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

Brief Chapter Summary and Learning Objectives

2.1 Production Possibilities Frontiers and Opportunity Costs (pages 36–42)

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

- The economic resources countries have available to produce goods and services are scarce. Decision makers face trade-offs as the result of scarcity.
- 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 (pages 42-47)

Understand comparative advantage and explain how it is 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 (pages 48-52)

Explain the basic idea of how a market system works.

- Markets enable buyers and sellers of goods and services to come together to trade.
- Entrepreneurs, those who own or operate businesses, produce goods and services that consumers want, and decide how these goods and services should be produced to yield the most profit.
- It is essential that government protects right to private property in order for a market system to work well.

Key Terms

Absolute advantage, p. 45. 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.

Allocative efficiency, p, 37. A state of the economy in which production is in accordance with consumer preferences; in particular, every good or service is produced up to the point where the last unit provides a marginal benefit to society equal to the marginal cost of producing it.

Circular-flow diagram, p. 49. A model that illustrates how participants in markets are linked.

Comparative advantage, p. 45. The ability of an individual, a firm, or a country to produce a good or service at a lower opportunity cost than potential trading partners.

Economic growth, p. 42. The ability of the economy to increase the production of goods and services.

Entrepreneur, p. 48. Someone who operates a business, bringing together the factors of production—labour, capital, and natural resources—to produce goods and services.

Factor market, p. 48. A market for the factors of production, such as labour, capital, natural resources, and entrepreneurial ability.

Factors of production, p. 36. The inputs used to make goods and services.

Free Market, p. 50. A market with few government restrictions on how goods or services can be produced or sold, on who can buy or sell goods or services, or on how factors of production can be employed.

Market, p. 48. 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, p. 37. The highest-valued alternative that must be given up to engage in an activity.

Product market, p. 48. Markets for goods—such as computers—and services—such as haircuts.

Production possibilities frontier (*PPF*), p. 36. A curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology.

Property rights, p. 51. The rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it.

Scarcity, p. 36. A situation in which unlimited wants exceed the limited resources available to fulfill those wants.

Trade, p. 42. The act of buying and selling.

Chapter Outline

Managers Making Choices at Toyota

The managers at firms such as Toyota must make decisions regarding the production and marketing of their products. These decisions include the location and relocation of manufacturing plants and the production methods used at these plants. For example, producing more of one model of automobile means producing fewer of other models.

2.1 Production Possibilities Frontiers and Opportunity Costs (pages 36–42)

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

Scarcity is a situation in which unlimited wants exceed the limited resources available to fulfill those wants.

Factors of production are the inputs used to make goods and services.

A production possibilities frontier is a simple model that can be used to analyze trade-offs Toyota faces in deciding how many of each type of automobile (in the textbook example, either Corolla sedans or Lexus RX350 SUVs) it should produce given its limited resources and its technology.

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

A. Graphing the Production Possibilities Frontier

Combinations of products on the frontier are technically efficient because the maximum output is obtained from the available resources. Combinations inside the frontier are inefficient because some resources are not being used. Combinations outside the frontier are unattainable with current resources. This can be used to emphasize the concept of scarcity and, since only one point on the *PPF* can be chosen, it also illustrates the concept of allocative efficiency.

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

Allocative efficiency is a state of the economy in which production is in accordance with consumer preferences; in particular, every good or service is produced up to the point where the last unit provides a marginal benefit to society equal to the marginal cost of producing it.

B. Increasing Marginal Opportunity Costs

A "bowed out" *PPF* illustrates increasing marginal opportunity costs, which occur because some workers, machines, and other resources are better suited to one use than 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. Growth is illustrated by an outward shift of the *PPF*. This shift may be symmetric or asymmetric as illustrated in Fig 2.3 on p. 42.

Teaching Tips

By using a consumer good on the vertical axis and a capital good on the horizontal axis, it is then a simple task to illustrate endogenous growth. Any choice other than the vertical intercept involves the production of capital, which moves the curve out in the next period. The further down the *PPF* that is chosen, the more capital is produced and the faster the economy grows. The opportunity cost of growth can be measured in terms of foregone consumer goods. Allocation of resources to capital goods in the present results in increased production possibilities of both goods in the future.

2.2 Comparative Advantage and Trade (pages 42-47)

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

Trade is the act of buying or selling. One of the great benefits of trade is that it 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. If one individual, firm, or country's *PPF* shows greater production of both goods, then this individual, firm, or country has an absolute advantage in 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 in 1920, but a comparative advantage only as a hitter.

2.3 The Market System (pages 48-53)

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. A **product market** is a market for goods—such as computers—or services—such as haircuts. A **factor market** is a market for the factors of production, such as labour, capital, natural resources, and entrepreneurial ability.

An **Entrepreneur** is someone who operates a business, bringing together the factors of production—labour, capital, and natural resources—to produce goods and services.

Factors of production are the 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 goods or services can be produced or sold, on who can buy or sell goods or services, or on how factors 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. 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.

C. The Legal Basis of a Successful Market System

The absence of government intervention is not enough for a market economy to work well. Government must provide secure rights to private property. Government can aid the working of a market by enforcing contracts between individuals through an independent court system. **Property rights** refer to the rights that individuals or firms have to the exclusive use of their property, including the right to buy or sell it. Property rights in Canada are based on British common law (except in Quebec, where the civil code system is in effect). The Sale of Goods Act governs contract law for the sale of goods except land.

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?

Note to instructor: Canada's Copyright Act permits copying onto blank cassettes and blank CDs, and a levy is charged on the purchase of this type of recordable medium. However, digital recording devices such as MP3 players are not included.

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," which begins on page 50.

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 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 favours from government officials.

Step 3: **Answer part (b) by contrasting the behaviour 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, 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*

Outsourcing refers to firms producing goods and services outside of their home country. Economists and policymakers have debated the effect of international trade and outsourcing on employment in most industrialized countries. Mark Carney, former Governor of the Bank of Canada and current Governor of the Bank of England, in a September 2012 speech said "Canada's improved terms of trade cause income, wealth, and GDP to rise."

Questions: (a) Should Canada eliminate all trade barriers 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 Canada would eliminate all internal and external trade barriers. Studies shows that opposition to free trade has a significant cost. (b) The jobs most vulnerable to outsourcing are primarily the relatively lower-wage positions.

Source: Mark Carney, "Dutch Disease", Bank of Canada Sept 7, 2012.
http://www.bankofcanada.ca/2012/09/publications/speeches/dutch-disease/.

SOLUTIONS TO END-OF-CHAPTER EXERCISES

Answers to *Thinking Critically* Questions

1. As we saw in the chapter, most production possibilities frontiers are not straight lines, but bow outwards. Toyota has a number of facilities dedicated to the production of diesel engines, which could not easily be used to produce hybrid cars. As a result the cost of switching to producing nothing but hybrids would be very expensive for Toyota in terms of lost production.

2. Toyota cannot fill these orders using only its Canadian plant. The combination lies outside the production possibility frontier and is therefore unattainable.

Review Questions

2.1 Production Possibilities Frontiers and Opportunity Costs (pages 36-42)

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

1.1 The production possibilities frontier (*PPF*) is a curve showing all the attainable combinations of two products that may be produced with available resources and existing technology. Combinations of goods that are on the frontier are efficient because all available resources are being fully utilized, and the fewest possible resources are being used to produce a given amount of output. Points inside the production possibilities frontier are inefficient, because the maximum output is not being obtained from the available resources. A production possibilities frontier will shift outward (to the right) if more resources become available for making the products or if technology improves so that firms can produce more output with the same amount of inputs.

1.2 *Increasing marginal opportunity costs* means that as more and more of a product is made, the opportunity cost of making each additional unit rises. It occurs because the first units of a good are made with the resources that are best suited for making it, but as more and more of the product is made, resources must be used that are better suited for producing something else. *Increasing marginal opportunity costs* implies that the production possibilities frontier is bowed out—that its slope gets steeper and steeper as you move down the production possibilities frontier.

2.2 Comparative Advantage and Trade (pages 42-47)

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

2.1 Absolute advantage is the ability to produce more of a good or service than competitors using the same amount of resources. Comparative advantage is the ability to produce a good or service at a lower opportunity cost than competitors. It is possible to have a comparative advantage in producing a good even if someone else has an absolute advantage in producing that good (and every other good). Unless the two producers have exactly the same opportunity costs of producing two goods—the same trade-off between the two goods—one producer will have a comparative advantage in making one of the goods and the other producer will have a comparative advantage in making the other good.

2.2 The basis for trade is comparative advantage. If each party specializes in making the product for which it has the comparative advantage, they can arrange a trade that makes both of them better off. Each party will be able to obtain the product made by its trading partner at a lower opportunity cost than without trade.

2.3 The Market System (pages 48-52)

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

3.1 A circular-flow diagram illustrates how participants in markets are linked. It shows that in factor markets, households supply labour and other factors of production in exchange for wages and other payments from firms. In product markets, households use the payments they earn in factor markets to purchase the goods and services produced by firms.

3.2 A free market is one with few government restrictions on how goods or services can be produced or sold, or on how factors of production can be employed. Economic decisions are made by buyers and sellers in the marketplace. In a centrally planned economy, the government—rather than households and firms—makes almost all the economic decisions. Free market economies have a much better track record of providing people with rising standards of living.

3.3 Private property rights are the rights that individuals or firms have to the exclusive use of their property, including the right to buy or sell it. If individuals and firms believe that property rights are not well enforced, they will be reluctant to risk their wealth by opening new businesses. Therefore, the enforcement of property rights and contracts is vital for the functioning of the economy. Independent courts are crucial because property rights and contracts will be enforced only if judges make impartial decisions based on the law, rather than decisions that favour powerful or politically connected individuals.

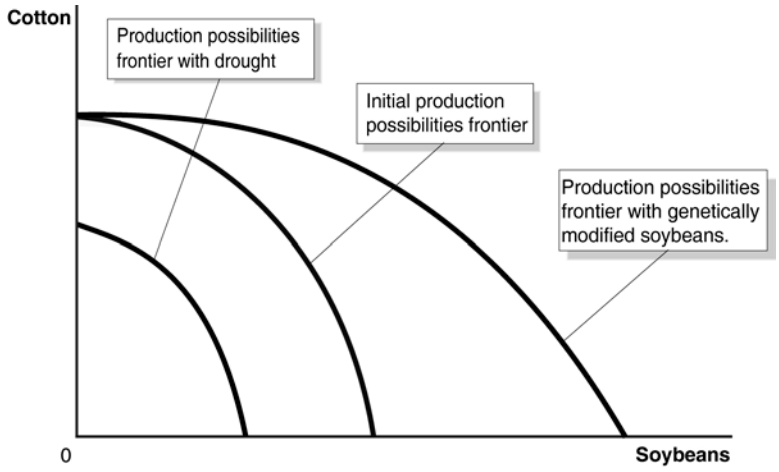
Problems and Applications

2.1 Production Possibilities Frontiers and Opportunity Costs (pages 36-42)

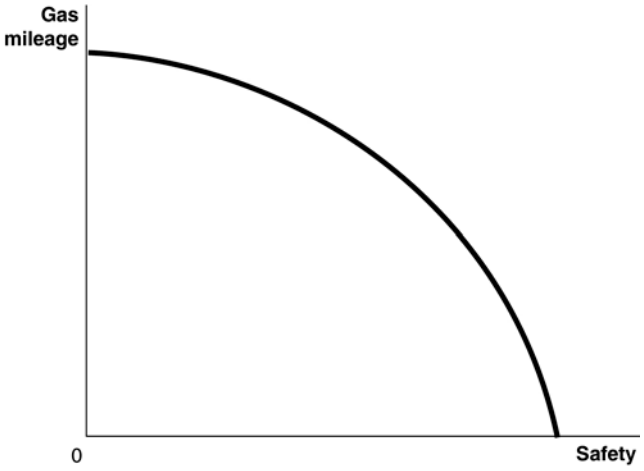
Learning Objective: Use a production possibilities frontier to analyze opportunity costs and trade-offs.

1.1 **a.** The production possibilities frontiers in the figure are bowed to the right from the origin because of increasing marginal opportunity costs. The drought causes the production possibilities frontier to shift to the left. See graph below in part (b).

b. The genetic modifications would shift the maximum soybean production to the right (doubling it), but not the maximum cotton production.

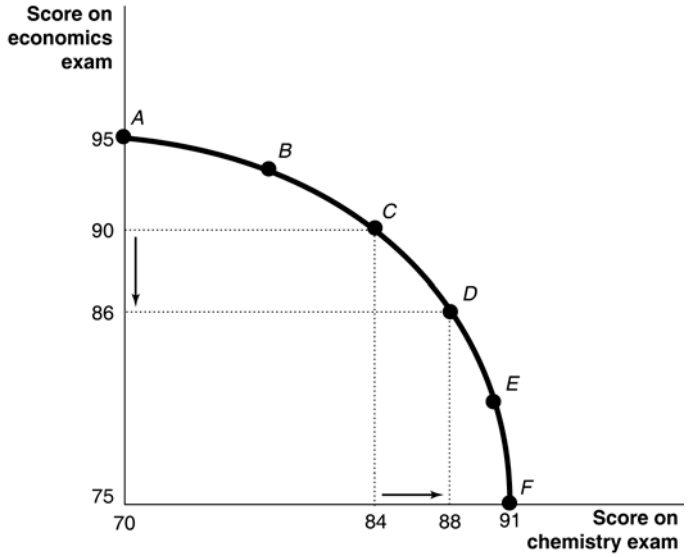


1.2 Increased safety will decrease gas mileage, as shown in the figure below. Trade-offs can be between physical goods, such as cotton and soybeans in problem 1.1, or between less tangible features such as mileage and safety.



1.3 You would still have an opportunity cost represented by the next best use of your time.

1.4 **a.**



If you spend all five hours studying for your economics exam, you will score a 95 on the exam; therefore, your production possibilities frontier will intersect the vertical axis at 95. If you devote all five hours to studying for your chemistry exam, you will score a 91 on the exam; therefore, your production possibilities frontier will intersect the horizontal axis at 91.

b. The points for choices *C* and *D* can be plotted using information from the table. Moving from choice *C* to choice *D* increases your chemistry score by four points, but lowers your economics score by four points. Therefore, the opportunity cost of increasing your chemistry score by four points is the four point decline in your economics score.

c. Choice *A* might be sensible if the marginal benefits of doing well on the chemistry exam are low relative to the marginal benefits from doing well on the economics exam—for example, if the chemistry exam is only a small portion of your grade but the economics exam is a large portion of your grade; or if you are majoring in economics and don't care much about

chemistry; or if you already have an A sewn up in chemistry but the economics professor will replace a low exam grade with this exam grade.

1.5 Your report should focus on the opportunity costs of spending more money on research to find a cure for heart disease. While heart disease kills thousands of Canadians every year, you need to consider what else could be done with the government resources your minister is considering spending. These same resources could be spent on preventative programs, the arts, roads, etc. You also need to consider the impact the additional spending is likely to have on heart disease treatments. These factors make many government decisions very difficult to make.

1.6. The government should consider whether the costs involved in either of the two programs exceed the benefits received from the programs. If the government decides that the costs of program A exceed its benefit, it may decide that the funds would be better spent on program B. Program A will allow four more students to participate than program B, but at an extra cost of $812.5 per participant. Although this would be a difficult trade-off to consider, spending less even though four fewer students can participate would save resources that could be used for other purposes.

2.2 Comparative Advantage and Trade (pages 42-47)

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

2.1 In the example in Figure 2.4 the opportunity cost of one pound of apples is one pound of cherries to you, and two pounds of cherries to your neighbour. Any price of apples between one and two pounds of cherries will be a fair trading price, and because ten pounds of apples for fifteen pounds of cherries is the same as one pound of apples for 1.5 pounds of cherries, it falls within this range. We could take any other value in this range to complete the table. Let's take, for example, 1.25 pounds of cherries per pound of apples. We will keep the pounds of apples traded as before at ten. The completed table will now be as follows:

TABLE 2.1: A Summary of the Gains from Trade

	You		**Your Neighbour**	
	Apples (pounds)	Cherries (pounds)	Apples (pounds)	Cherries (pounds)
Production *and* consumption *without* trade	8	12	9	42
Production *with* trade	20	0	0	60
Consumption *with* trade	10	$10 \times 1.25 = 12.5$	10	$60 - 12.5 = 47.5$
Gains from trade (increased consumption)	2	$12.5 - 12 = 0.5$	1	$47.5 - 42 = 5.5$

Note that both you and your neighbour are better off after trade than before trade. Note also that this rate of trading cherries for apples is better for your neighbour than the original rate of trading and worse for you.

2.2 Yes, the United States would have benefited from importing those products for which Britain had a comparative advantage, which, in fact, is what happened.

2.3 **a.** When France produces one more bottle of wine, it produces two fewer pounds of schnitzel. When Germany produces one more bottle of wine, it produces three fewer pounds of schnitzel. Therefore, France's opportunity cost of producing wine—two pounds of schnitzel—is lower than Germany's—three pounds of schnitzel. When Germany produces one more pound of schnitzel, it produces 0.33 fewer bottles of wine. When France produces one more pound of schnitzel, it produces 0.50 fewer bottles of wine. Therefore, Germany's opportunity cost of producing schnitzel—0.33 bottles of wine—is lower than that of France—0.50 bottles of wine. We can conclude that France has the comparative advantage in making wine and that Germany has the comparative advantage in making schnitzel.

b. We know that France should specialize where it has a comparative advantage and Germany should specialize where it has a comparative advantage. If both countries specialize, France will make four bottles of wine and zero pounds of schnitzel, and Germany will make zero bottles of wine and fifteen pounds of schnitzel. After both countries specialize, France could then trade three bottles of wine to Germany in exchange for seven pounds of schnitzel. This will give France the same amount of wine as they initially had, but an extra one pound of schnitzel. Germany will have three bottles of wine and eight pounds of schnitzel—that is, the same amount of wine, but more schnitzel. Other mutually beneficial trades are possible as well.

2.4 An individual or a country cannot produce beyond its production possibilities frontier. The production possibilities frontier shows the most that an individual or country can produce for a given amount of resources and technology. Without trade an individual or country cannot consume beyond its production possibilities frontier, but with specialization and trade an individual or country can consume beyond its production possibilities frontier. In Figure 2.5, both you and your neighbour were able to consume beyond your production possibilities frontiers, and in Solved Problem 2.2, both Canada and the United States were able to consume beyond their production possibilities frontiers.

2.5 Specialization and trade are about standard of living, not jobs. In both cases, individuals and countries have jobs. You have a job if you produce everything yourself and do not trade with others, and you have a job if you specialize and trade with others. But your standard of living will be higher if you specialize and trade. A country will have jobs if does not trade with other countries, and it will have jobs if it specializes and trades with other countries, but its standard of living will be higher if it specializes and trades with other countries.

2.6 Importing only products that could not be produced here would result in Canada producing—rather than importing—many goods for which it does not have a comparative advantage. These products would be produced at a higher opportunity cost than if they had been imported.

2.3 The Market System (pages 48-52)

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

3.1 **a.** An auto purchase takes place in the product market. The household (George) demands the good and the firm (Toyota) supplies the good.

b. The labour market is a factor market. Households supply labour and the firm demands labour.

c. The labour market is a factor market. The household (George) supplies the factor of production (labour), while the firm (McDonald's) demands it.

d. The land market is a factor market. The household supplies the factor of production (land) and the firm (McDonald's) demands it.

3.2 Adam Smith was making the "invisible hand" argument that, in pursuing their self-interest, business people end up producing the goods and services most desired by consumers.

3.3 Adam Smith realized—as economists today realize—that people's motives can be complex. But in analyzing people in the act of buying and selling, economists have concluded that in most instances, the motivation of financial reward provides the best explanation for the actions people take. Moreover, being self-interested—looking out for your own well-being and happiness—and being selfish—caring only about yourself—are not exactly the same things. Many successful business people are, in fact, generous: donating to charity, volunteering for activities, and otherwise acting in a generous way. This is not inconsistent with making business decisions that maximize profits for their companies.

3.4 **a**. "Psychic rewards" refer to the psychological benefits of, in this case, buying lottery tickets, which provide the excitement of playing the lottery and the chance of winning big.

b. An entrepreneur might receive the psychic rewards of creating and running his or her own business along with the chance of making large profits.

c. Answers will vary here. Elements of being an entrepreneur do appear to be similar to buying a lottery ticket, with the psychic rewards of playing the game along with the possibly of large returns. Other elements may differ, such as the probability of success.

3.5 Having secure property rights would enable resource owners to use their resources in more efficient ways, because they would spend less time on activities such as guarding their property. Owners would also be able to make improvements to their property without fear that someone would seize the property. They would also better able to finance a business by borrowing money, using their property as collateral for a loan.

CHAPTER 2

Trade-offs, Comparative Advantage, and the Market System

CHAPTER 2

Learning Objectives

2.1 Production Possibilities Frontiers and Opportunity Costs

2.2 Comparative Advantage and Trade

2.3 The Market System

Managers Make Choices at Toyota

To compete in the automobile market, the managers of Toyota must make many strategic decisions, such as:

- Whether to introduce new car models.
- Where in the world to advertise.
- Whether to concentrate production in Japanese facilities or to build new factories in overseas markets.
- Which quantities of which models to produce.
- **AN INSIDE LOOK** on **page 54** discusses how managers decide between producing hybrid cars and diesel cars, and improving existing gasoline-powered models.

Economics in Your Life

The Trade-offs When You Buy a Car

When you buy a car, you probably consider factors such as safety and fuel efficiency. To increase fuel efficiency, automobile manufacturers make cars small and light, but because large cars absorb more of the impact of an accident than do small cars, people are usually safer driving large cars.

See if you can answer these questions by the end of the chapter:

What can we conclude from these facts about the relationship between safety and fuel efficiency?

Under what circumstances would it be possible for automobile manufacturers to make cars safer and more fuel efficient?

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

Scarcity requires trade-offs. Goods and services and the economic resources used to make them, or *factors of production*—workers, capital, natural resources, and entrepreneurial ability—are scarce.

Production Possibilities Frontiers and Opportunity Costs

2.1 LEARNING OBJECTIVE

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

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

Graphing the Production Possibilities Frontier

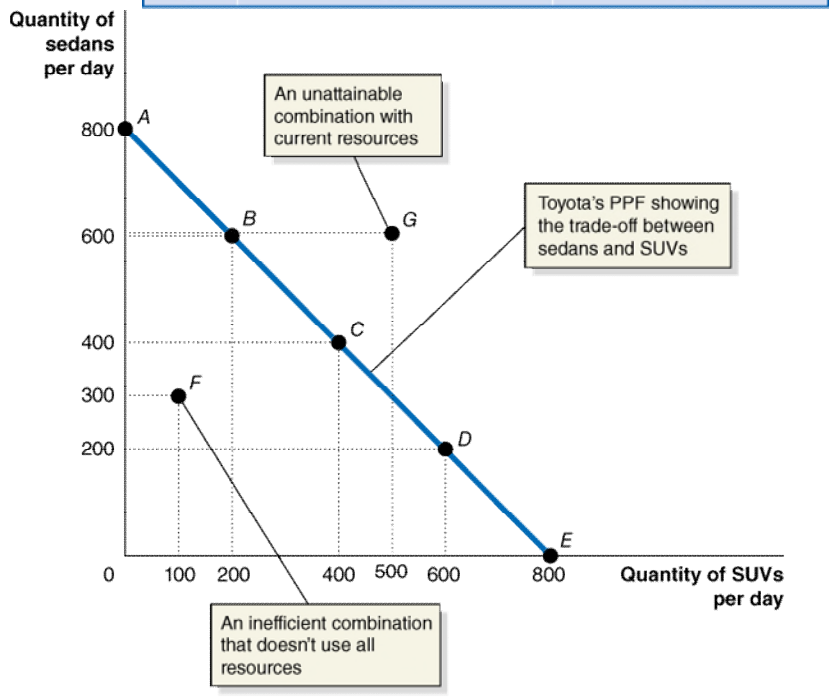
Figure 2.1

Toyota's Production Possibilities Frontier

Toyota faces a trade-off: To build one more sedan, it must build one less SUV. The production possibilities frontier illustrates the trade-off Toyota faces. Combinations on the production possibilities frontier—such as points A, B, C, D, and E —are technically efficient because the maximum output is being obtained from the available resources. Combinations inside the frontier—such as point F —are inefficient because some resources are not being used. Combinations outside the frontier—such as point G —are unattainable with current resources.

Toyota's Production Possibilities at Its Cambridge Plant

Choice	Quantity of Corolla Sedans Produced	Quantity of RX 350 SUVs Produced
A	800	0
B	600	200
C	400	400
D	200	600
E	0	800
F	300	100
G	600	500



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

Making the Connection

Facing Trade-offs in Health Care Spending

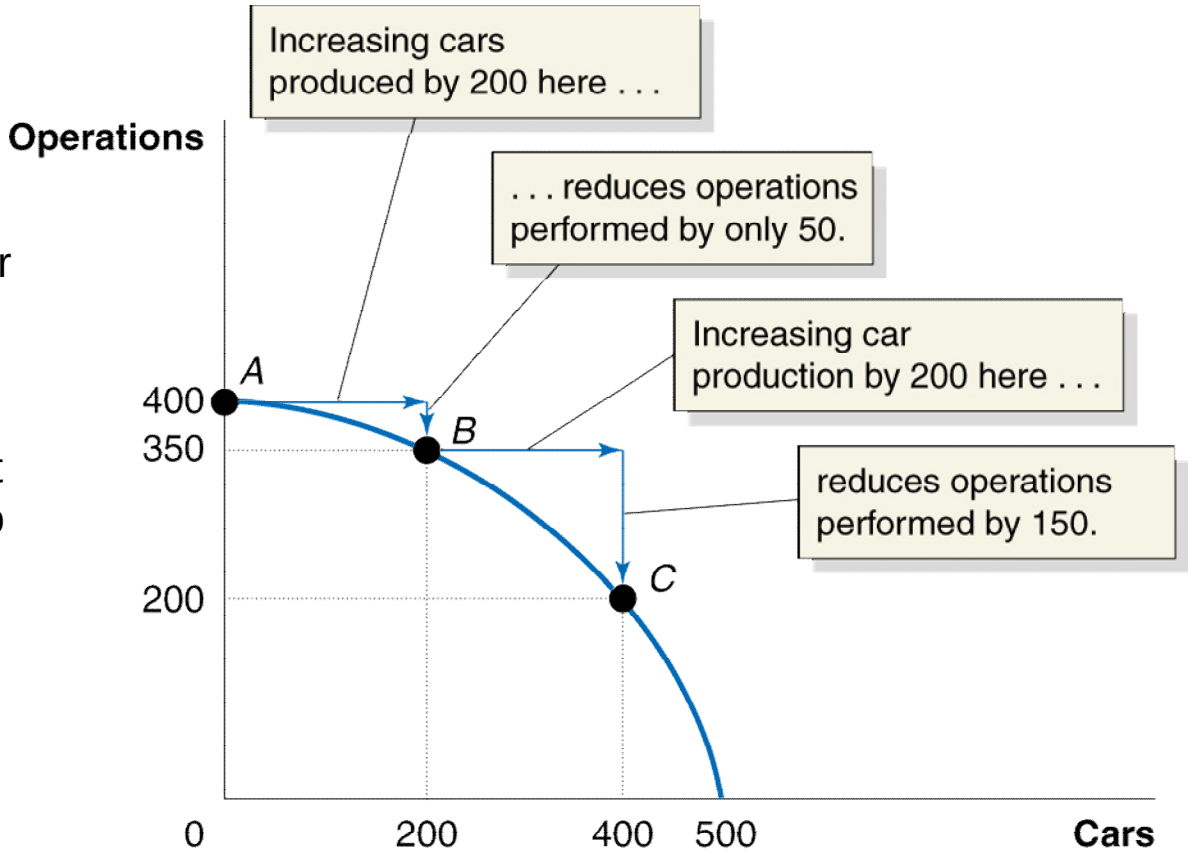
Spending more on health care means spending less on other goods and services .

Spending more on health care would mean that less funding is available for all the other government programs, such as education, housing, infrastructure, and so on. If governments increase taxes to fund higher health care costs (instead of cutting spending in other areas), people will have less money for the purchases they want to make. Very soon governments will have to make real and meaningful choices about the areas that will receive funding. If doctors and nurses are paid more or more doctors and nurses are hired, who are we going to pay less or what services will receive less funding? Will there be fewer teachers? Fewer police officers? More roads in disrepair? Will we have less money to spend on ourselves? Scarcity of resources means that these sorts of tradeoffs have to be made.

Your Turn: Test your understanding by doing related problems 1.5 and 1.6 on page 57 at the end of this chapter

Figure 2.2 Increasing Marginal Opportunity Costs

As the economy moves down the production possibilities frontier, it experiences *increasing marginal opportunity costs* because increasing automobile production by a given quantity requires larger and larger decreases in tank production. For example, to increase automobile production from 0 to 200—moving from point *A* to point *B*—the economy has to give up only 50 tanks. But to increase automobile production by another 200 vehicles—moving from point *B* to point *C*—the economy has to give up 150 tanks.



The more resources already devoted to an activity, the smaller the payoff to devoting additional resources to that activity.

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

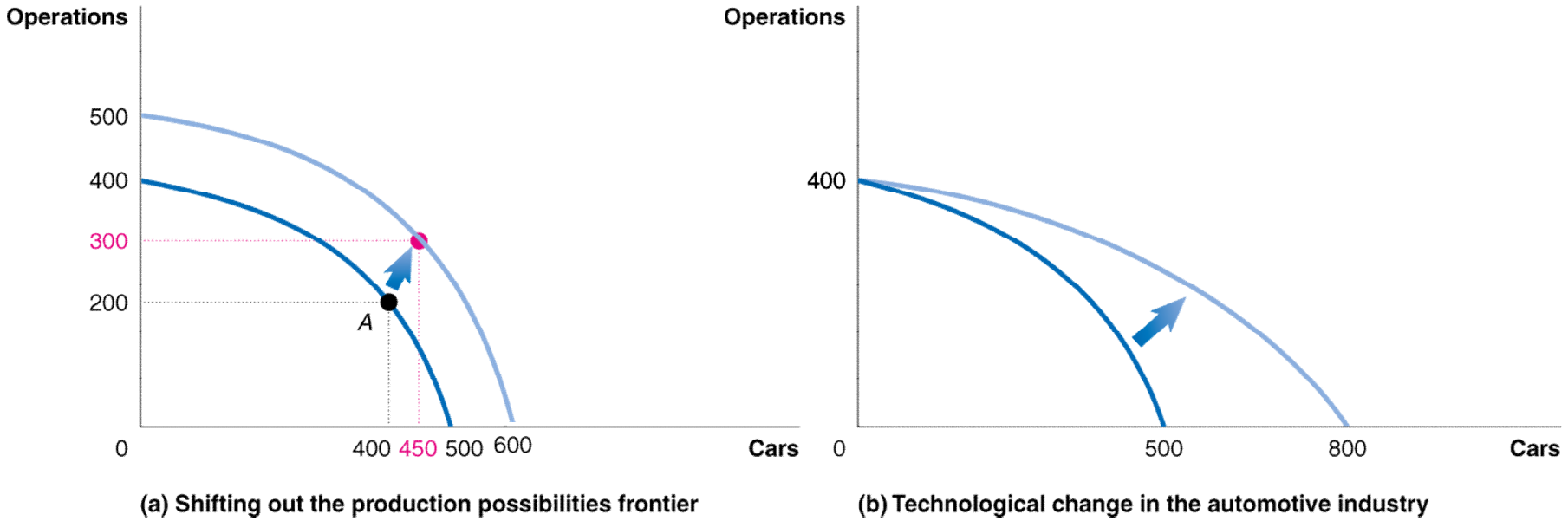


Figure 2.3 Economic Growth

Panel (a) shows that as more economic resources become available and technological change occurs, the economy can move from point *A* to point *B*, producing more operations and producing more cars. Panel (b) shows the results of technological change in the automobile industry that increases the quantity of cars workers can produce per year while leaving unchanged the maximum quantity of operations that can be produced. Shifts in the production possibilities frontier represent *economic growth*.

Comparative Advantage and Trade

2.2 LEARNING OBJECTIVE

Understand comparative advantage and explain how it is the basis for trade.

Specialization and Gains from Trade

	You		Your Neighbour	
	Apples (kg)	Cherries (kg)	Apples (kg)	Cherries (kg)
Pick nothing but apples	20	0	30	0
Pick nothing but cherries	0	20	0	60

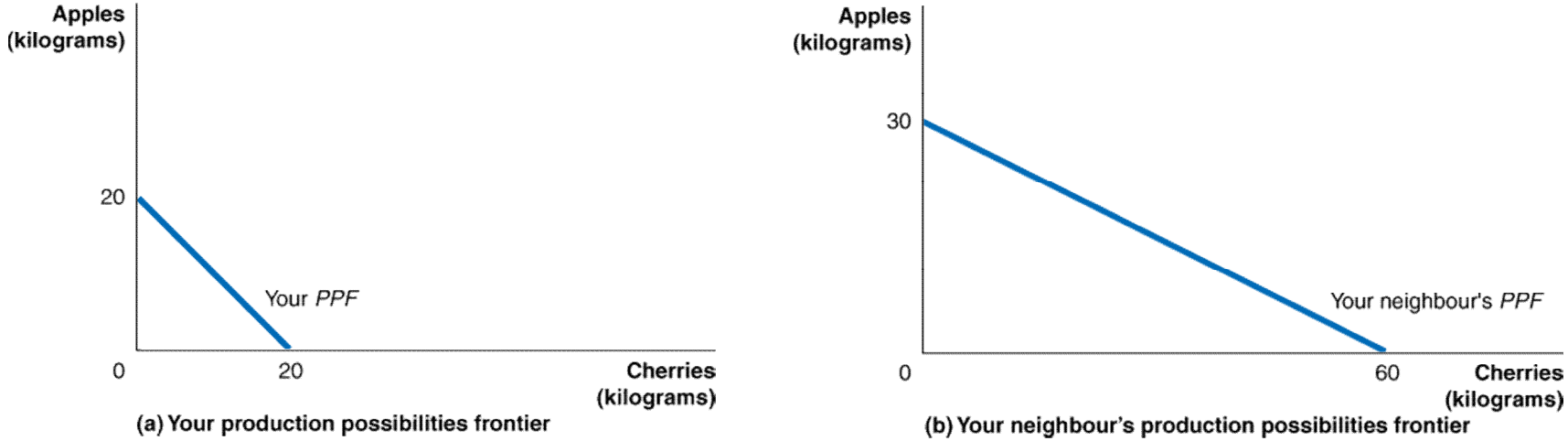


Figure 2.4 **Production Possibilities for You and Your Neighbor, without Trade**

The table shows how many kilograms of apples and how many kilograms of cherries you and your neighbour can each pick in one week.
Panel (a) shows your *PPF*. If you devote all your time to picking apples and none of your time to picking cherries, you can pick 20 pounds. If you devote all your time to picking cherries, you can pick 20 kilograms.
Panel (b) shows that if your neighbour devotes all her time to picking apples, she can pick 30 kg. If she devotes all her time to picking cherries, she can pick 60 kg.

Trade The act of buying and selling.

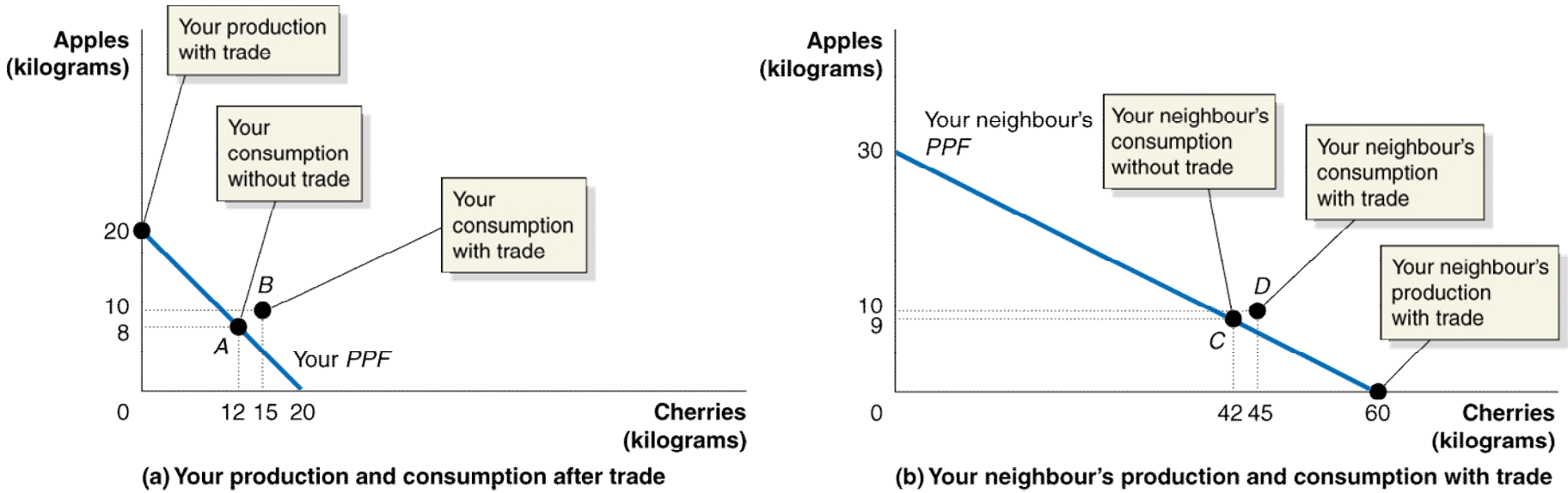


Figure 2.5 Gains from Trade

When you don't trade with your neighbour, you pick and consume 8 kg of apples and 12 kg of cherries per week—point *A* in panel (a). When your neighbour doesn't trade with you, she picks and consumes 9 kg of apples and 42 kg of cherries per week—point *C* in panel (b). If you specialize in picking apples, you can pick 20 kg. If your neighbour specializes in picking cherries, she can pick 60 kg. If you trade 10 kg of your apples for 15 kg of your neighbour's cherries, you will be able to consume 10 kg of apples and 15 kg of cherries— point *B* in panel (a). Your neighbour can now consume 10 kg of apples and 45 kg of cherries—point *D* in panel (b). You and your neighbour are both better off as a result of trade.

Table 2.1

A Summary of the Gains from Trade

	You		Your Neighbour	
	Apples (kg)	Cherries (kg)	Apples (kg)	Cherries (kg)
Production *and* consumption *without* trade	8	12	9	42
Production *with* trade	20	0	0	60
Consumption *with* trade	10	15	10	45
Gains from trade (increased consumption)	2	3	1	3

Absolute Advantage versus Comparative Advantage

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.

Table 2.2

Opportunity Costs of Picking Apples and Cherries

	Opportunity Cost of Apples	Opportunity Cost Cherries
You	1 kg of cherries	1 kg of apples
Your Neighbour	2 kg of cherries	0.5 kg of apples

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.

Don't Let This Happen to You

Don't Confuse Absolute Advantage and Comparative Advantage

Make sure you know the definitions.

Keep in mind it is possible to have one without the other.

Your Turn: **Test your understanding by doing related problem 2.2 on page 57 at the end of this chapter.**

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 goods and services for which they have a comparative advantage and obtain the other goods and services they need by trading.

Solved Problem **2.2**

Comparative Advantage and the Gains from Trade

Suppose that Canada and the United States both produce video games and nacho chips. These are the combination of the two goods that each country can produce in one day:

Canada		United States	
Video Games (titles)	**Nacho Chips (tonnes)**	**Video Games (titles)**	**Nacho Chips (tonnes)**
0	60	0	200
10	45	10	160
20	30	20	120
30	15	30	80
40	0	40	40
		50	0

a. Who has the comparative advantage in producing nacho chips? Who has the comparative advantage in producing video games?

Solved Problem **2.2** - Comparative Advantage and the Gains from Trade

Solving the Problem

Step 1: **Review the chapter material.**

Step 2: **Answer part (a) by calculating who has a comparative advantage in each activity.**

Canada has the comparative advantage in producing video game titles and the United States has the comparative advantage in producing nacho chips.

b. Suppose that Canada is currently producing (and consuming) 30 video games and 15 tonnes of nacho chips, while the United States is currently producing (and consuming) 10 video games and 160 tonnes of nachos. Demonstrate that Canada and the United States can both be better off if they specialize in producing only one good and engage in trade.

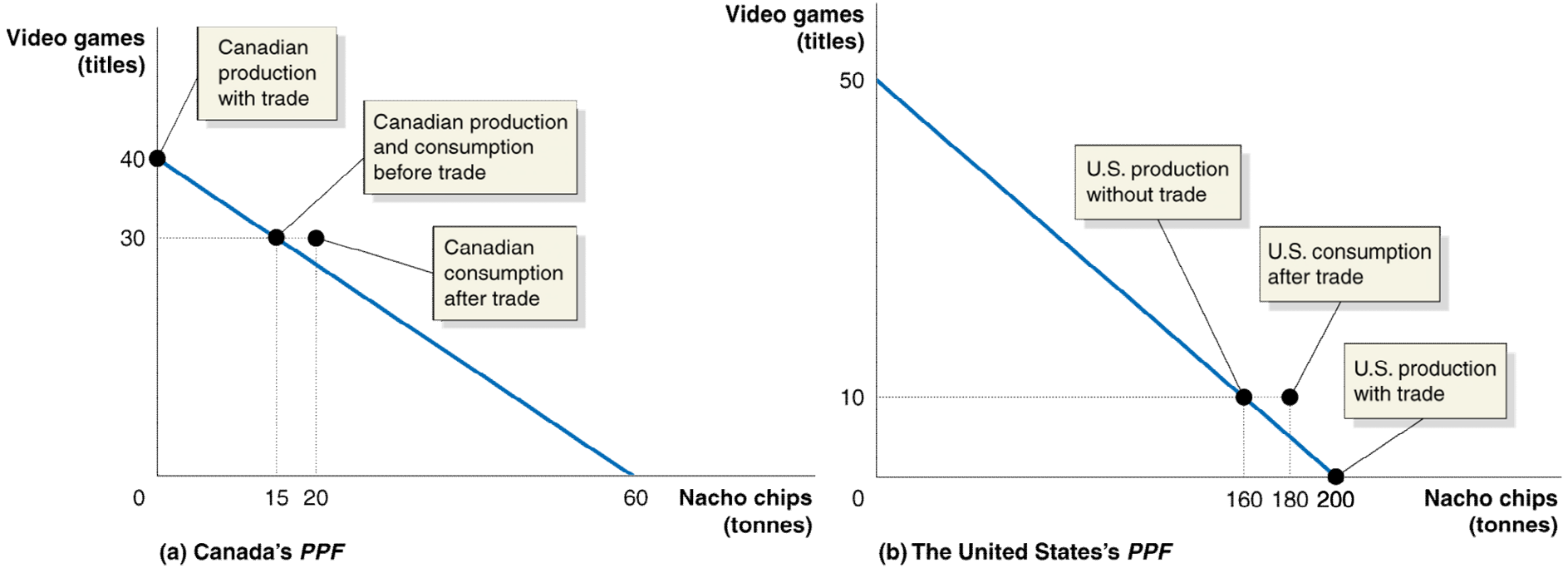
Step 3: **Answer part (b) by showing that specialization makes Canada and the United States better off.**

	Before Trade		After Trade	
	Video Games (titles)	Nacho Chips (tonnes)	Video Games (titles)	Nacho Chips (tonnes)
Canada	30	15	30	20
United States	10	160	20	180

Solved Problem **2.2 –** Comparative Advantage and the Gains form trade

c. Illustrate your answer to question (b) by drawing a *PPF* for Canada and a *PPF* for the United States. Show on your *PPF*s the combinations of video games and nachos produced and consumed in each country before and after trade.

Step 4: Answer part (c) by drawing the *PPF*s.



Your Turn: For more practice, do related problem 2.3 on page 57 at the end of this chapter.

The Market System

2.3 LEARNING OBJECTIVE

Explain the basic idea of how a market system works.

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

Product market A market for goods—such as computers—or services—such as medical treatment.

Factor market 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.

Factors of production are divided into four broad categories:

- *Labour* includes all types of work, from the part-time labour of teens working at McDonald's to the work of CEOs of large corporations..
- *Capital* refers to physical capital, such as computers, machines, and buildings that is used to make other goods.
- *Natural resources* include land, water, oil, iron ore, and other raw materials (or "gifts of nature") that are used in producing goods.
- An *entrepreneur* is someone who operates a business. *Entrepreneurial ability* is the ability to bring together the other factors of production to successfully produce and sell goods and services.

The Circular Flow of Income

Two key groups participate in markets:

- A *household* consists of all the individuals in a home.
- *Firms* are suppliers of goods and services.

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

Figure 2.6

The Circular-Flow Diagram

Households and firms are linked together in a circular flow of production, income, and spending.

The blue arrows show the flow of the factors of production.

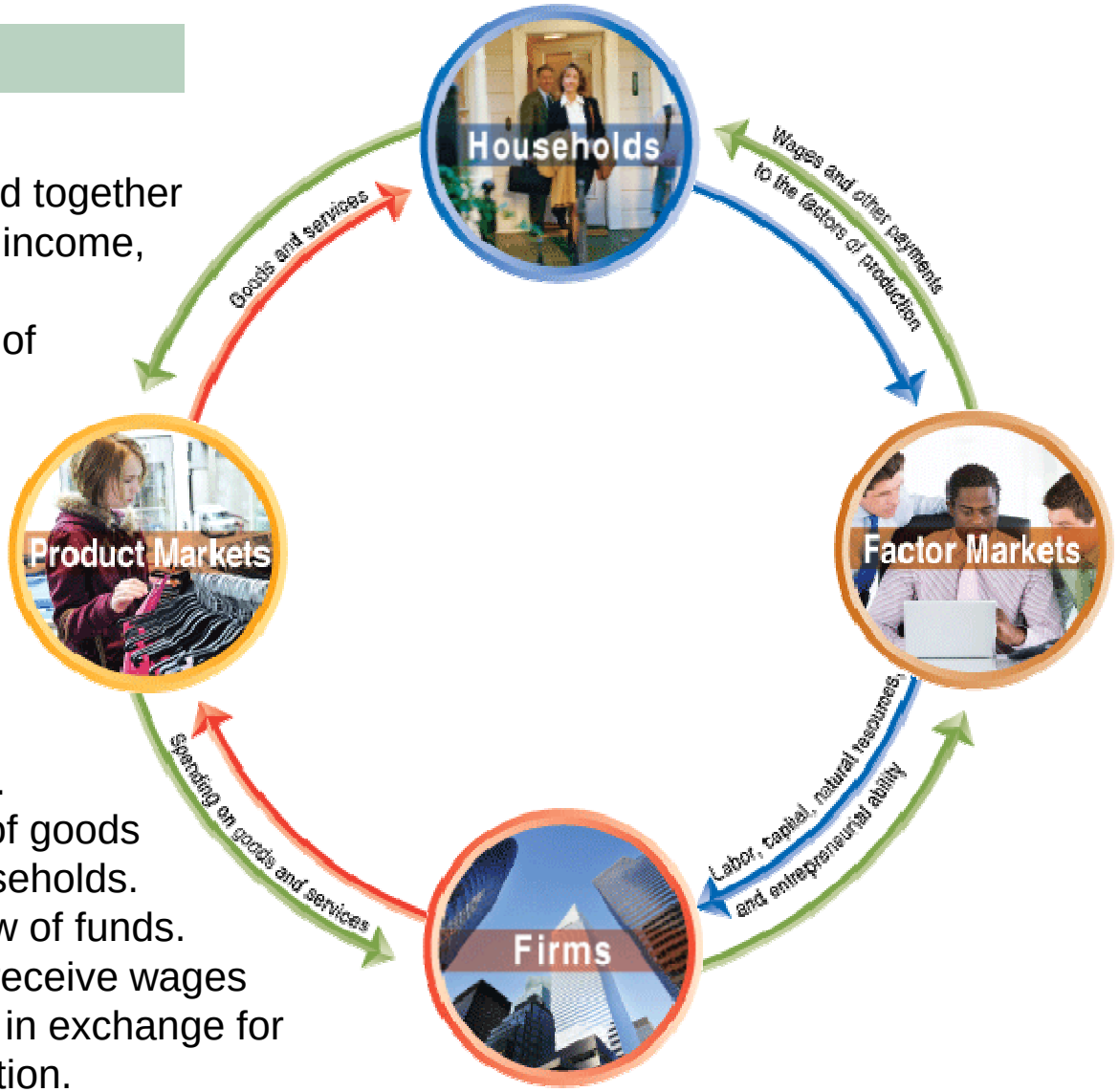
In factor markets, households supply labor, entrepreneurial ability, and other factors of production to firms.

Firms use these factors of production to make goods and services that they supply to households in product markets.

The red arrows show the flow of goods and services from firms to households.

The green arrows show the flow of funds.

In factor markets, households receive wages and other payments from firms in exchange for supplying the factors of production.



Households use these wages and other payments to purchase goods and services from firms in product markets. Firms sell goods and services to households in product markets, and they use the funds to purchase the factors of production from households in factor markets.

The Gains from Free Markets

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.

Countries that come closest to the free market benchmark have been more successful than those with centrally planned economies in providing their people with rising living standards, as Adam Smith argued in 1776.

The Market Mechanism

Individuals usually act in a rational, self-interested way. In analyzing people in the act of buying and selling, the motivation of financial reward usually provides the best explanation for the actions people take.

For the market mechanism to work in responding to changes in consumers' wants, *prices must be flexible*. In a famous phrase, Smith said that firms would be led by the "invisible hand" of the market to provide consumers with what they want.

Firms respond *individually* to changes in *relative prices* by making decisions that *collectively* end up satisfying the wants of consumers.

Making the Connection

A Story of the Market System in Action: How Do You Make a Playbook?

BlackBerry makes smartphones and used to make the PlayBook. Given that BlackBerry's headquarters are in Waterloo, Ontario, you might think that PlayBooks were made in Ontario. In fact, BlackBerry didn't produce any of the physical parts of the PlayBook, nor did it assemble them to make the finished product. Far from being produced entirely by one company in one place, the PlayBook required the coordinated activities

All told, a PlayBook contained hundreds of different parts that were designed and manufactured by firms all over the world. Many of these firms are not even aware of which other firms are also producing parts for the PlayBook.

The invisible hand of the market has led these firms to contribute their knowledge and resources to the process that ultimately results in the playbook available for sale in a store in Canada.

Your Turn: Test your understanding by doing related problem 3.2 on page 58 at the end of this chapter.

The Legal Basis of a Successful Market System

Protection of Private Property

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

Patents and *copyrights* protect *intellectual property rights* for inventors of ideas for new products or production methods and for creators of books, films, and software.

Enforcement of Contracts and Property Rights If property rights are not well enforced, fewer goods and services will be produced. This reduces economic efficiency, leaving the economy inside its production possibilities frontier.

Economics in Your Life

The Trade-offs When You Buy a Car

At the beginning of the chapter, we asked you to think about two questions:

1. When buying a new car, what is the relationship between safety and fuel efficiency?
2. Under what circumstances would it be possible for automobile manufacturers to make cars safer and more fuel efficient?

You have to recognize that there is a trade-off between safety and fuel efficiency, which looks much like the relationship in Figure 2.1.

To make a point like *G* in Figure 2.1 attainable, automobile makers would have to discover new technologies that allow them to make cars lighter and safer at the same time.

AN
INSIDE
LOOK

Toyota Faces a Trade-off