CHAPTER 2 | Trade-offs, Comparative Advantage, and the Market System

Chapter Summary and Learning Objectives

2.1 Production Possibilities Frontiers and Opportunity Costs (pages 40–46)

Use a production possibilities frontier to analyze opportunity costs and trade-offs. The production possibilities frontier (PPF) is a curve that shows the maximum attainable combinations of two products that may be produced with available resources. The PPF is used to illustrate the trade-offs that arise from scarcity. Points on the frontier are technically efficient. Points inside the frontier are inefficient, and points outside the frontier are unattainable. The opportunity cost of any activity is the highest-valued alternative that must be given up to engage in that activity. Because of increasing marginal opportunity costs, PPFs are usually bowed out rather than straight lines. This illustrates the important economic concept that the more resources that are already devoted to any activity, the smaller the payoff from devoting additional resources to that activity is likely to be. Economic growth is illustrated by shifting a PPF outward.

2.2 Comparative Advantage and Trade (pages 46–51)

Understand comparative advantage and explain how it is the basis for trade. Fundamentally, markets are about trade, which is the act of buying or selling. People trade on the basis of comparative advantage. An individual, a firm, or a country has a comparative advantage in producing a good or service if it can produce the good or service at the lowest opportunity cost. People are usually better off specializing in the activity for which they have a comparative advantage and trading for the other goods and services they need. It is important not to confuse comparative advantage with absolute advantage. An individual, a firm, or a country has an absolute advantage in producing a good or service if it can produce more of that good or service from the same amount of resources. It is possible to have an absolute advantage in producing a good or service without having a comparative advantage.

2.3 The Market System (pages 51–58)

Explain the basic idea of how a market system works. A market is a group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade. Product markets are markets for goods and services, such as computers and medical treatment. Factor markets are markets for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability. A circular-flow diagram shows how participants in product markets and factor markets are linked. Adam Smith argued in his 1776 book The Wealth of Nations that in a free market, where the government does not control the production of goods and services, changes in prices lead firms to produce the goods and services most desired by consumers. If consumers demand more of a good, its price will rise. Firms respond to rising prices by increasing production. If consumers demand less of a good, its price will fall. Firms respond to falling prices by producing less of a good. An entrepreneur is someone who operates a business. In the market system, entrepreneurs are responsible for organizing the production of goods and services. The market system will work well only if there is protection for property rights, which are the rights of individuals and firms to use their property.
Chapter Review

Chapter Opener: Managers Making Choices at BMW (page 39)

The managers at firms such as BMW (Bavarian Motor Works) must make decisions regarding the production and marketing of their products. These decisions include the location of manufacturing plants and the production methods used at these plants. Because BMW is a German firm, there are good reasons to locate factories in Germany. However, locating factories in other countries can reduce manufacturing costs (for example, by paying lower wages). Locating in countries where the automobiles are sold also reduces the risk that foreign governments will impose import restrictions.

Production Possibilities Frontiers and Opportunity Costs (pages 40–46)

Learning Objective: Use a production possibilities frontier to analyze opportunity costs and trade-offs.

Scarcity exists because we have unlimited wants but only limited resources available to fulfill those wants. This scarcity requires that we make decisions about how to use our resources. In other words, we face trade-offs. A production possibilities frontier (PPF) is a curve showing the maximum alternative combinations of two products that may be produced with available resources. A PPF is a graphical representation of the trade-offs and opportunity costs a producer faces. As shown in Figure 2.1, points on a PPF are efficient, while points under the PPF are inefficient. Points beyond the PPF are unattainable with current resources. A PPF will always have a negative slope because increasing production requires shifting resources away from one activity toward the second activity.

The slope of a PPF is used to measure the opportunity cost of increasing the production of one good along the frontier relative to the other good. The slope of a linear frontier and the opportunity cost of moving along the frontier are constant, but convex or “bowed out” production possibilities frontiers represent a more likely outcome. A convex PPF means marginal opportunity costs rise as more and more of one good is produced. For example, starting from point A in Figure 2.2 and moving downward to points B and C, the slope of the frontier becomes steeper and steeper. This means that the cost of producing one more automobile (the number of tanks that must be given up as resources are transferred to automobile production) is greater at each point.

Along a production possibilities frontier, resources and technology are fixed. If there is an increase in the available resources or an improvement in the technology used to produce goods and services, then the PPF will shift outward. The economy will be able to produce more goods and services, which means the economy has experienced economic growth. Economic growth is the ability of the economy to increase the production of goods and services. Growth may lead to greater increases in production of one good than another.
CHAPTER 2  |  Trade-offs, Comparative Advantage, and the Market System  

**Study Hint**

*Solved Problem 2.1* will help you draw a *PPF* and understand how a linear *PPF* illustrates opportunity costs incurred in production. Be sure you understand how slope is measured along the frontier and that the magnitude of this slope represents the opportunity cost of substituting the production of one good for the production of another.

**Making the Connection** “Facing Trade-offs in Health Care Spending” describes the choice households must make regarding how they use their limited incomes. As the price of health care rises, some households choose not to purchase health insurance. As a provider of public insurance in Medicare and Medicaid, the government also must decide where to use resources within those public insurance programs.

### 2.2  Comparative Advantage and Trade (pages 46–51)

**Learning Objective:** Understand comparative advantage and explain how it is the basis for trade.

By specializing in production and engaging in trade, individuals can enjoy a higher standard of living than would be possible if these individuals produced everything they consumed. Specialization in production is so common that most people take for granted that they must trade income earned from their own labor to buy the services of plumbers, carpenters, medical doctors, and stock brokers. Specialization makes trade necessary. *Trade* is the act of buying or selling.

**Absolute advantage** is the ability of an individual, firm, or country to produce more of a good or service than competitors using the same amount of resources. **Comparative advantage** is the ability of an individual, firm, or country to produce a good or service at a lower opportunity cost than other producers. An individual country should specialize in the production of the good or services in which it has a comparative advantage, and then trade this good to other countries for goods in which it does not have a comparative advantage.

**Study Hint**

*Don’t Let This Happen to You* clarifies the differences between absolute and comparative advantage. An individual, firm, or a country has the absolute advantage in the production of a good if that individual, firm, or country can produce more of the good. Comparative advantage in the production of a good goes to the individual, firm, or country that can produce the good at a lower opportunity cost. It is possible for an individual, firm, or country to have absolute advantage in the production of both goods, but the country will have a comparative advantage in the production of only one of the two goods.

*Solved Problem 2.2* describes the benefits realized when a nation specializes in the production of a good for which it has a comparative advantage. In the problem, the United States has a comparative advantage in producing honey, while Canada has a comparative advantage in producing maple syrup. Each country should specialize in producing the good for which it has a comparative advantage and trade some of that good for the other good. With trade, the United States and Canada can consume outside of their *PPFs*.

Most examples of absolute and comparative advantage are similar to the hypothetical examples in section 2.2 of the textbook. This is due, in part, to the difficulty of identifying people who have an absolute advantage in two different areas. But the career of Babe Ruth offers a good example of someone with an absolute advantage in two activities who was still ultimately better off specializing in the activity in which he had a comparative advantage. Before he achieved his greatest fame as a home run hitter and outfielder with the New York Yankees, Ruth was a star pitcher with the Boston Red Sox. Ruth may have been the best left-handed pitcher in the American League during his years with Boston (1914–1919), but he was used more and more as a fielder in his last two years with the team. In fact, he established a record
for home runs in a season (29) in 1919 when he was still pitching. The Yankees acquired Ruth in 1920 and made him a full-time outfielder. The opportunity cost of this decision for the Yankees was the wins Ruth could have earned as a pitcher. But because New York already had skilled pitchers, the opportunity cost of replacing Ruth as a pitcher was lower than the cost of replacing him as a hitter. No one else on the Yankees could have hit 54 home runs, Ruth’s total in 1920; the next highest Yankee total was 11. It can be argued that Ruth had an absolute advantage as both a hitter and pitcher in 1920 but a comparative advantage only as a hitter.

2.3 The Market System (pages 51–58)
Learning Objective: Explain the basic idea of how a market system works.

A market is a group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade. Product markets are markets for goods, such as computers, and services, such as medical treatment. Factor markets are markets for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability. A circular-flow diagram is a model that illustrates how participants in markets are linked. The diagram demonstrates the interaction between firms and households in both product and factor markets. Households buy goods and services in the product market and provide resources for sale in the factor market, while firms provide goods and services in the product market and buy resources in the factor market. A free market is a market with few government restrictions on how a good or service can be produced or sold, or on how a factor of production can be employed.

Entrepreneurs are an essential part of a market economy. An entrepreneur is someone who operates a business, bringing together the factors of production—labor, capital, and natural resources—to produce goods and services. Entrepreneurs often risk their own funds to start businesses and organize factors of production to produce those goods and services consumers want.

The role of government in a market system is limited but essential. Although government in a market economy imposes few restrictions on the choices made by consumers, resource owners, and firms, government protection of private property rights is necessary for markets to operate efficiently.

Property rights are the rights individuals or firms have to the exclusive use of their physical and intellectual property, including the right to buy or sell it. New technology has created challenges to the protection of property rights. Unauthorized copying of music and other intellectual property in cyberspace reduces the rewards of creativity and may reduce the amount of such activity in the future.

Study Hint
Consumers seldom know the identity of the people who produce the products they buy. The impersonal and decentralized character of markets is illustrated very well by the discussion of the production of Apple’s iPad found in Making the Connection “A Story of the Market System in Action: How Do You Make an iPad?” The iPad contains many components. Many of the manufacturers of the components of the iPad do not know what the final product will be. No one person at Apple knows how to produce all of these components, so Apple relies heavily on its suppliers.

The role of government in a free market economy can be compared to that of an umpire or referee in a sporting event. The most vocal critics of these officials would argue they are needed. It would not take long for a professional football or baseball game to turn into a shouting match (or worse!) if players were allowed to enforce the rules of their own games. However, the quality of sporting events suffers when officials bar players, coaches, or managers from participating in contests for frivolous reasons.
The stories of successful businesses such as Microsoft and Google can give a misleading impression about the risks of business ownership. Many businesses fail. The National Restaurant Association estimates an 80 percent failure rate for independently owned restaurants within their first two years of operation. The average work week for many small business owners is much longer than that of the average employee—80 hours is not uncommon—and owners often borrow heavily to start and maintain their businesses.

Extra Solved Problem 2.3

Adam Smith’s “Invisible Hand”

Supports Learning Objective 2.3: Explain the basic idea of how a market system works.

Alan Krueger, an economist at Princeton University, has argued that Adam Smith “. . . worried that if merchants and manufacturers pursued their self-interest by seeking government regulation and privilege, the invisible hand would not work its magic . . . .”


a. What types of regulation and privilege might merchants and manufacturers seek from the government?

b. How might these regulations and privileges keep the invisible hand from working?

Solving the Problem

Step 1: Review the chapter material.
This problem concerns how goods and services are produced and sold and how factors of production are employed in a free market economic system as described by Adam Smith in An Inquiry into the Nature and Causes of the Wealth of Nations. You may want to review the section “The Gains from Free Markets,” which begins on page 52.

Step 2: Answer question (a) by noting the economic system in place in Europe in 1776.
At the time, governments gave guilds—associations of producers—the authority to control production. The production controls limited the amount of output of goods such as shoes and clothing, as well as the number of producers of these items. Limiting production and competition led to higher prices and fewer choices for consumers. Instead of catering to the wants of consumers, producers sought the favor of government officials.

Step 3: Answer question (b) by contrasting the behavior of merchants and manufacturers under a guild system and a market system.
Because governments gave producers the power to control production, producers did not have to respond to consumers’ demands for better quality, variety, and lower prices. Under a market system, producers who sell poor quality goods at high prices suffer economic losses; producers who provide better quality goods at low prices are rewarded with profits. Therefore, it is in the self-interest of producers to address consumer wants. This is how the invisible hand works in a free market economy, but not in Europe in the eighteenth century.
**Key Terms**

**Absolute advantage** The ability of an individual, a firm, or a country to produce more of a good or service than competitors, using the same amount of resources.

**Circular-flow diagram** A model that illustrates how participants in markets are linked.

**Comparative advantage** The ability of an individual, a firm, or a country to produce a good or service at a lower opportunity cost than competitors.

**Economic growth** The ability of the economy to increase the production of goods and services.

**Entrepreneur** Someone who operates a business, bringing together the factors of production—labor, capital, and natural resources—to produce goods and services.

**Factor markets** A market for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability.

**Factors of production** The inputs used to make goods and services.

**Free market** A market with few government restrictions on how a good or service can be produced or sold or on how a factor of production can be employed.

**Market** A group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade.

**Opportunity cost** The highest-valued alternative that must be given up to engage in an activity.

**Product markets** A market for goods—such as computers—and services—such as medical treatment.

**Production possibilities frontier (PPF)** A curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology.

**Property rights** The rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it.

**Scarcity** A situation in which unlimited wants exceed the limited resources available to fulfill those wants.

**Trade** The act of buying and selling.
Self-Test

(Answers are provided at the end of the Self-Test.)

Multiple-Choice Questions

1. What is the name given to the highest-valued alternative that must be given up to engage in any activity?
   a. scarcity
   b. the production possibilities frontier
   c. opportunity cost
   d. a trade-off

2. What happens if a country produces a combination of goods that uses all of the resources available in the economy?
   a. The country is operating on its production possibilities frontier.
   b. The country is maximizing its opportunity cost.
   c. The country has eliminated scarcity.
   d. All of the above occur if a country uses all available resources.

3. Refer to the graph below. Which of the following combinations is unattainable with the current resources available in this economy?

   a. combination G
   b. combination F
   c. combinations A or E
   d. None of the combinations above can be attained with current resources.
4. Refer to the graph below. Which of the following combinations is inefficient?

![Graph of Quantity of Hybrids vs. Quantity of SUVs](image)

a. combination G  
b. combination F  
c. combinations A or E  
d. both F and G

5. Refer to the graph below. Which of the following best represents the situation in which BMW must face a trade-off between producing SUVs and producing hybrids?

![Graph of Quantity of Hybrids vs. Quantity of SUVs](image)

a. any point on the graph represents that trade-off  
b. moving from B to C  
c. moving from F to B  
d. moving from C to G
6. Refer to the graph below. How many hybrids are produced at the point where BMW produces 800 SUVs?

   a. 0
   b. any amount up to 800
   c. exactly 800
   d. 400

7. Refer to the graph below. What is the opportunity cost of moving from point B to point C?

   a. 200 SUVs
   b. 400 SUVs
   c. 200 hybrids
   d. 400 hybrids
8. Refer to the graph below. The graph shows the data from Solved Problem 2.1. What is the opportunity cost of switching from Choice D to Choice E?

![Graph showing the data from Solved Problem 2.1.]

a. two pies  
b. eight pies  
c. two cakes  
d. one cake

9. Refer to the graph below. The graph is a representation of the data in Solved Problem 2.1. In this problem, what is the opportunity cost of producing five cakes?

![Graph showing the data in Solved Problem 2.1.]

a. zero cakes  
b. zero pies  
c. ten pies  
d. There is insufficient information to answer the question.
10. Refer to the graph below. Which of the following combinations of pies and cakes is unattainable given existing resources?

a. two cakes and six pies
b. one cake and seven pies
c. zero cakes and ten pies
d. four cakes and seven pies

11. Refer to the graph below. As you move from point A to point B and then to point C on this graph, what happens to the marginal opportunity cost?

a. It increases.
b. It decreases.
c. It remains constant.
d. It equals zero.
12. Refer to the graph below. What is the opportunity cost of producing 400 aircraft carriers?

a. 200 automobiles  
b. 50 aircraft carriers  
c. 200 automobiles  
d. 600 automobiles

13. Refer to the graph below. What is the opportunity cost of moving from point B to point C?

a. 200 automobiles  
b. 400 automobiles  
c. 50 aircraft carriers  
d. 150 aircraft carriers
14. Refer to the graph below. What does the term “increasing marginal opportunity cost” mean in this graph?

![Graph showing production possibility frontier with points A, B, and C]

a. There is a higher opportunity cost of producing either aircraft carriers or automobiles, so long as the quantity produced of that good is decreasing.
b. There is a higher opportunity cost of producing either aircraft carriers or automobiles, so long as the quantity produced of that good is increasing.
c. Increasing the production of aircraft carriers results in higher automobile production costs, such as the costs of labor and capital to build automobiles.
d. Increasing the production of either aircraft carriers or automobiles creates more opportunities in the economy.

15. If the opportunity cost of producing one good is the same regardless of the quantity that the good is produced, then
   a. the production possibility frontier is linear.
   b. the production possibility frontier is bowed out.
   c. the production possibility frontier does not exist.
   d. the production possibility frontier has a positive slope.

16. The principle of increasing marginal opportunity cost states that the more resources devoted to any activity, the ________ the payoff to devoting additional resources to that activity.
   a. smaller
   b. greater
   c. proportional
   d. more instant
17. Refer to the graphs below. Which graph better represents an improvement only in the technology used to make automobiles?

a. the graph on the left
b. the graph on the right
c. both graphs
d. neither graph

18. Refer to the graphs below. Which graph represents the concept of economic growth?

a. the graph on the left
b. the graph on the right
c. both graphs
d. neither graph
19. Refer to the graphs below. Which graph best represents the concept of economic growth?

- A. the graph on the left
- B. the graph on the right
- C. both graphs
- D. neither graph

20. Refer to the graphs below. Which of the following could have caused the outward shift of the curve in the graph on the left side?

- A. an increase in technology that affects the production of both aircraft carriers and automobiles
- B. technological change that affects only the aircraft carrier industry
- C. unemployment in the economy
- D. a change in the cost of producing automobiles

21. Which of the following would create economic growth, that is, shift the production possibilities frontier outward?

- A. an increase in the available labor
- B. an increase in technology that affects the production of both goods
- C. an increase in the available natural resources
- D. all of the above
22. Which of the following statements is most consistent with the principle about the basis for international trade?
   a. The United States would be better off being self-sufficient because it has an absolute advantage in producing most goods.
   b. The United States would be better off if it specialized in the production of some goods, and then traded some of them to other countries.
   c. The United States would be better off by producing at home the goods that it now imports—that way the nation can generate additional jobs here at home.
   d. The United States can never have an absolute advantage in producing every good it consumes, so it would be better off if it imported goods that it does not have an absolute advantage.

23. Absolute advantage is the ability of an individual, firm, or country to
   a. produce more of a good or service than competitors using the same amount of resources.
   b. produce a good or service at a lower opportunity cost than other producers.
   c. consume more goods or services than others at lower costs.
   d. reach a higher production possibilities frontier by lowering opportunity costs.

24. If a country has a comparative advantage in the production of a good, then that country
   a. also has an absolute advantage in producing that good.
   b. should allow another country to specialize in the production of that good.
   c. has a lower opportunity cost in the production of that good.
   d. All of the above are true.

25. Refer to the graphs below. Each graph represents one country. Which country has a comparative advantage in the production of shirts?
   a. Country A
   b. Country B
   c. neither country
   d. both countries
26. Refer to the graphs below. Each graph represents one country. Which country should specialize in the production of computer chips?

![Diagram of graphs for Country A and Country B](image)

a. Country A  
b. Country B  
c. Neither country; they both should produce some computer chips and some shirts.  
d. Both countries should specialize in the production of computer chips.

27. The table below shows the quantity of two goods that a worker in Country A and a worker in Country B can produce per day. Which country has an absolute advantage in the production of each good?

<table>
<thead>
<tr>
<th>Output per day of work</th>
<th>Food</th>
<th>Clothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country A</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Country B</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

a. Country A has an absolute advantage in the production of each good.  
b. Country B has an absolute advantage in the production of each good.  
c. Both countries have an absolute advantage in the production of each good.  
d. Neither country has an absolute advantage in the production of each good.
28. Consider the table below. Which country has a comparative advantage in the production of each good?

<table>
<thead>
<tr>
<th></th>
<th>Output per day of work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food</td>
</tr>
<tr>
<td>Country A</td>
<td>6</td>
</tr>
<tr>
<td>Country B</td>
<td>1</td>
</tr>
</tbody>
</table>

a. Country A has a comparative advantage in the production of both goods.
b. Country B has a comparative advantage in the production of both goods.
c. Country A has a comparative advantage in the production of food; Country B has a comparative advantage in the production of clothing.
d. Country B has a comparative advantage in the production of food; Country A has a comparative advantage in the production of clothing.

29. Consider the table below. What is country A’s opportunity cost of producing 1 unit of clothing?

<table>
<thead>
<tr>
<th></th>
<th>Output per day of work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food</td>
</tr>
<tr>
<td>Country A</td>
<td>6</td>
</tr>
<tr>
<td>Country B</td>
<td>1</td>
</tr>
</tbody>
</table>

a. 2 units of food
b. 1/2 a unit of food
c. 6 units of food
d. 2 units of clothing

30. Refer to the graphs below. If you have a comparative advantage in the production of apples, what point would best represent your production with trade?

a. A
b. A'
c. C
d. D
31. Refer to the graphs below. What is point B’ on your neighbor’s PPF curve?

![PPF Curve Graphs]

a. Point B’ is your neighbor’s production before trade.
b. Point B’ is your neighbor’s consumption before trade.
c. Point B’ is your neighbor’s production after trade.
d. Point B’ is your neighbor’s consumption after trade.

32. Which of the following refers to markets where goods such as computers or services such as medical treatment are offered?

a. product markets  
b. essential markets  
c. factor markets  
d. competitive markets

33. In which markets are factors of production, such as labor, capital, natural resources, and entrepreneurial ability traded?

a. product markets  
b. essential markets  
c. factor markets  
d. competitive markets

34. Which of the following comprises the two key groups of participants in the circular flow of income?

a. domestic residents and foreign residents  
b. government and financial institutions  
c. households and firms  
d. savers and borrowers

35. Fill in the blanks. In a simple circular-flow model, there are flows of _________ and flows of _________.

a. factors of production; goods and services  
b. funds received from the sale of factors of production; spending on final goods and services  
c. Both (a) and (b) are correct.  
d. None of the above. Actually, there are no flows in the circular flow of income.
36. In the circular-flow diagram above, which arrow shows the flow of goods and services?
   a. A  
   b. B  
   c. C  
   d. D

37. In the circular-flow diagram above, which arrow shows the flow of spending by households?
   a. A  
   b. B  
   c. C  
   d. D

38. In the circular-flow diagram above, which arrow shows the flow of factors of production?
   a. A  
   b. B  
   c. C  
   d. D

39. In the circular-flow diagram above, which two arrows show the flow of funds?
   a. A and B  
   b. B and C  
   c. B and D  
   d. A and D
40. According to Adam Smith, which of the following is true?
   a. Markets work because producers, aided by government, ensure that neither too many nor too few goods are produced.
   b. Market prices can come to reflect the prices desired by all consumers.
   c. Individuals usually act in a rational, self-interested way.
   d. A guild system is the best way for coordinating the activities of buyers and sellers.

41. According to Adam Smith, which of the following is the instrument the invisible hand uses to direct economic activity?
   a. price
   b. government regulation
   c. financial markets
   d. cost

42. According to Adam Smith, which of the following is necessary for the proper functioning of the market system?
   a. For markets to work, people should take into account how their decisions affect society as a whole.
   b. For markets to work, government should help citizens make the right decisions.
   c. For markets to work, people must be free to pursue their self-interest.
   d. For markets to work, people and government need to coordinate their decisions.

43. What is the role of an entrepreneur?
   a. to operate a business that produces a good or service
   b. to bring together the factors of production—labor, capital, and natural resources
   c. to take risks
   d. all of the above

44. In a free market system, which of the following groups brings together the factors of production—labor, capital, and natural resources—in order to produce goods and services?
   a. the government
   b. entrepreneurs
   c. lobbyists
   d. politicians

45. Which of the following is critical to the success of a market system?
   a. to allow individuals or firms to have exclusive use of their property
   b. to prevent individuals from buying or selling their property depending on the circumstances
   c. Both a. and b. are critical to the success of a market system.
   d. to allow the government to determine the optimal use of private property

46. Generally speaking, for a market system to work, individuals must
   a. be very cautious in their approach to saving and investment.
   b. take risks and act in rational, self-interested ways.
   c. be able to evaluate and understand all available options.
   d. consult people who have experience.
47. What are copyrights designed to do?
   a. prevent entrepreneurs from earning excessive profits
   b. eliminate unnecessary duplication whenever it arises
   c. protect intellectual property rights
   d. all of the above

48. What is the outcome of enforcing contracts and property rights in a market system?
   a. increased economic activity
   b. decreased economic activity
   c. no effect on economic activity
   d. an unpredictable but definite effect on economic activity

49. In the United States, property rights
   a. are guaranteed by two amendments to the U.S. Constitution.
   b. are guaranteed by some state governments but not other state governments.
   c. are prohibited by the federal government.
   d. exist in markets but are not enforced by the government.

50. If a market system functions well, which of the following is necessary for the enforcement of contracts and property rights?
   a. powerful political connections
   b. an independent court system
   c. action by government to prevent the exercise of certain property rights
   d. all of the above

Short Answer Questions

1. Does the story about Apple’s production of the iPad on page 55 in the textbook imply that people must cooperate with one another in order for specialization in production and trade to occur? Explain.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
2. Comment briefly on the following statement: “The circular-flow diagram implies that households’ spending on goods and services in product markets equals the income they earn from providing factors of production in factor markets.”

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

3. Could a production possibilities frontier ever slope upward?

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

4. Provide an example showing that absolute advantage in an activity does not necessarily imply comparative advantage in an activity.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

5. In the explanation of Adam Smith’s argument in favor of replacing the guild system with a market system, the textbook states that “a key to understanding Smith’s argument is the assumption that individuals usually act in a rational, self-interested way.” Did Smith believe that the success of a market system requires that people act selfishly?

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

True/False Questions

T F 1. In his book *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith argued that a guild system was the most efficient way for a nation to coordinate the decisions of buyers and sellers.

T F 2. The story about Apple’s production of the iPad shows how production requires the coordinated activities of many people, spread around the world.

T F 3. A nation with an absolute advantage in the production of two goods will usually have a comparative advantage in only one of the goods.

T F 4. A production possibilities frontier that is bowed outward illustrates increasing marginal opportunity costs.

T F 5. Technological advances always increase the production of all goods and services equally.
CHAPTER 2 | Trade-offs, Comparative Advantage, and the Market System

T F 6. It is possible to have an absolute advantage in producing a good without having a comparative advantage.

T F 7. Households are suppliers of the factors of production that are used by firms to produce goods and services.

T F 8. The circular-flow diagram is used to explain why the opportunity cost of increasing the production of one good is the decrease in production of another good.

T F 9. If property rights are not enforced by the government, then more goods and services will be produced in free markets.

T F 10. Opportunity cost refers to the all of the alternatives that must be given up to engage in an activity.

T F 11. An individual who has comparative advantage in producing a good must also have absolute advantage in producing that good.

T F 12. The Congressional Budget Office has estimated that annual federal government spending on Medicare should remain at a constant level through 2020.

T F 13. Because the governments of the United States, Canada, and Western European countries impose few restrictions on economic activity, the economies of these countries approximate free market economies.

T F 14. The Bavarian Motor Works Company has always produced its automobiles in Germany to supervise production and employ German workers, who have high levels of technical skills.

T F 15. The marginal opportunity cost along a linear (straight-line) production possibilities frontier is constant.

Answers to the Self-Test

Multiple-Choice Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>c</td>
<td>Opportunity cost is the highest-valued alternative that must be given up to engage in an activity. Refer to page 41 in the textbook.</td>
</tr>
<tr>
<td>2.</td>
<td>a</td>
<td>The production possibilities frontier is a curve showing all the attainable combinations of two products that may be produced with available resources.</td>
</tr>
<tr>
<td>3.</td>
<td>a</td>
<td>To produce the combination G, the economy needs more machines, more workers, or more of both. If the economy were to produce 600 hybrids with existing resources, then it could produce, at most, 200 SUVs.</td>
</tr>
<tr>
<td>4.</td>
<td>b</td>
<td>This combination is attainable but inefficient because not all resources are being used.</td>
</tr>
<tr>
<td>5.</td>
<td>b</td>
<td>A move along the curve shows the sacrifice associated with increasing the quantity of SUVs produced, which is the amount by which production of roadsters will have to be reduced.</td>
</tr>
<tr>
<td>6.</td>
<td>a</td>
<td>Point E describes this choice. Point E shows that 800 SUVs are produced when zero hybrids are produced.</td>
</tr>
<tr>
<td>7.</td>
<td>c</td>
<td>As you move from point B to point C, the production of SUVs increases by 200. The opportunity cost of the increased production of SUVs is a decrease in the quantity of hybrids produced.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td>Comment</td>
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<tr>
<td>----------</td>
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</tr>
<tr>
<td>8.</td>
<td>d</td>
<td>As you move from D to E, the production of pies increases by 2 and the production of cakes decreases by 1. Refer to pages 42–43 in the textbook.</td>
</tr>
<tr>
<td>9.</td>
<td>c</td>
<td>Opportunity cost is what you sacrifice. If Rosie produced 0 cakes, then Rosie could make 10 pies.</td>
</tr>
<tr>
<td>10.</td>
<td>d</td>
<td>Four cakes could be produced, but only with fewer than 6 pies. Choice D on the graph shows that a maximum of 2 cakes can be made with 6 pies.</td>
</tr>
<tr>
<td>11.</td>
<td>a</td>
<td>The opportunity cost associated with producing automobiles increases as more are produced. Refer to Figure 2.2 on page 44 in the textbook.</td>
</tr>
<tr>
<td>12.</td>
<td>d</td>
<td>Either the economy produces 400 aircraft carriers or it produces 600 automobiles with the same amount of resources.</td>
</tr>
<tr>
<td>13.</td>
<td>d</td>
<td>The economy now produces 400 automobiles instead of 200. To produce the additional 200 automobiles, the economy must decrease production of aircraft carriers by 150 (an opportunity cost 350 – 200 = 150 aircraft carriers).</td>
</tr>
<tr>
<td>14.</td>
<td>b</td>
<td>As the economy moves along the production possibilities frontier, it experiences increasing marginal opportunity costs because increasing the production of one good by a given amount requires larger and larger decreases in the production of the other good.</td>
</tr>
<tr>
<td>15.</td>
<td>a</td>
<td>If the opportunity cost of producing one good is constant, then the production possibilities frontier is linear and, therefore, it has a constant negative slope.</td>
</tr>
<tr>
<td>16.</td>
<td>a</td>
<td>This is the principle of increasing marginal opportunity cost.</td>
</tr>
<tr>
<td>17.</td>
<td>b</td>
<td>An improvement in the technology used to make automobiles causes a shift of the production possibilities frontier only along the horizontal axis.</td>
</tr>
<tr>
<td>18.</td>
<td>a</td>
<td>This graph shows that something affects both the production of automobiles and the production of aircraft carriers, such as an increase in resources or better technologies.</td>
</tr>
<tr>
<td>19.</td>
<td>c</td>
<td>These graphs show an increase in the production of one or both goods. This increase in the productive capacity of the economy is referred to as economic growth.</td>
</tr>
<tr>
<td>20.</td>
<td>a</td>
<td>Economic growth is the ability of the economy to increase the production of goods and services.</td>
</tr>
<tr>
<td>21.</td>
<td>d</td>
<td>All of these factors create economic growth.</td>
</tr>
<tr>
<td>22.</td>
<td>b</td>
<td>Countries are better off if they specialize in the production of goods that they have a comparative advantage and trade some of them to other countries. Refer to the section entitled “Comparative Advantage and the Gains From Trade” on page 49 in the textbook.</td>
</tr>
<tr>
<td>23.</td>
<td>a</td>
<td>Absolute advantage is the ability of an individual, firm, or country to produce more of a good or service than competitors using the same amount of resources.</td>
</tr>
<tr>
<td>24.</td>
<td>c</td>
<td>The country with a lower opportunity cost of production has a comparative advantage in the production of that good.</td>
</tr>
<tr>
<td>25.</td>
<td>b</td>
<td>The opportunity costs are as follows: The opportunity cost of shirts is: 1 computer chip for Country A and 1/3 computer chip for Country B. The opportunity cost of computer chips is: 1 shirt for Country A and 3 shirts for Country B. Country B has a comparative advantage in the production of shirts because it sacrifices fewer computer chips to produce one shirt.</td>
</tr>
</tbody>
</table>
### Question Answer Comment

26. a The opportunity costs are as follows: The opportunity cost of shirts is: 1 computer chip for Country A and 1/3 computer chip for Country B. The opportunity cost of computer chips is: 1 shirt for Country A and 3 shirts for Country B. Therefore, Country A has a comparative advantage (or lower opportunity cost) in the production of computer chips because it sacrifices fewer shirts to produce one computer chip. Country A should produce computer chips.

27. a A worker in Country A can produce more food and more clothing in one day than a worker in Country B can.

28. c A worker in Country A can produce 6 times as many units of food in one day as a worker in Country B, but only 1.5 as many units of clothing. Country A has a lower opportunity cost than Country B in the production of food, and Country B has a lower opportunity cost than Country A in the production of clothing.

29. a For Country A, the production of 3 units of clothing requires a sacrifice of 6 units of food. Therefore, each unit of clothing has an opportunity cost of 2 units of food.

30. c If you have a comparative advantage in the production of apples, then you would specialize entirely in the production of apples.

31. d After trade, you and your neighbor can consume more than you can produce.

32. a Goods and services are exchanged in product markets.

33. c Labor, capital, natural resources, and entrepreneurial ability are factors of production that are traded in factor markets.

34. c A household includes all the individuals in a home. Firms are suppliers of goods and services.

35. c In the circular flow of income, there are flows of funds and spending, and also flows of factors of production and goods and services.

36. b Goods and services flow from firms to the households through the product market.

37. a Spending on goods and services flows from households to firms through the product market.

38. c Factors of production flow from households to the firms through the factor market.

39. d Arrow A shows the funds that households use to purchase goods and services from firms in product markets. Arrow D shows the funds that firms use to pay households for wages and other payments for factors of production in factor markets.

40. c Individuals usually act in a rational, self-interested way. Adam Smith understood that people’s motives can be complex.

41. a Price represents both the value of the good to consumers and the cost (to producers) of making those goods.

42. c Individuals usually act in a rational, self-interested way. When people act in their own self-interest, the right quantity of goods will be produced.

43. d The role of an entrepreneur is to operate a business and take risks in bringing together the factors of production—labor, capital, and natural resources—to produce goods and services.

44. b In a market system, entrepreneurs bring together the factors of production—labor, capital, and natural resources—to produce goods and services.
45. a  The legal basis for a successful market is property rights. Property rights are the rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it.

46. b  Risk taking is an essential ingredient of entrepreneurship, and this risk taking is essential for the market system to function well.

47. c  Property rights are very important in any modern economy. See page 53 in the textbook.

48. a  Much business activity involves someone agreeing to carry out some action in the future. For a market to work, there must be property rights and enforceable contracts.

49. a  Property rights in the United States are guaranteed by the Fifth and Fourteenth amendments to the U.S. Constitution.

50. b  Independence and impartiality on the part of judges are very important.

**Short Answer Responses**

1. Cooperation is essential for specialization and trade, but it is an impersonal cooperation. It is not necessary for business owners, workers, suppliers and consumers to know or see one another. In fact, many of these individuals can be located thousands of miles away from each other, live in different countries, and speak different languages. Their cooperation is due to their self-interest, not their regard for one another’s welfare.

2. This is true. In the circular-flow diagram, households’ spending for the goods and services they purchase is linked to the income they earn from providing factors of production. For household members to earn income to buy the goods and services they want, they must first sell their resource services to firms who purchase these services in factor markets. The market value of factor services determines the income resource owners receive.

3. No, production possibilities frontiers will always slope downward. Resources used in production are scarce, and increasing production of one good will always require a decrease in the production of another good along a production possibilities frontier. This means that production possibilities frontiers are always negative sloped, or downward sloping.

4. Consider the following example: Student One can read 10 pages of psychology per day or 8 pages of economics per day, while Student Two can read 5 pages of psychology per day or 5 pages of economics per day. Student One has an absolute advantage in reading both psychology and economics; however, Student One’s cost of reading 1 page of economics is 1.25 pages of psychology, and Student Two’s cost of reading 1 page of economics is only 1 page of psychology.

5. Smith did not believe that self-interest was the sole motive nor did he believe that self-interest was synonymous with selfishness. People are motivated by a broad range of factors, but when they buy and sell in markets, monetary rewards usually provide the most important motivation.
True/False Answers

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>F</td>
<td>Adam Smith explained the inefficiencies of the guild system and explained how markets were more efficient.</td>
</tr>
<tr>
<td>3.</td>
<td>T</td>
<td>A nation can have the comparative advantage in the production of only one of the two goods.</td>
</tr>
<tr>
<td>4.</td>
<td>T</td>
<td>As the slope of the frontier becomes steeper, the opportunity cost of obtaining one more unit of one good increases.</td>
</tr>
<tr>
<td>5.</td>
<td>F</td>
<td>Technological advances often affect the production of some goods (those that use the advances most) more than others.</td>
</tr>
<tr>
<td>6.</td>
<td>T</td>
<td>Absolute advantage is about who produces more, while comparative advantage is about who produces the good at a lower opportunity cost.</td>
</tr>
<tr>
<td>8.</td>
<td>F</td>
<td>A production possibilities frontier, not the circular flow diagram, illustrates opportunity cost in production.</td>
</tr>
<tr>
<td>9.</td>
<td>F</td>
<td>For the market system to work properly, property rights must be enforced. Refer to page 57 in the textbook for a discussion of the importance of property rights.</td>
</tr>
<tr>
<td>10.</td>
<td>F</td>
<td>See the definition of opportunity cost on page 41 of the textbook.</td>
</tr>
<tr>
<td>11.</td>
<td>F</td>
<td>Comparative advantage involves production at the lowest cost, not necessarily the highest level of production overall.</td>
</tr>
<tr>
<td>12.</td>
<td>F</td>
<td>The Congressional Budget Office estimated that federal spending on Medicare will more than double over the next 10 years. See Making the Connection on pages 43 and 44 in the textbook.</td>
</tr>
<tr>
<td>14.</td>
<td>F</td>
<td>The chapter opener discusses the BMW plant in Spartanburg, South Carolina.</td>
</tr>
</tbody>
</table>
| 15.      | T      | The change in the opportunity cost per each additional unit of the good being produced—the marginal opportunity cost—is constant along a linear \( PPF \).