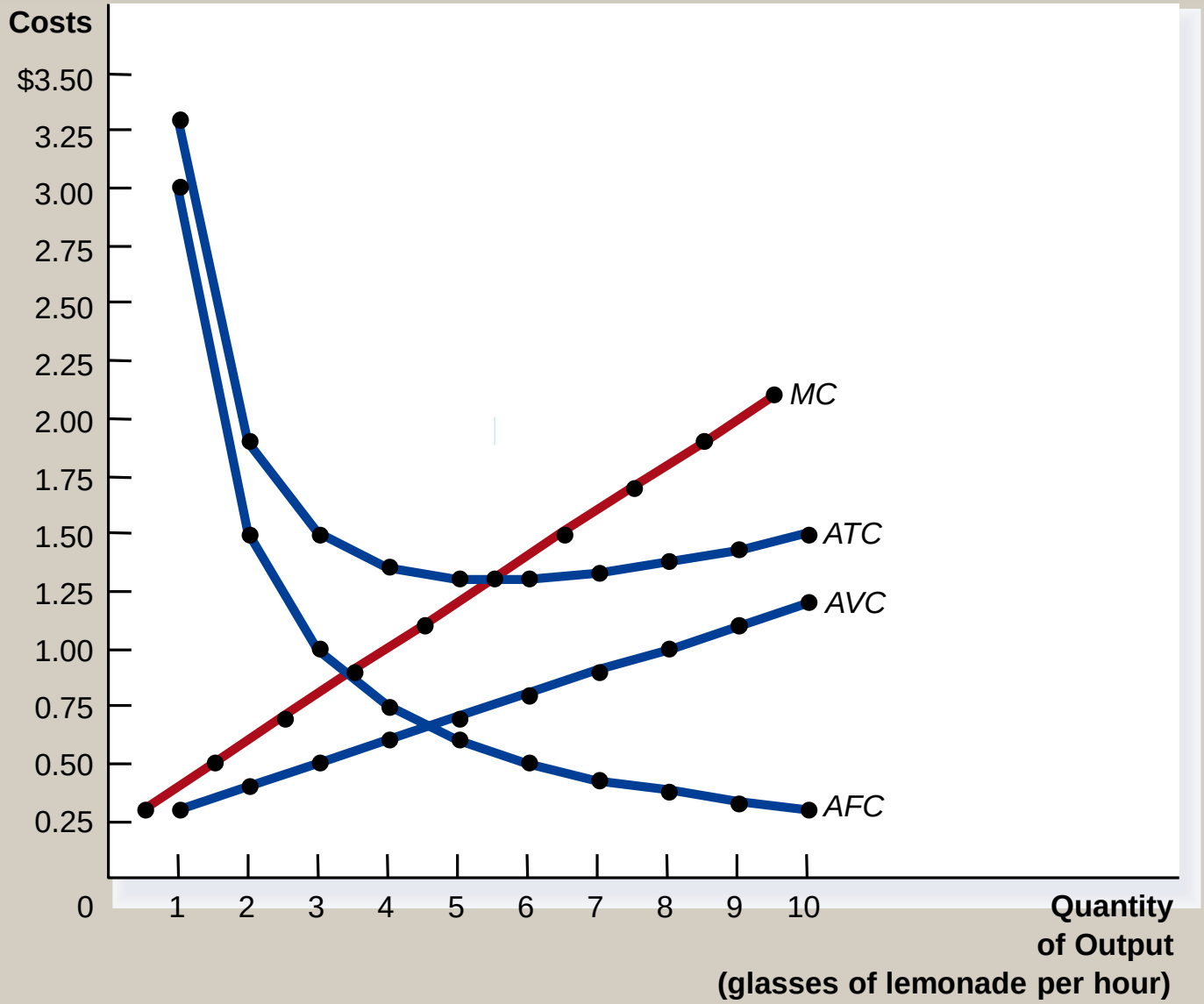
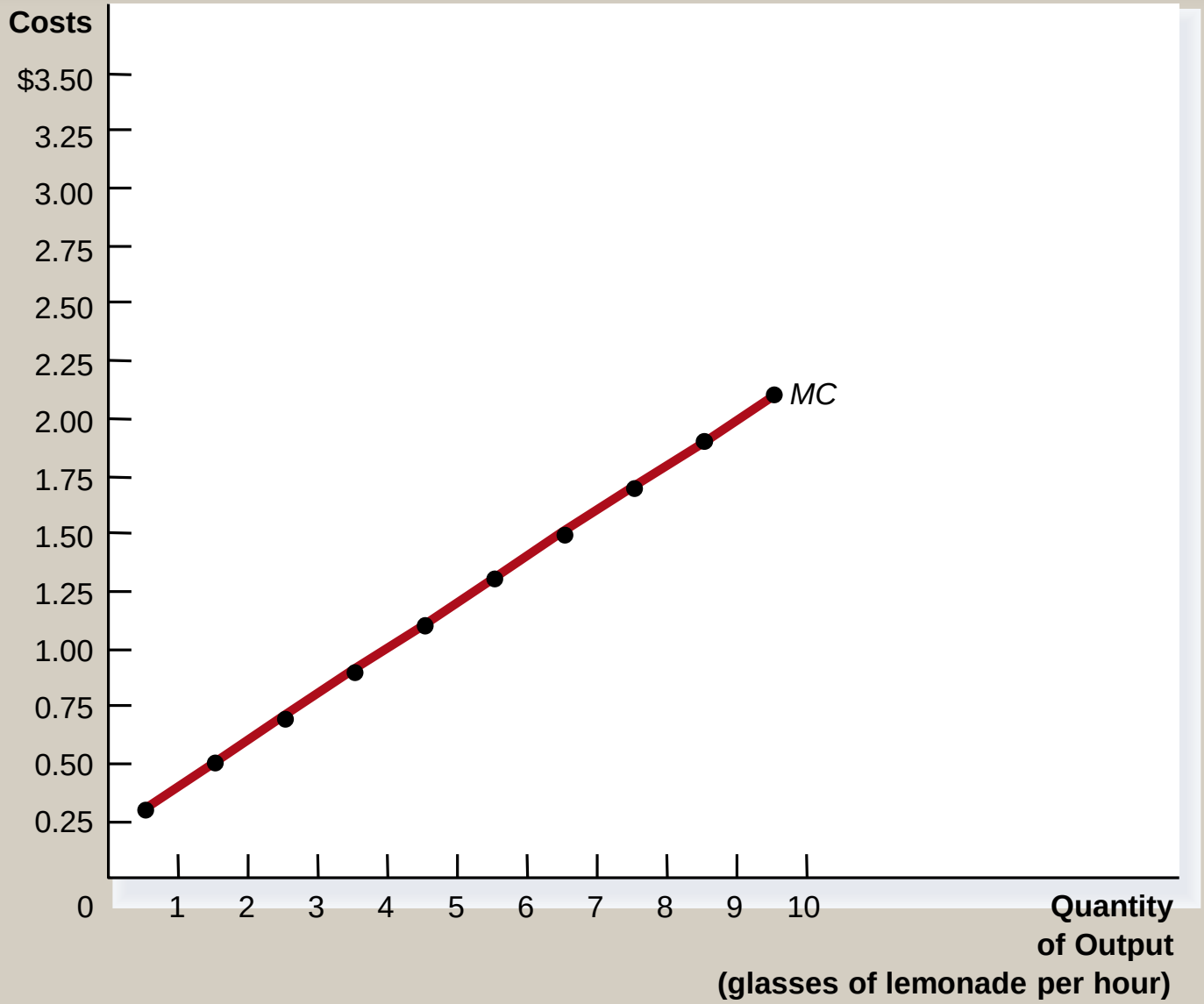


Figure 5 : Marginal-Cost Curves



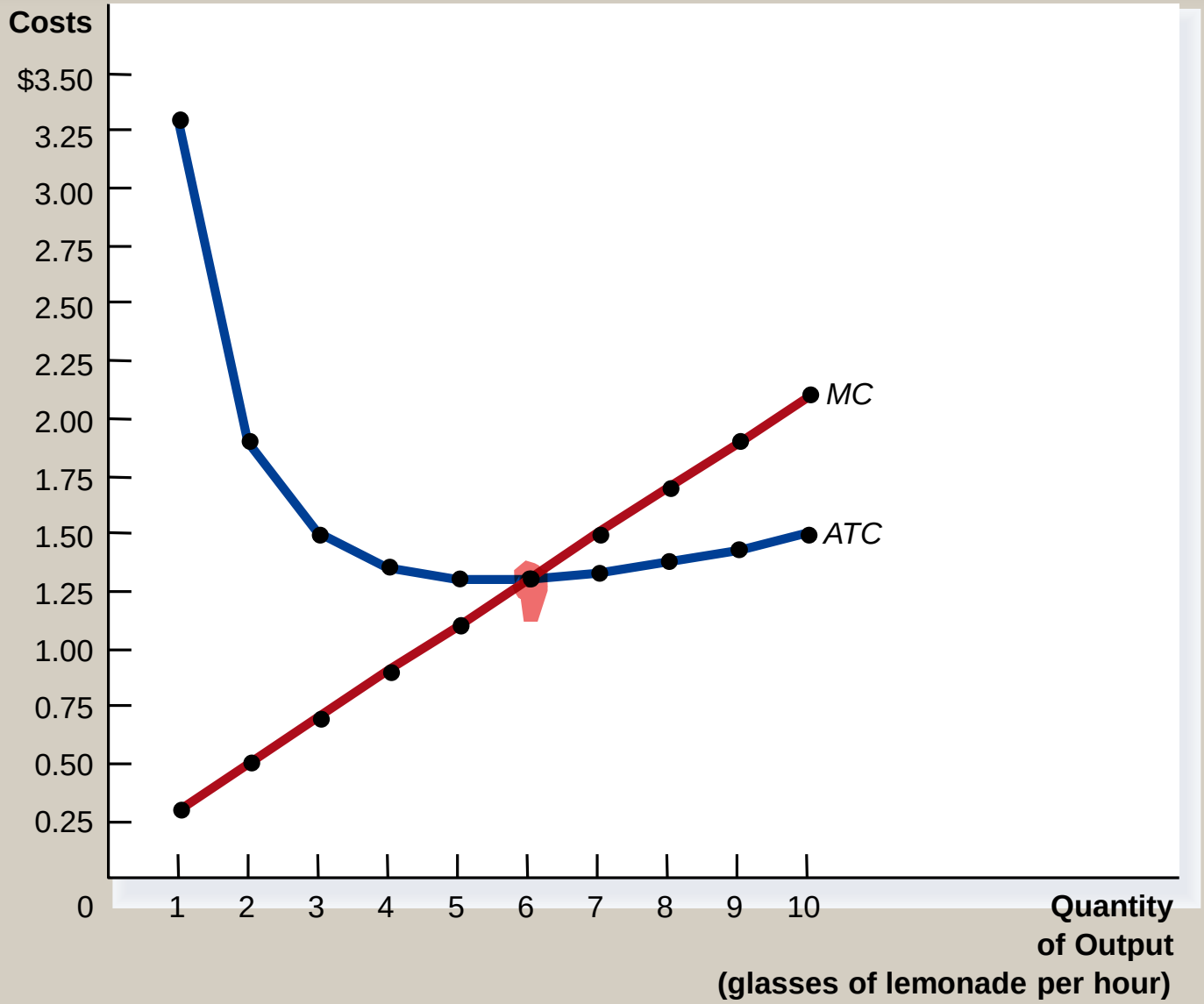
Cost Curves and Their Shapes

- The average total-cost curve is *U-shaped*.
- At very low levels of output average total cost is high because fixed cost is spread over only a few units.
- Average total cost declines as output increases.
- Average total cost starts rising because average variable cost rises substantially.

Cost Curves and Their Shapes

- The bottom of the U-shaped *ATC* curve occurs at the quantity that *minimizes average total cost*. This quantity is sometimes called the *efficient scale* of the firm.

Figure :Average-Cost and Marginal-Cost Curves



Cost Curves and Their Shapes

- Relationship between Marginal Cost and Average Total Cost
  - Whenever marginal cost is less than average total cost, average total cost is falling.
  - Whenever marginal cost is greater than average total cost, average total cost is rising.
    - The marginal-cost curve crosses the average-total-cost curve at the efficient scale.
      - Efficient scale is the quantity that minimizes average total cost.

Typical Cost Curves

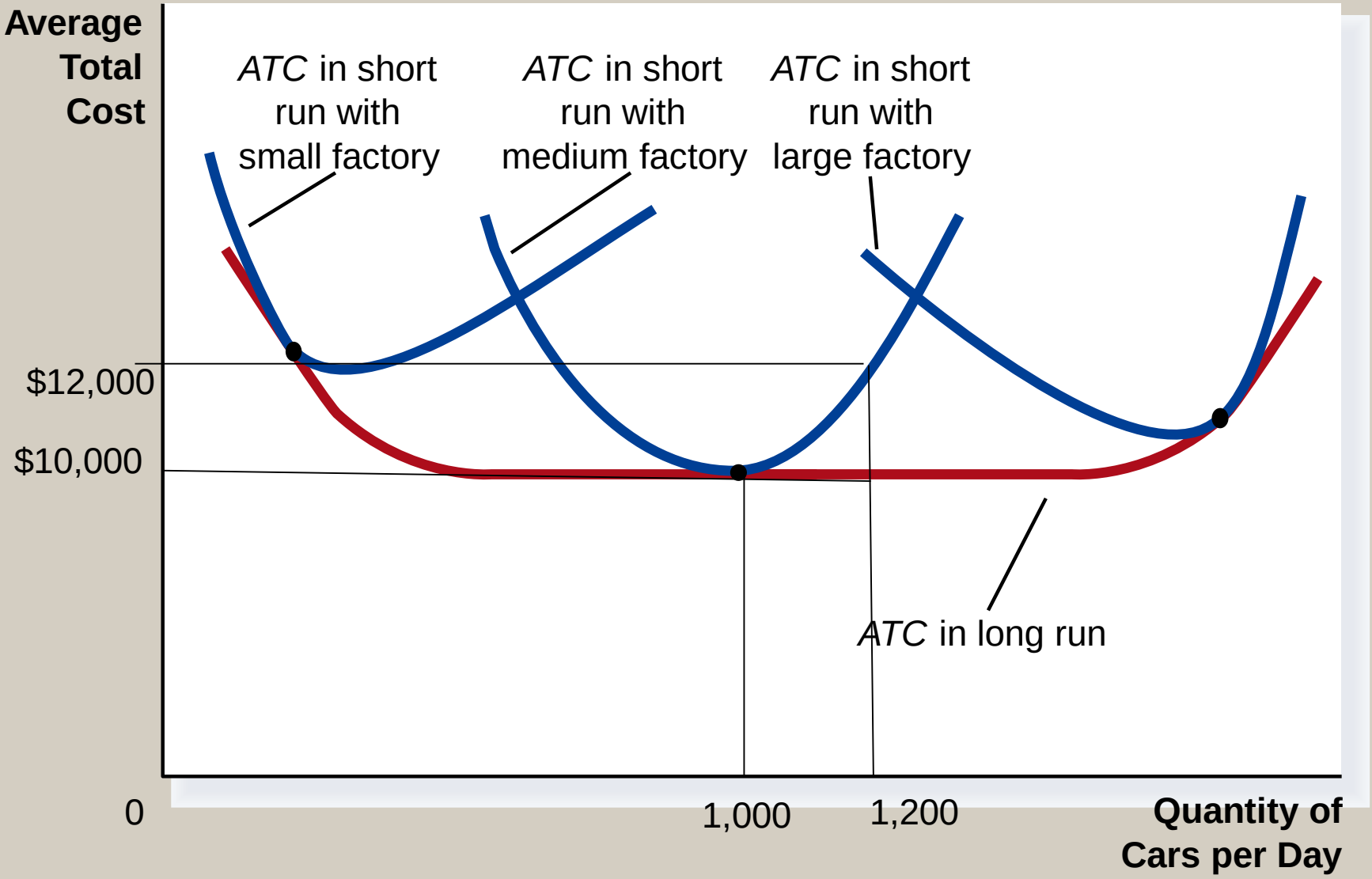
- Three Important Properties of Cost Curves
  - Marginal cost eventually rises with the quantity of output.
  - The average-total-cost curve is U-shaped.
  - The marginal-cost curve crosses the average-total-cost curve at the minimum of average total cost.

COSTS IN THE SHORT RUN AND IN THE LONG RUN

- For many firms, the division of total costs between fixed and variable costs depends on the time horizon being considered.
  - In the short run, some costs are fixed.
  - In the long run, fixed costs become variable costs.

•Because many costs are fixed in the short run but variable in the long run, a firm's long-run cost curves differ from its short-run cost curves.

Figure 7 Average Total Cost in the Short and Long Run



Economies and diseconomies of scale

- Economies of scale – factors that lower average cost as the size of the firm rises in the long run
  - Sources: specialization and division of labor, indivisibilities of capital, etc.
- Diseconomies of scale – factors that raise average cost as the size of the firm rises in the long run
  - Sources: increased cost of managing and coordination as firm size rises
- Constant returns to scale – average costs do not change as firm size changes

Long-run average total cost (LRATC)