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CHAPTER 2

ECONOMIC TOOLS AND ECONOMIC SYSTEMS

ANSWERS TO END-OF-BOOK QUESTIONS AND PROBLEMS

1.1 *(Sunk Cost and Choice)* Suppose you go to a restaurant and buy an expensive meal. Halfway through, despite feeling quite full, you decide to clean your plate. After all, you think, you paid for the meal, so you are going to eat all of it. What's wrong with this thinking?

This question highlights the importance of ignoring sunk costs in marginal decision making. Once you have purchased the meal, you cannot get your money back whether or not you finish the meal. There is no benefit to overeating.

1.2 *(Opportunity Cost)* You can spend spring break either at home working for $80 per day for five days or go to Florida for the week. If you stay home, your expenses will total about $100. If you go to Florida, the airfare, hotel, food, and miscellaneous expenses will total about $700. What's your opportunity cost of going to Florida?

The opportunity cost is the total cost of going to Florida and includes dollar costs incurred as well as the forgone opportunity of working. Assuming you would work for 5 days if you stayed home, the cost would total $1,000: the $700 cost of going to Florida plus the net value of what you could have earned—$300 ($400 in earnings less expenses of $100)—if you stayed home.

1.3 *(Opportunity Cost)* Let's say that you simply love to work—it's not just about the money you earn. Given this assumption, what would be the opportunity cost of not working? How would this assumption affect simply using monetary values to measure opportunity cost?

If working gives you pleasure, then not working imposes an additional opportunity cost on you. Not only do you lose income, but your level of happiness or well-being is further diminished because you are also sacrificing the pleasure or utility you gain from working with others. Simply using monetary values underestimates the true opportunity cost of not working.

1.4 *(Opportunity Cost)* Determine whether each of the following statements is true, false, or uncertain. Explain your answers:
a. The opportunity cost of an activity is the total value of all the alternatives passed up.
b. Opportunity cost is an objective measure of cost.
c. When making choices, people carefully gather all available information about the costs and benefits of alternative choices.
d. A decision maker seldom knows the actual value of a forgone alternative based on future outcomes and therefore must make decisions based on expected values.

a. False—opportunity cost relates to the next best alternative in use; b. True—from the perspective of the firm, you can take an objective measure of what is being sacrificed when producing cars as opposed to trucks. But consumers evaluate opportunity costs based on their preferences, which are subjective; c. False—this would be too costly in a world of imperfect information and positive cost of processing this information; d. True—if your forgone alternative is sometime in the future. Here, you either calculate expected values if you know how to do this and appropriate information is available or you have to make educated guesses about forgone alternatives. If the forgone alternative is more current, calculating expected value is not required.

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2.1 *(Absolute and Comparative Advantage)* You have the following information concerning the production of wheat and cloth in Canada and the United Kingdom:

Labour Hours Required to Produce One Unit

	United Kingdom	Canada
Wheat	2	1
Cloth	6	5

a. What is the opportunity cost of producing a unit of wheat in the United Kingdom? In Canada?
b. Which country has an absolute advantage in producing wheat? In producing cloth?
c. Which country has a comparative advantage in producing wheat? In producing cloth?
d Which country should specialize in producing wheat? In producing cloth?

a. *In the United Kingdom, the opportunity cost of one unit of wheat is 1/3 unit of cloth (producing one unit of wheat takes 2 hours, the time that would allow you to produce only 1/3 of a unit of cloth). In Canada, the opportunity cost of one unit of wheat is 1/5 unit of cloth (producing one unit of wheat takes 1 hour, the time that would allow you to produce only 1/5 unit of cloth).*

b. *Canada has an absolute advantage in both goods; it is able to produce both products in less time than the United Kingdom requires.*

c. *Canada has a comparative advantage in wheat because it has the lowest opportunity cost of production (one-fifth cloth versus one-third cloth for the United Kingdom), while the United Kingdom has the comparative advantage in cloth. (The opportunity cost of cloth in Canada is 5 wheat. The opportunity cost of cloth in the United Kingdom is 3 wheat.)*

d. *Canada should specialize in wheat, and the United Kingdom should specialize in cloth. The country with the lower opportunity cost of producing a good should specialize in producing that output.*

2.2 *(Specialization)* Provide some examples of specialized markets or retail outlets. What makes the Web so conducive to specialization?

Students' answers will vary according to their experiences. One specialized market is that for military weapons. The stock exchange provides a specialized market for buying and selling company shares, and there are specialized markets for selling government bonds and foreign currencies. Specialized retail outlets could include movie theatres specializing in "art" films, wine shops, cheese shops, language schools, and so forth. Media such as the Web allow firms in specialized markets to advertise their products at relatively low cost and also permit customers to conduct interactive online searches for relatively specialized goods and services.

2.3 *(Specialization)* Explain how the specialization of labour can lead to increased productivity.

With specialization, individuals end up doing what they are most capable of doing compared to other individuals. Individuals end up doing what they are most productive at compared to other individuals. If you do a little bit of everything, it is likely that you won't be nearly as productive s you would otherwise be. Automobile manufacturing plants are much more productive than one individual attempting to produce a car by him or herself. This is one reason why factory production with specialization eventually dominated the marketplace.

2.4 *(Specialization)* If specialization yields increased productivity, why do some people do various household tasks on their own as opposed to hiring specialists to do these jobs?

To do household tasks costs time and money and most people have the time but not the money to have household tasks done. Hence, most people end up doing their household work, investing the time but saving

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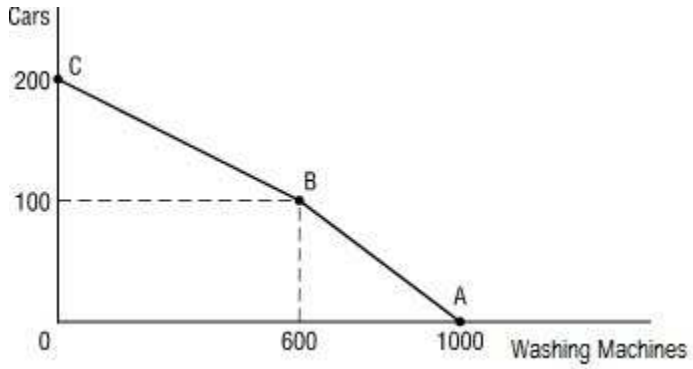
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on money. Many wealthy people engage the services of specialists to do household work because they have the cash or the opportunity cost of doing household work is much too high. Other individuals do some household work, such as childcare, because of the high utility and quality control generated by doing this specific task.

3.1 *(Shape of the PPF)* Suppose a production possibilities frontier includes the following combinations:

Cars	Washing Machines
0	1,000
100	600
200	0

a. Graph the PPF, assuming that it has no curved segments.
b. What is the cost of producing an additional car when 50 cars are being produced?
c. What is the cost of producing an additional car when 150 cars are being produced?
d. What is the cost of producing an additional washing machine when 50 cars are being produced? When 150 cars are being produced?
e. What do your answers tell you about opportunity costs?



a. The PPF drawn above is composed of two straight-line segments, AB *and* BC.

b. The cost of a car when 50 cars are produced is 4 washing machines. In the segment BA*, as you move from 0 to 100 cars, you must give up (1,000 − 600 = 400) washing machines. Thus, each additional car costs 400/100 = 4 washing machines along segment* BA *of this PPF.*

c. The cost of a car when 150 cars are produced is 6 washing machines. In the segment BC *of this PPF, as you move from 100 to 200 cars, you must forgo 600 washing machines. Thus, each additional car costs 600/100 = 6 washing machines along segment* BC *of this PPF. The 150th car costs you 6 washing machines.*

The cost of a washing machine when 50 cars are produced is one-quarter of a car. In the segment BA*, as you move from 600 to 1,000 washing machines, you must forgo 100 cars. {[100/(1,000 − 600)]} = ¼, the slope of segment* BA *of the PPF. Note: The PPF would indicate that when 50 cars are produced, 800 washing machines can be produced.*

d. When 50 cars are being produced, the cost of an additional washing machine is one-quarter (100/400) of a car. The cost of an additional washing machine when 150 cars are produced is one-sixth of a car. In the segment BC*, as you move from 0 to 600 washing machines, you must forgo 100 cars. (100/600) = 1/6, the slope of segment* BC *of the PPF. Note: The PPF indicates that when 150 cars are produced, only 300 washing machines are produced. Also note that the answers to this question are the inverse of the answers to questions (b) and (c).*

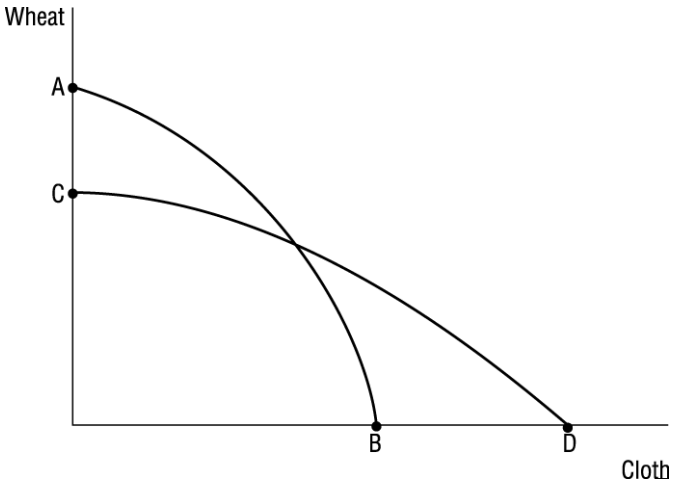
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e. As you increase the production level of either good, its (opportunity) cost per unit eventually increases. When you go from 50 cars produced to 150 cars produced, the cost in terms of washing machines forgone rises from 4 washing machines to 6 washing machines. When you go from 300 washing machines produced to 800 washing machines produced, the opportunity cost in terms of cars forgone rises from 1/6 of a car to 1/4 of a car.

3.2 *(Production Possibilities)* Suppose an economy uses two resources (labour and capital) to produce two goods (wheat and cloth). Capital is relatively more useful in producing cloth, and labour is relatively more useful in producing wheat. If the supply of capital falls by 10 percent and the supply of labour increases by 10 percent, how will the PPF for wheat and cloth change?

The PPF will shift inward along the axis measuring cloth production and outward along the axis measuring wheat production. This is represented by a shift from CD to AB on the following graph:



3.3 *(Production Possibilities)* There's no reason why a production possibilities frontier could not be used to represent the situation facing an individual. Imagine your own PPF. Right now—today—you have certain resources—your time, your skills, perhaps some capital. And you can produce various outputs. Suppose you can produce combinations of two outputs, call them studying and partying.

a. Draw your PPF for studying and partying. Be sure to label the axes of the diagram appropriately. Label the points where the PPF intersects the axes, as well as several other points along the frontier.

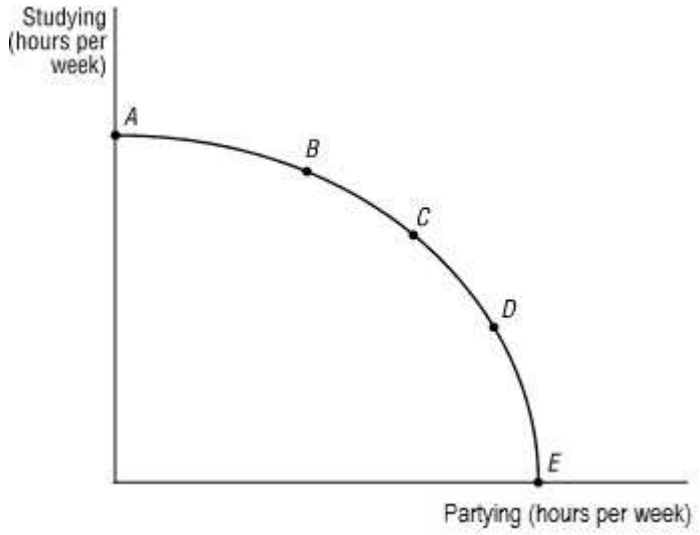
b. Explain what it would mean for you to move upward and to the left along your personal PPF. What kinds of adjustments would you have to make in your life to make such a movement along the frontier?

c. Under what circumstances would your personal PPF shift outward? Do you think the shift would be a "parallel" one? Why, or why not?

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a.



b. Moving upward and to the left along the PPF could be represented by a move from point C to point B. You would be giving up some partying to engage in more studying. You would have to focus your schedule so that you would frequent places where there were inducements to study rather than to party. The library, a quiet spot in the cafeteria, or a café playing classical music and offering quiet solitude would be your quest for at least a few more hours of the week.

c. The PPF drawn assumes that you have a fixed amount of time skills as well as some capital. Your time available can't change; there are only 24 hours in a day. However, your study skills could be enhanced by training or by acquiring a new computer. This increase in skills and capital in the production of studying would shift the PPF outward along the vertical axis, indicating that with the same time constraint, you are able to accomplish more studying. A parallel shift in the PPF could occur if that new computer also allowed you greater satisfaction partying on the internet. In this imagined example, the computer, the capital good, would enable you to do more of both in the same time.

3.4 *(Shifting Production Possibilities)* Determine whether each of the following would cause the economy's PPF to shift inward, outward, or not at all:
a. An increase in average length of annual vacations
b. An increase in immigration
c. A decrease in the average retirement age
d. The migration of skilled workers to other countries

Items a, c, and d all decrease the amount of labour available; thus, the PPF would shift inward. Item b increases the available labour, and thus the PPF would shift outward.

3.5 *(Production Possibilities)* Under what conditions would an economy be operating inside its PPF? On its PPF? Outside its PPF? Which of these three are possible and why?

To start off, draw a PPF as a point of reference. Inside: underperforming (unemployment, poor productivity unrelated to the quantity of factor inputs or technology); On: full employment, doing the best one can given all the inputs available, economic efficiency; Outside: not achievable, given inputs and technology, outside of the realm of possibility. Inside and on the PPF are possible. They are both obtainable, but only being on the PPF is economically efficient and consistent with full employment.

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3.6 *(Shifting Production Possibilities)* We have one economy where people save a larger percentage of their income than in another. Both economies start off with the same level of per capita income. If both economies invest their savings, how would this affect the production possibility curves and why?

We're basically assuming that both economies are starting off with the same PPF. If one of the economies saves more than the other, than the saving-intensive economy will be consuming less today than the less saving-intensive economy. But if the savings are invested in both economies, there will be more investment in the saving-intensive economy. This will shift outward this economy's PPF by more than that of the less saving-intensive economy. These differences in outward shifts would be intensified if investment embodies the best practice plant and equipment and technology. This generates more opportunities for future consumption and savings in the saving-intensive economy.

4.1 *(Economic Systems)* Canada is best described as having a mixed economy. What are some elements of command in Canada? What are some market elements? What are some traditional elements?

The government represents an element of command in the Canadian economy. Government spending includes services such as teachers and police officers and goods such as roads and bridges. In addition, government regulates the private economy in a number of areas including antitrust, workplace safety, zoning, food safety, illegal activities, and so on. Elements of tradition or custom would include our style of dress, our choice of occupation similar to that of our parents, and whether to live in multi-generational homes as many new Canadians do.

4.2 *(Economic Systems)* Why would you expect mixed economies such as Canada's to perform better than pure exchange or pure command economies? For example, Canada performs much better than more free market New Zealand. Why is this the case?

We know for a fact that different variants of mixed economies perform best. Economies such as Norway, Finland, Denmark, Sweden, France, Germany, and of course Canada and the United States are examples of successful mixed economies. Mixed economies are characterized with the appropriate mix of government intervention, inclusive of rules and regulations, government demand for goods and services, and the provision of public goods to facilitate the achievement of high levels of GDP per person and relatively high rates of economic growth. One reason Canada has outperformed New Zealand is a better mix of free market and government. Check out this site for one perspective: http://theprogressivecynic.com/2013/11/18/our-mixed-economic-system/. And, here's another: http://www.investopedia.com/terms/m/mixed-economic-system.asp

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SUPPLEMENTAL CASES, EXERCISES, AND PROBLEMS

Experiential Exercises

1. The following data are drawn from Statistics Canada and World Bank sources, easily located on the Web (just type Stats Canada or World Bank into Google search).

	Unemployment Rate	Canadian Real GDP $billions 2010 Constant or Real US Dollars
1980	7.5	776
1985	10.5	883
1990	8.1	1008
1995	9.5	1097
2000	6.8	1137
2005	6.8	1515
2010	8.1	1614
2013	7.0	1728
2014	6.9	1771

   a. Have students assume that for each year the real GDP estimate represents a point along Canada's production possibility frontier. (Hint: the frontier should look more like an inverted L since there are no data on substitution between different types of output.)

   b. If this were the case, what's happening to the production possibility frontier from one year to the next and why? Ask students to illustrate through shifts in the production possibility frontier.

   c. Ask students to determine and then explain the relationship between the unemployment rate and the level of real GDP.

   d. Remind students that there was a great economic crisis in 2008. Ask them if they impute any information about the impact of the crisis on the Canadian economy and the extent to which it might have recovered from the crisis.

2. The ability to measure the true (opportunity) cost of a choice is a skill that will pay great dividends. Send students to any issue of the *Financial Post* or the *Wall Street Journal* to find an article that discusses a decision some firm has made. Then have them review this chapter's section titled "Choice and Opportunity Cost" and make a list of the kinds of opportunity costs involved in the firm's decision.

Additional Questions and Problems

1. *(Opportunity Costs)* Discuss the ways in which the following conditions might affect the opportunity cost of going to a movie tonight:
   a. You have a final exam tomorrow.
   b. School will be out for one month starting tomorrow.
   c. The same movie will be on TV next week.
   d. The Super Bowl is on TV.

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a. *This greatly increases the opportunity cost. Your opportunity cost includes the ticket price plus the value of the loss of study time and loss of sleep that may have a negative effect on your final exam grade tomorrow.*

b. *This significantly lowers the opportunity cost. Your opportunity cost includes the ticket price plus the value of any other activity you might have engaged in tonight instead, such as staying home and watching TV.*

c. *This leaves the opportunity cost unchanged, but the movie becomes a less attractive alternative.*

d. *This may increase or decrease the opportunity cost, depending on whether or not you are a football fan.*

2. *(Comparative Advantage)* "You should never buy precooked frozen foods because the price you pay includes the labour costs of preparing the food." Is this conclusion always valid, or can it be invalidated by the law of comparative advantage?

This statement conflicts with the idea of comparative advantage. If your opportunity cost of preparing food is higher than the cost of buying prepared food, the law of comparative advantage would direct you to buy the product with the lowest opportunity cost. There will be some people with very high time costs (e.g., surgeons) who will make the decision not to cook. The fact that prepared foods have become popular indicates that they are fulfilling a need. This need arises from the increasing opportunity cost of preparing one's own food. The increasing opportunity cost is caused by the fact that value of time to the professional person is rising faster than the cost of precooked frozen food.

3. *(Production Possibilities)* Under what conditions is it possible to increase production of one good without decreasing production of another good*?*

An economy can produce more of one good without sacrificing production of another good if it is operating inside its PPF. The economy is inside the PPF when some resources are idle or when they are allocated inefficiently. Therefore, production can increase by using more of the idle resources or by allocating resources more efficiently.

4. *(Shifting Production Possibilities)* In response to an influx of undocumented workers, the U.S. Congress made it a federal offence to hire them. How do you think this measure affected the U.S. production possibilities frontier? Do you think all industries were affected equally*?*

Such a law should cause the PPF to shift inward, because fewer resources would be available to the United States economy. The more labour-intensive industries, such as agriculture and services, would be hurt the most, especially those requiring unskilled labour.

5. *(Production Possibilities)* "If society decides to use its resources efficiently (that is, to produce *on* its production possibilities frontier), then future generations will be worse off because they will not be able to use these resources." If this assertion is true, full employment of resources may not be a good thing. Comment on the validity of this assertion.

The answer to this question depends on how the resources are used. If resources are used to produce consumer non-durables and if little capital is produced, then future generations will be worse off. If society's resources are used to produce capital goods and research, then economic growth in the future will be faster, making future generations better off. The key to this question is the realization that most of society's productive resources are reproducible and that full employment can promote growth.

6. *(Economic Questions)* What basic economic questions must be answered in a barter economy? In a primitive economy? In a capitalist economy? In a command economy?

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All of the listed types of economies face the same three basic questions: what goods and services to produce, how to produce those goods and services, and for whom the goods and services should be produced.

7. *(Economic Systems)* What are the major differences between a pure capitalist system and a pure command system? Is Canada closer to a pure capitalist system or to a pure command system?

   Laws about resource ownership and the extent to which the government attempts to coordinate economic activity vary among economic systems from the most free (the capitalist system) to the most regimented (command system). A pure capitalist system is characterized by private ownership of all resources and coordination of all economic activity based on prices generated in free markets. A pure command economy is characterized as government control of both resources and production. Canada represents a mixed system with government accounting for less than one-third of all economic activity. In addition, government regulates the private economy in a number of ways (e.g., laws affecting antitrust, workplace safety, zoning, and illegal activities).

ANSWERS TO CASE STUDIES

2.1 The Opportunity Cost of University

1. During the Vietnam War, colleges and universities in the United States were overflowing with students. Was this bumper crop of students caused by a greater than expected return on a college education or by a change in the opportunity cost of attending college? Explain.

   During the Vietnam War period, the armed forces were populated with male draftees. A male college student, however, received a deferment for the period during which he was a full-time student. Therefore, the opportunity cost of entering college, at least for the vast majority of young males, no longer included the civilian salary that one could have earned. Also, the deferment allowed male students to put off enlisting in the armed forces, and some may have hoped that the war would be over by the time they graduated in four years. For females, on the other hand, the opportunity cost may well have increased because of the labour shortage created by the draft and the increase in college attendance among males.

   This case is available to students online at http://www.nelson.com/econmacro1e.

2.2 Rules of the Game and Economic Development

1. Why is the standard of living higher in countries where doing business is easier? Why do governments collect any taxes or impose any regulations at all?

   More business development means more jobs, more tax revenue, and more consumer products. The jobs boost household income. The tax revenue helps fund highways, schools, public safety, and other public goods valued in a healthy economy. More consumer goods offer households a wider choice of products.

   Governments collect taxes to fund goods that the public wants, and government imposes certain regulations to keep business activity from harming the public.

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CHAPTER 2
ECONOMIC TOOLS AND ECONOMIC SYSTEMS

In this chapter, you will find:
INTRODUCTION
LEARNING OUTCOMES
CHAPTER OUTLINE
CHAPTER SUMMARY
TEACHING POINTS

INTRODUCTION

This chapter emphasizes key ideas in economic analysis, such as opportunity cost, the production possibilities frontier, absolute and comparative advantage, the division of labour and the gains from specialization, and how economic systems answer the three economic questions of what, how, and for whom. All these ideas address the economic problem of how to allocate scarce resources among unlimited wants. The use of graphs was introduced in the Appendix to Chapter 1. In this chapter, graphs are integrated into the discussion.

LEARNING OUTCOMES

1 Describe the impact of differing opportunities on choice

Resources are scarce, but human wants are unlimited. Because you cannot satisfy all your wants, you must choose, and whenever you choose, you must forgo some option. Choice involves an opportunity cost. The opportunity cost of the selected option is the value of the best alternative that is forgone.

2 Explain how comparative advantage, specialization, and exchange affect economic outcomes (output)

The law of comparative advantage says that the individual, firm, region, or country with the lowest opportunity cost of producing a particular good should specialize in that good. Specialization according to the law of comparative advantage promotes the most efficient use of resources. The specialization of labour increases efficiency by (a) taking advantage of individual preferences and natural abilities, (b) allowing each worker to develop expertise and experience at a particular task, (c) reducing the need to shift between different tasks, and (d) allowing for the introduction of more specialized machines and large-scale production techniques.

3 Outline how economies function as production systems

The production possibilities frontier, or PPF, shows the productive capabilities of an economy when all resources are used efficiently. The frontier's bowed-out shape reflects the law of increasing opportunity cost, which arises because some resources are not perfectly adaptable to the production of different goods. Over time, the frontier can shift in or out as a result of changes in the availability of resources, in technology, or in the rules of the game. The frontier demonstrates several economic concepts, including efficiency, scarcity, opportunity cost, the law of increasing opportunity cost, economic growth, and the need for choice.

4 Describe different economic systems and the decision-making rules that define them

All economic systems, regardless of their decision-making processes, must answer three basic questions: What is to be produced? How is it to be produced? And for whom is it to be produced?

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Economies answer the questions differently, depending on who owns the resources and how economic activity is coordinated. Economies can be directed by market forces, by the central plans of government, or, in most cases, by a mix of the two.

CHAPTER OUTLINE

CHOICE AND OPPORTUNITY COST

Opportunity Cost

The opportunity cost is the value of the best alternative that is forgone. Because of scarcity, whenever people make a choice, another opportunity is forgone.

Opportunity Cost Is Subjective

Only the individual making the choice can identify the most attractive alternative. Calculating opportunity cost requires time, information, and the assumption that people rationally choose the most valued alternative.

Calculating Opportunity Cost Requires Time and Information

Learning about alternatives is costly and time consuming. Some choices are based on limited or wrong information, and may turn out badly.

Time: The Ultimate Constraint

Suppose you have unlimited money. When you choose to pursue one activity, you cannot do something else at the same time. You must choose from among the competing uses of your scarcest resource—time.

Opportunity Cost Varies with Circumstance

The opportunity cost depends on the alternatives.

Sunk Cost and Choice

- **Sunk cost:** A cost that has already been incurred and cannot be recovered and thus should be irrelevant for present and future economic decisions.
- **Economic decision makers** should ignore sunk costs and consider only those costs that are affected by the choice.

COMPARATIVE ADVANTAGE, SPECIALIZATION, AND EXCHANGE

The Law of Comparative Advantage

The individual, firm, region, or country with the *lowest opportunity cost* of producing a particular output should specialize in producing that output.

Absolute Advantage Versus Comparative Advantage

- **Absolute advantage**: The ability to produce a product with fewer resources than other producers require.
- **Comparative advantage**: The ability to produce a product at a lower opportunity cost than other producers face. Resources are allocated most efficiently when production and trade conform to the law of comparative advantage.

Specialization and Exchange

- **Barter**: A system of exchange in which products are traded directly for other products.
- **Money**: A medium of exchange in economies with extensive specialization.

Division of Labour and Gains from Specialization

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- Division of labour: breaking down the production of a good into separate tasks
- Specialization of labour: focusing work effort on a particular product or a single task
  - Takes advantage of individual preferences and natural abilities
  - Allows workers to develop more experience at a task
  - Reduces the need to shift between tasks
  - Permits the introduction of labour-saving machinery
  - May be tedious and injury prone due to repetitive motion

THE ECONOMY'S PRODUCTION POSSIBILITIES

Efficiency and the Production Possibilities Frontier, or PPF

- The production possibilities frontier (PPF) is a simple model designed to depict the production capabilities of an economy, given current resources. The PPF assumes:
  - Output is limited to two broad classes of products: consumer goods and capital goods.
  - Production takes place over a given time period.
  - The economy's resources are fixed in quantity and quality over this period.
  - The available technology does not change during the period.
  - The "rules of the game" are also assumed to be fixed.

Inefficient and Unattainable Production

- The PPF identifies the possible combinations of the two types of goods that can be produced when all available resources are employed efficiently. Resources are employed efficiently when there is no change that could increase the production of one good without decreasing the production of the other good.
  - **Efficient production:** Getting the most from available resources, indicated by points *along* the production possibilities frontier.
  - **Inefficient production:** Points *inside* the PPF.
  - **Unattainable production:** Points *outside* the PPF.

Shape of the Production Possibilities Frontier

- The PPF derives its *bowed-out* shape from the law of increasing opportunity cost.
- **The law of increasing opportunity cost:** To produce more of one good, a successively larger amount of the other good must be sacrificed.
- Opportunity cost increases as the economy produces more of one good and less of the other because resources in the economy are not all perfectly adaptable to the production of both types of goods.
- If all resources were perfectly adaptable to alternative uses, the PPF would be a straight line, reflecting a constant opportunity cost along the PPF.

What Can Shift the Production Possibilities Frontier?

Over time, the PPF may shift if resources, technology, or the rules of the game change. Economic growth is reflected by an outward shift of the PPF.

Changes in Resource Availability

If people work longer hours, the PPF shifts outward. A decrease of resources, such as during times of war, will shift the PPF inward.

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Increases in Capital Stock
When more capital goods (such as machines or education) are produced during one period, more output will be produced the following period, shifting the PPF outward.

Technological Change
Technological discoveries that employ resources more efficiently will shift the PPF outward.

Improvements in the Rules of the Game
Improvements in the formal and informal institutions that support the economy shift will shift the PPF outward.

What We Learn from the PPF

- The PPF illustrates the concepts of efficiency, scarcity, opportunity cost, law of increasing opportunity cost, economic growth, and the need for choice.
- However, the PPF does not tell us which combination to choose. How society goes about choosing depends on the nature of its economic system.

ECONOMIC SYSTEMS

Three Questions Every Economic System Must Answer

An economic system is the set of mechanisms and institutions that resolve the what, how, and for whom questions.

What Goods and Services Are to Be Produced?
All economies must make numerous choices about what will be produced.

How Are Goods and Services to Be Produced?
Millions of decisions must be made to determine which resources will be employed and how those resources will be combined.

For Whom Are Goods and Services to Be Produced?
The economic system must decide how to allocate goods and services among the population.

Pure Capitalism

Pure capitalism is characterized by individual decision making and distribution through markets:

- All resources are under private ownership.
- **Private property rights:** Owners have the right to use, rent, or sell their resources or property.
- Market prices are generated in free markets and guide resources to their most productive use.
- Goods and services are channelled to the consumers who value them the most.
- According to Adam Smith, market forces allocate resources by the "invisible hand."

A pure market system has flaws:

- No central authority protects property rights, enforces contracts, or ensures that rules of the game are followed.
- People with no resources to sell could starve.
- Unequal bargaining power can result in some individuals earning very low incomes, well below their productive potential—a point made by Adam Smith.
- Some producers may try to monopolize markets by eliminating the competition.
- Production or consumption of some goods involves damaging by-products (e.g., pollution).
- Private firms have no incentive to produce public goods.

Because of these limitations, *government* has been given some role in most market economies.

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Pure Command System

A pure command system is an economic system characterized by the public ownership of resources and centralized planning.

- In theory, property is owned communally; central plans spell out the answers to the questions of what, for whom, and how much; and individual choices are incorporated into central plans (communism).

A pure command system has flaws:

- Running an economy is so complicated that some resources are used inefficiently.
- Because nobody in particular owns resources, each person has less incentive to employ resources in their highest-valued use, so some resources are wasted.
- Central plans may reflect the preferences of central planners more than the preferences of society.
- Because government is responsible for all production, the variety of products tends to be more limited than in a capitalist economy.

Mixed and Transitional Economies

In mixed and transitional economies, the economic system is characterized by the private ownership of some resources and the public ownership of other resources; some markets are regulated by government.

- No country exemplifies either type of economic system in its pure form.
- Canada represents a mixed system, with government directly accounting for about one-quarter of all economic activity. In addition, government regulates the private sector in a variety of ways (e.g., workplace safety, environmental quality, competitive fairness, food and drug quality).

Economies Based on Custom or Religion

Some economies are moulded largely by custom or religion—for example, the caste system in India or the prohibition on charging interest under Islamic law.

CHAPTER SUMMARY

Resources are scarce, but human wants are unlimited. Because you cannot satisfy all your wants, you must choose, and whenever you choose, you must forgo some option. Choice involves an opportunity cost. The opportunity cost of the selected option is the value of the best alternative forgone.

The law of comparative advantage says that the individual, firm, region, or country with the lowest opportunity cost of producing a particular good should specialize in that good. Specialization according to the law of comparative advantage promotes the most efficient use of resources.

The specialization of labour increases efficiency by (a) taking advantage of individual preferences and natural abilities, (b) allowing each worker to develop expertise and experience at a particular task, (c) reducing the need to shift between different tasks, and (d) allowing for the introduction of more specialized machines and large-scale production techniques.

The production possibilities frontier, or PPF, shows the productive capabilities of an economy when all resources are used efficiently. The frontier's bowed-out shape reflects the law of increasing opportunity cost, which arises because some resources are not perfectly adaptable to the production of different goods. Over time, the frontier can shift in or out as a result of changes in the availability of resources, in technology, or in the rules of the game. The frontier demonstrates several economic

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concepts, including efficiency, scarcity, opportunity cost, the law of increasing opportunity cost, economic growth, and the need for choice.

All economic systems, regardless of their decision-making processes, must answer three basic questions: What is to be produced? How is it to be produced? And for whom is it to be produced? Economies answer the questions differently, depending on who owns the resources and how economic activity is coordinated. Economies can be directed by market forces, by the central plans of government, or, in most cases, by a mix of the two.

TEACHING POINTS

1. This chapter contains several fundamental concepts that should be fully discussed because they are used throughout the textbook to discuss economic choice in a variety of settings. When discussing opportunity cost and choice, be sure to distinguish between those costs that are associated with marginal decision making and those that are not (i.e., sunk costs). Also, many students will not immediately recognize that nonmonetary costs are components of opportunity costs so it helps to emphasize this point.

2. Comparative advantage is a second important concept emphasized in this chapter. For additional examples of comparative advantage, consider the classic example in which an attorney can type and file faster and more accurately than a secretary. Because of comparative advantage, it is usually preferable for the lawyer to hire a secretary to do the typing and filing, rather than for the lawyer to do the typing and filing since the opportunity cost is lower. Another example is that it is better for Hawaii to specialize in pineapple growing and then trade with Idaho for potatoes, rather than Hawaii growing both pineapples and potoes. This chapter makes the point that opportunity cost is a relative concept, which is based on relative rather than absolute resource requirements in the production of goods. Because comparative advantage implies the specialization of resource use, trade becomes important in allocating goods to consumers. Students often note that self-reliance is an admirable concept. The discussion of comparative advantage shows that specialization and exchange lead to a more efficient allocation of resources.

3. When drawing the production possibilities frontier, partition the horizontal axis into equal segments, and then show the ever-increasing amounts of the alternative good that must be sacrificed to obtain more of the good in question. You thereby illustrate the law of increasing opportunity costs. Students often confuse increasing total and increasing marginal opportunity costs. You should emphasize, through your construction, that it is incremental costs that are increasing. Draw your curve large with plenty of bow in it. Numerical examples are helpful to some students.

4. Sometimes people claim that the PPF is bowed out because of the law of diminishing returns. Diminishing returns, of course, assumes an increase in one type of resource, holding other resources constant. This is not the case along the PPF, since all resources tend to be reallocated between goods with movement along the PPF. You could incorporate the law of diminishing returns into your discussion by fixing capital between the sectors and then shifting only the labour resources. The textbook's approach, however, is to assume that resources are not homogeneous; some are specific to the production of a particular good. The result is increasing opportunity costs and a bowed-out PPF.

5. Once the PPF is understood in terms of its construction and shape, it is important to emphasize the concepts that it illustrates. Scarcity is reflected by the fact that some output combinations are not feasible. The infinite number of output combinations that are feasible illustrates choice.

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Efficiency is illustrated when production occurs along the PPF, and the shape of the PPF illustrates the law of increasing opportunity costs. Furthermore, if resources are different, then the required specialization of resource usage implies that some form of trading occurs in order for each resource owner to consume all (both) goods.

6. A discussion of shifts in the production possibilities frontier leads naturally to a consideration of the sources of economic growth. Technological advances will shift the PPF. Such advances take time and require society to save, just as with the accumulation of physical capital. Emphasize that the PPF need not always shift out in a balanced way. Technological advance is often specific to an industry. Improvements to the rules of the game and in the education and health of the population may also lead to an outward shift in the PPF.

7. This chapter closes by considering how different economic systems answer the three economic questions. You may wish to discuss how numerous political systems have shifted toward more market-based economies over the past century to emphasize the capitalist approach. The chapter contains a fairly short reference to Adam Smith and his notion of the "invisible hand." You may want to discuss this important concept in more detail.

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