Chapter 13: The Costs of Production
Principles of Economics, 8th Edition
N. Gregory Mankiw
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1. Introduction
   a. *We are now shifting to the analysis of supply decisions.*
   b. *We are going to this analysis of cost to look at industrial organization, which studies how firms make decisions about prices and quantities based on the market conditions that they face.*

2. What Are Costs?
   a. Total Revenue, Total Cost, and Profit
      i. *Costs are important in the calculation of a firm's profits–which we will argue is its ultimate goal.*
         (1) *The goal of "maximizing" profits follows from the assumption that rational people make decisions based on their desire to increase their welfare.*
         (2) *When an organization does not have a profit that flows to its owners, its managers will attempt to "maximize" some other goal such as prestige or peace of mind.*
      ii. Total revenue is the amount a firm receives for the sale of its output. P. 248.
      iii. Total cost is the amount a firm pays to buy the inputs into production. P. 248.
      iv. Profit is total revenue minus total cost. P. 248.
         (1) *You also think about profit as the difference between the value created (people bought it) and the costs incurred.*

3. Costs as Opportunity Costs
   a. The cost of something is what you give up to get it.
      i. An explicit cost is for inputs that require an outlay of money by the firm. P. 249.
      ii. An implicit cost is for inputs costs that do not require an outlay of money by the firm. P. 249.
      iii. Accountants only consider explicit costs, which require an outlay of money by the firm.
      iv. Economists consider both explicit and implicit costs, which do not require an outlay of money by the firm.
      v. Sacrificed income of an entrepreneur is an opportunity cost of their being in business.
   b. The Cost Of Capital As An Opportunity Cost
      i. An important implicit cost of almost every business is the opportunity cost of the financial capital that has been invested in the business.
      ii. *Other critical implicit costs are entrepreneur's time and assets that have already been paid off.*
   c. Economic Profit Versus Accounting Profit

i. To an economist, economic profit is revenue minus opportunity cost. P. 250.
ii. To an accountant, accounting profit is revenue minus explicit costs. P. 250.
iii. **Figure 1: Economists versus Accountants. P. 250.**

4. Production and Costs
   a. Caroline's factory is fixed, while her labor force is variable.
      i. This is reasonable in the short run, but not the long run.
   b. The production function is the relationship between quantity of inputs used to make a good and the quantity of output of that good. P. 252.
      i. Marginal product is the increase in output that arises from an additional unit of input. P. 252.
      ii. Diminishing marginal product is the property whereby the marginal product of an input *(eventually)* declines as the quantity of the input increases. P. 253.
         (1) **Table 1: A Production Function and Total Cost: Caroline's Cookie Factory. P. 251.**
         (2) **Figure 2: Caroline's Production Function and Total Cost Curve. P. 251.**
   c. From the Production Function to the Total Cost Curve
      i. When a firm is becoming more productive, its costs are decreasing and visa versa.

5. The Various Measures of Cost
   a. **Table 2: The Various Measures of Cost: Conrad's Coffee Shop, P. 254.**
   b. **Figure 3: Conrad's Total Cost Curve. P. 255.**
   c. Fixed and Variable
      i. Fixed costs are costs that do not vary with the quantity of output produced. P. 255.
         (1) Conceptually, the important thing about fixed costs is that they often are unavoidable.
         (2) Think about rent owed to the Mafia.
      ii. Variable costs are costs that do vary with the quantity of output produced. P. 255.
         (1) Conceptually, the important thing about variable costs is that they often are avoidable.
   d. Average and Marginal Cost
      i. Average total cost is total cost divided by the quantity of output. P. 256.
      ii. Average fixed cost is fixed costs divided by the quantity of output. P. 256.

iii. Average variable cost is variable costs divided by the quantity of output. P. 256.
iv. Marginal cost is the increase in total cost that arises from an extra unit of production. P. 256.

e. Cost Curves and Their Shapes:
i. Three Important Features:
(1) Marginal cost eventually rises with the quantity of output.
(a) *In Figure 5, we see that MC can initially decline.*
(b) **Figure 4: Conrad's Average Cost and Marginal Cost Curves. P. 257.**
(2) The average total cost curve is U-shaped.
(a) Efficient scale is the quantity of output that minimizes average total cost. P. 258.
(3) The MC curve crosses the ATC curve at the minimum of ATC.
(a) Whenever MC < ATC, ATC is falling.
(b) Whenever MC > ATC, ATC is rising.

f. Typical Cost Curves
(1) **Figure 5: Cost Curves for a Typical Firm. P. 259.**
(a) ***This is the cost curve upon which to focus your attention.***
(b) This is a summary of the critical cost curves.

6. Costs in the Short Run and in the Long Run *(Now versus Infinity*)
a. The Relationship between Short-Run and Long-Run Average Total Cost
i. In the long run there are no fixed costs.
ii. The long run curves contain all the short run possibilities.
iii. **Figure 6: Average Total Cost in the Short and Long Runs. P. 260.**
b. Economies and Diseconomies of Scale
i. Economies of scale are the property whereby long run average total cost falls as the quantity of output increases. P. 261.
(1) *Economists have some good reasons for this based on specialization and more efficient use of fixed costs.*
ii. Diseconomies of scale are the property whereby long run average total cost rises as the quantity of output increases. P. 261.
(1) *Economists do a poorer job of explaining why getting too big is increased per unit costs.*
(2) The most common explanation is due to human limitations in large organizations.
(3) *There are other marketing and logistical costs associated with attracting more customers.*
iii. Constant returns to scale is the property whereby long run average total cost stays the same as the quantity of output changes. P. 261.

iv. C*ompanies often accomplish this with building additional plants when existing plants experience diseconomies of scale.*

c. **FYI: Lessons from a Pin Factory, P. 261.**
   i. Adam Smith recognized the gains from specialization.
d. **Table 3: The Many Types of Cost: A Summary, P. 262.**

7. Conclusion

8. Summary