Chapter 8

The Costs of Production

Chapter Objectives

- Explicit and implicit costs
- Law of diminishing returns
- Fixed and variable costs
- Total, average, and marginal costs
- The firm's size in the long run

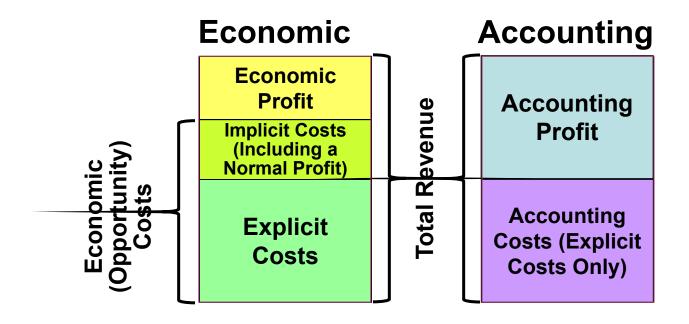
Economic Costs

- Equal to opportunity costs
- Explicit + implicit costs
- Explicit costs
 - -Monetary payments
- Implicit costs
 - Value of next best use
 - -Self-owned resources
 - Self-employed resources

Profit

- Accounting profit
 - Total revenue less explicit cost
- Normal profit
 - Equal to implicit cost
- Economic or pure profit
 - -Total revenue less economic cost

Profits Compared



Short and Long Run

- The short run
 - Fixed plant capacity
 - Variable intensity of plant use
 - Variable output
- The long run
 - Variable plant capacity
 - -Firms enter and exit

Production Relationships

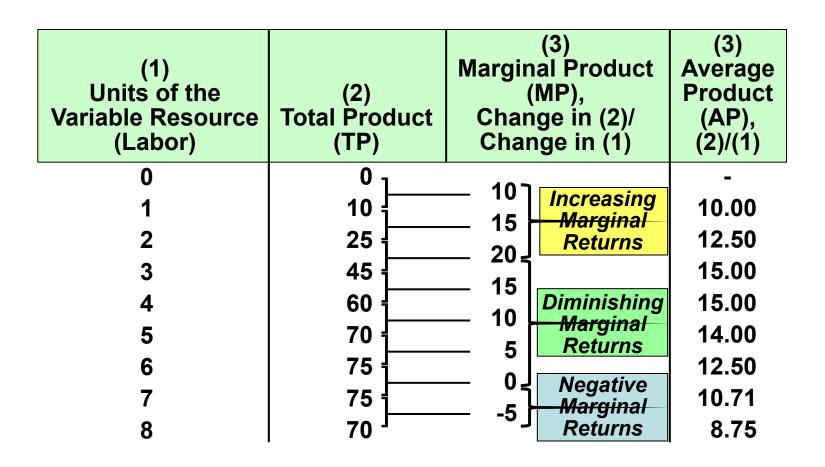
- Total product (TP)
- Marginal product (MP)

Average product (AP)

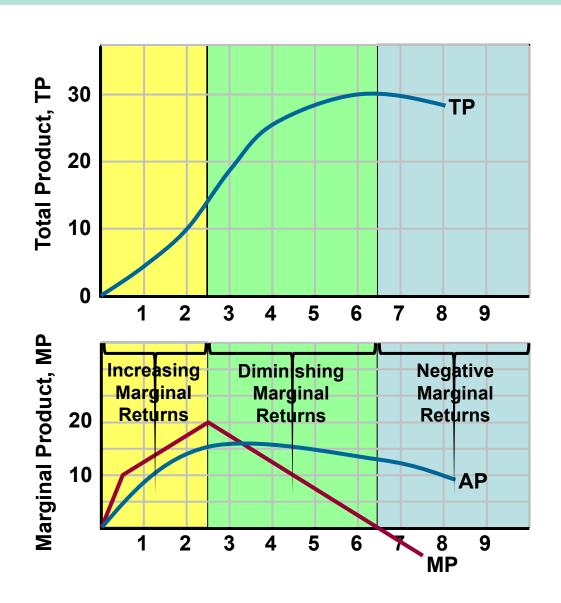
Law of Diminishing Returns

- Fixed technology
- Add variable resource to fixed resource
- Marginal product will decline
 - Beyond some point
- Rationale

Law of Diminishing Returns



Law of Diminishing Returns



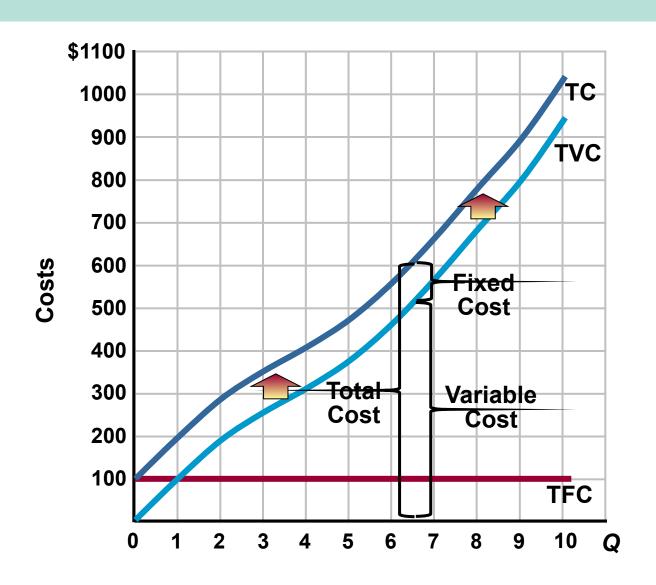
Short-Run Production Costs

- Fixed Costs
 - Do not vary with output
- Variable Costs
 - -Materials, most labor
- Total Cost
 - -TC = TFC + TVC

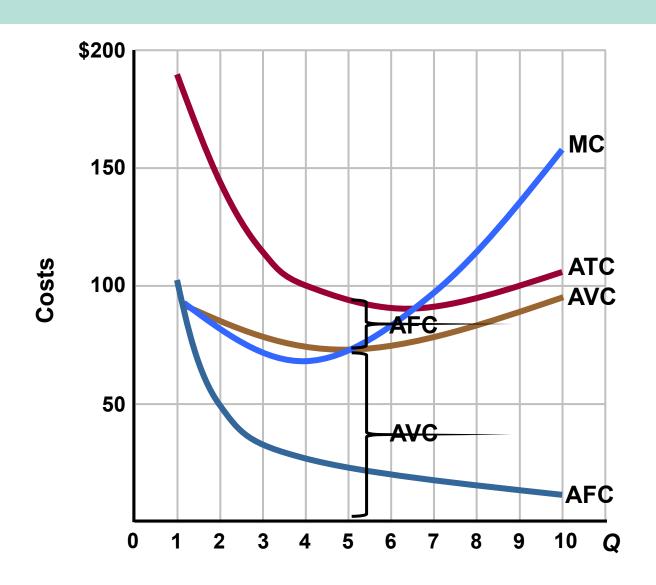
Per-Unit Production Costs

- Average fixed cost
 AFC = TFC/Q
- Average variable cost
 AVC = TVC/Q
- Average total cost
 ATC = TC/Q = TFC/Q + TVC/Q
 = AFC+AVC
- Marginal cost
 MC = change in TC/change in Q

Short-Run Production Costs



Short-Run Production Costs

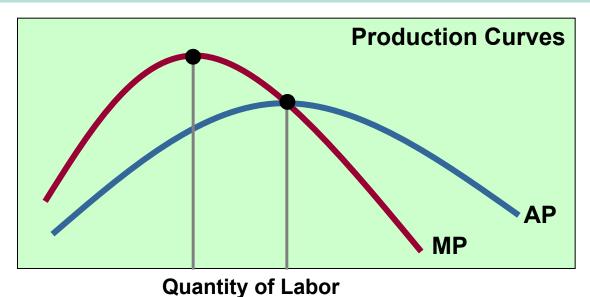




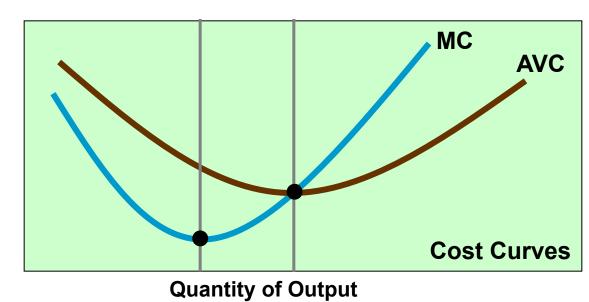
- Marginal cost and diminishing returns
- Marginal cost and marginal product
- Marginal cost and average variable cost
- Marginal cost and average total cost
- Production curves and cost curves
- Shifts in cost curves

Graphical Relationships





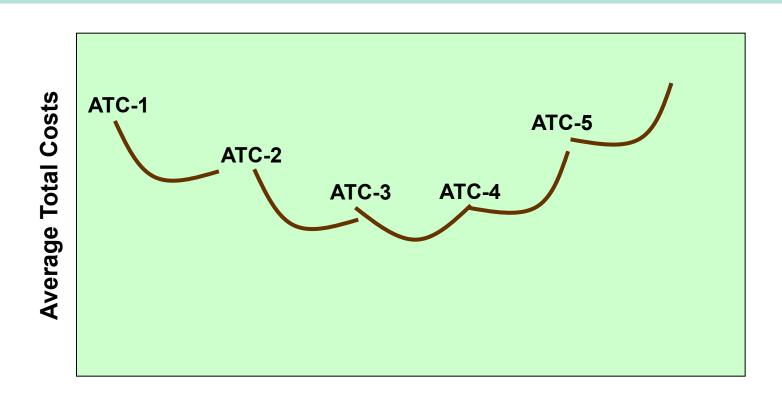
Cost (Dollars)



Long-Run Production Costs

- Choose your plant size
- Minimize ATC
- Different ATC curves
 - -Short run
- Long run ATC
 - Envelope of short run ATC

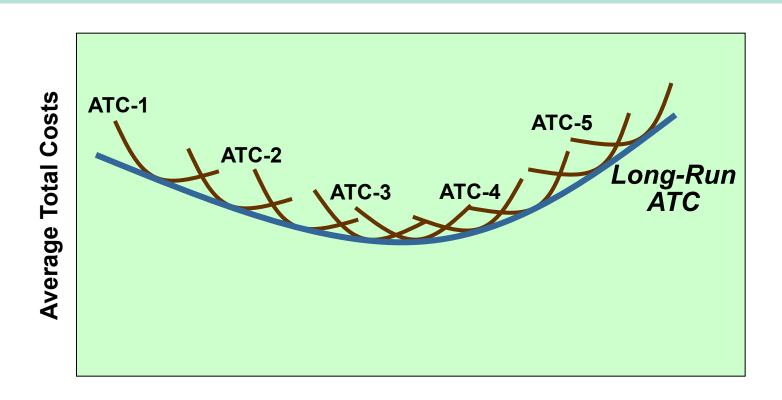
Long-Run ATC Curve



Output

Any number of short-run optimum size cost curves can be constructed

Long-Run ATC Curve



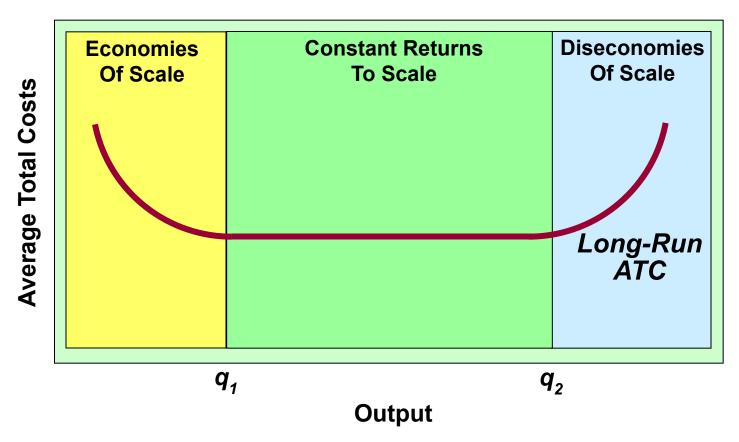
Output

The long-run ATC curve just "envelopes" the short run ATCs

Long Run Production Cost

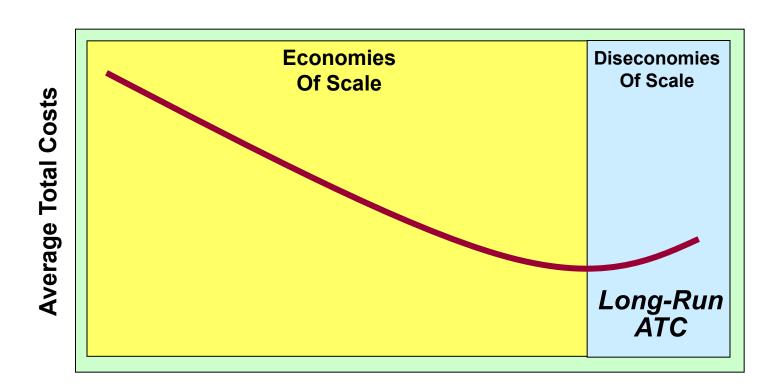
- Economies of Scale
 - Labor specialization
 - Managerial specialization
 - Efficient capital
- Diseconomies of Scale
- Constant Returns to Scale

Long-Run ATC Shapes



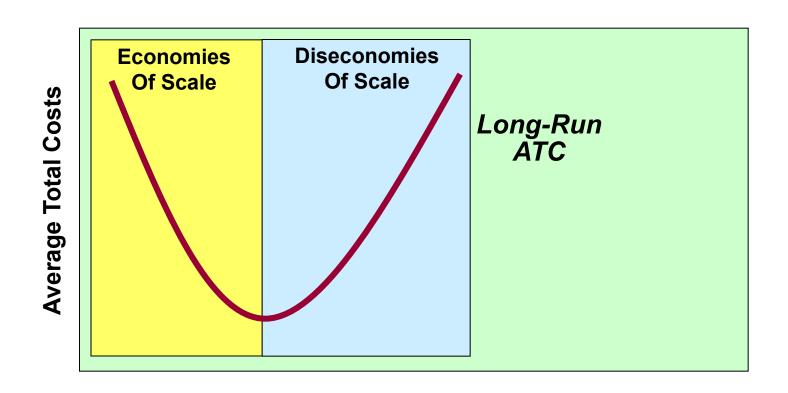
Long-run ATC curve where economies of scale exist

Long-Run ATC Shapes



Long-run ATC curve where costs are lowest only when large numbers are participating

Long-Run ATC Shapes



Long-run ATC curve where economies of scale exist, are exhausted quickly, and turn back up substantially

Industry Structure

- Minimum efficient scale (MES)
- Natural monopoly
- Applications and illustrations
 - -Price of corn
 - -Successful start-up firms
 - -The Verson stamping machine
 - -The daily newspaper
 - Aircraft and concrete plants

Sunk Costs

- Irrelevant in decision making
- Cannot be recovered
- Do not affect marginal benefit and marginal cost
- Firm example:
 - -R&D costs

Key Terms

- economic (opportunity) cost
- explicit costs
- implicit costs
- normal profit
- economic profit
- short run
- long run
- total product (TP)
- marginal product (MP)
- average product (AP)
- law of diminishing returns natural monopoly
- fixed costs

- variable costs
- total cost
- average fixed cost (AFC)
- average variable cost (AVC)
- average total cost (ATC)
- marginal cost (MC)
- · economies of scale
- diseconomies of scale
- constant returns to scale
- minimum efficient scale (MES)

Next Chapter Preview...

Pure Competition