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

Brief Chapter Summary and Learning Objectives

2.1 Production Possibilities Frontiers and Opportunity Costs

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

- The model of the production possibilities frontier is used to analyze the opportunity costs and trade-offs that individuals, firms, or countries face.

2.2 Comparative Advantage and Trade

Describe comparative advantage and explain how it serves as the basis for trade.

- 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.

2.3 The Market System

Explain the basics of how a market system works.

- Markets enable buyers and sellers of goods and services to come together to trade.

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

Factors of production. Labor, capital, natural resources, and other 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 market. A market for goods—such as computers—or services—such as medical treatment.

Production possibilities frontier (*PPF*). A curve showing the maximum attainable combinations of two products that can 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.

Chapter Outline

Managers at Tesla Motors Face Trade-Offs

All-electric cars have struggled in the marketplace because the batteries that power them are costly and they have to be recharged about every 300 miles. Although sales of all-electric cars made by Tesla Motors represented only 0.1 percent of the U.S. car market in 2015, the company planned to introduce a new, lower-priced model that would appeal to people who had bought gasoline-powered cars. Tesla initially sold its Model S sedan for a base price of $75,000. It began selling a second automobile—the Model X—in late 2015. The Model X was designed to compete with gasoline-powered SUVs but also sold for a very high base price. To gain significant market share Tesla must allocate resources to produce an all-electric car for about $35,000. Tesla's managers must also decide how to sell and service the cars the company sells. Tesla only sells cars online and relies on company-owned service centers for maintenance and repairs. Tesla will likely face increased competition in future years from Apple and other companies that are exploring the electric vehicle market.

2.1 Production Possibilities Frontiers and Opportunity Costs

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

A key fact of economic life is that scarcity requires trade-offs. **Scarcity** is a situation in which unlimited wants exceed the limited resources available to fulfill those wants. Goods and services and the resources, or factors of production, that are used to make goods and services, are scarce.

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

A. Graphing the Production Possibilities Frontier

All combinations of products located on the production possibilities frontier are efficient because all available resources are being used. Combinations inside the frontier are inefficient because maximum output is not being obtained from available resources. Points outside the frontier are unattainable given the firm's current resources.

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

B. Increasing Marginal Opportunity Costs

A production possibilities frontier that is bowed outward illustrates increasing marginal opportunity costs, which occur because some workers, machines, and other resources are better suited to one use than to another. Increasing marginal opportunity costs illustrate an important concept: The more resources already devoted to any activity, the smaller the payoff to devoting additional resources to that activity.

C. Economic Growth

Economic growth is the ability of the economy to increase the production of goods and services. Economic growth can occur if more resources become available or if a technological advance makes resources more productive. Growth may lead to greater increases in production for one good than another.

Extra Apply the Concept

Facing Trade-offs in Health Care Spending

Households have limited incomes. If the price of health care rises, households have to choose whether to buy less health care or spend less on other goods and services. The same is true of the federal government's spending on health care. The government provides health insurance to about 30 percent of the population through programs such as Medicare for people over age 65 and Medicaid for low-income people. If the price of health care rises, the government has to either cut back on the services provided through Medicare and Medicaid or cut spending in another part of the government's budget. (Of course, both households and the government can borrow to pay for some of their spending, but ultimately the funds they can borrow are also limited.)

About 54 percent of the population has private health insurance, often provided by an employer. When the fees doctors charge, the cost of prescription drugs, and the cost of hospital stays rise, the cost to employers of providing health insurance increases. As a result, employers will typically increase the amount they withhold from employees' paychecks to pay for the insurance. Some employers—particularly small firms—will even stop offering health insurance to their employees. In either case, the price employees pay for health care will rise. How do people respond to rising health care costs? Isn't health care a necessity that people continue to consume the same amount of, no matter how much its price increases? In fact, studies have shown that rising health care costs cause people to cut back their spending on medical services, just as people cut back their spending on other goods and services when their prices rise. One academic study indicates that for every 1 percent increase in the amount employers charge employees for insurance, 164,000 people become uninsured. Of course, people without health insurance can still visit the doctor and obtain prescriptions, but they have to pay higher prices than do people with insurance. Although the consequences of being uninsured can be severe, particularly if someone develops a serious illness, economists are not surprised that higher prices for health insurance lead to less health insurance being purchased: Faced with limited incomes, people have to make choices among the goods and services they buy.

The Congressional Budget Office estimates that as the U.S. population ages and medical costs continue to rise, federal government spending on Medicare will more than double over the next 10 years. Many policymakers are concerned that this rapid increase in Medicare spending will force a reduction in spending on other government programs. Daniel Callahan, a researcher at the Hastings Center for Bioethics, has argued that policymakers should consider taking some dramatic steps, such as having Medicare stop paying for open-heart surgery and other expensive treatments for people over 80 years of age. Callahan argues that the costs of open-heart surgery and similar treatments for the very old exceed the benefits, and the funds would be better spent on treatments for younger patients, where the benefits would exceed the costs. Spending less on prolonging the lives of the very old in order to save resources

that can be used for other purposes is a very painful trade-off to consider. But in a world of scarcity, trade-offs of some kind are inevitable.

Sources: Daniel Callahan, "The Economic Woes of Medicare," *The New York Times*, November 13, 2008; Ezekiel J. Emanuel, "The Cost–Coverage Trade-off," *Journal of the American Medical Association*, Vol. 299, No. 8, February 27, 2008, pp. 947–949; and Congressional Budget Office, *A Preliminary Analysis of the President's Budget and an Update of CBO's Budget and Economic Outlook*, March 2009.

Questions & Solutions

1. Suppose the U.S. president is attempting to decide whether the federal government should spend more on research to find a cure for heart disease. He asks you, one of his economic advisors, to prepare a report discussing the relevant factors he should consider. Use the concepts of opportunity cost and trade-offs to discuss some of the main issues you would deal with in your report.

Solution:

If the federal government has a fixed budget for medical research, then the opportunity cost of funding more research on heart disease is the reduction in funding for research on other diseases. The decision should be made at the margin: to maximize the benefits from government spending on medical research, the last dollar devoted to research on heart disease should result in the same marginal benefit—less disease and fewer deaths—as the last dollar spent on research for other diseases. If the additional funding for research on heart disease comes at the expense of other non-medical research expenditures, then the opportunity cost will be different, but a similar analysis should be conducted.

2. Uwe Reinhardt, an economist at Princeton University, wrote the following in a column in the *New York Times*:

> [Cost-effectiveness analysis] seeks to establish which of several alternative strategies capable of achieving a given therapeutic goal is the least-cost strategy. It seems a sensible form of inquiry in a nation that is dismayed over the rising cost of health care. . . . Opponents of cost-effectiveness analysis include individuals who sincerely believe that health and life are "priceless."

Are health and life priceless? Are there any decisions you make during your everyday life that indicate whether you consider health and life to be priceless?

Source: Uwe E. Reinhardt, "'Cost-Effectiveness Analysis' and U.S. Health Care," *The New York Times*, March 13, 2009.

Solution:

Nothing is priceless. Every day we makes decisions, such as driving a car or flying in a plane, that increase by at least a small amount the chances that we will be hurt or killed. If health and life were literally priceless, every decision we make would have the sole objective of minimizing the chances of our being injured or killed. In a broader sense, we do not devote all of our resources to improving health care because resources devoted to, say, saving lives through medical research are not available for other needs, such as improving education. We always have to consider the opportunity cost of using resources in one way rather than in another.

2.2 Comparative Advantage and Trade

Learning Objective: Describe comparative advantage and explain how it serves as the basis for trade.

Trade is the act of buying and selling. Trade makes it possible for people to become better off by increasing both their production and their consumption.

A. Specialization and Gains from Trade

*PPF*s depict the combinations of two goods that can be produced if no trade occurs. We can use *PPF*s to show how someone can benefit from trade even if she is better than someone else at producing both goods.

B. Absolute Advantage versus Comparative Advantage

Absolute advantage is 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.

If the two individuals have different opportunity costs for producing two goods, each individual will have a comparative advantage in the production of one of the goods. **Comparative advantage** is the ability of an individual, a firm, or a country to produce a good or service at a lower opportunity cost than competitors. Comparing the possible combinations of production and consumption before and after specialization and trade occur proves that trade is mutually beneficial.

C. Comparative Advantage and the Gains from Trade

The basis for trade is comparative advantage, not absolute advantage. Individuals, firms, and countries are better off if they specialize in producing the goods and services for which they have a comparative advantage and obtain the other goods and services they need by trading.

Teaching Tips

Even good students have difficulty understanding comparative advantage. A good example of comparative advantage is the career of baseball legend Babe Ruth. 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 as an outfielder in his last two years with the team. In fact, he established a record for home runs in a season (29) in 1919. 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 he could have earned as a pitcher. But because New York already had skilled pitchers, the opportunity cost of replacing him as a pitcher was lower than the cost of replacing Ruth as a hitter. No one else on the Yankees could have hit 54 home runs, Ruth's total in 1920; the next highest total was 11. It can be argued that Ruth had an absolute advantage as both a hitter and pitcher for the Yankees in 1920, but a comparative advantage only as a hitter.

2.3 The Market System

Learning Objective: Explain the basics of how a market system works.

In the United States and most other countries, trade is carried out in markets. 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. A **product market** is a market for goods—such as computers—or services—such as medical treatment. A **factor market** is a market for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability. **Factors of production** are the labor, capital, natural resources, and other inputs used to make goods and services.

A. The Circular Flow of Income

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.

B. The Gains from Free Markets

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. Adam Smith is considered the father of modern economics. His book, *An Inquiry into the Nature and Causes of the Wealth of Nations*, published in 1776, was an influential argument for the free market system.

C. The Market Mechanism

A key to understanding Adam Smith's argument is the assumption that individuals usually act in a rational, self-interested way. This assumption underlies nearly all economic analysis.

D. The Role of the Entrepreneur in the Market System

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 that consumers want.

E. The Legal Basis of a Successful Market System

The absence of government intervention is not enough for a market economy to work well. Government has to provide a legal environment that allows markets to operate efficiently. **Property rights** are the rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it. To protect intellectual property rights, the federal government grants a patent that gives an inventor – often a firm—the exclusive right to produce and sell a new product for 20 years from the date the patent was filed. Books, films, and software receive copyright protection. Under U.S. law, the creator of a book, film, or piece of music has the exclusive right to use the creation during the creator's lifetime. The creator's heirs retain this right for 70 years after the death of the creator.

Business activity often involves someone agreeing to carry out some action in the future. These agreements often take the form of legal contracts. For the market system to work, businesses and individuals have to rely on these contracts being carried out. Enforcing contracts or property rights requires an independent court system and judges who are able to make impartial decisions on the basis of the law. If property rights are not well enforced fewer goods and services will be produced, leaving the economy inside its production possibilities frontier.

Teaching Tips

To initiate class discussion regarding intellectual property rights, ask students these questions:

1. How many of you have downloaded music via the Internet?
2. Should the government have the right to grant exclusive rights to musicians and other artists to produce and sell their creative works?
3. Should the government fine or prosecute individuals who illegally obtain music, books, movies, and other creative works in violation of property rights laws?

Extra Solved Problem 2.3

Adam Smith's "Invisible Hand"

Alan Krueger, an economist at Princeton University who served as chair of the Council of Economic Advisers in the Obama administration, 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 . . . ."

Source: Alan B. Krueger, "Rediscovering the Wealth of Nations," *New York Times*, August 16, 2001.

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 is about 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."

Step 2: Answer part a. by describing 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 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 favors from government officials.

Step 3: Answer part b. by contrasting the behavior of merchants and manufacturers under a guild system and a market system.
Because governments in a guild system gave producers the power to control production, producers did not have to respond to consumers' demands for better quality, greater 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 most of Europe in the eighteenth century.

Extra Economics in Your Life:
International Trade and Household Income

Many people believe that outsourcing—firms producing goods and services outside of their home country—harms their nations' economies by increasing domestic unemployment and decreasing incomes. But most economists believe that free trade policies, including allowing goods and services to be produced in other countries, benefit domestic economies. In a letter dated March 5th 2015, 14 economists (including R. Glenn Hubbard) who served at chairs of the Council of Economic Advisers under seven Republican and Democratic presidents, wrote an open letter to congressional leaders expressing their

support for the renewal of the Trade Promotion Authority in order to reach agreements with U.S. trading partners through the Trans-Pacific Partnership (TPP) and the Trans-Atlantic Trade and Investment Partnership (TTIP). The letter read, in part: "International trade is fundamentally good for the U.S. economy, beneficial to American families over time, and consonant with our domestic priorities."

Ben Bernanke, former chairman of the Federal Reserve Board, cited a study that examined the effect of international trade on income in the United States since World War II: ". . . the increase in trade . . . has boosted U.S. annual incomes on the order of $10,000 per household. The same study found that removing all remaining barriers to trade would raise incomes anywhere from $4,000 to $12,000 per household."

Source: N. Gregory Mankiw, "Economists Actually Agree on This: The Wisdom of Free Trade," *New York Times*, April 24, 2015; and Ben Bernanke, "Embracing the Challenge of Free Trade: Competing and Prospering in a Global Economy," The Federal Reserve Board, May 1, 2007. http://www.federalreserve.gov/boarddocs/speeches/2007/20070501/default.htm.

Questions: (a) Should the United States accept the advice of economists and support free trade policies even if this increases the risk of some workers losing their jobs to outsourcing? (b) What type of job would make you more or less vulnerable to outsourcing?

Answers: (a) Given the opposition from firms and workers in industries that would be harmed by free trade, it is unlikely that the United States would eliminate all trade barriers. But studies such as the one cited by Ben Bernanke show that increased trade can significantly boost the incomes of U.S. households. (b) Another study Bernanke cited found twenty-one occupations that were most vulnerable to outsourcing were primarily for relatively lower-wage positions.