



Chapter 2: Scarcity and The Production Possibilities Curve

The Economic Problem: Scarcity and Choice Again

Learning Objectives

After studying this chapter, you should be able to

- 2.1** Explain the relationship among scarcity, choice, and opportunity cost
- 2.2** Use the concepts of production possibilities schedules and production possibilities curves
- 2.3** Illustrate shifts in the production possibilities curve
- 2.4** Explain the fundamental economic questions and classify them as microeconomic or macroeconomic issues
- 2.5** Construct a circular flow model and explain the flow of goods, services, and resources in the economy

Assess Your Knowledge

Answers to these questions can be found on ...

1. Think of cost as the trade-off you encounter when you make choices. After high school graduation, you opted for college over entering the workforce. Using this concept of cost, what did the decision to go to college cost you?
2. Which of the following will enable a country to produce more goods and services?
 - a. An increase in the country's workforce
 - b. A general increase in the prices of goods and services
 - c. Neither a nor b
 - d. Both a and b
3. What is a firm?
4. What is economic growth?

Scarcity and Choice Again

LEARNING OBJECTIVE 2.1 Explain the relationship among scarcity, choice, and opportunity cost

Limited resources require making choices, but decision-making goes beyond merely selecting one option over another. Every choice involves sacrifice. For example, if you have \$40 and must choose between purchasing a video game or going to the movies with friends, selecting the video game means losing the shared experience of the cinema. On the other hand, choosing the movie means giving up the chance to own the game. This highlights not only a preference for one option but also the trade-off involved, as limited funds prevent enjoying both the game and the movie. Consider buying a television set, which could mean forgoing a trip to Paris. Choosing

a movie night might lead to a lower grade in economics. Attending an 8:30 a.m. class costs you extra sleep. Each decision carries a trade-off, revealing the true cost of your choices.

When you make a choice and opt for one thing over another, you incur a cost. We call this cost opportunity cost. **Opportunity cost** refers to the next-best alternative that is sacrificed when you make a decision. Remember, this cost isn't necessarily measured in terms of money; it's defined by whatever you give up.

opportunity cost the next-best alternative that is sacrificed when a choice is made.

When the Canadian government invests in new submarines instead of healthcare, the opportunity cost is the healthcare services that could have been funded. On a personal level, choosing to go to the movies means the ticket price becomes the opportunity cost, representing what else could have been done with that money.

Imagine Sarah, a diligent student, with 10 hours of free time, faces a choice between studying and playing video games. She chooses gaming. For Sarah, an hour spent studying typically boosts her test scores by 5 points, with each point valued at \$10 due to potential future job opportunities or scholarships. Thus, by choosing gaming over studying, Sarah's opportunity cost is \$500, not \$50. This figure represents the tangible value she forgoes—the potential \$500 gain from investing her time in studying, quantifying her decision's trade-off.

In an alternate scenario where Sarah recognizes the importance of studying and decides to spend 10 hours on it instead of gaming, her opportunity cost becomes the leisure she foregoes by not playing. For each hour dedicated to studying, she misses out on an hour of gaming enjoyment. Assuming an hour of gaming is valued at \$6 worth of pleasure, Sarah's decision to study carries an opportunity cost of \$60 in missed entertainment. This scenario highlights that opportunity cost quantifies the value of what we sacrifice to pursue a different option.

$$\text{Opportunity cost} = \frac{\text{What we give up}}{\text{What we get}}$$

Example: In order to get 3 digital movie downloads, you must give up 6 USB flash drives. Calculate the opportunity cost of digital movies.

Solution:

$$\frac{\text{What we give up}}{\text{What we get}} = \frac{6 \text{ USB flash drives}}{3 \text{ digital movie}} = \frac{2 \text{ USB flash drives}}{1 \text{ digital movie}}$$

The opportunity cost of a digital movie is 2 flash drives.

We are forced to choose only because of scarcity; and whenever we choose, we incur a cost, that is, an opportunity cost. Figure 2.1 illustrates the relationship well.

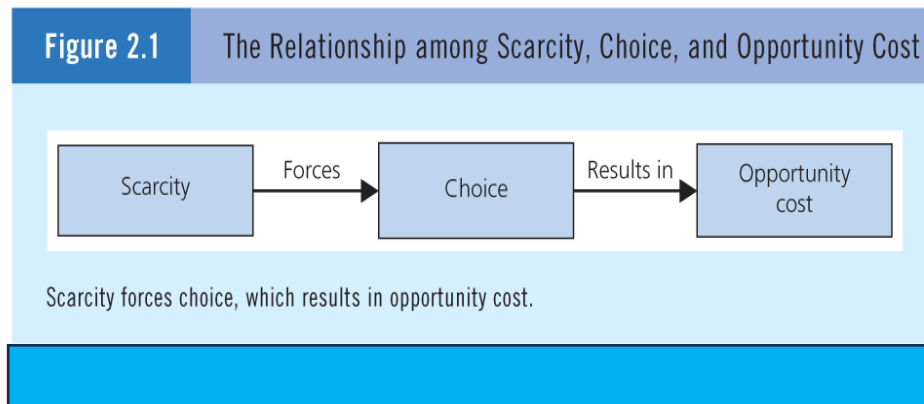
Practical examples of opportunity cost

In our daily lives, we're constantly make decisions. Consider whether to take a part-time job while in college, or if a scheduling conflict arises, choosing between economics and mathematics. Or even debating whether to attend economics class on a given day. Let's explain how the concept of opportunity cost aids in deciding about attending (or skipping) an economics class. Assuming you've made it to college, you attend classes believing in the benefits they offer. What could these benefits be? Perhaps a strong attendance record that boosts your grade, a deeper understanding of central bank strategies for interest rate control—a topic that intrigues you, and spending time with friends who are also in the course. However, attending class isn't without its costs. You might miss out on a card game with friends, a trip to the mall, or the chance to catch a movie you've been excited to see. These missed opportunities represent the cost of attending class, illustrating the concept of opportunity cost in deciding whether to go to class.

Scarcity forces choice, which results in opportunity cost.

To make the decision, you weigh the benefits against the costs. If, in your own subjective evaluation, the benefits of going to class outweigh the costs, then you will decide in favour of attending the class. If, in your estimation, the costs outweigh the benefits, then you will decide against attending the class. This is the cost-benefit approach to decision making. The **cost-benefit approach** is an analysis in decision making that involves the comparison of costs and benefits. The decision rule is simple: if the benefits outweigh the costs, then do the activity; otherwise, don't.

Figure 2.1 The Relationship among Scarcity, Choice, and Opportunity Cost



cost-benefit approach an analysis in decision making that involves the comparison of costs and benefits

Cost benefit analysis in all decision making

When analyzing decisions, it is important to distinguish between total and marginal concepts in both benefits and costs. The **total benefit** of an activity refers to the overall satisfaction, value, or gain derived from undertaking that activity—whether it is consuming a product, attending school, operating a business, or engaging in an activity. For example, a firm’s total benefit might be the total revenue earned from selling a product line. In contrast, the **marginal benefit** is the additional value gained from engaging in one more unit of the activity. For a business, this could mean the revenue from selling one extra unit of output: **marginal revenue**. For a student, it could be the extra learning or income potential from taking one additional course.

A similar distinction applies to costs. The **total cost** refers to the cumulative expense of undertaking an activity, covering all units consumed, produced, or performed. This includes tuition for all courses taken, or the total cost of producing all units in a factory. The **marginal cost**, by contrast, is the added cost that comes from doing just a little bit more. In production, it is the cost of producing one additional unit. In education, it might be the cost (in time or money) of adding one more course.

Economics relies on these comparisons to guide rational decision-making. When deciding whether to begin an activity—starting a business, enrolling in a program, or purchasing a product—individuals and firms compare **total benefits** with **total costs**. The decision is

considered rational if the total benefit exceeds the total cost. This framework explains the launch of new projects, programs, or purchases.

Marginal Analysis

Once the activity has begun, ongoing decisions require marginal analysis. The relevant question becomes whether to continue the activity. For instance, should a firm produce one more unit, or should a student take one more course? These choices are made by comparing **marginal benefit** and **marginal cost**. As long as the marginal benefit remains greater than or equal to the marginal cost, it makes sense to proceed. If the cost of an additional unit exceeds the benefit it brings, the activity should stop.

This approach applies broadly—to consumption, production, education, and policy. It explains how consumers decide how much to buy, how firms decide how much to produce, and how governments decide how much to spend. Marginal analysis lies at the heart of economic reasoning.

Rational decision-making requires comparing total benefits with total costs when initiating an activity and comparing marginal benefits with marginal costs when deciding whether to continue. This principle applies across a wide range of financial decisions—budgeting, investment, income planning, and consumption. Minor decisions shape long-term outcomes.

A student who considers working an extra hour at \$12 must weigh the income earned against what is given up. If that hour would otherwise be used to study for an important exam, and if the estimated long-term benefit of studying is \$25 per hour, then the work does not pass the marginal test. The student should allocate time to studying instead of earning additional income.

Consumption decisions follow the same logic. A student who receives a \$375 tax refund might consider spending \$55 on headphones. Even modest purchases carry consequences. If the satisfaction gained is only \$35, the total benefit falls short of the total cost. Redirecting the money toward savings or student debt repayment would provide a greater return.

In some cases, decisions involve trade-offs between short-term income and long-term career prospects. Suppose a student receives a freelance job offer worth \$120 for a six-hour weekend shift. Some offers come at a cost. That same weekend, a networking event offers access to potential summer internships. If the student believes the event could lead to a \$4,000 internship, then the opportunity cost of missing it exceeds the \$120 freelance income. In this case, the marginal analysis favors attending the event.

All economic decisions, whether personal, business, or public, involve weighing benefits against costs. The comparison between **total benefits** and **total costs** determines whether an activity should begin; the comparison between **marginal benefits** and **marginal costs** determines whether it should continue. This framework applies to every choice involving scarce resources. By recognizing both the full cost and the added cost of action, individuals and institutions can make more disciplined, forward-looking decisions that maximize value and minimize waste.

Thinking in terms of opportunity cost applies to both simple and complex decisions, including those with substantial financial implications. Consider David's choice after finishing secondary school: he can either start a full-time job that pays \$25,000 per year or attend college for two years to earn a diploma. The total cost of college—\$35,000 for tuition, books, transportation, and supplies—adds to the opportunity cost, as he would forgo the income he could have earned during that time by working.

To fully assess the cost of the diploma for David, we need to consider both the direct educational expenses and the opportunity cost associated with not working. The immediate costs amount to \$35,000, but this figure doesn't include the potential \$25,000 annual income he forfeits by choosing study over work, totaling \$50,000 over two years. Therefore, if David considers only the \$35,000 direct cost, he greatly underestimates the true cost of his education. The comprehensive cost of the diploma is actually \$85,000, combining both the direct costs and the forgone salary, which represents the opportunity cost.

For David to make an informed decision, he must weigh the diploma's \$85,000 total cost against its potential benefits. These benefits might include a higher salary, better working conditions, increased job security, and the prestige that comes with holding a college diploma. If these advantages outweigh the cost, David may decide that pursuing education is worth delaying immediate employment. However, if the benefits do not justify the \$85,000 expense,

he might choose to enter the workforce, earning \$25,000 annually. This evaluation highlights the importance of factoring in both direct and opportunity costs when making major decisions.

Production Possibilities

LEARNING OBJECTIVE 2.2 Discuss and use the concept of production possibilities schedules and production possibilities curves

What are production possibilities?

The production possibilities of an economy illustrate its capacity to manufacture goods and services using available resources. Let's consider an economy that solely focuses its resources

on producing two goods: smartphones and personal computers. We will illustrate the economy's potential production combinations of these two items in a hypothetical Table 2.1.

This table represents different scenarios where the economy allocates its resources between smartphone and personal computer production in various proportions. Each combination reflects a specific allocation of resources, showing how the economy's output shifts based on its production choices. This approach helps in understanding the trade-offs and opportunity costs associated with focusing on one product over the other, given the limited resources available.

Reading Comprehension

The answers to these questions can be found on ...

1. What is the relationship between scarcity, choice, and opportunity cost?
2. Define opportunity cost and give an example to demonstrate your understanding of the concept.
3. Briefly explain the cost-benefit approach to decision making. Give an example of the practical use of this approach.
4. Using the concept of opportunity cost, give a possible explanation for the observation that most college students prefer late morning classes to early morning classes.

Table 2.1 A Production Possibilities Schedule Showing Constant Cost

Possibilities	Number of Smart Phones (000 000)	Number of Computers (000 000)
<i>A</i>	15	0
<i>B</i>	12	1
<i>C</i>	9	2
<i>D</i>	6	3
<i>E</i>	3	4
<i>F</i>	0	5

If the economy dedicates all its resources exclusively to smartphone production, it could reach a maximum output of 15 million smartphones (option A). Conversely, if it allocates all resources to produce only personal computers, the maximum output is 5 million computers (option F). Between these two extremes, the economy can achieve a variety of production combinations of smartphones and computers. For instance, it could produce 12 million smartphones and 1 million computers (option B), or 3 million smartphones and 4 million computers (option E), as illustrated in the hypothetical Table 2.1.

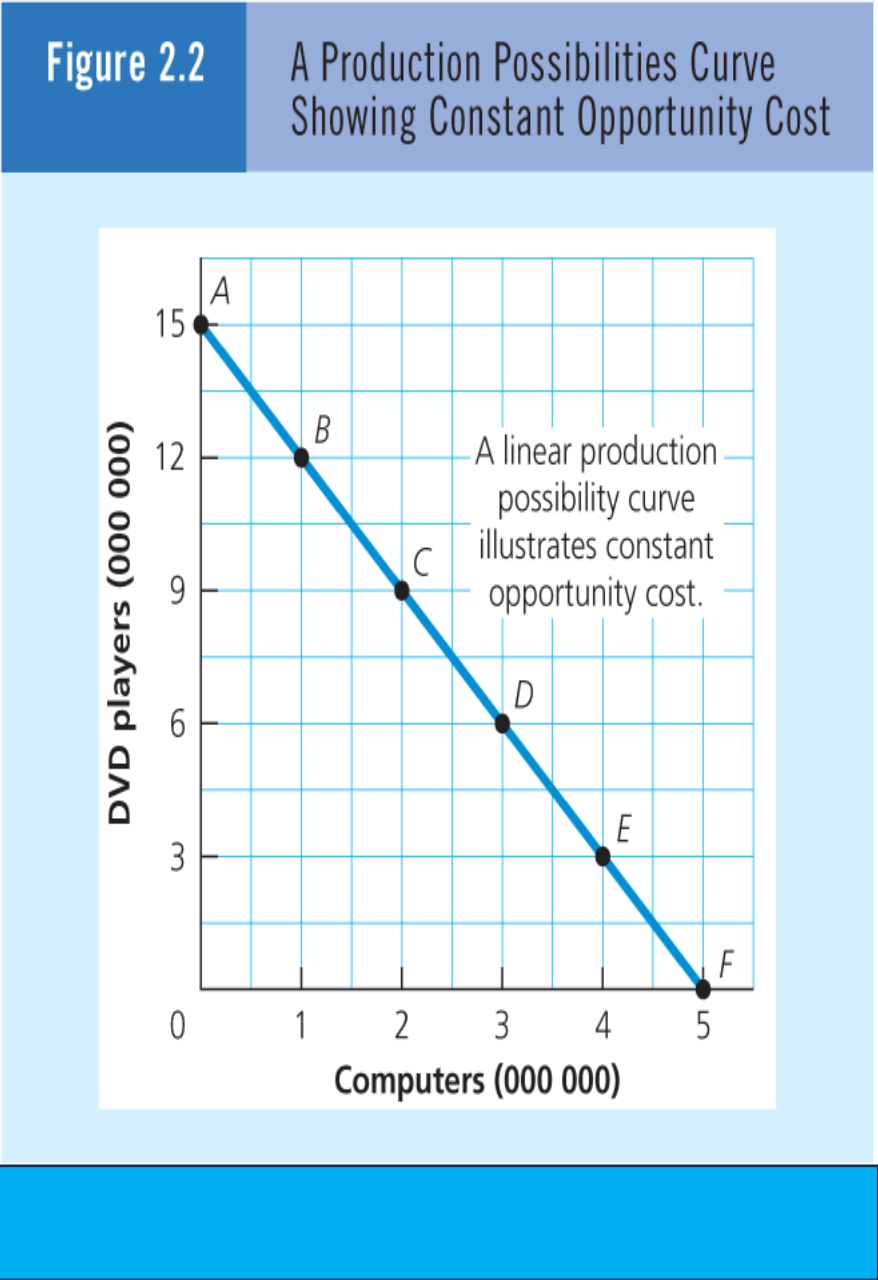
This scenario highlights that to produce an additional 1 million computers, the economy must sacrifice the production of 3 million smartphones. Therefore, the opportunity cost of manufacturing 1 million computers is 3 million smartphones. In this example, the opportunity cost of switching production from smartphones to computers remains constant across different production possibilities.

Table 2.1, known as a **production possibilities (p-p) schedule**, represents an economy's production capabilities in a table. It demonstrates the various combinations of goods and services—in this instance, smartphones and computers—that an economy can produce, given its current technological capabilities and assuming full utilization of its resources. This schedule shows how an economy can allocate its resources between different goods to understand the trade-offs and opportunity costs associated with each possible combination.

production possibility (p-p) schedule a table showing various combinations of two goods and services that can be produced with full utilization of all resources and a given state of technology.

Note that the economy can produce 6 000 000 smart phones and 1 000 000 computers; but in so doing, it will not be using all its resources. Note also that if it is producing 6 000 000 smart phones, it cannot at the same time produce 4 000 000 computers. Why not? Because it does not have enough resources.

Figure 2.2 **A Production Possibilities Curve Showing Constant Opportunity Cost**



The production possibilities curve

The information from the production possibilities table can be illustrated on a graph, where smartphones are plotted on the vertical axis and computers on the horizontal axis. This graph plots the six combinations of smartphones and computers, labeled A to F in Table 2.1, as demonstrated in Figure 2.2. The resulting curve indicates the maximum quantities of smartphones and computers that can be produced by this hypothetical economy with the current

technology. Known as a **production possibilities curve (PPC) or production possibilities frontier (PPF)**, this curve serves as a visual representation of the economy's production capabilities. It delineates all possible combinations of goods that can be produced when all resources are utilized efficiently, and the technological conditions remain constant.

production possibilities (p-p) curve a graph showing all combinations of goods and services that can be produced if all resources are fully employed and technology is constant.

The curve depicted in Figure 2.2 is linear, a straight line, due to the assumption of constant opportunity cost. This means that the cost of producing an additional unit of computers is always the same quantity of smartphones. Essentially, it suggests that computers and smartphones can be exchanged at a constant rate, specifically, three smartphones for one computer. This characteristic of a linear production possibilities curve is a graphical representation of constant opportunity cost.

Non-linear production possibilities curves

PRODUCTION POSSIBILITIES CURVES (PPCS) ARE USUALLY CONCAVE TO THE ORIGIN, REFLECTING THE LAW OF INCREASING OPPORTUNITY COSTS. THIS SHAPE INDICATES THAT AS MORE OF ONE GOOD IS PRODUCED, INCREASINGLY LARGER AMOUNTS OF THE OTHER GOOD MUST BE SACRIFICED. IN SOME RARE CASES—WHEN RESOURCES ARE PERFECTLY ADAPTABLE TO BOTH GOODS—THE PPC MAY APPEAR LINEAR, BUT THIS IS AN EXCEPTION, NOT THE RULE.

IN PRACTICE, CONSTANT OPPORTUNITY COST IS AN UNCOMMON SCENARIO DUE TO THE VARIED EFFICIENCY OF RESOURCES ACROSS DIFFERENT USES. CONSTANT OPPORTUNITY COST WOULD ONLY PREVAIL IF EVERY RESOURCE WERE EQUALLY EFFICIENT IN EVERY POTENTIAL APPLICATION, AN UNREALISTIC CONDITION. RESOURCES, INCLUDING LABOR AND LAND, DISPLAY DIFFERENT LEVELS OF PRODUCTIVITY DEPENDING ON THEIR APPLICATION. FOR EXAMPLE, SOME INDIVIDUALS EXCEL AS ENGINEERS, WHEREAS OTHERS ARE BETTER SUITED TO COMPUTER SCIENCE. THIS DIVERSITY IN RESOURCE EFFICIENCY LEADS TO PRODUCTION POSSIBILITIES CURVES (PPCS) THAT TYPICALLY EXHIBIT A CURVED SHAPE, REFLECTING THE VARYING OPPORTUNITY COSTS INCURRED WHEN PRODUCING DIFFERENT COMBINATIONS OF GOODS. FOR INSTANCE, CERTAIN PARCELS OF LAND ARE INHERENTLY BETTER SUITED FOR GRAPE CULTIVATION, WHILE OTHERS ARE MORE CONDUCTIVE TO GROWING APPLES. THIS VARIATION MEANS THAT NOT ALL RESOURCES ARE EQUALLY EFFECTIVE IN ALL USES; THIS CAUSES THE OPPORTUNITY COST OF PRODUCING ONE GOOD OVER ANOTHER TO CHANGE. CONSEQUENTLY,

PPCS FREQUENTLY HAVE A CURVED SHAPE TO ILLUSTRATE THE SHIFTING OPPORTUNITY COSTS, TO DEPICT REAL-WORLD PRODUCTION SCENARIOS MORE ACCURATELY. THIS CURVATURE REFLECTS THE ECONOMIC PRINCIPLE THAT RESOURCES ARE NOT UNIFORMLY EFFICIENT ACROSS ALL USES; THERE ARE VARYING OPPORTUNITY COSTS WHEN PRODUCING DIFFERENT COMBINATIONS OF GOODS. AS SUCH, THE PPC CURVE PROVIDES A MORE REALISTIC VISUAL REPRESENTATION OF AN ECONOMY'S CAPACITY TO PRODUCE GOODS, CONSIDERING THE COMPLEXITY AND DIVERSITY OF RESOURCE ALLOCATION AND EFFICIENCY.

IN REAL-WORLD SCENARIOS, RESOURCES ARE NOT EQUALLY EFFICIENT IN EVERY SECTOR. FOR EXAMPLE, CERTAIN RESOURCES MAY BE BETTER SUITED FOR PRODUCING SMARTPHONES, WHILE OTHERS EXCEL IN MANUFACTURING COMPUTERS. WHEN RESOURCES ARE REALLOCATED FROM ONE TYPE OF PRODUCTION TO ANOTHER, INCREASING COSTS ARE USUALLY ENCOUNTERED. THIS INCREASE IN COSTS ARISES BECAUSE THE RESOURCES REDIRECTED TO THE NEW SECTOR TEND TO BE LESS EFFICIENT THERE. INITIALLY, REASSIGNING WORKERS FROM SMARTPHONE PRODUCTION TO COMPUTER MANUFACTURING MIGHT SEEM STRAIGHTFORWARD, BUT AS MORE RESOURCES ARE SHIFTED, IT BECOMES INCREASINGLY DIFFICULT TO FIND WORKERS FROM THE SMARTPHONE SECTOR WHO ARE ALSO EFFICIENT IN COMPUTER PRODUCTION. THE LIMITED POOL OF WORKERS PROFICIENT IN BOTH SECTORS HIGHLIGHTS LEADS TO INCREASING OPPORTUNITY COSTS WHEN RESOURCES ARE SHIFTED AWAY FROM THEIR OPTIMAL USES.

THEREFORE, PRODUCTION POSSIBILITIES CURVES (P-P CURVES) ARE UNLIKELY TO BE LINEAR BECAUSE OF THE DIFFERENCES IN THE EFFICIENCY OF RESOURCES ACROSS DIFFERENT SECTORS OF THE ECONOMY.

BUSINESS SITUATION 2.1

A manufacturer of neckties has a given amount of money that can be used to produce silk ties and polyester ties. Producing more silk ties is possible only at the expense of polyester ties.

What tool can this manufacturer use to illustrate this trade-off situation?

The answer to this Business Situation can be found in Appendix A.

The shape of a production possibilities curve

Table 2.2 will help to answer the question. We retain the assumptions that the economy uses all its resources and that it has a given technology.

Table 2.2 A Production Possibilities Schedule Showing Increasing Cost

	Number of Smart Phones	Number of Computers
Possibilities	(000 000)	(000 000)
<i>A</i>	15	0
<i>B</i>	14	1
<i>C</i>	12	2
<i>D</i>	9	3
<i>E</i>	5	4
<i>F</i>	0	5

Table 2.2 demonstrates the principle of increasing opportunity cost. Producing 15,000,000 smartphones leaves no capacity for computer manufacturing. Allocating resources from smartphone to computer production to produce 1,000,000 computers reduces smartphone output to 14,000,000. This adjustment necessitates sacrificing 1,000,000 smartphones for 1,000,000 computers. Producing an additional 1,000,000 computers requires a further sacrifice of 2,000,000 smartphones (decreasing smartphone production from 14,000,000 to 12,000,000), making the opportunity cost for the second million computers 2,000,000 smartphones. The cost continues to rise: 3,000,000 smartphones for the third million computers, 4,000,000 for the fourth, and 5,000,000 smartphones for the fifth million computers. Table 2.3 summarizes these escalating costs; it highlights the increased number of smartphones sacrificed for each subsequent million computers produced.

Indeed, as the economy boosts its production of computers, the cost of producing additional units—measured in terms of foregone smartphones—escalates. This phenomenon of increasing opportunity cost is a fundamental economic principle that applies broadly across various productive activities. It reflects the reality that resources are not equally efficient in all uses; as more resources are diverted from their optimal use (in this case, smartphone production) to an alternative use (computer production), the less efficient they become, leading to higher opportunity costs. This concept is a cornerstone of economic theory, illustrating the trade-offs and decisions that societies face in allocating their limited resources.

Increasing opportunity cost

Economists call this trend of escalating costs the **law of increasing opportunity cost**. It states that as the production of a good increases, the opportunity cost of producing another good rises.

***law of increasing opportunity cost** the phenomenon of increasing opportunity cost a good as an economy increases its production of another good.*

Table 2.3 The Opportunity Cost of Computers in Terms of Smart Phones

Computer	Opportunity Cost in Smart Phones
First 1 000 000 computers	1 000 000 smart phones
Second 1 000 000 computers	2 000 000 smart phones
Third 1 000 000 computers	3 000 000 smart phones
Fourth 1 000 000 computers	4 000 000 smart phones
Fifth 1 000 000 computers	5 000 000 smart phones

Figure 2.3 A Production Possibilities Curve Showing Increasing Opportunity Cost

Figure 2.3

A Production Possibilities Curve Showing Increasing Opportunity Cost

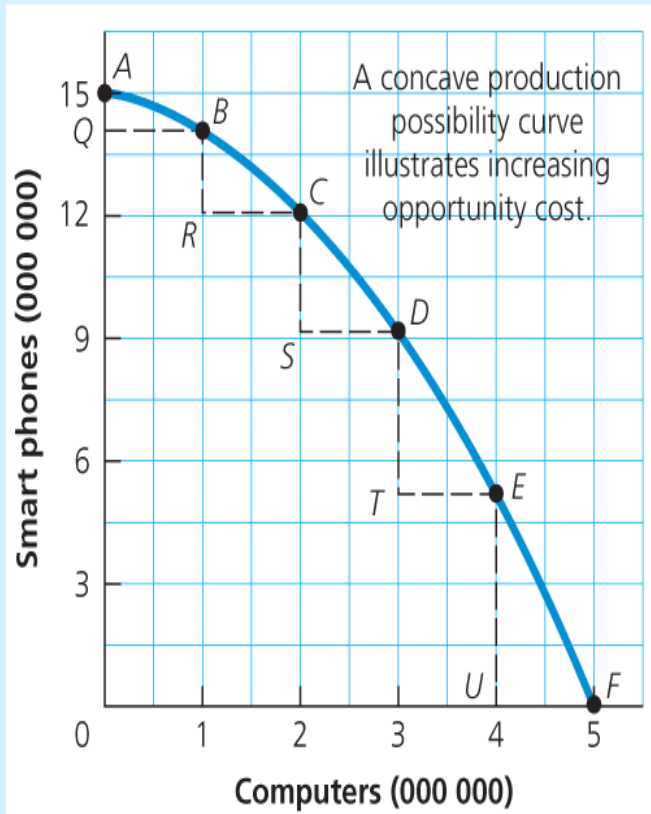
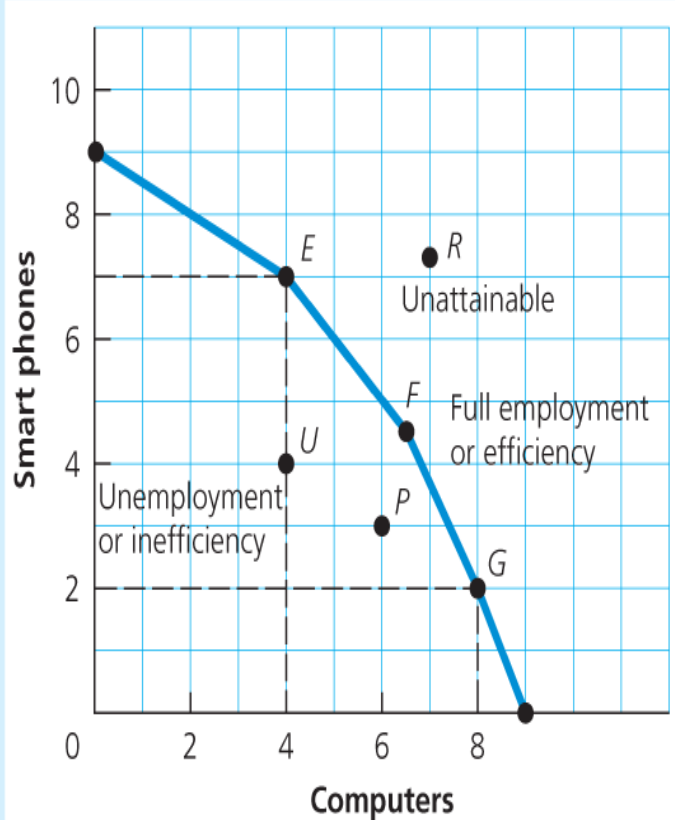


Figure 2.4 A Production Possibilities Diagram Illustrating Scarcity and Choice

Figure 2.4

A Production Possibilities Diagram Illustrating Scarcity and Choice



The shape of the production possibilities curve with increasing opportunity cost

Let us plot the information in Table 2.2 on a graph. The resulting graph is shown as Figure 2.3.

Note that the horizontal segments QB , RC , SD , TE , and UF are all equal, representing equal increases in units of computers. The vertical segments QA , BR , CS , DT , and EU represent the units of smart phones that must

be sacrificed to obtain the additional units of computers. Thus, to increase the production of computers from 1 000 000 to 2 000 000 (RC), the economy must give up 2 000 000 smart phones (BR). To increase the production of computers from 2 000 000 to 3 000 000 (SD), the economy must give up 3 000 000 smart phones (CS); and to increase the production of computers from 4 000 000 to 5 000 000 (UF), the economy must give up 5 000 000 smart phones (EU). Note that $EU > DT > CS > BR$. This means that the opportunity cost of a unit of computers increases as the economy increase its production of computers. A curve that is bowed outward like the curve in Figure 2.3 is said to be concave. A concave production

possibilities curve illustrates increasing opportunity cost. Because of the prevalence of increasing opportunity cost, the p-p curve is concave.

Illustrating scarcity and choice

Consider the production possibilities diagram in Figure 2.4. All points on the curve, such as *E*, *F*, and *G*, represent combinations of smart phones and computers that the economy can produce with full employment of all available resources and with its current state of technology. Therefore, points on the p-p curve represent full employment.

Notice that once the economy is operating on its p-p curve, it cannot increase its production of one commodity without reducing its production of some other commodity. Economists use the term **productive efficiency** to describe this situation. Such points as *U* and *P*, which lie below the p-p curve, represent unemployment of resources. An economy that is operating inside its p-p curve is not producing its maximum output of goods and services. Economists use the term **productive inefficiency** to describe an economy in which it is possible to produce more of one commodity without producing less of some other commodity. Such a point as *R* represents a combination of smart phones and computers that lies beyond the economy's productive capacity. Such a combination is currently unattainable. The diagram illustrates scarcity. If the economy is operating at point *E*, producing seven units of smart phones and four units of computers, and decides to increase its production of computers to eight units, it can do so only by reducing its production of smart phones, moving from point *E* to point *G*. The necessary reduction in the production of smart phones is a result of scarcity, as is the fact that combination *R* is unattainable. With more resources, the economy could conceivably attain combination *R*. Scarcity forces the economy to choose among various production alternatives that are available. With full use of its resources and given technology, the economy must choose among points along the p-p curve.

productive efficiency a situation in which a firm or an economy cannot increase its production of one good without reducing its production of another good.

productive inefficiency a situation in it is possible for a firm or an economy to produce more of one good without producing less of another good.

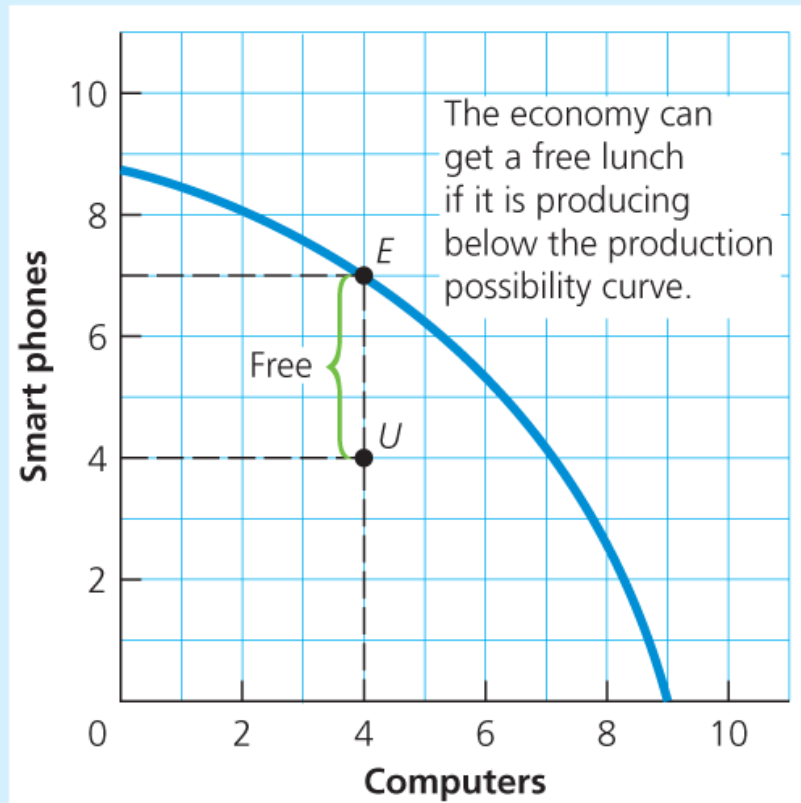
Can the economy ever be in a situation where it can produce more of one item without giving up any of another item?

That is an interesting question. Let us answer it with the help of Figure 2.5. Assume that the economy is operating at point U , producing four units of smart phones and four units of computers. At U , there is unemployment. By using unemployed resources, the economy can move to point E on the p-p curve, producing seven units of smart phones and still four units of computers. Thus, the economy produces three additional units of smart phones without sacrificing any computers. Because the increased output associated with the move from U to E does not involve sacrificing any output, we can conclude that the opportunity cost of unemployed resources is zero. If we are at U , it is even possible to increase the production of both goods as the economy moves towards the P-P curve.

Figure 2.5 *Free Lunch: Getting Something for Nothing*

Figure 2.5

Free Lunch: Getting Something for Nothing



Shifts in the Production Possibilities Curve

LEARNING OBJECTIVE 2.3 Discuss and illustrate shifts in the production possibilities curve

Factors that affect the production possibilities curve

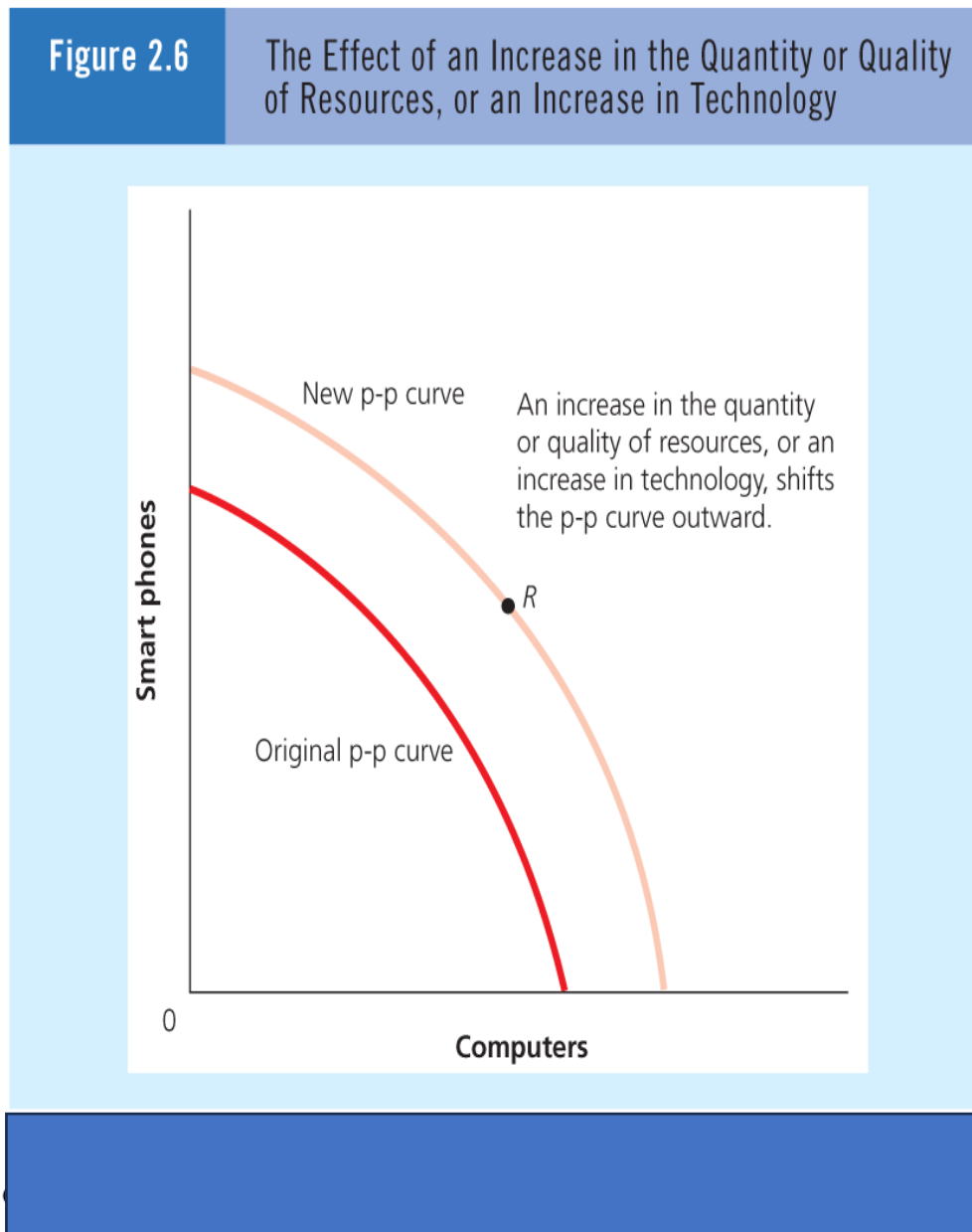
Let's look at Figure 2.6. Point *R* lies beyond the original p-p curve and is therefore currently unattainable. It represents a combination of smart phones and computers that this economy

Reading Comprehension

1. What does a linear p-p curve tell us about opportunity cost?
2. Explain why p-p curves are more likely to be concave than linear.
3. State the law of increasing opportunity cost.
4. Define the following:
 - a) Productive efficiency
 - b) Productive inefficiency
5. In economics, there is no way of getting something for nothing (no free lunch). Do you agree? Explain fully.

cannot produce with its available resources and its current state of technology. Should technology advance or should the quantity or quality of its resources increase, then the economy could produce more smart phones and more computers. This would result in a new p-p curve lying to the right of the original curve as shown in Figure 2.6, enabling the economy, conceivably, to attain a combination represented by point *R*. Point *R* would then lie on the new p-p curve, and would be attainable.

Figure 2.6 The Effect of an Increase in the Quantity or Quality of Resources, or Improvement Increase in Technology



The outward shift of the p-p curve in Figure 2.6 represents an increase in the economy's productive capacity. Economists refer to this increase in productive capacity as **economic growth**. Of course, a decrease in the quantity or quality of resources will cause the p-p curve to shift inward, to the left.

economic growth an

increase in the economy's productive capacity

The new p-p curve in Figure 2.6 is parallel to the original curve

A parallel shift of the production possibilities curve (PPC) indicates that improvements in resource quantity or quality, or technological advancements, equally impact the production of smartphones and computers. However, it is more common for technological innovations and changes in resource quantity and quality to affect different industries in distinct ways. For instance, the adoption of robotics in automobile manufacturing might revolutionize that industry while leaving agriculture largely unaffected. This disparity underscores the varied nature of technological progress and resource development, highlighting their uneven influence across different sectors of the economy.

Differences in technological change

If technological advances occur only in the manufacturing industry, the capacity to produce manufactured goods would increase, while the ability to produce fish and fish products would remain unchanged. This would result in a non-parallel outward shift of the production possibility (p-p) curve, as shown in Diagram A of Figure 2.7. Conversely, if technological advances take place solely in the fishing industry, the growth resulting from this advancement would be limited to that sector. The p-p curve would again shift outward in a non-parallel manner, as illustrated by Diagram B of Figure 2.7.

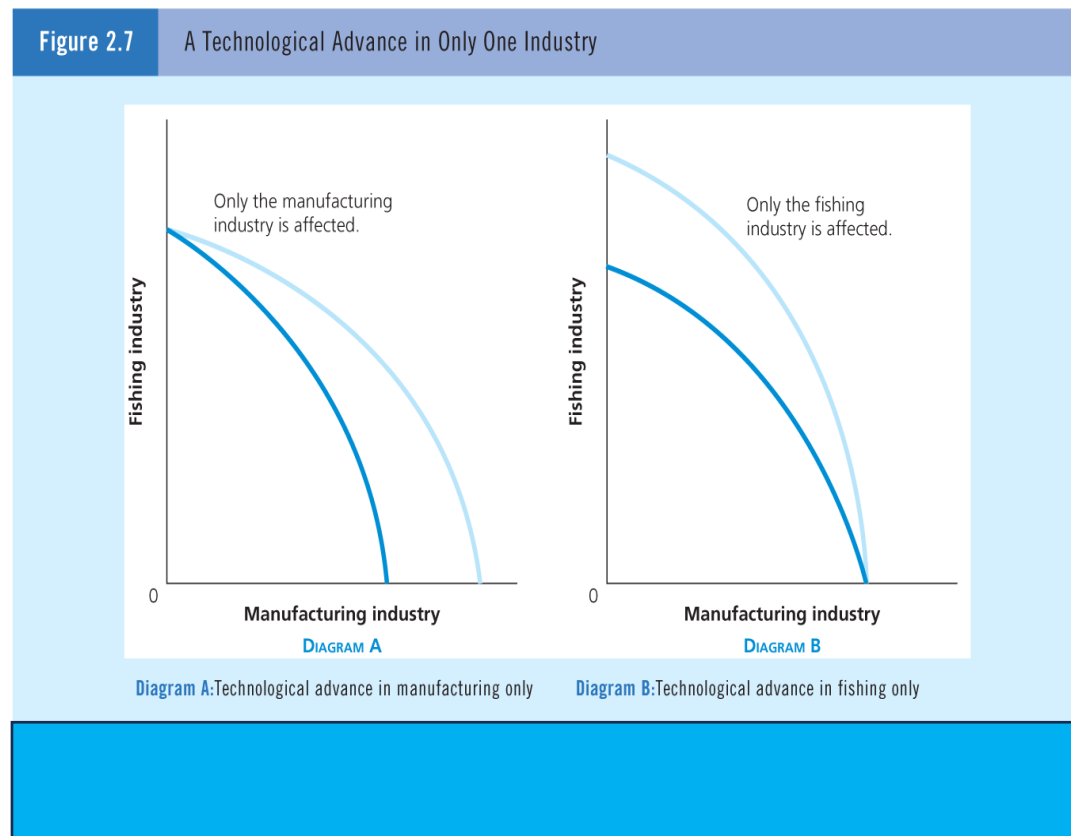
Figure 2.7 Technological Advance in Only One Industry

Diagram A: Techno advance in manufacturing only

Diagram B: Technological advance in fishing only

Changes in output and the production possibilities curve

Only a change in the quantity or quality of the economy's resources, or a change in technology, will shift the production



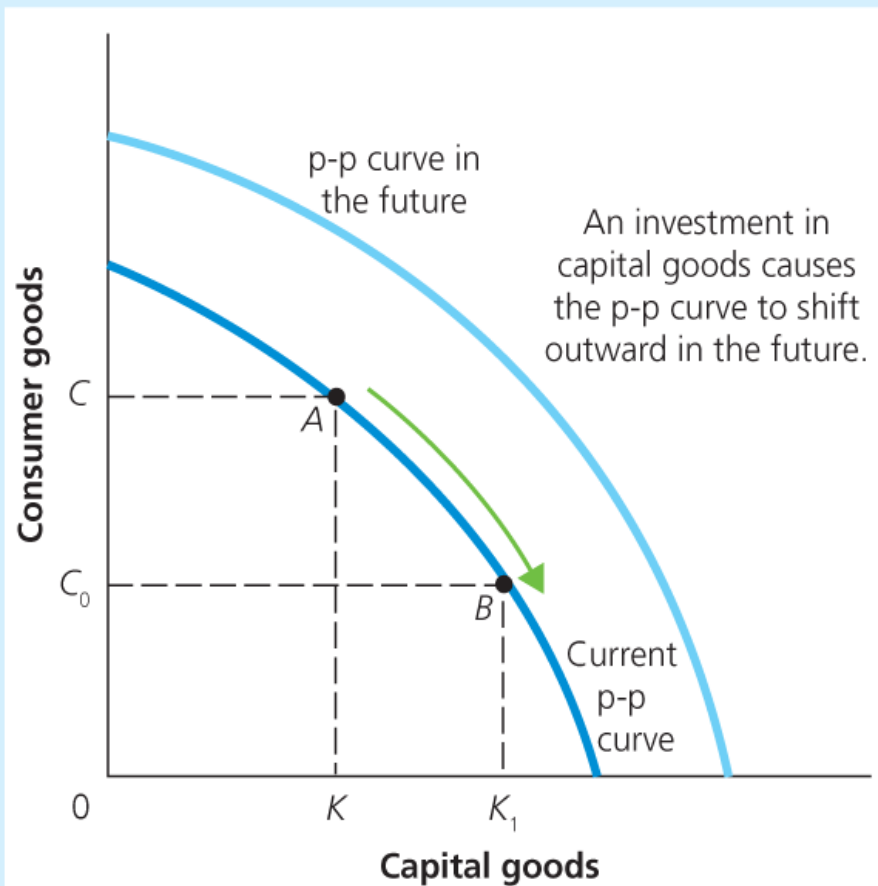
possibilities (p-p) curve. Such a shift indicates a change in the economy's productive capacity. For instance, if new resources are discovered but not yet utilized, the p-p curve will shift to the right, reflecting the economy's potential to produce more goods and services, even if that potential is not currently realized. Conversely, if existing resources that were previously unused are now being utilized, actual production will increase, but the p-p curve will not shift since there is no increase in the economy's productive capacity.

Shifts in the production of capital and consumer goods

Figure 2.8 A Sacrifice in Current Consumption for Future Consumption

Figure 2.8

A Sacrifice in Current Consumption for Future Consumption



When society prioritizes the production of more capital goods and fewer consumer goods, it sacrifices current consumption to enhance the economy's capital stock. This increased capital stock will enable the economy to produce more of both capital and consumer goods in the future, resulting in an outward shift of the

production possibilities curve (P-P curve). For instance, moving from point A to point B involves reducing current consumer goods from OC to OC_0 while increasing capital goods from OK to OK_1 . This shift will ultimately provide the economy with greater resources for producing both types of goods in the future.

In summary, the production possibilities curve (P-P curve) illustrates the following important economic concepts:

1. Efficiency: Any point on the P-P curve signifies efficiency or full employment of resources.

This means that the economy is utilizing its available resources to their maximum potential, producing goods and services without any waste. At these points, it's impossible to increase the production of one product without reducing the production of another.

2. Inefficiency: Points located inside the curve represent inefficiency or unemployment of

Reading Comprehension

The answers to these questions can be found on ...

1. Give three examples of specific events that would cause Canada's p-p curve to shift to the right.
2. How can economic growth be illustrated on a p-p diagram?
3. Explain why a fall in prices will not shift an economy's p-p curve.
4. Explain why p-p curves are unlikely to shift in or out in a parallel manner.
5. How can you use the PP curve to show the effects of earthquakes?

resources. This scenario indicates that the economy is not utilizing all of its resources effectively, leading to lower overall production levels. It reflects a situation where some resources are underutilized or idle, which could be due to economic downturns or structural issues.

3. Scarcity: Any point outside the P-P curve illustrates scarcity, indicating that the combination of goods represented cannot be produced given the existing resources and technology. These

points reflect unattainable production levels with the current capacity of the economy, highlighting the limitations imposed by resource availability.

4. Opportunity Cost: A movement along the curve represents a trade-off between the production of two different goods. As more of one product is produced, less of the other is produced, illustrating the concept of opportunity cost. The opportunity cost of producing an additional unit of one product is represented by the slope of the P-P curve, indicating the rate at which one good must be sacrificed to increase the output of the other.

5. Economic Growth: A rightward or outward shift of the P-P curve signifies economic growth. This shift occurs when there is an increase in resources, such as a larger labor force or more capital goods, or an improvement in technology that enhances productivity. Economic growth allows for an increase in the production capacity of an economy, enabling it to produce more goods and services.

6. Disasters: The P-P curve can also demonstrate a decrease in total production due to natural or man-made disasters. In such cases, the curve shifts to the left or toward the origin, indicating a reduction in the economy's capacity to produce goods and services. This shift reflects the loss of resources, such as infrastructure damage or loss of labor, resulting from catastrophic events.

Fundamental Economic Questions

LEARNING OBJECTIVE 2.4 Explain the fundamental economic questions and classify them as microeconomic or macroeconomic issues

What are the fundamental questions of microeconomics?

The fundamental microeconomic questions can be stated briefly as

- What?
- How?

■ For whom?

What does the “What” refer to?

The “*What*” refers to the specific goods and services that an economy will produce and the quantities in which they will be produced. It encompasses decisions about whether to produce automobiles, houses, grapes, milk, computers, musical instruments, television sets, oil, electricity, roads, and so on, as well as the quantities of each. Due to the constant issue of scarcity, producing more of one good means sacrificing the production of another. For instance, if more hospital beds are provided, there might be fewer classrooms as a result. Determining what to produce and in what amounts are critical decisions that every economy must confront.

What does the “How” refer to?

Once the decisions have been made regarding the types and quantities of goods and services that will be produced, a decision must be made regarding how the goods and services will be produced. How will apples be harvested? Will it be done manually or with the help of specialized machinery? What method of production will be used in producing automobiles? Will robotics be used instead of labour for certain activities? *How* refers to the method of production that will be used in producing the goods and services that have been decided on. The economy’s scarce resources can be combined in many ways to produce goods and services. The economy must decide which to use.

What does “For whom” refer to?

For whom refers to who gets the goods and services after they have been produced. Once the “what” and the “how” questions have been addressed, a decision must be made regarding the distribution of the goods and services among the various members of the community. Should all the available goods and services produced be divided equally among all members of society, or should some people get a larger share than others?

What are some of the important issues of macroeconomics?

A list of macroeconomic problems and issues may be arbitrary, but we can identify five key issues at the core of macroeconomics.

Aggregate Output Macroeconomics focuses on **aggregate output**, which refers to the total volume of goods and services produced within an economy. This is a critical issue because the standard of living is directly tied to the volume of goods and services available for consumption. If a society can maintain its total output of goods and services close to its potential, its citizens are likely to experience a higher quality of life. Fluctuations in output are also significant; economists refer to the alternating periods of growth and contraction in aggregate production as **business cycles**. These economic fluctuations can lead to challenges such as unemployment and inflation—two crucial macroeconomic issues that policymakers often need to address.

aggregate output the total volume of goods and services produced in the economy over a period.

business cycles fluctuations in the aggregate output of goods and services.

Unemployment. Unemployment is the state in which individuals, capable and willing to work at prevailing wage rates, struggle to secure employment. Low unemployment typically corresponds to an efficient economy operating near its production potential (the p-p curve). Conversely, high unemployment accompanies economic inefficiency and reduced output. Unemployment directly affects people's income and, consequently, their ability to afford the goods and services they need. The question arises: why does our economy frequently fall short of achieving full employment?

Unemployment the condition that exists when people who are willing and able to work at prevailing wage rates are unable to find jobs

Inflation Inflation, refers to the sustained increase in the average level of prices over time. You may have observed over the last three years that a dollar doesn't buy as much as it did a few years ago, and your parents might have experienced even more significant declines in the value of a dollar. When the value or purchasing power of a dollar diminishes, it leads to a rise in the cost of living. The cost of living represents the amount of money you need to spend to obtain goods and services. Inflation is essentially an ongoing increase in the cost of living, and most people are averse to it because they find themselves needing more money to purchase the same quantity of goods and services. The current high rate of inflation makes this issue particularly relevant.

***inflation** a sustained increase in the average level of prices over time; a persistent increase in the cost of living*

cost of living *the amount of money that must be paid to obtain goods and services*

Economic growth enables Canadians to enjoy high living standards.

While some countries have grappled with staggering inflation rates exceeding 200%, a general trend emerges: developed nations typically maintain low inflation rates, while developing countries often face higher inflationary pressures. For instance, in 2023, the rate of inflation was 400% in Venezuela, 172% in Zimbabwe, and 113% in Argentina. In contrast, in Canada, the rate of inflation in 2023 was 3.3%. In the United States, inflation was reported at 6.5% in 2022. Nonetheless, economists remain concerned about the perils associated with high inflation rates.

Economic Growth Economic growth is the increase in the volume of goods and services produced in an economy. Over the past few decades, the Canadian economy has experienced significant economic growth. Economic growth improves the standard of living. Comparing today's production of goods and services to that of the 1960s and 1970s, it's evident that our standard of living has improved. Achieving economic growth is contingent not only on efficient resource utilization but also on expanding our productive capacity over time. Macroeconomics seeks to address key questions related to economic growth: What are the primary factors driving it? How can we attain and sustain prolonged periods of economic growth? While economic growth brings significant benefits, it's also essential to consider its associated costs.

The International Economy The Canadian economy is intricately linked to the global economy, and it doesn't operate in isolation. Virtually every economy is influenced by factors beyond its borders, and today's economies are more interconnected than ever before. International trade blocks have formed, and new ones continue to emerge, underscoring the reality of globalization, even though there have been instances of reduced interaction between certain countries, such as the US and China, in the early 2020s.

The Canadian economy is heavily influenced by global events. For instance, when crude oil prices surge, it can significantly affect Canada's economic landscape. Recent developments, such as the war in Ukraine, have introduced new complexities. We must consider whether Canadian businesses can compete globally in this evolving geopolitical environment and if Canadian producers can effectively access international markets. Macroeconomics seeks to address such questions, enhancing our understanding of the connection between global events and Canada's economy.

BUSINESS SITUATION 2.2

On September 14, 2023, the Prime Minister of Canada announced that if grocery stores don't stabilize the prices of groceries, the government may step in.

How can the government intervene to stabilize grocery prices?

The answer to this Business Situation can be found in Appendix A.

The Simple Circular Flow Model

LEARNING OBJECTIVE 2.5 Construct a circular flow model and explain the flow of goods, services, and resources in the economy

The circular flow model

Businesses (we can call them firms) purchase resources (land, labour, capital, and entrepreneurship) and use them to produce goods and services for sale to their customers. The sellers of the resources receive income in the form of rent, wages and salaries, interest and dividends, and profits, which they use to purchase goods and services from the firms. The expenditures of the firms' customers accrue to the firms as their income or revenue, which they use to purchase resources; and the process continues. This flow of resources, goods and services, expenditures, and income between sectors of the economy is referred to as the **circular flow Objective w**.

circular flow an economic model that shows the flow of resources, goods and services, expenditures, and income between sectors of the economy

The diagrammatic representation of the circular flow model

Let us make the following simplifying assumptions:

1. The economy consists of only two sectors: households and firms. **Households** make decisions about what resources to sell and what goods and services to buy. **Firms** make decisions about what resources to purchase and how the resources will be used to produce goods and services for sale to the households.

Reading Comprehension

The answers to these questions can be found on ...

1. What are the fundamental microeconomic questions?
2. What do the following microeconomic questions refer to: what? how? and for whom?
3. Identify four important macroeconomic questions or issues and explain briefly why each is important.
4. Why would ordinary Canadians be interested in the cost of living?

households the economic actors that makes decisions about what resources to sell and what goods and services to buy

firms the economic actors that makes decisions about what resources to purchase and how the resources will be used to produce goods and services

2. All the economy's resources are owned by the households.

3. Money is used in all

exchanges. That is, firms use money to buy the factors of production, and households use money to buy goods and services.

4. The income received by households is spent in purchasing goods and services, and the income (revenue) received by firms is spent in purchasing resources.

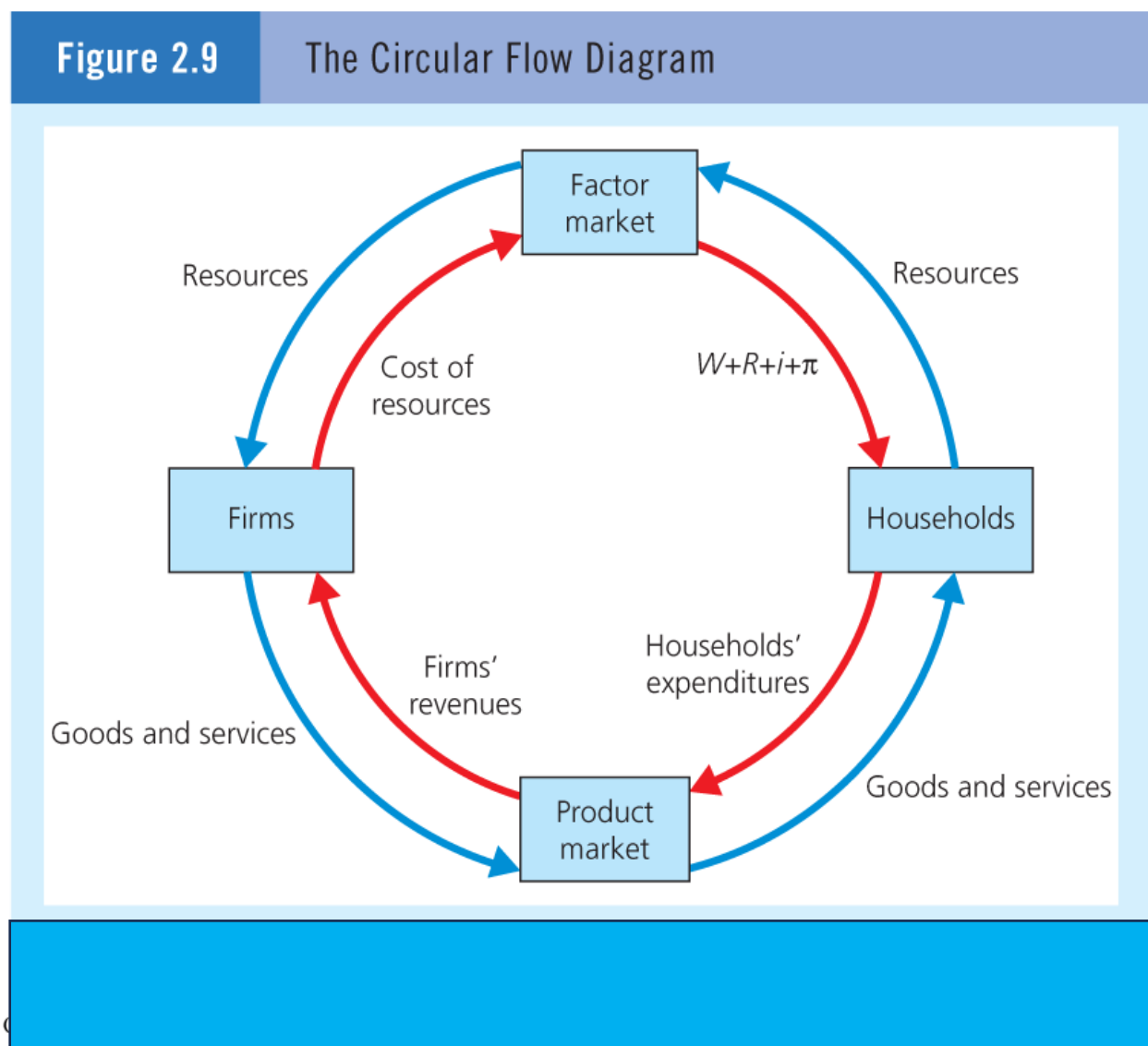
5. It is assumed that households maximize satisfaction and firms maximize profits.

Figure 2.9 illustrates the circular flow model. In this model, the sale of resources and the sale of goods and services occur within markets. A market is a mechanism that facilitates the buying and selling of resources as well as goods and services. You might envision a market as a physical space where transactions take place; for example, you may have purchased your new Nike or

Brooks running shoes or your last movie ticket in such a setting. Similarly, firms like Amazon buy labor services in a market. However, a market is not limited to a geographic location. Today, many buying and selling activities occur without any physical meeting of buyers and sellers, as transactions are frequently conducted via airmail, telephone, and the internet. Let's examine Figure 2.9.

market the mechanism that facilitates the buying and selling of resources and goods and services

Figure 2.9 The Circular Flow Diagram



We can begin with the households because we have assumed that they have the resources. Resources flow from the households to the factor market. The direction of flow is indicated by arrows. The **factor market**, also called the **resource market**, is the market in which factors of production are bought and sold. For example, firms buy steel and raw materials and labour services in the factor market.

factor market or resource market the market in which factors of production are bought and sold

product market or goods and services market the market in which goods and services (products) are bought and sold

Firms buy and households sell resources in the factor market. After the exchange of resources for money, we see a flow of resources from the factor market to the firms, and a flow of income from the factor market to the households. The flow of income from the factor market to the households consists of wages (W), rent (R), interest and dividends (i), and profits (π).

After the exchange, firms acquire resources, while households receive income. Firms then utilize these resources in the production process to create goods and services, which are subsequently sold to households in the product market (also known as the goods and services market). In these markets, consumers purchase various items such as clothing, vacations, furniture, and automobiles. As a result, goods and services move from firms to consumers, while expenditures flow from households to firms in the product market.

Reading Comprehension

The answers to these questions can be found on ...

1. Explain the roles of households and firms in the factor market and the product market. Give one example each of a product market and a factor market.
2. In the real world, earning a profit is associated with firms. Why, in the circular flow model, do households earn profits?
3. Distinguish between real flow and money flows. Give an example each of a real flow and a money flow in the circular flow model.

Note that the roles of buyers and sellers are reversed in the product and factor markets. In the factor market, the sellers are the households, while the buyers are the firms. In the product market, the sellers are the firms, while the buyers are the households.

The difference between real flows and money flows

Land, labour, capital, and entrepreneurship from households to firms. Goods and services from the firms to households. Such flows are referred to as **real flows** and are the flow of real, physical goods and services, such as cellphones, laser

jet printers, refrigerators, and medical services, and resources such as water, labour, and machinery/. Because of the way in which this diagram is arranged, these flows happen to be the outer flows in this model.

real flows flows of real, physical goods and services and resources

Expenditure and income represent two sides of the same transaction. In the factor market, expenditures flow from firms to households as income, including rent, wages and salaries, interest and dividends, and profits. Conversely, in the product market, expenditures from households to firms take the form of revenues. These flows are referred to as **money flows**, encompassing the movement of income and expenditures within the economy.

money flows flows of income and expenditures in monetary terms