CHAPTER OBJECTIVES

- To explain the basic process of balancing costs and benefits in economic decision making.
- To introduce marginal analysis, and to define marginal benefit and marginal cost and explain their relationship to total benefit and total cost.
- To explain how individuals measure the costs and benefits of actions, and to introduce the Law of Diminishing Marginal Utility.
- To explain the measurement of business costs, revenues, and profit, and to differentiate between normal and economic profit.
- To identify the rules for maximizing satisfaction by individuals and maximizing profit by businesses.
- To introduce the concepts of externalities and social costs and benefits.
- To examine how individual costs and benefits form the basis of collective, or public, choices.

KEY TERMS AND CONCEPTS

<table>
<thead>
<tr>
<th>Cost-benefit analysis</th>
<th>Total revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility</td>
<td>Marginal revenue</td>
</tr>
<tr>
<td>Opportunity cost</td>
<td>Profit or loss</td>
</tr>
<tr>
<td>Marginal benefit (marginal utility)</td>
<td>Profit maximizing rules</td>
</tr>
<tr>
<td>Total benefit (total utility)</td>
<td>Externality</td>
</tr>
<tr>
<td>Law of Diminishing Marginal Utility</td>
<td>Positive externality</td>
</tr>
<tr>
<td>Total cost</td>
<td>Negative externality</td>
</tr>
<tr>
<td>Marginal cost</td>
<td>Social benefits and costs</td>
</tr>
<tr>
<td>Net benefit</td>
<td>Public choice</td>
</tr>
<tr>
<td>Net benefit maximizing rules</td>
<td>Rational ignorance</td>
</tr>
<tr>
<td>Explicit costs</td>
<td>Special interest group</td>
</tr>
<tr>
<td>Implicit costs</td>
<td>Normal profit</td>
</tr>
<tr>
<td>Economic cost of production</td>
<td>Excess profit (economic profit)</td>
</tr>
</tbody>
</table>
STUDY ORGANIZER

1. Recognize how an individual's benefits and costs of an action can be measured in terms of utility.
2. Be able to calculate marginal cost and marginal benefit or revenue, total cost and total benefit or revenue, and net benefit or profit.
3. Understand the relationship between marginal and total costs, and between marginal and total benefits or revenues.
5. Know the two net benefit maximization rules and understand the relationship between the two rules.
6. Determine the net benefit maximizing level of activity when total benefit and total cost, and when marginal benefit and marginal cost, are given tabularly and graphically.
7. Differentiate between a business' explicit and implicit costs, and between normal profit and excess profit.
8. Identify the two profit maximization rules.
9. Given total cost and total revenue, tabularly and graphically determine the profit maximizing level of output.
10. Given marginal cost and marginal revenue, tabularly and graphically determine the profit-maximizing level of output.
11. Explain the effect on net benefit or profit when marginal benefit or revenue is greater than, equal to, and less than marginal cost.
12. Distinguish between positive and negative externalities and give examples of each.
13. Explain the difference between private costs and benefits and social costs and benefits.
14. Understand how the net benefit maximizing level of an activity for society is affected by external costs and external benefits.
15. Know the basic idea behind public choice and explain the effects of rational ignorance and special interest groups on collective decision making.
CHAPTER REVIEW

1. All rational decision making involves a balancing of the _______ and _______ of the decision.

2. When an individual makes a purchase or takes an action, he or she receives satisfaction, or _______. The cost of a purchase or an action can be measured by the value of the alternative forgone to make the purchase or take the action, or by its _______ cost.

   a. The satisfaction from consuming a particular number of units of a good, service, or activity is _______ benefit or utility. The change in total satisfaction from consuming an additional unit of a good, service, or activity is _______ benefit or utility.

   b. If the total utility from consuming five units of an item is 300 points, the total utility from consuming six units is 320 points, and the total utility from consuming seven units is 330 points, then the marginal utility of the sixth unit consumed is _______ points and the marginal utility of the seventh unit consumed is _______ points.

   c. The Law of Diminishing Marginal Utility states that, as additional units of a good, service, or activity are consumed, a point is eventually reached where each additional unit consumed adds _______ to total utility, or has a _______ marginal utility, than the unit consumed just before it.

   d. The cost of consuming a specified number of units of a good, service, or activity is _______ cost. The change in total cost from consuming one more unit of a good, service, or activity is _______ cost.
e. If the marginal cost of the first unit of an activity is 10 utility points, the marginal cost of the second unit is 30 utility points, the marginal cost of the third unit is 60 utility points, and the total cost of no units of the activity is zero, then the total cost of the first unit of the activity is _______ utility points, the total cost of two units of the activity is _______ utility points, and the total cost of three units is _______ utility points.

3. The objective of making a purchase or taking an action is to maximize _______ ________, which is total benefit minus total ________.

a. There are two net benefit maximization rules. Net benefit is maximized where total ________ exceeds total ________ by the greatest amount. Net benefit is also maximized where marginal benefit ________ marginal cost.

b. When marginal benefit is greater than marginal cost, net benefit ________; when marginal benefit is less than marginal cost, net benefit ________.

c. Graphically, net benefit is positive as long as the total ________ curve is above the total ________ curve. Also, the vertical distance by which the total benefit curve exceeds the total cost curve is greatest at the point where the marginal benefit curve ________ the marginal cost curve.

4. To maximize its profit, a business evaluates the ________ from the sale of its product and the ________ of producing and selling the product at various levels of output.

a. The dollar payments made by a business to outsiders who provide land, labor, and capital are ________ costs. The opportunity costs to a business owner from using his or her own resources in the business rather than in some other way are ________ costs, which must be recovered by the owner(s) for the business to _________. The return necessary to cover these implicit costs is called ________ profit.
**Chapter 11: Benefits, Costs, and Maximization**

<table>
<thead>
<tr>
<th>explicit; implicit; normal</th>
<th>b. In economics, the total cost of operating a business is equal to both __________ and __________ costs, or includes ________ profit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>excess</td>
<td>c. Profit greater than normal profit is called __________, or __________, profit. If total profit earned is $50,000 and normal profit is $30,000, economic profit is ________.</td>
</tr>
<tr>
<td>economic; $20,000</td>
<td></td>
</tr>
<tr>
<td>5. The total amount received from selling a particular number of units of a firm's product is total _________. The change in total revenue when one more unit of a firm's product is demanded is __________ _________. Total revenue equals ________ times the quantity demanded.</td>
<td></td>
</tr>
<tr>
<td>revenue; price</td>
<td>a. If the total revenue from selling four units of a product was $1,000, and the total revenue from five units was $1,150, the marginal revenue from the fifth unit would be _______.</td>
</tr>
<tr>
<td></td>
<td>b. If the total revenue from selling ten units of a product was $2,000, and the marginal revenue from the eleventh unit was $25, the total revenue from eleven units would be _______.</td>
</tr>
<tr>
<td></td>
<td>c. The cost of producing a particular number of units of a product is __________ ________; the change in total cost from producing one more unit of a product is ________ ________.</td>
</tr>
<tr>
<td>total cost; marginal cost</td>
<td></td>
</tr>
<tr>
<td>6. The primary economic objective of a business is to maximize ________, which is equal to total revenue minus total ________.</td>
<td></td>
</tr>
<tr>
<td>profit; cost</td>
<td>a. There are two profit-maximizing rules. A firm will maximize its profit by operating where total revenue __________ total costs by the greatest amount. Profit is also maximized by operating where marginal revenue ________ marginal cost.</td>
</tr>
<tr>
<td>exceeds; equals</td>
<td>b. If marginal revenue is greater than marginal cost, profit __________; if marginal revenue is less than marginal cost, profit ________.</td>
</tr>
</tbody>
</table>
total revenue; total cost
equals (crosses)

c. Graphically, a firm is maximizing its profit by operating where
the __________ curve exceeds the __________ curve by the greatest amount, or where the marginal revenue curve
equals (crosses) the marginal cost curve.

7. The effect of an action on another person or thing that is not a
primary party to the action is called a(n) ___________. As a result
of this effect, the level of activity that maximizes private net benefit
might not maximize ________ net benefit.

a. Air pollution is an example of a __________ externality, which is
a __________ to a nonprimary party to an action. The reduction in
robberies in an area because of a small but active neighborhood
watch group is an example of a __________ externality, which is a
__________ to a nonprimary party to an action.

b. The private benefits from an action plus any positive externalities
from the action equal the __________ benefits of the action. The
private costs of an action plus any negative externalities resulting
from the action equal the __________ costs of the action. The
social benefits minus the social costs of an action equal society's
net benefit

social
net benefit

c. If there are negative externalities associated with an activity, the
amount of the activity that maximizes society's net benefit is
_________ than the amount that maximizes private net benefit. If an
activity creates positive externalities, the amount of the activity that
maximizes society's net benefit is ________ than the amount that
maximizes private net benefit.

d. If the activity given in Figure 11.1 had negative externalities, the
__________ social cost curve would be to the __________ of the
private cost curve, and the best activity level for society would be
__________ than activity level N in the figure. If the activity given in
Figure 11.1 had positive externalities, the __________ social
benefit curve would be to the ________ of the ________ marginal
benefit curve, and the best activity level for society would be
__________ than activity level N in the figure.
### Chapter 11: Benefits, Costs, and Maximization

<table>
<thead>
<tr>
<th>social benefit</th>
<th>social cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>marginal; benefit; marginal; cost</td>
<td></td>
</tr>
</tbody>
</table>

#### e. Society's net benefit from an action is maximized at the activity level where total ________ ________ exceeds total ________ ________ by the greatest amount, or where ________ social ________ equals ________ social ________.

<table>
<thead>
<tr>
<th>group</th>
<th>voting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 8. Many decisions in the U.S. economy are made collectively, or as a ________. Collective decision making occurs mainly at the government level, and individuals participate in these decisions through the ________ mechanism.

<table>
<thead>
<tr>
<th>public choice</th>
<th>maximize; collective</th>
</tr>
</thead>
<tbody>
<tr>
<td>costs; benefits</td>
<td></td>
</tr>
</tbody>
</table>

#### a. The study of the economic motives and attitudes of voters and public officials in making collective decisions is called ________ ________. The basic idea behind public choice is that individuals try to ________ their own well-being when making ________ decisions.

<table>
<thead>
<tr>
<th>cost</th>
<th>benefit; rationally ignorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>special interest</td>
<td></td>
</tr>
</tbody>
</table>

#### b. In making collective decisions, as in making individual decisions, people weigh the ________ and ________ of their choices. For example, some people do not seek information about a candidate or an issue before an election because the perceived ________ of acquiring the information is greater than the perceived ________. These people choose to be ________ ________.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>
**EXERCISES**

Maximizing by an Individual

1. Assume that the costs and benefits given in Table 11.1, which are measured in utility points, apply to a student planning to spend an evening studying. Answer questions a through e below Table 11.1 based on this information.

<table>
<thead>
<tr>
<th># of Hours Studying</th>
<th>Marginal Cost</th>
<th>Total Cost</th>
<th>Marginal Benefit</th>
<th>Total Benefit</th>
<th>Net Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>75</td>
<td>500</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>225</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>300</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>375</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>450</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

a. In Table 11.1, calculate and fill in the total cost and total benefit for each number of hours spent studying.

b. Calculate and fill in the net benefit column.

c. This individual would maximize net benefit by studying for ________ hours. At this maximizing level, the net benefit will be ________ points. Prior to the maximizing level, marginal cost is_______ (greater or less) than marginal benefit, causing net benefit to ________ (rise or fall). Beyond the maximizing level, marginal cost is ________ (greater or less) than marginal benefit, causing net benefit to ________ (rise or fall).

d. Graph total cost and total benefit in Figure 11.2.
According to Figure 11.2, net benefit is maximized where ________________,
or at an activity level of ________ hours.
Maximizing by a Business

1. Assume that the costs and benefits in Table 11.2 apply to the manufacture and sale of an item. Answer questions a through e below based on Table 11.2.

<table>
<thead>
<tr>
<th>Number of Units of Output</th>
<th>Total Cost</th>
<th>Marginal Cost</th>
<th>Price per Unit</th>
<th>Total Revenue</th>
<th>Marginal Revenue</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$50</td>
<td>$</td>
<td>$440</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>1</td>
<td>150</td>
<td>$420</td>
<td>420</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>300</td>
<td>$400</td>
<td>400</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>3</td>
<td>500</td>
<td>$380</td>
<td>380</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>4</td>
<td>750</td>
<td>$360</td>
<td>360</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>5</td>
<td>1050</td>
<td>$340</td>
<td>340</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>6</td>
<td>1400</td>
<td>$320</td>
<td>320</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>7</td>
<td>1800</td>
<td>$300</td>
<td>300</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>8</td>
<td>2250</td>
<td>$280</td>
<td>280</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

a. Calculate and fill in total revenue.
b. Calculate and fill in marginal cost and marginal revenue.
c. Determine profit.
d. This company would maximize its profit by producing and selling ____________ units of output at a price of $__________ each. At this level of sales, it would earn $__________ in total profit.
e. Graph total cost and total revenue in the upper graph of Figure 11.3, marginal cost and marginal marginal revenue are plotted at the midpoints.)
SAMPLE EXAMINATION QUESTIONS

Indicate the best answer to each question.

1. The cost of a purchase or action measured in terms of its forgone alternative is its:
   a. sunk cost.
   b. money cost.
   c. forgone cost.
   d. opportunity cost.

2. Marginal utility and total utility are, respectively:
   a. the satisfaction from the least-liked good consumed, and the satisfaction from all the goods consumed.
   b. the satisfaction one person gets, and the satisfaction all people get from consuming a particular amount of a good.
   c. the satisfaction from consuming one type of good, and the satisfaction from consuming several different types of goods.
   d. the change in total satisfaction from consuming one more unit of a good, and the total satisfaction from consuming a particular amount of a good.

3. The total utility from consuming three units of an item is 300 utility points and the marginal utility of the fourth unit of the item is 150 utility points. The total utility from consuming five units of the item is:
   a. 150 utility points.
   b. 400 utility points.
   c. 450 utility points.
   d. 600 utility points.

4. A person receives 25 marginal utility points from the first piece of pizza she consumes, 40 total utility points from two pieces of pizza, and 10 marginal utility points from the third piece. How many total utility points does she receive from three pieces of pizza?
   a. 15 points.
   b. 25 points.
   c. 50 points.
   d. 75 points.
5. According to the Law of Diminishing Marginal Utility:
   a. marginal utility is increasing when total utility is decreasing.
   b. the second unit of a good consumed adds less to total satisfaction than was added by the first unit consumed.
   c. there is less satisfaction from consuming when there is a wide range of goods to choose from than when there is a narrow range.
   d. beyond some point, the next unit of a good consumed adds less to total satisfaction than was added by the unit consumed just before it.

The following table applies to questions 6 and 7. Total Cost is given in utility points.

<table>
<thead>
<tr>
<th>Quantity of Good X</th>
<th>Total Utility</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>110</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>120</td>
</tr>
<tr>
<td>4</td>
<td>180</td>
<td>190</td>
</tr>
</tbody>
</table>

6. According to the information in this table, diminishing marginal utility:
   a. sets in when the second unit is consumed.
   b. sets in when the third unit is consumed.
   c. sets in when the fourth unit is consumed.
   d. does not set in.

7. To maximize net benefit, this individual should consume:
   a. 1 unit of Good X.
   b. 2 units of Good X.
   c. 3 units of Good X.
   d. 4 units of Good X.

8. Net benefit is equal to:
   a. total benefit.
   b. total benefit minus total cost.
   c. total benefit plus marginal benefit.
   d. marginal benefit minus marginal cost.
Answer questions 9 and 10 on the basis of the following figure.

9. According to this figure, an individual's:
   a. total benefit from this activity increases up to five units and then decreases.
   b. total benefit from this activity exceeds total cost by the greatest amount at five units.
   c. total cost from this activity decreases up to five units and then increases.
   d. all of the above

10. According to this figure, at six units of activity this individual's marginal cost would:
    a. equal marginal benefit from the activity.
    b. be less than marginal benefit from the activity.
    c. be greater than marginal benefit from the activity.
    d. be less or greater than marginal benefit, depending on whether the activity was decreasing or increasing at the time.

11. The amount of profit that must be earned to keep a business in operation is:
    a. normal profit.
    b. economic profit.
    c. considered to be an explicit cost of production by economists.
    d. none of the above

12. Profit is at a maximum where:
    a. total revenue equals total cost.
    b. total revenue is at a maximum.
    c. marginal revenue is at a maximum.
    d. marginal revenue equals marginal cost.
Chapter 11: Benefits, Costs, and Maximization

The following table applies to questions 13 and 14.

<table>
<thead>
<tr>
<th>Units of Output</th>
<th>Marginal Revenue</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$160</td>
<td>$60</td>
</tr>
<tr>
<td>1</td>
<td>120</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. According to this table, to maximize profit this firm should produce and sell:
   a. 1 unit of output.
   b. 2 units of output.
   c. 3 units of output.
   d. 4 units of output.

14. The firm's profit at its profit-maximizing output is:
   a. $40.
   b. $80.
   c. $140.
   d. $280.

Answer questions 15 and 16 on the basis of the following figure.
15. According to this figure, profit is maximized at:
   a. 500 units of output.
   b. 800 units of output.
   c. 1,000 units of output.
   d. zero or 1,000 units of output.

16. According to this figure, at 800 units of output, marginal revenue:
   a. equals marginal cost.
   b. exceeds marginal cost.
   c. is at its maximum level.
   d. is less than marginal cost.

17. Which of the following statements is true?
   a. The social benefit of an action is equal to the private benefit minus any negative externalities.
   b. Society maximizes its net benefit as long as marginal social benefit is greater than marginal social cost.
   c. Society maximizes its net benefit by operating where total social benefit exceeds total social cost by the greatest amount.
   d. all of the above

18. If an activity creates negative externalities:
   a. less of the activity is performed than is in the best interest of society.
   b. the marginal social cost of the activity is less than its private marginal cost.
   c. imposing taxes and other restraints on the activity's producers could be an appropriate policy to induce them to reduce the externalities.
   d. the level of the activity that maximizes society's net benefit is greater than the level that maximizes the net benefit of the individual's performing the activity.

19. Suppose the private marginal cost of an activity exceeds its private marginal benefit at the level of the activity where society's net benefit is maximized. Based on this, society should want the amount of the activity to:
   a. remain at the private-maximizing level.
   b. increase from the private-maximizing level.
   c. decrease from the private-maximizing level.
   d. either decrease or increase from the private-maximizing level, depending on how much private marginal cost exceeds private marginal benefit.
Chapter 11: Benefits, Costs, and Maximization

20. According to public choice theory, individuals, in making collective decisions, try to maximize:
   a. their own well-being.
   b. the well-being of society.
   c. overall voter turnout on major issues.
   d. their own total benefits, regardless of the total costs they will incur.

*Note: Correct answers to the Exercises and the Sample Examination Questions can be found at the end of the Study Guide.*