

ECON 201: PRINCIPLES OF MACROECONOMICS



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Harrisburg Area Community College
ECON 201: Principles of Macroeconomics

Mihajlo Balić

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CHAPTER OVERVIEW

1: Economics - The Study of Choice

[1.1: Defining Economics](#)

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1.1: Defining Economics

Learning Objective

1. Define economics.
2. Explain the concepts of scarcity and opportunity cost and how they relate to the definition of economics.
3. Understand the three fundamental economic questions: What should be produced? How should goods and services be produced? For whom should goods and services be produced?
4. Be able to distinguish between the various types of economic systems.

Economics is a social science that examines how people make decisions as they face scarce resource. It is social because it involves people and their behavior. It is a science because it uses, as much as possible, a scientific approach in its investigation of choices.

Scarce Resources and Opportunity Cost

All choices mean that one alternative is selected over another. Selecting among alternatives involves two concepts central to economics: scarce resources and opportunity cost.

Scarce Resources

In economics, **resources** (also referred to as inputs or factors of production) are classified into four different categories based on their nature and availability. The types of resources are:

Land - resource derived from nature and is used in economic activities. It includes land, water, minerals, soil, gas, and timber.

Labor - also known as human resource, labor refers to the physical and mental abilities of individuals that contribute to economic production. It includes the skills, knowledge, and expertise of people employed in various sectors of the economy.

Capital - this resource is man-made good used in the production of other goods and services. It includes machinery, equipment, buildings, tools, and infrastructure.

Entrepreneur - the risk-taker and innovator who combines other inputs to produce an output. It includes skills like innovation, leadership, and decision-making.

Our resources are limited or scarce. **Scarcity** is the condition in which our wants are greater than the limited resources available to satisfy those wants. At any one time, we have only so much land, so many factories, so much oil, so many people. But our wants, our desires for the things that we can produce with those resources, are unlimited. We would always like more and better housing, more and better education—more and better of practically everything.

Virtually everything is scarce. Consider the air we breathe, which is available in huge quantity at no charge to us. Could it possibly be scarce?

The test of whether air is scarce is whether it has alternative uses. What uses can we make of the air? We breathe it. We pollute it when we drive our cars, heat our houses, or operate our factories. In effect, one use of the air is as a garbage dump. We certainly need the air to breathe. But just as certainly, we choose to dump garbage in it. Those two uses are clearly alternatives to each other. The more garbage we dump in the air, the less desirable—and healthy—it will be to breathe. If we decide we want to breathe cleaner air, we must limit the activities that generate pollution. Air is a scarce good because it has alternative uses.

Not all goods, however, confront us with such choices. A **free good** is one for which the choice of one use does not require that we give up another. One example of a free good is gravity. The fact that gravity is holding you to the earth does not mean that your neighbor is forced to drift up into space! One person's use of gravity is not an alternative to another person's use.

There are not many free goods. Outer space, for example, was a free good when the only use we made of it was to gaze at it. But now, our use of space has reached the point where one use can be an alternative to another. Conflicts have already arisen over the allocation of orbital slots for communications satellites. Thus, even parts of outer space are scarce. Space will surely become more scarce as we find new ways to use it. Scarcity characterizes virtually everything. Consequently, the scope of economics is wide indeed.

Opportunity Cost

It is within the context of scarcity that economists define what is perhaps the most important concept in all of economics, the concept of opportunity cost. **Opportunity cost** is the value of the best alternative forgone in making any choice.

The opportunity cost to you of reading the remainder of this chapter will be the value of the best other use to which you could have put your time. If you choose to spend \$20 on a potted plant, you have simultaneously chosen to give up the benefits of spending the \$20 on pizzas or a paperback book or a night at the movies. If the book is the most valuable of those alternatives, then the opportunity cost of the plant is the value of the enjoyment you otherwise expected to receive from the book.

The concept of opportunity cost must not be confused with the purchase price of an item. Consider the cost of a college or university education. That includes the value of the best alternative use of money spent for tuition, fees, and books. But the most important cost of a college education is the value of the forgone alternative uses of time spent studying and attending class instead of using the time in some other endeavor. Students sacrifice that time in hopes of even greater earnings in the future or because they place a value on the opportunity to learn. Or consider the cost of going to the doctor. Part of that cost is the value of the best alternative use of the money required to see the doctor. But, the cost also includes the value of the best alternative use of the time required to see the doctor. The essential thing to see in the concept of opportunity cost is found in the name of the concept. Opportunity cost is the value of the best opportunity forgone in a particular choice. It is not simply the amount spent on that choice.

Scarcity, the Fundamental Economic Questions, and The Economic Systems

Scarcity forces every society to answer the following questions:

1. **What should be produced?** Using the economy's scarce resources to produce one thing requires giving up another. Producing better education, for example, may require cutting back on other services, such as health care. A decision to preserve a wilderness area requires giving up other uses of the land. Every society must decide what it will produce with its scarce resources.
2. **How should goods and services be produced?** There are all sorts of choices to be made in determining how goods and services should be produced. Should a firm employ a few skilled or a lot of unskilled workers? Should it produce in its own country or should it use foreign plants? Should manufacturing firms use new or recycled raw materials to make their products?
3. **For whom should goods and services be produced?** If a good or service is produced, a decision must be made about who will get it. A decision to have one person or group receive a good or service usually means it will not be available to someone else.

Every society must determine what should be produced, how it should be produced, and for whom it should be produced. The mechanism it uses to answer the economic questions is called economic system. An **economic system** refers to the way a society organizes and manages its resources, production, distribution, and consumption of goods and services. The various types of economic systems are:

Capitalism - In a capitalist economy, also known as a market economy, the production and distribution of goods and services are primarily determined by the interactions of supply and demand in the marketplaces.

Adam Smith, 18th-century Scottish philosopher and economist, also known as the father of modern economics proposed that a free market economy is capable of achieving an efficient allocation of resources without the need for government's intervention. In his most famous work "The Wealth of Nations," published in 1776, Smith discussed various economic concepts, including the idea of the invisible hand and the concepts of laissez-faire.

The **invisible hand** is a metaphor used by Smith to describe how individual self-interest can lead to positive outcomes for society as a whole. According to Smith, when individuals pursue their self-interest in a free market, they are guided by an invisible hand that promotes the overall well-being of society. This means that the pursuit of personal gain can indirectly benefit others by stimulating economic growth, innovation, and the efficient allocation of resources.

The concept of **laissez-faire**, which translates to "let do" or "let it be," is closely related to the idea of the invisible hand. Smith argued that the government should adopt a hands-off approach to economic affairs and refrain from excessive interference in the free market.

Socialism - In a socialist economy, also known as a planned or command economy, the government controls and plans the production, distribution, and pricing of goods and services.

Karl Marx and Friedrich Engels are known for their influential ideas on socialism, which they outlined in their works, particularly in "The Communist Manifesto" and "Das Kapital." They believed that a government-controlled or socialist economy would be

necessary initially, but would eventually lead to a communist system in which each person contributes according to ability and takes according to need. It is important to note that these ideas have been interpreted and implemented in various ways by different socialist movements and governments throughout history.

Mixed Economy - A mixed economy is an economic system that combines elements of both capitalism and socialism. In a mixed economy, there is a blend of private ownership and control of resources and industries, as well as government intervention and regulation. The exact balance between private enterprise and government intervention can vary in a mixed economy, with some countries leading more toward a market-oriented approach while others have a greater degree of government involvement.

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1.2: The Field of Economics

Learning Objective

1. Explain the distinguishing characteristics of the economic way of thinking.
2. Distinguish between microeconomics and macroeconomics.

We have examined the basic concepts of scarcity and opportunity cost in economics. In this section, we will look at economics as a field of study. We begin with the characteristics that distinguish economics from other social sciences.

The Economic Way of Thinking

Economists study choices. This fact is not what distinguishes economics from other social sciences; all social scientists are interested in choices. An anthropologist might study the choices of ancient peoples; a political scientist might study the choices of legislatures; a psychologist might study how people choose a mate; a sociologist might study the factors that have led to a rise in single-parent households. Economists study such questions as well. What is it about the study of choices by economists that makes economics different from these other social sciences?

Three features distinguish the economic approach to choice from the approaches taken in other social sciences:

1. Economists give special emphasis to the role of opportunity costs in their analysis of choices.
2. Economists assume that individuals make choices that seek to maximize the value of some objective, and that they define their objectives in terms of their own self-interest.
3. Individuals maximize by deciding whether to do a little more or a little less of something. Economists argue that individuals pay attention to the consequences of small changes in the levels of the activities they pursue.

The emphasis economists place on opportunity cost, the idea that people make choices that maximize the value of objectives that serve their self-interest, and a focus on the effects of small changes are ideas of great power. They constitute the core of economic thinking. The next three sections examine these ideas in greater detail.

Opportunity Costs Are Important

If doing one thing requires giving up another, then the expected benefits of the alternatives we face will affect the ones we choose. Economists argue that an understanding of opportunity cost is crucial to the examination of choices.

As the set of available alternatives changes, we expect that the choices individuals make will change. A rainy day could change the opportunity cost of reading a good book; we might expect more reading to get done in bad than in good weather. A high income can make it very costly to take a day off; we might expect highly paid individuals to work more hours than those who are not paid as well. If individuals are maximizing their level of satisfaction and firms are maximizing profits, then a change in the set of alternatives they face may affect their choices in a predictable way.

The emphasis on opportunity costs is an emphasis on the examination of alternatives. One benefit of the economic way of thinking is that it pushes us to think about the value of alternatives in each problem involving choice.

Individuals Maximize in Pursuing Self-Interest

What motivates people as they make choices? Perhaps more than anything else, it is the economist's answer to this question that distinguishes economics from other fields.

Economists assume that individuals make choices that they expect will create the maximum value of some objective, given the constraints they face. Furthermore, economists assume that people's objectives will be those that serve their own self-interest.

Unfortunately it is not possible to observe or measure well-being of individuals, however, economists use the concept of **utility** to refer to satisfaction one receives from engaging in an activity and have developed a measurement called **utils** to describe how much satisfaction or pleasure someone enjoys. We can say that the goal of individuals is to maximize total utility, given the limitations created by the one's budget.

Economists assume, for example, that the owners of business firms seek to maximize profit. Given the assumed goal of profit maximization, economists can predict how firms in an industry will respond to changes in the markets in which they operate. As

labor costs in the United States rise, for example, economists are not surprised to see firms moving some of their manufacturing operations overseas.

Similarly, economists assume that maximizing behavior is at work when they examine the behavior of consumers. In studying consumers, economists assume that individual consumers make choices aimed at maximizing their level of satisfaction. In the next chapter, we will look at the results of the shift from one good to another; that is a shift that reflects the pursuit of self-interest by consumers and by manufacturers.

In assuming that people pursue their self-interest, economists are not assuming people are selfish. People clearly gain satisfaction by helping others, as suggested by the large charitable contributions people make. Pursuing one's own self-interest means pursuing the things that give one satisfaction. It need not imply greed or selfishness.

Choices Are Made at the Margin

Economists argue that most choices are made “at the margin.” The margin is the current level of an activity. Think of it as the edge from which a choice is to be made. A choice at the **margin** is a decision to do a little more or a little less of something.

Assessing choices at the margin can lead to extremely useful insights. Consider, for example, the problem of curtailing water consumption when the amount of water available falls short of the amount people now use. Economists argue that one way to induce people to conserve water is to raise its price. A common response to this recommendation is that a higher price would have no effect on water consumption, because water is a necessity. Many people assert that prices do not affect water consumption because people “need” water.

But choices in water consumption, like virtually all choices, are made at the margin. Individuals do not make choices about whether they should or should not consume water. Rather, they decide whether to consume a little more or a little less water. Let's say that the household water consumption in the United States totals about 105 gallons per person per day. Think of that starting point as the edge from which a choice at the margin in water consumption is made. Could a higher price cause you to use less water brushing your teeth, take shorter showers, or water your lawn less? Could a higher price cause people to reduce their use, say, to 104 gallons per person per day? To 103? When we examine the choice to consume water at the margin, the notion that a higher price would reduce consumption seems much more plausible. Prices affect our consumption of water because choices in water consumption, like other choices, are made at the margin.

The elements of opportunity cost, maximization, and choices at the margin can be found in each of two broad areas of economic analysis: microeconomics and macroeconomics. Your economics course, for example, may be designated as a “micro” or as a “macro” course. We will look at these two areas of economic thought in the next section.

Microeconomics and Macroeconomics

The field of economics is typically divided into two broad realms: microeconomics and macroeconomics. It is important to see the distinctions between these broad areas of study.

Microeconomics is the branch of economics that focuses on the choices made by individual decision-making units in the economy—typically consumers and firms—and the impacts those choices have on individual markets. **Macroeconomics** is the branch of economics that focuses on the impact of choices on the total, or aggregate, level of economic activity.

Why do tickets to the best concerts cost so much? How does the threat of global warming affect real estate prices in coastal areas? Why do women end up doing most of the housework? Why do senior citizens get discounts on public transit systems? These questions are generally regarded as microeconomic because they focus on individual units or markets in the economy.

Is the total level of economic activity rising or falling? Is the rate of inflation increasing or decreasing? What is happening to the unemployment rate? These are questions that deal with aggregates, or totals, in the economy; they are problems of macroeconomics. The question about the level of economic activity, for example, refers to the total value of all goods and services produced in the economy. Inflation is a measure of the rate of change in the average price level for the entire economy; it is a macroeconomic problem. The total levels of employment and unemployment in the economy represent the aggregate of all labor markets; unemployment is also a topic of macroeconomics.

Both microeconomics and macroeconomics give attention to individual markets. But in microeconomics that attention is an end in itself; in macroeconomics it is aimed at explaining the movement of major economic aggregates—the level of total output, the level of employment, and the price level.

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1.3: The Economists' Tool Kit

Learning Objective

1. Explain how economists test hypotheses, develop economic theories, and use models in their analyses.
2. Explain how the all-other-things unchanged (*ceteris paribus*) problem and the fallacies affect the testing of economic hypotheses and how economists try to overcome these problems.
3. Distinguish between normative and positive statements.

Economics differs from other social sciences because of its emphasis on opportunity cost, the assumption of maximization in terms of one's own self-interest, and the analysis of choices at the margin. But certainly much of the basic methodology of economics and many of its difficulties are common to every social science—indeed, to every science. This section explores the application of the scientific method to economics.

Models in Economics

All scientific thought involves simplifications of reality. The real world is far too complex for the human mind—or the most powerful computer—to consider. Scientists use models instead. A **model** is designed to simplify reality in an attempt to explain real-world relationships and to predict outcomes. Economic models take many forms and those used by governments, academics, and businesses in real world tend to be fairly complicated mathematical and statistical models that require the use of a computer. In this course, however, we will rely on simple equations, two dimensional graphs and tables.

Testing Hypotheses in Economics

Here is a hypothesis suggested by the model of demand and supply: an increase in the price of gasoline will reduce the quantity of gasoline consumers demand. How might we test such a hypothesis?

Economists try to test hypotheses such as this one by observing actual behavior and using empirical (that is, real-world) data. Let's say, for example, that the average retail price of gasoline in the United States rose from an average of \$2.25 per gallon at the beginning of the year to \$3.08 per gallon by the end of the year. Let's also say, for example, that the number of gallons of gasoline consumed by U.S. motorists rose 0.3% during that same period.

The small increase in the quantity of gasoline consumed by motorists as its price rose is inconsistent with the hypothesis that an increased price will lead to a reduction in the quantity demanded. Does that mean that we should dismiss the original hypothesis? On the contrary, we must be cautious in assessing this evidence. Several problems exist in interpreting any set of economic data. One problem is that several things may be changing at once; another is that the initial event may be unrelated to the event that follows. The next two sections examine these problems in detail.

The All-Other-Things-Unchanged Problem

The hypothesis that an increase in the price of gasoline produces a reduction in the quantity demanded by consumers carries with it the assumption that there are no other changes that might also affect consumer demand. A better statement of the hypothesis would be: An increase in the price of gasoline will reduce the quantity consumers demand, *ceteris paribus*. **Ceteris paribus** is a Latin phrase that means “all other things unchanged.”

But things can change during the observed period. Economic activity and incomes may rise in the United States, and people with higher incomes may buy more gasoline. Employment may rise as well, and people with jobs may use more gasoline as they drive to work. Population in the United States may increase during the period. In short, many things may change during the period, all of which tend to increase the quantity of gasoline people purchase.

Our observation of the gasoline market during the year did not offer a conclusive test of the hypothesis that an increase in the price of gasoline would lead to a reduction in the quantity demanded by consumers. Other things changed and affected gasoline consumption. Such problems are likely to affect any analysis of economic events. We cannot ask the world to stand still while we conduct experiments in economic phenomena. Economists employ a variety of statistical methods to allow them to isolate the impact of single events such as price changes, but they can never be certain that they have accurately isolated the impact of a single event in a world in which virtually everything is changing all the time.

In laboratory sciences such as chemistry and biology, it is relatively easy to conduct experiments in which only selected things change and all other factors are held constant. The economists' laboratory is the real world; thus, economists do not generally have the luxury of conducting controlled experiments.

The Fallacy of False Cause

Hypotheses in economics typically specify a relationship in which a change in one variable causes another to change. We call the variable that responds to the change the dependent variable; the variable that induces a change is called the independent variable. Sometimes the fact that two variables move together can suggest the false conclusion that one of the variables has acted as an independent variable that has caused the change we observe in the dependent variable.

Consider the following hypothesis: People wearing shorts cause warm weather. Certainly, we observe that more people wear shorts when the weather is warm. Presumably, though, it is the warm weather that causes people to wear shorts rather than the wearing of shorts that causes warm weather; it would be incorrect to infer from this that people cause warm weather by wearing shorts.

Reaching the incorrect conclusion that one event causes another because the two events tend to occur together is called the **fallacy of false cause**.

Because of the danger of the fallacy of false cause, economists use special statistical tests that are designed to determine whether changes in one thing actually do cause changes observed in another. Given the inability to perform controlled experiments, however, these tests do not always offer convincing evidence that persuades all economists that one thing does, in fact, cause changes in another.

In the case of gasoline prices and consumption, there are good theoretical reasons to believe the price increase should lead to a reduction in the quantity consumers demand. And economists have tested the hypothesis about price and the quantity demanded quite extensively. They have developed elaborate statistical tests aimed at ruling out problems of the fallacy of false cause. While we cannot prove that an increase in price will, *ceteris paribus*, lead to a reduction in the quantity consumers demand, we can have considerable confidence in the proposition.

Other Relevant Fallacies

The **fallacy of division** occurs when it is incorrectly assumed that what is true for the whole is also true for the parts. For instance, let's say someone argues that since a football team is collectively skilled and successful, every player on the team must also possess the same level of skill and talent. This assumption ignores the fact that individual players on the team may have varying levels of skill, experience, and contributions. So, what is true for the team does not necessarily reflect the characteristics of each player.

The **fallacy of composition** occurs when it is incorrectly assumed that what is true for the individual parts is also true for the whole. For example, let's say someone argues that since each individual brick in the wall is small and lightweight, the entire wall must also be small and lightweight. This assumption ignores the fact that when individual bricks are combined, they can form a large and sturdy structure. So, what is true of the individual bricks does not necessarily reflect the characteristics of the entire wall.

Normative and Positive Statements

Two kinds of assertions in economics can be subjected to testing. We have already examined one, the hypothesis. Another testable assertion is a statement of fact, such as "It is raining outside" or "Microsoft is the largest producer of operating systems for personal computers in the world." A statement of fact or a hypothesis is a **positive statement**.

Although people often disagree about positive statements, such disagreements can ultimately be resolved through investigation. There is another category of assertions, however, for which investigation can never resolve differences. A **normative statement** is one that makes a value judgment. Such a judgment is the opinion of the speaker; no one can "prove" that the statement is or is not correct. Here are some examples of normative statements in economics: "We ought to do more to help the poor." "People in the United States should save more." "Corporate profits are too high." The statements are based on the values of the person who makes them. They cannot be proven false.

Because people have different values, normative statements often provoke disagreement. An economist whose values lead him or her to conclude that we should provide more help for the poor will disagree with one whose values lead to a conclusion that we should not. Because no test exists for these values, these two economists will continue to disagree, unless one persuades the other to adopt a different set of values. Many of the disagreements among economists are based on such differences in values and therefore are unlikely to be resolved.

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CHAPTER OVERVIEW

2: Confronting Scarcity- Choices in Production

[2.1: The Production Possibilities Curve](#)

[2.2: Applications of the Production Possibilities Model](#)

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2.1: The Production Possibilities Curve

Learning Objective

1. Explain the concept of the production possibilities curve and understand the implications of its downward slope and bowed-out shape.
2. Use the production possibilities model to distinguish between full employment and situations of idle factors of production and between efficient and inefficient production.
3. Understand specialization and its relationship to the production possibilities model and comparative advantage.

An economy's factors of production are scarce; they cannot produce an unlimited quantity of goods and services. A production possibilities curve is a graphical representation of the alternative combinations of goods and services an economy can produce. It illustrates the production possibilities model. In drawing the production possibilities curve, we shall assume that the economy can produce only two goods and that the quantities of factors of production and the technology available to the economy are fixed.

Constructing a Production Possibilities Curve

To construct a production possibilities curve, we will begin with the case of a hypothetical firm, Alpine Sports, Inc., a specialized sports equipment manufacturer. Christie Ryder began the business 15 years ago with a single ski production facility near Killington ski resort in central Vermont. Ski sales grew, and she also saw demand for snowboards rising—particularly after snowboard competition events were included in the 2002 Winter Olympics in Salt Lake City. She added a second plant in a nearby town. The second plant, while smaller than the first, was designed to produce snowboards as well as skis. She also modified the first plant so that it could produce both snowboards and skis. Two years later she added a third plant in another town. While even smaller than the second plant, the third was primarily designed for snowboard production but could also produce skis.

We can think of each of Ms. Ryder's three plants as a miniature economy and analyze them using the production possibilities model. We assume that the factors of production and technology available to each of the plants operated by Alpine Sports are unchanged.

Suppose the first plant, Plant 1, can produce 200 pairs of skis per month when it produces only skis. When devoted solely to snowboards, it produces 100 snowboards per month. It can produce skis and snowboards simultaneously as well.

The table in Figure 2.1 gives three combinations of skis and snowboards that Plant 1 can produce each month. Combination A involves devoting the plant entirely to ski production; combination C means shifting all of the plant's resources to snowboard production; combination B involves the production of both goods. These values are plotted in a production possibilities curve for Plant 1. The curve is a downward-sloping straight line, indicating that there is a linear, negative relationship between the production of the two goods.

Neither skis nor snowboards is an independent or a dependent variable in the production possibilities model; we can assign either one to the vertical or to the horizontal axis. Here, we have placed the number of pairs of skis produced per month on the vertical axis and the number of snowboards produced per month on the horizontal axis.

The negative slope of the production possibilities curve reflects the scarcity of the plant's capital and labor. Producing more snowboards requires shifting resources out of ski production and thus producing fewer skis. Producing more skis requires shifting resources out of snowboard production and thus producing fewer snowboards.

The slope of Plant 1's production possibilities curve measures the rate at which Alpine Sports must give up ski production to produce additional snowboards. Because the production possibilities curve for Plant 1 is linear, we can compute the slope between any two points on the curve and get the same result. Between points A and B, for example, the slope equals -2 pairs of skis/snowboard (equals -100 pairs of skis/50 snowboards). (Many students are helped when told to read this result as “ -2 pairs of skis *per* snowboard.”) We get the same value between points B and C, and between points A and C.

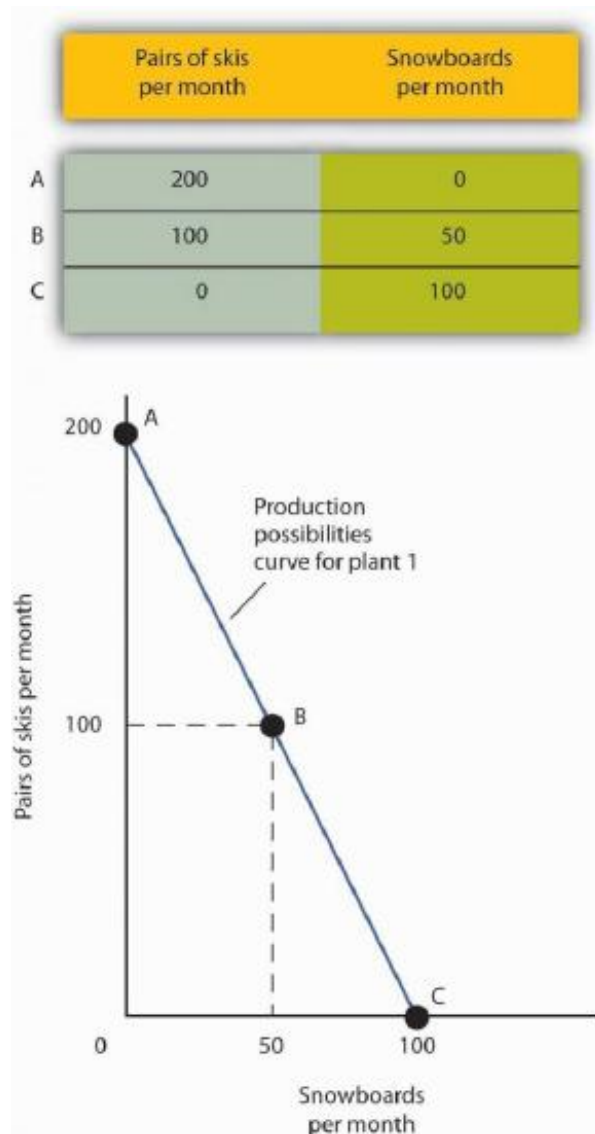
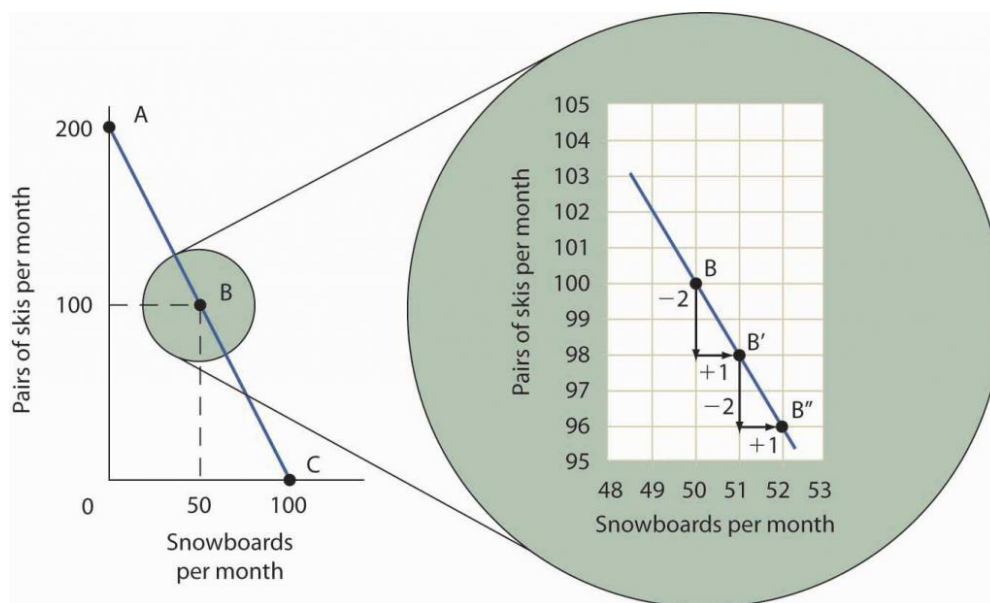


Figure 2.1 A Production Possibilities Curve The table shows the combinations of pairs of skis and snowboards that Plant 1 is capable of producing each month. These are also illustrated with a production possibilities curve. Notice that this curve is linear.

To see this relationship more clearly, examine Figure 2.2. Suppose Plant 1 is producing 100 pairs of skis and 50 snowboards per month at point B. Now consider what would happen if Ms. Ryder decided to produce 1 more snowboard per month. The segment of the curve around point B is magnified in Figure 2.2. The slope between points B and B' is -2 pairs of skis/snowboard. Producing 1 additional snowboard at point B' requires giving up 2 pairs of skis. We can think of this as the opportunity cost of producing an additional snowboard at Plant 1. This opportunity cost equals the absolute value of the slope of the production possibilities curve.

Figure 2.2 The Slope of a Production Possibilities Curve



The slope of the linear production possibilities curve in Figure 2.1 is constant; it is -2 pairs of skis/snowboard. In the section of the curve shown in Figure 2.2, the slope can be calculated between points B and B'. Expanding snowboard production to 51 snowboards per month from 50 snowboards per month requires a reduction in ski production to 98 pairs of skis per month from 100 pairs. The slope equals -2 pairs of skis/snowboard (that is, it must give up two pairs of skis to free up the resources necessary to produce one additional snowboard). To shift from B' to B'', Alpine Sports must give up two more pairs of skis per snowboard. The absolute value of the slope of a production possibilities curve measures the opportunity cost of an additional unit of the good on the horizontal axis measured in terms of the quantity of the good on the vertical axis that must be forgone.

The absolute value of the slope of any production possibilities curve equals the opportunity cost of an additional unit of the good on the horizontal axis. It is the amount of the good on the vertical axis that must be given up in order to free up the resources required to produce one more unit of the good on the horizontal axis. We will make use of this important fact as we continue our investigation of the production possibilities curve.

Figure 2.3 shows production possibilities curves for each of the firm's three plants. Each of the plants, if devoted entirely to snowboards, could produce 100 snowboards. Plants 2 and 3, if devoted exclusively to ski production, can produce 100 and 50 pairs of skis per month, respectively. The exhibit gives the slopes of the production possibilities curves for each plant. The opportunity cost of an additional snowboard at each plant equals the absolute values of these slopes (that is, the number of pairs of skis that must be given up per snowboard).

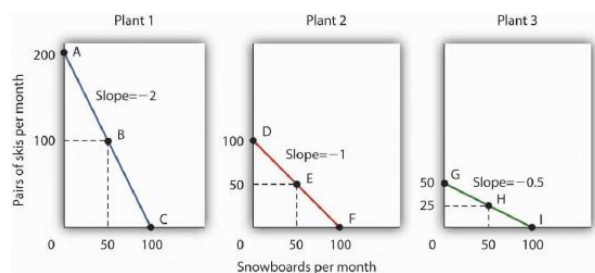


Figure 2.3 Production Possibilities at Three Plants: The slopes of the production possibilities curves for each plant differ. The steeper the curve, the greater the opportunity cost of an additional snowboard. Here, the opportunity cost is lowest at Plant 3 and greatest at Plant 1.

Figure 2.3 gives the slopes of the production possibilities curves for each of the firm's three plants. The opportunity cost of an additional snowboard at each plant equals the absolute values of these slopes. More generally, the absolute value of the slope of any

production possibilities curve at any point gives the opportunity cost of an additional unit of the good on the horizontal axis, measured in terms of the number of units of the good on the vertical axis that must be forgone.

The greater the absolute value of the slope of the production possibilities curve, the greater the opportunity cost will be. The plant for which the opportunity cost of an additional snowboard is greatest is the plant with the steepest production possibilities curve; the plant for which the opportunity cost is lowest is the plant with the flattest production possibilities curve. The plant with the lowest opportunity cost of producing snowboards is Plant 3; its slope of -0.5 means that Ms. Ryder must give up half a pair of skis in that plant to produce an additional snowboard. In Plant 2, she must give up one pair of skis to gain one more snowboard. We have already seen that an additional snowboard requires giving up two pairs of skis in Plant 1.

Comparative Advantage and the Production Possibilities Curve

To construct a combined production possibilities curve for all three plants, we can begin by asking how many pairs of skis Alpine Sports could produce if it were producing only skis. To find this quantity, we add up the values at the vertical intercepts of each of the production possibilities curves in Figure 2.3. These intercepts tell us the maximum number of pairs of skis each plant can produce. Plant 1 can produce 200 pairs of skis per month, Plant 2 can produce 100 pairs of skis at per month, and Plant 3 can produce 50 pairs. Alpine Sports can thus produce 350 pairs of skis per month if it devotes its resources exclusively to ski production. In that case, it produces no snowboards.

Now suppose the firm decides to produce 100 snowboards. That will require shifting one of its plants out of ski production. Which one will it choose to shift? The sensible thing for it to do is to choose the plant in which snowboards have the lowest opportunity cost—Plant 3. It has an advantage not because it can produce more snowboards than the other plants (all the plants in this example are capable of producing up to 100 snowboards per month) but because it is the least productive plant for making skis. Producing a snowboard in Plant 3 requires giving up just half a pair of skis.

Economists say that an economy has a comparative advantage in producing a good or service if the opportunity cost of producing that good or service is lower for that economy than for any other. Plant 3 has a comparative advantage in snowboard production because it is the plant for which the opportunity cost of additional snowboards is lowest. To put this in terms of the production possibilities curve, Plant 3 has a comparative advantage in snowboard production (the good on the horizontal axis) because its production possibilities curve is the flattest of the three curves.

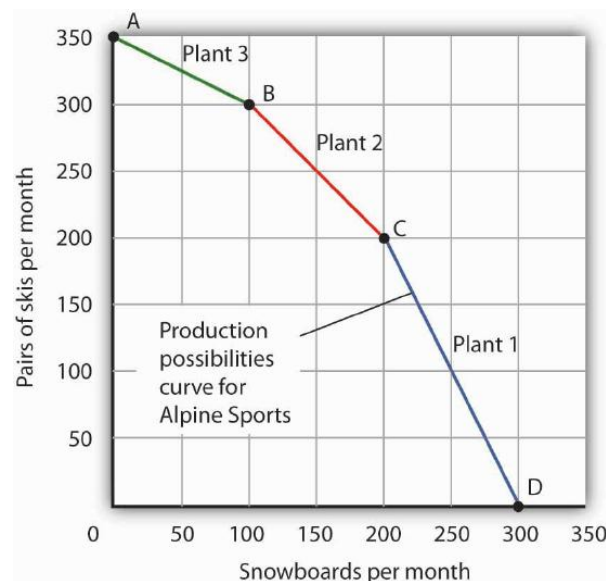


Figure 2.4 The Combined Production Possibilities Curve for Alpine Sports The curve shown combines the production possibilities curves for each plant. At point A, Alpine Sports produces 350 pairs of skis per month and no snowboards. If the firm wishes to increase snowboard production, it will first use Plant 3, which has a comparative advantage in snowboards.

Plant 3's comparative advantage in snowboard production makes a crucial point about the nature of comparative advantage. It need not imply that a particular plant is especially good at an activity. In our example, all three plants are equally good at snowboard

production. Plant 3, though, is the least efficient of the three in ski production. Alpine thus gives up fewer skis when it produces snowboards in Plant 3. Comparative advantage thus can stem from a lack of efficiency in the production of an alternative good rather than a special proficiency in the production of the first good.

The combined production possibilities curve for the firm's three plants is shown in Figure 2.4. We begin at point A, with all three plants producing only skis. Production totals 350 pairs of skis per month and zero snowboards. If the firm were to produce 100 snowboards at Plant 3, ski production would fall by 50 pairs per month (recall that the opportunity cost per snowboard at Plant 3 is half a pair of skis). That would bring ski production to 300 pairs, at point B. If Alpine Sports were to produce still more snowboards in a single month, it would shift production to Plant 2, the facility with the next-lowest opportunity cost. Producing 100 snowboards at Plant 2 would leave Alpine Sports producing 200 snowboards and 200 pairs of skis per month, at point C. If the firm were to switch entirely to snowboard production, Plant 1 would be the last to switch because the cost of each snowboard there is 2 pairs of skis. With all three plants producing only snowboards, the firm is at point D on the combined production possibilities curve, producing 300 snowboards per month and no skis.

Notice that this production possibilities curve, which is made up of linear segments from each assembly plant, has a bowed-out shape; the absolute value of its slope increases as Alpine Sports produces more and more snowboards. This is a result of transferring resources from the production of one good to another according to comparative advantage. We shall examine the significance of the bowed-out shape of the curve in the next section.

The Law of Increasing Opportunity Cost

We see in Figure 2.4 that, beginning at point A and producing only skis, Alpine Sports experiences higher and higher opportunity costs as it produces more snowboards. The fact that the opportunity cost of additional snowboards increases as the firm produces more of them is a reflection of an important economic law. The law of increasing opportunity cost holds that as an economy moves along its production possibilities curve in the direction of producing more of a particular good, the opportunity cost of additional units of that good will increase.

We have seen the law of increasing opportunity cost at work traveling from point A toward point D on the production possibilities curve in Figure 2.4. The opportunity cost of each of the first 100 snowboards equals half a pair of skis; each of the next 100 snowboards has an opportunity cost of 1 pair of skis, and each of the last 100 snowboards has an opportunity cost of 2 pairs of skis. The law also applies as the firm shifts from snowboards to skis. Suppose it begins at point D, producing 300 snowboards per month and no skis. It can shift to ski production at a relatively low cost at first. The opportunity cost of the first 200 pairs of skis is just 100 snowboards at Plant 1, a movement from point D to point C, or 0.5 snowboards per pair of skis. We would say that Plant 1 has a comparative advantage in ski production. The next 100 pairs of skis would be produced at Plant 2, where snowboard production would fall by 100 snowboards per month. The opportunity cost of skis at Plant 2 is 1 snowboard per pair of skis. Plant 3 would be the last plant converted to ski production. There, 50 pairs of skis could be produced per month at a cost of 100 snowboards, or an opportunity cost of 2 snowboards per pair of skis.

The bowed-out production possibilities curve for Alpine Sports illustrates the law of increasing opportunity cost. Scarcity implies that a production possibilities curve is downward sloping; the law of increasing opportunity cost implies that it will be bowed out, or concave, in shape.

The bowed-out curve of Figure 2.4 becomes smoother as we include more production facilities. Suppose Alpine Sports expands to 10 plants, each with a linear production possibilities curve. Panel (a) of Figure 2.5 shows the combined curve for the expanded firm, constructed as we did in Figure 2.5. This production possibilities curve includes 10 linear segments and is almost a smooth curve. As we include more and more production units, the curve will become smoother and smoother. In an actual economy, with a tremendous number of firms and workers, it is easy to see that the production possibilities curve will be smooth. We will generally draw production possibilities curves for the economy as smooth, bowed-out curves, like the one in Panel (b). This production possibilities curve shows an economy that produces only skis and snowboards. Notice the curve still has a bowed-out shape; it still has a negative slope. Notice also that this curve has no numbers. Economists often use models such as the production possibilities model with graphs that show the general shapes of curves but that do not include specific numbers.

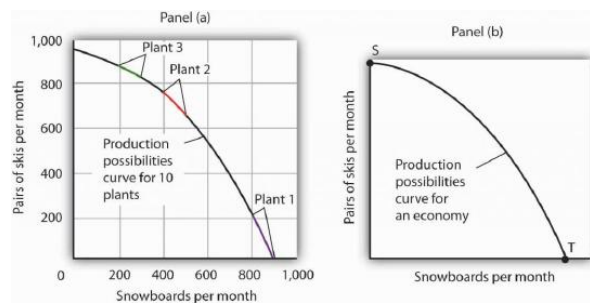


Figure 2.5 Production Possibilities for the Economy As we combine the production possibilities curves for more and more units, the curve becomes smoother. It retains its negative slope and bowed-out shape. In Panel (a) we have a combined production possibilities curve for Alpine Sports, assuming that it now has 10 plants producing skis and snowboards. Even though each of the plants has a linear curve, combining them according to comparative advantage, as we did with 3 plants in Figure 2.4, produces what appears to be a smooth, nonlinear curve, even though it is made up of linear segments. In drawing production possibilities curves for the economy, we shall generally assume they are smooth and “bowed out,” as in Panel (b). This curve depicts an entire economy that produces only skis and snowboards.

Movements Along the Production Possibilities Curve

We can use the production possibilities model to examine choices in the production of goods and services. In applying the model, we assume that the economy can produce two goods, and we assume that technology and the factors of production available to the economy remain unchanged. In this section, we shall assume that the economy operates on its production possibilities curve so that an increase in the production of one good in the model implies a reduction in the production of the other.

We shall consider two goods and services: national security and a category we shall call “all other goods and services.” This second category includes the entire range of goods and services the economy can produce, aside from national defense and security. Clearly, the transfer of resources to the effort to enhance national security reduces the quantity of other goods and services that can be produced. In the wake of the 9/11 attacks in 2001, nations throughout the world increased their spending for national security. This spending took a variety of forms. One, of course, was increased defense spending. Local and state governments also increased spending in an effort to prevent terrorist attacks. Airports around the world hired additional agents to inspect luggage and passengers.

The increase in resources devoted to security meant fewer “other goods and services” could be produced. In terms of the production possibilities curve in Figure 2.6, the choice to produce more security and less of other goods and services means a movement from A to B. Of course, an economy cannot really *produce* security; it can only attempt to provide it. The attempt to provide it requires resources; it is in that sense that we shall speak of the economy as “producing” security.

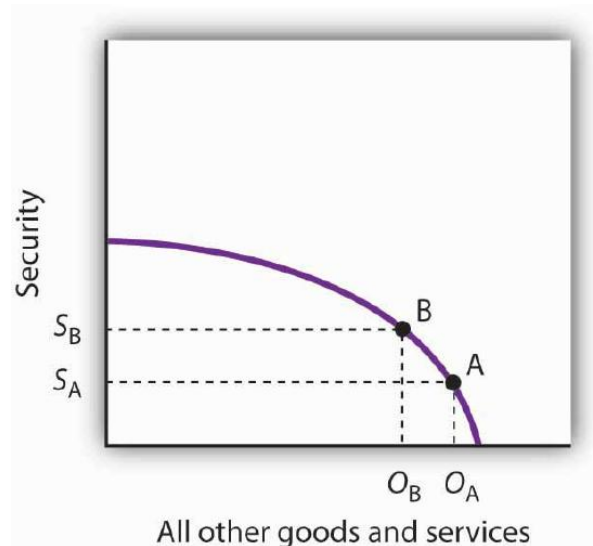


Figure 2.6 Spending More for Security Here, an economy that can produce two categories of goods, security and “all other goods and services,” begins at point A on its production possibilities curve. The economy produces S_A units of security and O_A units of all other goods and services per period. A movement from A to B requires shifting resources out of the production of all other goods and services and into spending on security. The increase in spending on security, to S_B units of security per period, has an opportunity cost of reduced production of all other goods and services. Production of all other goods and services falls by $O_A - O_B$ units per period.

At point A, the economy was producing S_A units of security on the vertical axis—defense services and various forms of police protection—and O_A units of other goods and services on the horizontal axis. Next, the economy chose to increase spending on security in the effort to defeat terrorism. Since we have assumed that the economy has a fixed quantity of available resources, the increased use of resources for security and national defense necessarily reduces the number of resources available for the production of other goods and services.

The law of increasing opportunity cost tells us that, as the economy moves along the production possibilities curve in the direction of more of one good, its opportunity cost will increase. We may conclude that, as the economy moved along this curve in the direction of greater production of security, the opportunity cost of the additional security began to increase. That is because the resources transferred from the production of other goods and services to the production of security had a greater and greater comparative advantage in producing things other than security.

The production possibilities model does not tell us where on the curve a particular economy will operate. Instead, it lays out the possibilities facing the economy. Many countries, for example, chose to move along their respective production possibilities curves to produce more security and national defense and less of all other goods in the wake of 9/11. We will see in the chapter on demand and supply how choices about what to produce are made in the marketplace.

Producing on Versus Producing Inside the Production Possibilities Curve

An economy that is operating inside its production possibilities curve could, by moving onto it, produce more of all the goods and services that people value, such as food, housing, education, medical care, and music. Increasing the availability of these goods would improve the standard of living. Economists conclude that it is better to be on the production possibilities curve than inside it.

Two things could leave an economy operating at a point inside its production possibilities curve. First, the economy might fail to use fully the resources available to it. Second, it might not allocate resources on the basis of comparative advantage. In either case, production within the production possibilities curve implies the economy could improve its performance.

Idle Factors of Production

Suppose an economy fails to put all its factors of production to work. Some workers are without jobs, some buildings are without occupants, some fields are without crops. Because an economy’s production possibilities curve assumes the full use of the factors of production available to it, the failure to use some factors results in a level of production that lies inside the production possibilities curve.

If all the factors of production that are available for use under current market conditions are being utilized, the economy has achieved full employment. An economy cannot operate on its production possibilities curve unless it has full employment.

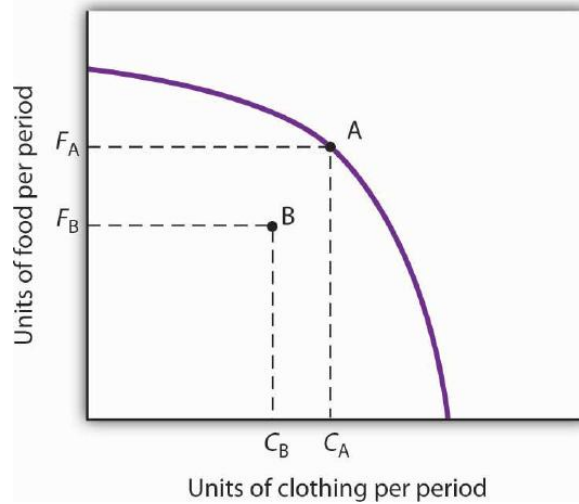


Figure 2.7 Idle Factors and Production The production possibilities curve shown suggests an economy that can produce two goods, food and clothing. As a result of a failure to achieve full employment, the economy operates at a point such as B, producing F_B units of food and C_B units of clothing per period. Putting its factors of production to work allows a move to the production possibilities curve, to a point such as A. The production of both goods rises.

Figure 2.7 shows an economy that can produce food and clothing. If it chooses to produce at point A, for example, it can produce F_A units of food and C_A units of clothing. Now suppose that a large fraction of the economy's workers lose their jobs, so the economy no longer makes full use of one factor of production: labor. In this example, production moves to point B, where the economy produces less food (F_B) and less clothing (C_B) than at point A. We often think of the loss of jobs in terms of the workers; they have lost a chance to work and to earn income. But the production possibilities model points to another loss: goods and services the economy could have produced that are not being produced.

Inefficient Production

Now suppose Alpine Sports is fully employing its factors of production. Could it still operate inside its production possibilities curve? Could an economy that is using all its factors of production still produce less than it could? The answer is "Yes," and the key lies in comparative advantage. An economy achieves a point on its production possibilities curve only if it allocates its factors of production on the basis of comparative advantage. If it fails to do that, it will operate inside the curve.

Suppose that, as before, Alpine Sports has been producing only skis. With all three of its plants producing skis, it can produce 350 pairs of skis per month (and no snowboards). The firm then starts producing snowboards. This time, however, imagine that Alpine Sports switches plants from skis to snowboards in numerical order: Plant 1 first, Plant 2 second, and then Plant 3. Figure 2.8 illustrates the result. Instead of the bowed-out production possibilities curve ABCD, we get a bowed-in curve, AB'C'D. Suppose that Alpine Sports is producing 100 snowboards and 150 pairs of skis at point B'. Had the firm based its production choices on comparative advantage, it would have switched Plant 3 to snowboards and then Plant 2, so it could have operated at a point such as C. It would be producing more snowboards and more pairs of skis—and using the same quantities of factors of production it was using at B'. Had the firm based its production choices on comparative advantage, it would have switched Plant 3 to snowboards and then Plant 2, so it would have operated at point C. It would be producing more snowboards and more pairs of skis—and using the same quantities of factors of production it was using at B'. When an economy is operating on its production possibilities curve, we say that it is engaging in efficient production. If it is using the same quantities of factors of production but is operating inside its production possibilities curve, it is engaging in inefficient production. Inefficient production implies that the economy could be producing more goods without using any additional labor, capital, or natural resources.

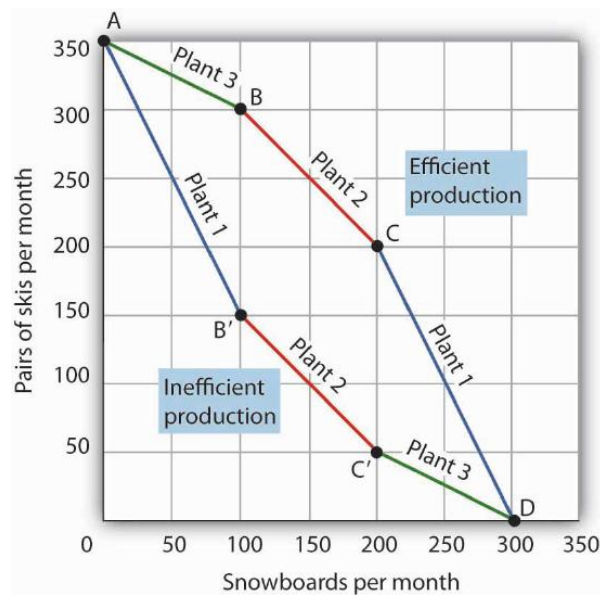


Figure 2.8 Efficient Versus Inefficient Production: When factors of production are allocated on a basis other than comparative advantage, the result is inefficient production. Suppose Alpine Sports operates the three plants we examined in Figure 2.4. Suppose further that all three plants are devoted exclusively to ski production; the firm operates at A. Now suppose that, to increase snowboard production, it transfers plants in numerical order: Plant 1 first, then Plant 2, and finally Plant 3. The result is the bowed-in curve AB'C'D. Production on the production possibilities curve ABCD requires that factors of production be transferred according to comparative advantage.

Points on the production possibilities curve thus satisfy two conditions: the economy is making full use of its factors of production, and it is making efficient use of its factors of production. If there are idle or inefficiently allocated factors of production, the economy will operate inside the production possibilities curve. Thus, the production possibilities curve not only shows what can be produced; it provides insight into how goods and services should be produced. It suggests that to obtain efficiency in production, factors of production should be allocated on the basis of comparative advantage. Further, the economy must make full use of its factors of production if it is to produce the goods and services it is capable of producing.

Specialization

The production possibilities model suggests that specialization will occur. Specialization implies that an economy is producing the goods and services in which it has a comparative advantage. If Alpine Sports selects point C in Figure 2.8, for example, it will assign Plant 1 exclusively to ski production and Plants 2 and 3 exclusively to snowboard production.

Such specialization is typical in an economic system. Workers, for example, specialize in particular fields in which they have a comparative advantage. People work and use the income they earn to buy—perhaps import—goods and services from people who have a comparative advantage in doing other things. The result is a far greater quantity of goods and services than would be available without this specialization.

Think about what life would be like without specialization. Imagine that you are suddenly completely cut off from the rest of the economy. You must produce everything you consume; you obtain nothing from anyone else. Would you be able to consume what you consume now? Clearly not. It is hard to imagine that most of us could even survive in such a setting. The gains we achieve through specialization are enormous.

Nations specialize as well. Much of the land in the United States has a comparative advantage in agricultural production and is devoted to that activity. Hong Kong, with its huge population and tiny endowment of land, allocates virtually none of its land to agricultural use; that option would be too costly. Its land is devoted largely to nonagricultural use.

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2.2: Applications of the Production Possibilities Model

Learning Objective

1. Understand the argument for unrestricted international trade in terms of economic specialization and comparative advantage.
2. Define economic growth in terms of the production possibilities model and discuss factors that make such growth possible.
3. Explain the classification of economic systems.

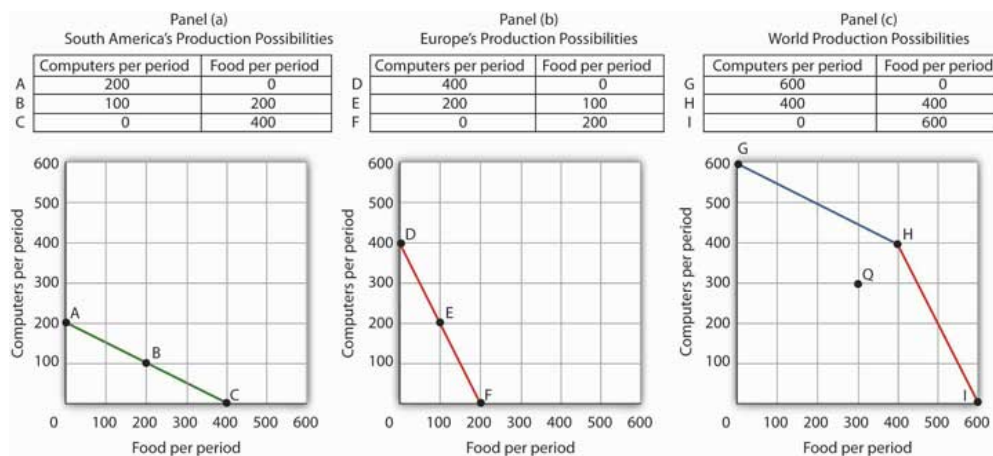
The production possibilities curve gives us a model of an economy. The model provides powerful insights about the real world, insights that help us to answer some important questions: How does trade between two countries affect the quantities of goods available to people? What determines the rate at which production will increase over time? What is the role of economic freedom in the economy? In this section we explore applications of the model to questions of international trade, economic growth, and the choice of an economic system.

Comparative Advantage and International Trade

One of the most important implications of the concepts of comparative advantage and the production possibilities curve relates to international trade. We can think of different nations as being equivalent to Christie Ryder's plants. Each will have a comparative advantage in certain activities, and efficient world production requires that each nation specialize in those activities in which it has a comparative advantage. A failure to allocate resources in this way means that world production falls inside the production possibilities curve; more of each good could be produced by relying on comparative advantage.

If nations specialize, then they must rely on each other. They will sell the goods in which they specialize and purchase other goods from other nations. Suppose, for example, that the world consists of two continents that can each produce two goods: South America and Europe can produce food and computers. Suppose they can produce the two goods according to the tables in Panels (a) and (b) of Figure 2.9. We have simplified this example by assuming that each continent has a linear production possibilities curve; the curves are plotted below the tables in Panels (a) and (b). Each continent has a separate production possibilities curve; the two have been combined to illustrate a world production possibilities curve in Panel (c) of the exhibit.

Figure 2.9 Production Possibilities Curves and Trade



Suppose the world consists of two continents: South America and Europe. They can each produce two goods: food and computers. In this example, we assume that each continent has a linear production possibilities curve, as shown in Panels (a) and (b). South America has a comparative advantage in food production and Europe has a comparative advantage in computer production. With free trade, the world can operate on the bowed-out curve GHI, shown in Panel (c). If the continents refuse to trade, the world will operate inside its production possibilities curve. If, for example, each continent were to produce at the midpoint of its production possibilities curve, the world would produce 300 computers and 300 units of food per period at point Q. If each continent were to specialize in the good in which it has a comparative advantage, world production could move to a point such as H, with more of both goods produced.

The world production possibilities curve assumes that resources are allocated between computer and food production based on comparative advantage. Notice that, even with only two economies and the assumption of linear production possibilities curves for each, the combined curve still has a bowed-out shape. At point H, for example, South America specializes in food, while Europe produces only computers. World production equals 400 units of each good. In this situation, we would expect South America to export food to Europe while Europe exports computers to South America.

But suppose the regions refuse to trade; each insists on producing its own food and computers. Suppose further that each chooses to produce at the midpoint of its own production possibilities curve. South America produces 100 units of computers and 200 units of food per period, while Europe produces 200 units of computers and 100 units of food per period. World production thus totals 300 units of each good per period; the world operates at point Q in Figure 2.9. If the two continents were willing to move from isolation to trade, the world could achieve an increase in the production of both goods. Producing at point H requires no more resources, no more effort than production at Q. It does, however, require that the world's resources be allocated on the basis of comparative advantage.

The implications of our model for trade are powerful indeed. First, we see that trade allows the production of more of all goods and services. Restrictions on trade thus reduce production of goods and services. Second, we see a lesson often missed in discussions of trade: a nation's trade policy has nothing to do with its level of employment of its factors of production. In our example, when South America and Europe do not engage in trade and produce at the midpoints of each of their respective production possibilities curves, *they each have full employment*. With trade, the two nations still operate on their respective production possibilities curves: *they each have full employment*. Trade certainly redistributes employment in the two continents. In South America, employment shifts from computer production to food production. In Europe, it shifts from food production to computer production. Once the shift is made, though, there is no effect on employment in either continent.

Of course, this idealized example would have all of South America's computer experts becoming farmers while all of Europe's farmers become computer geeks! That is a bit much to swallow, but it is merely the result of assuming linear production possibilities curves and complete specialization. In the real world, production possibilities curves are concave, and the reallocation of resources required by trade is not nearly as dramatic. Still, free trade can require shifts in resources from one activity to another. These shifts produce enormous benefits, but they do not come without costs.

Nearly all economists agree that largely unrestricted trade between countries is desirable; restrictions on trade generally force the world to operate inside its production possibilities curve. In some cases restrictions on trade could be desirable, but in the main, free trade promotes greater production of goods and services for the world's people.

Economic Growth

An increase in the physical quantity or in the quality of factors of production available to an economy or a technological gain will allow the economy to produce more goods and services; it will shift the economy's production possibilities curve outward. The process through which an economy achieves an outward shift in its production possibilities curve is called economic growth. An outward shift in a production possibilities curve is illustrated in Figure 2.10. In Panel (a), a point such as N is not attainable; it lies outside the production possibilities curve. Growth shifts the curve outward, as in Panel (b), making previously unattainable levels of production possible.

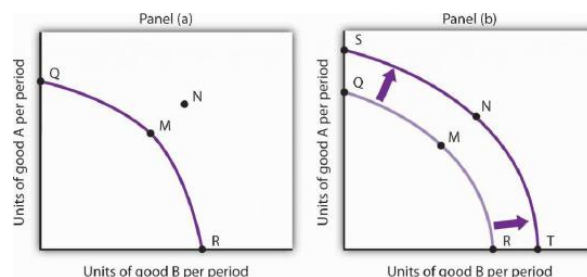


Figure 2.10 Economic Growth and the Production Possibilities Curve An economy capable of producing two goods, A and B, is initially operating at point M on production possibilities curve OMR in Panel (a). Given this production possibilities curve, the economy could not produce a combination such as shown by point N, which lies outside the curve. An increase in the factors of production available to the economy would shift the curve outward to SNT, allowing the choice of a point such as N, at which more of both goods will be produced.

The Sources of Economic Growth

Economic growth implies an outward shift in an economy's production possibilities curve. Recall that when we draw such a curve, we assume that the quantity and quality of the economy's factors of production and its technology are unchanged. Changing these will shift the curve. Anything that increases the quantity or quality of the factors of production available to the economy or that improves the technology available to the economy contributes to economic growth.

Consider, for example, the dramatic gains in human capital that have occurred in the United States since the beginning of the past century. In 1900, about 3.5% of U.S. workers had completed a high school education. By 2006, that percentage rose almost to 92. Fewer than 1% of the workers in 1900 had graduated from college; as late as 1940 only 3.5% had graduated from college. By 2006, nearly 32% had graduated from college. In addition to being better educated, today's workers have received more and better training on the job. They bring far more economically useful knowledge and skills to their work than did workers a century ago.

Moreover, the technological changes that have occurred within the past 100 years have greatly reduced the time and effort required to produce most goods and services. Automated production has become commonplace. Innovations in transportation (automobiles, trucks, and airplanes) have made the movement of goods and people cheaper and faster. A dizzying array of new materials is available for manufacturing. And the development of modern information technology—including computers, software, and communications equipment—that seemed to proceed at breathtaking pace especially during the final years of the last century and continuing to the present has transformed the way we live and work.

Look again at the technological changes of the last few years described in the Case in Point on advances in technology. Those examples of technological progress through applications of computer technology—from new ways of mapping oil deposits to new methods of milking cows—helped propel the United States and other economies to dramatic gains in the ability to produce goods and services. They have helped shift the countries' production possibilities curve outward. They have helped fuel economic growth.

Waiting for Growth

One key to growth is, in effect, the willingness to wait, to postpone current consumption in order to enhance future productive capability. When Stone Age people fashioned the first tools, they were spending time building capital rather than engaging in consumption. They delayed current consumption to enhance their future consumption; the tools they made would make them more productive in the future.

Resources society could have used to produce consumer goods are being used to produce new capital goods and new knowledge for production instead—all to enhance future production. An even more important source of growth in many nations has been increased human capital. Increases in human capital often require the postponement of consumption. If you are a college student, you are engaged in precisely this effort. You are devoting time to study that could have been spent working, earning income, and thus engaging in a higher level of consumption. If you are like most students, you are making this choice to postpone consumption because you expect it will allow you to earn more income, and thus enjoy greater consumption, in the future.

Think of an economy as being able to produce two goods, capital and consumer goods (those destined for immediate use by consumers). By focusing on the production of consumer goods, the people in the economy will be able to enjoy a higher standard of living today. If they reduce their consumption—and their standard of living—today to enhance their ability to produce goods and services in the future, they will be able to shift their production possibilities curve outward. That may allow them to produce even more consumer goods. A decision for greater growth typically involves the sacrifice of present consumption.

Arenas for Choice: A Comparison of Economic Systems

Under what circumstances will a nation achieve efficiency in the use of its factors of production? The discussion above suggested that Christie Ryder would have an incentive to allocate her plants efficiently because by doing so she could achieve greater output of skis and snowboards than would be possible from inefficient production. But why would she want to produce more of these two goods—or of any goods? Why would decision makers throughout the economy want to achieve such efficiency?

Economists assume that privately owned firms seek to maximize their profits. The drive to maximize profits will lead firms such as Alpine Sports to allocate resources efficiently to gain as much production as possible from their factors of production. But whether firms will seek to maximize profits depends on the nature of the economic system within which they operate.

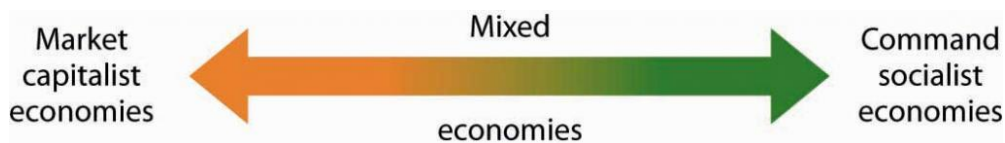
Classifying Economic Systems

Each of the world's economies can be viewed as operating somewhere on a spectrum between market capitalism and command socialism. In a market capitalist economy, resources are generally owned by private individuals who have the power to make decisions about their use. A market capitalist system is often referred to as a free enterprise economic system. In a command socialist economy, the government is the primary owner of capital and natural resources and has broad power to allocate the use of factors of production. Between these two categories lie mixed economies that combine elements of market capitalist and of command socialist economic systems.

No economy represents a pure case of either market capitalism or command socialism. While we talk about capitalist leaning economies and command leaning economies, it is safe to say that all economies of the world are mixed economies. To determine where an economy lies between these two types of systems, we evaluate the extent of government ownership of capital and natural resources and the degree to which government is involved in decisions about the use of factors of production.

Figure 2.11 suggests the spectrum of economic systems. Market capitalist economies lie toward the left end of this spectrum; command socialist economies appear toward the right. Mixed economies lie in between.

Figure 2.11 Economic Systems



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CHAPTER OVERVIEW

3: Demand and Supply

[3.1: Demand](#)

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[3.3: Demand, Supply, and Equilibrium](#)

[3.4: Government Intervention - Price Floors and Price Ceilings](#)

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3.1: Demand

Learning Objective

1. Define the quantity demanded of a good or service and illustrate it using a demand schedule and a demand curve.
2. Distinguish between the following pairs of concepts: demand and quantity demanded, demand schedule and demand curve, movement along and shift in a demand curve.
3. Identify demand shifters and determine whether a change in a demand shifter causes the demand curve to shift to the right or to the left.

How many pizzas will people eat this year? How many doctor visits will people make? How many houses will people buy?

Each good or service has its own special characteristics that determine the quantity people are willing and able to consume. One is the price of the good or service itself. Other independent variables that are important determinants of demand include consumer preferences, prices of related goods and services, income, demographic characteristics such as population size, and buyer expectations. The number of pizzas people will purchase, for example, depends very much on whether they like pizza. It also depends on the prices for alternatives such as hamburgers or spaghetti. The number of doctor visits is likely to vary with income—people with higher incomes are likely to see a doctor more often than people with lower incomes. The demands for pizza, for doctor visits, and for housing are certainly affected by the age distribution of the population and its size.

While different variables play different roles in influencing the demands for different goods and services, economists pay special attention to one: the price of the good or service. Given the values of all the other variables that affect demand, a higher price tends to reduce the quantity people demand, and a lower price tends to increase it. A medium pizza typically sells for \$5 to \$10. Suppose the price were \$30. Chances are, you would buy fewer pizzas at that price than you do now. Suppose pizzas typically sold for \$2 each. At that price, people would be likely to buy more pizzas than they do now.

We will discuss first how price affects the quantity demanded of a good or service and then how other variables affect demand.

Price and the Demand Curve

Because people will purchase different quantities of a good or service at different prices, economists must be careful when speaking of the “demand” for something. They have therefore developed some specific terms for expressing the general concept of demand.

The quantity demanded of a good or service is the quantity buyers are willing and able to buy at a particular price during a particular period, all other things unchanged. (As we learned, we can substitute the Latin phrase “*ceteris paribus*” for “all other things unchanged.”) Suppose, for example, that 100,000 movie tickets are sold each month in a particular town at a price of \$8 per ticket. That quantity—100,000—is the quantity of movie admissions demanded per month at a price of \$8. If the price were \$12, we would expect the quantity demanded to be less. If it were \$4, we would expect the quantity demanded to be greater. The quantity demanded at each price would be different if other things that might affect it, such as the population of the town, were to change. That is why we add the qualifier that other things have not changed to the definition of quantity demanded.

A demand schedule is a table that shows the quantities of a good or service demanded at different prices during a particular period, all other things unchanged. To introduce the concept of a demand schedule, let us consider the demand for coffee in the United States. We will ignore differences among types of coffee beans and roasts, and speak simply of coffee. The table in Figure 3.1 shows quantities of coffee that will be demanded each month at prices ranging from \$9 to \$4 per pound; the table is a demand schedule. We see that the higher the price, the lower the quantity demanded.

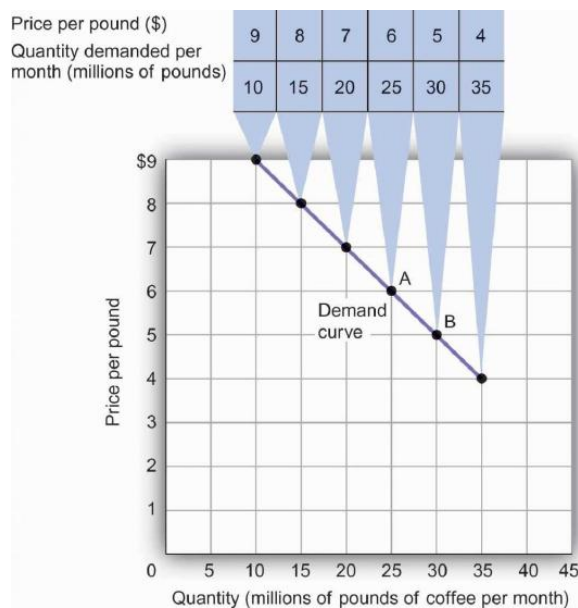


Figure 3.1 A Demand Schedule and a Demand Curve: The table is a demand schedule; it shows quantities of coffee demanded per month in the United States at particular prices, all other things unchanged. These data are then plotted on the demand curve. At point A on the curve, 25 million pounds of coffee per month are demanded at a price of \$6 per pound. At point B, 30 million pounds of coffee per month are demanded at a price of \$5 per pound.

The information given in a demand schedule can be presented with a demand curve, which is a graphical representation of a demand schedule. A demand curve thus shows the relationship between the price and quantity demanded of a good or service during a particular period, all other things unchanged. The demand curve in Figure 3.1 shows the prices and quantities of coffee demanded that are given in the demand schedule. At point A, for example, we see that 25 million pounds of coffee per month are demanded at a price of \$6 per pound. By convention, economists graph price on the vertical axis and quantity on the horizontal axis.

Price alone does not determine the quantity of coffee or any other good that people buy. To isolate the effect of changes in price on the quantity of a good or service demanded, however, we show the quantity demanded at each price, assuming that those other variables remain unchanged. We do the same thing in drawing a graph of the relationship between any two variables; we assume that the values of other variables that may affect the variables shown in the graph (such as income or population) remain unchanged for the period under consideration.

A change in price, with no change in any of the other variables that affect demand, results in a movement *along* the demand curve. For example, if the price of coffee falls from \$6 to \$5 per pound, consumption rises from 25 million pounds to 30 million pounds per month. That is a movement from point A to point B along the demand curve in Figure 3.1. A movement along a demand curve that results from a change in price is called a change in quantity demanded. Note that a change in quantity demanded is not a change or shift in the demand curve; it is a movement *along* the demand curve.

The negative slope of the demand curve in Figure 3.1 suggests a key behavioral relationship of economics. All other things unchanged, the law of demand holds that, for virtually all goods and services, a higher price leads to a reduction in quantity demanded and a lower price leads to an increase in quantity demanded.

The law of demand is called a law because the results of countless studies are consistent with it. Undoubtedly, you have observed one manifestation of the law. When a store finds itself with an overstock of some item, such as running shoes or tomatoes, and needs to sell these items quickly, what does it do? It typically has a sale, expecting that a lower price will increase the quantity demanded. In general, we expect the law of demand to hold. Given the values of other variables that influence demand, a higher price reduces the quantity demanded. A lower price increases the quantity demanded. Demand curves, in short, slope downward.

Changes in Demand

Of course, price alone does not determine the quantity of a good or service that people consume. Coffee consumption, for example, will be affected by such variables as income and population. Preferences also play a role. We also expect other prices to affect

coffee consumption. People often eat doughnuts or bagels with their coffee, so a reduction in the price of doughnuts or bagels might induce people to drink more coffee. An alternative to coffee is tea, so a reduction in the price of tea might result in the consumption of more tea and less coffee. Thus, a change in any one of the variables held constant in constructing a demand schedule will change the quantities demanded at each price. The result will be a *shift* in the entire demand curve rather than a movement along the demand curve. A *shift* in a demand curve is called a change in demand.

Suppose, for example, that something happens to increase the quantity of coffee demanded at each price. Several events could produce such a change: an increase in incomes, an increase in population, or an increase in the price of tea would each be likely to increase the quantity of coffee demanded at each price. Any such change produces a new demand schedule. Figure 3.2 shows such a change in the demand schedule for coffee. We see that the quantity of coffee demanded per month is greater at each price than before. We show that graphically as a shift in the demand curve. The original curve, labeled D_1 , shifts to the right to D_2 . At a price of \$6 per pound, for example, the quantity demanded rises from 25 million pounds per month (point A) to 35 million pounds per month (point A').

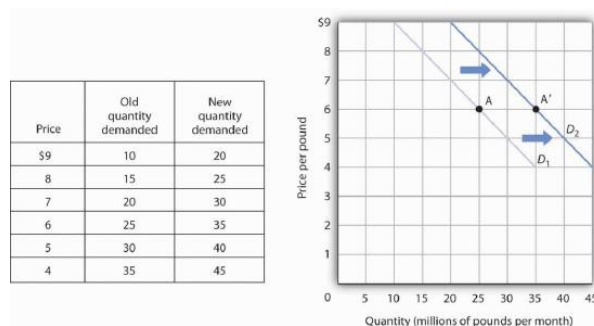


Figure 3.2 An Increase in Demand: An increase in the quantity of a good or service demanded at each price is shown as an increase in demand. Here, the original demand curve D_1 shifts to D_2 . Point A on D_1 corresponds to a price of \$6 per pound and a quantity demanded of 25 million pounds of coffee per month. On the new demand curve D_2 , the quantity demanded at this price rises to 35 million pounds of coffee per month (point A').

Just as demand can increase, it can decrease. In the case of coffee, demand might fall as a result of events such as a reduction in population, a reduction in the price of tea, or a change in preferences. For example, a finding that the caffeine in coffee contributes to heart disease, which is occasionally being debated in the scientific community, could change preferences and reduce the demand for coffee.

A reduction in the demand for coffee is illustrated in Figure 3.3. The demand schedule shows that less coffee is demanded at each price than in Figure 3.1. The result is a shift in demand from the original curve D_1 to D_3 . The quantity of coffee demanded at a price of \$6 per pound falls from 25 million pounds per month (point A) to 15 million pounds per month (point A'').

Note, again, that a change in quantity demanded, *ceteris paribus*, refers to a movement *along* the demand curve, while a change in demand refers to a *shift* in the demand curve.

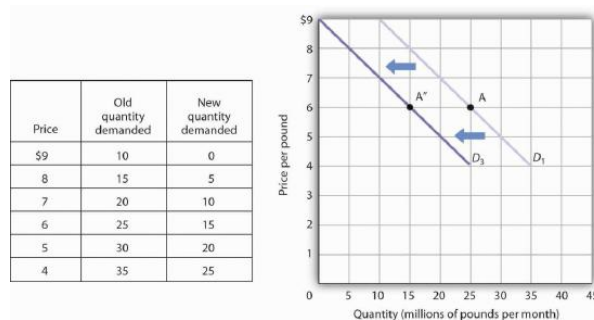


Figure 3.3 A Reduction in Demand: A reduction in demand occurs when the quantities of a good or service demanded fall at each price. Here, the demand schedule shows a lower quantity of coffee demanded at each price than we had in Figure 3.1. The reduction shifts the demand curve for coffee to D_3 from D_1 . The quantity demanded at a price of \$6 per pound, for example, falls from 25 million pounds per month (point A) to 15 million pounds of coffee per month (point A'').

A variable that can change the quantity of a good or service demanded at each price is called a demand shifter. When these other variables change, the all-other-things-unchanged conditions behind the original demand curve no longer hold. Although different goods and services will have different demand shifters, the demand shifters are likely to include (1) consumer preferences, (2) the prices of related goods and services, (3) income, (4) demographic characteristics, and (5) buyer expectations. Next we look at each of these.

Preferences

Changes in preferences of buyers can have important consequences for demand. We have already seen how Starbucks supposedly increased the demand for coffee. Another example is reduced demand for cigarettes caused by concern about the effect of smoking on health. A change in preferences that makes one good or service more popular will shift the demand curve to the right. A change that makes it less popular will shift the demand curve to the left.

Prices of Related Goods and Services

Suppose the price of doughnuts were to fall. Many people who drink coffee enjoy dunking doughnuts in their coffee; the lower price of doughnuts might therefore increase the demand for coffee, shifting the demand curve for coffee to the right. A lower price for tea, however, would be likely to reduce coffee demand, shifting the demand curve for coffee to the left.

In general, if a reduction in the price of one good increases the demand for another, the two goods are called complements. If a reduction in the price of one good reduces the demand for another, the two goods are called substitutes. These definitions hold in reverse as well: two goods are complements if an increase in the price of one reduces the demand for the other, and they are substitutes if an increase in the price of one increases the demand for the other. Doughnuts and coffee are complements; tea and coffee are substitutes. This information is summarized in Figure 3.4.

Complementary goods are goods used in conjunction with one another. Tennis rackets and tennis balls, eggs and bacon, and stationery and postage stamps are complementary goods. Substitute goods are goods used instead of one another. iPods, for example, are likely to be substitutes for CD players. Breakfast cereal is a substitute for eggs. A file attachment to an e-mail is a substitute for both a fax machine and postage stamps.

Figure 3.4: Complements and Substitutes

Complements (coffee and doughnuts)			
↓	Reducing the price of one...	↑	increases the demand for the other.
↑	Increasing the price of one...	↓	reduces the demand for the other.
Substitutes (coffee and tea)			
↑	Increasing the price of one...	↑	increases the demand for the other.
↓	Reducing the price of one...	↓	reduces the demand for the other.

Income

As incomes rise, people increase their consumption of many goods and services, and as incomes fall, their consumption of these goods and services falls. For example, an increase in income is likely to raise the demand for gasoline, ski trips, new cars, and

jewelry. There are, however, goods and services for which consumption falls as income rises—and rises as income falls. As incomes rise, for example, people tend to consume more fresh fruit but less canned fruit.

A good for which demand increases when income increases is called a normal good. A good for which demand decreases when income increases is called an inferior good. An increase in income shifts the demand curve for fresh fruit (a normal good) to the right; it shifts the demand curve for canned fruit (an inferior good) to the left.

Demographic Characteristics

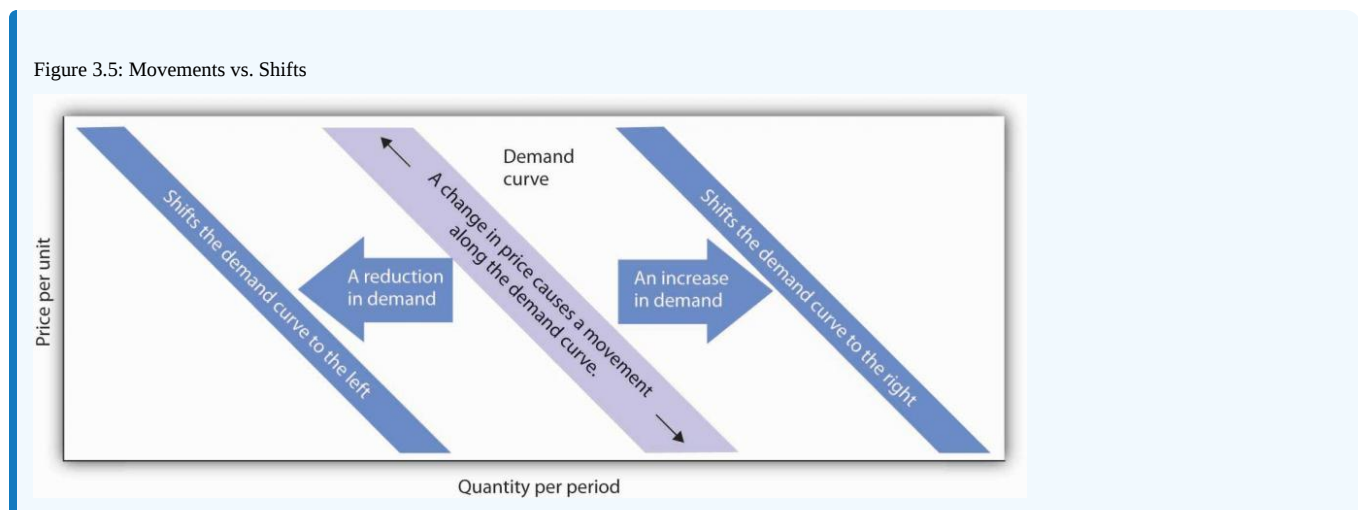
The number of buyers affects the total quantity of a good or service that will be bought; in general, the greater the population, the greater the demand. Other demographic characteristics can affect demand as well. As the share of the population over age 65 increases, the demand for medical services, ocean cruises, and motor homes increases. The birth rate in the United States fell sharply between 1955 and 1975 but has gradually increased since then. That increase has raised the demand for such things as infant supplies, elementary school teachers, soccer coaches, in-line skates, and college education. Demand can thus shift as a result of changes in both the number and characteristics of buyers.

Buyer Expectations

The consumption of goods that can be easily stored, or whose consumption can be postponed, is strongly affected by buyer expectations. The expectation of newer TV technologies, such as high-definition TV, could slow down sales of regular TVs. If people expect gasoline prices to rise tomorrow, they will fill up their tanks today to try to beat the price increase. The same will be true for goods such as automobiles and washing machines: an expectation of higher prices in the future will lead to more purchases today. If the price of a good is expected to fall, however, people are likely to reduce their purchases today and await tomorrow's lower prices. The expectation that computer prices will fall, for example, can reduce current demand.

In Summary

It is crucial to distinguish between a change in quantity demanded, which is a movement along the demand curve caused by a change in price, and a change in demand, which implies a shift of the demand curve itself. A change in demand is caused by a change in a demand shifter. An increase in demand is a shift of the demand curve to the right. A decrease in demand is a shift in the demand curve to the left. Figure 3.5 highlights the difference.



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3.2: Supply

Learning Objective

1. Define the quantity supplied of a good or service and illustrate it using a supply schedule and a supply curve.
2. Distinguish between the following pairs of concepts: supply and quantity supplied, supply schedule and supply curve, movement along and shift in a supply curve.
3. Identify supply shifters and determine whether a change in a supply shifter causes the supply curve to shift to the right or to the left.

What determines the quantity of a good or service sellers are willing to offer for sale? Price is one factor; *ceteris paribus*, a higher price is likely to induce sellers to offer a greater quantity of a good or service. Production cost is another determinant of supply. Variables that affect production cost include the prices of factors used to produce the good or service, returns from alternative activities, technology, the expectations of sellers, and natural events such as weather changes. Still another factor affecting the quantity of a good that will be offered for sale is the number of sellers—the greater the number of sellers of a particular good or service, the greater will be the quantity offered at any price per time period.

Price and the Supply Curve

The quantity supplied of a good or service is the quantity sellers are willing to sell at a particular price during a particular period, all other things unchanged. *Ceteris paribus*, the receipt of a higher price increases profits and induces sellers to increase the quantity they supply.

In general, when there are many sellers of a good, an increase in price results in an increase in quantity supplied, and this relationship is often referred to as the law of supply. We will see, though, through our exploration of microeconomics, that there are a number of exceptions to this relationship. There are cases in which a higher price will not induce an increase in quantity supplied. Goods that cannot be produced, such as additional land on the corner of Park Avenue and 56th Street in Manhattan, are fixed in supply—a higher price cannot induce an increase in the quantity supplied. There are even cases, which we investigate in microeconomic analysis, in which a higher price induces a reduction in the quantity supplied.

Generally speaking, however, when there are many sellers of a good, an increase in price results in a greater quantity supplied. The relationship between price and quantity supplied is suggested in a supply schedule, a table that shows quantities supplied at different prices during a particular period, all other things unchanged. Figure 3.6 gives a supply schedule for the quantities of coffee that will be supplied per month at various prices, *ceteris paribus*. At a price of \$4 per pound, for example, producers are willing to supply 15 million pounds of coffee per month. A higher price, say \$6 per pound, induces sellers to supply a greater quantity—25 million pounds of coffee per month.

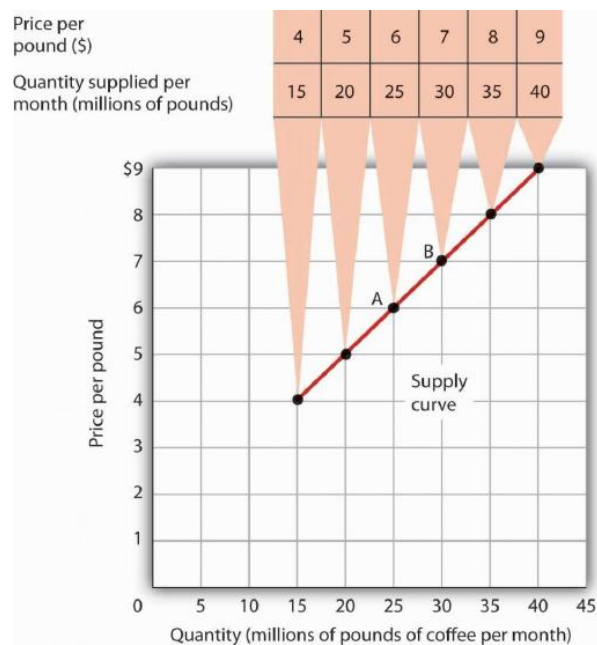


Figure 3.6 A Supply Schedule and a Supply Curve The supply schedule shows the quantity of coffee that will be supplied in the United States each month at particular prices, all other things unchanged. The same information is given graphically in the supply curve. The values given here suggest a positive relationship between price and quantity supplied.

A supply curve is a graphical representation of a supply schedule. It shows the relationship between price and quantity supplied during a particular period, all other things unchanged. Because the relationship between price and quantity supplied is generally positive, supply curves are generally upward sloping. The supply curve for coffee in Figure 3.6 shows graphically the values given in the supply schedule.

A change in price causes a movement *along* the supply curve; such a movement is called a change in quantity supplied. As is the case with a change in quantity demanded, a change in quantity supplied does not shift the supply curve. By definition, it is a movement along the supply curve. For example, if the price rises from \$6 per pound to \$7 per pound, the quantity supplied rises from 25 million pounds per month to 30 million pounds per month. That's a movement from point A to point B along the supply curve in Figure 3.6.

Changes in Supply

When we draw a supply curve, we assume that other variables that affect the willingness of sellers to supply a good or service are unchanged. It follows that a change in any of those variables will cause a change in supply, which is a shift in the supply curve. A change that increases the quantity of a good or service supplied at each price shifts the supply curve to the right. Suppose, for example, that the price of fertilizer falls. That will reduce the cost of producing coffee and thus increase the quantity of coffee producers will offer for sale at each price. The supply schedule in Figure 3.7 shows an increase in the quantity of coffee supplied at each price. We show the increase graphically as a shift in the supply curve from S_1 to S_2 . We see that the quantity supplied at each price increases by 10 million pounds of coffee per month. At point A on the original supply curve S_1 , for example, 25 million pounds of coffee per month are supplied at a price of \$6 per pound. After the increase in supply, 35 million pounds per month are supplied at the same price (point A' on curve S_2).

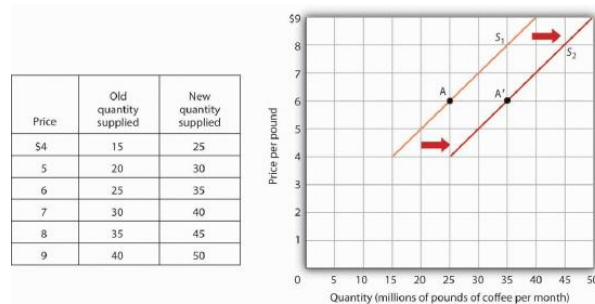


Figure 3.7 An Increase in Supply If there is a change in supply that increases the quantity supplied at each price, as is the case in the supply schedule here, the supply curve shifts to the right. At a price of \$6 per pound, for example, the quantity supplied rises from the previous level of 25 million pounds per month on supply curve S_1 (point A) to 35 million pounds per month on supply curve S_2 (point A').

An event that reduces the quantity supplied at each price shifts the supply curve to the left. An increase in production costs and excessive rain that reduces the yields from coffee plants are examples of events that might reduce supply. Figure 3.8 shows a reduction in the supply of coffee. We see in the supply schedule that the quantity of coffee supplied falls by 10 million pounds of coffee per month at each price. The supply curve thus shifts from S_1 to S_3 .

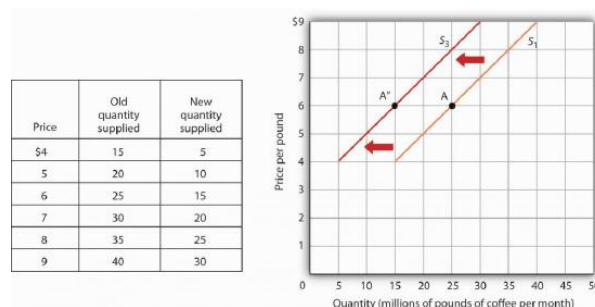


Figure 3.8 A Reduction in Supply A change in supply that reduces the quantity supplied at each price shifts the supply curve to the left. At a price of \$6 per pound, for example, the original quantity supplied was 25 million pounds of coffee per month (point A). With a new supply curve S_3 , the quantity supplied at that price falls to 15 million pounds of coffee per month (point A'').

A variable that can change the quantity of a good or service supplied at each price is called a supply shifter. Supply shifters include (1) prices of factors of production, (2) returns from alternative activities, (3) technology, (4) seller expectations, (5) natural events, and (6) the number of sellers. When these other variables change, the all-other-things-unchanged conditions behind the original supply curve no longer hold. Let us look at each of the supply shifters.

Prices of Factors of Production

A change in the price of labor or some other factor of production will change the cost of producing any given quantity of the good or service. This change in the cost of production will change the quantity that suppliers are willing to offer at any price. An increase in factor prices should decrease the quantity suppliers will offer at any price, shifting the supply curve to the left. A reduction in factor prices increases the quantity suppliers will offer at any price, shifting the supply curve to the right.

Suppose coffee growers must pay a higher wage to the workers they hire to harvest coffee or must pay more for fertilizer. Such increases in production cost will cause them to produce a smaller quantity at each price, shifting the supply curve for coffee to the left. A reduction in any of these costs increases supply, shifting the supply curve to the right.

Returns from Alternative Activities

To produce one good or service means forgoing the production of another. The concept of opportunity cost in economics suggests that the value of the activity forgone is the opportunity cost of the activity chosen; this cost should affect supply. For example, one opportunity cost of producing eggs is not selling chickens. An increase in the price people are willing to pay for fresh chicken

would make it more profitable to sell chickens and would thus increase the opportunity cost of producing eggs. It would shift the supply curve for eggs to the left, reflecting a decrease in supply.

Technology

A change in technology alters the combinations of inputs or the types of inputs required in the production process. An improvement in technology usually means that fewer and/or less costly inputs are needed. If the cost of production is lower, the profits available at a given price will increase, and producers will produce more. With more produced at every price, the supply curve will shift to the right, meaning an increase in supply.

Impressive technological changes have occurred in the computer industry in recent years. Computers are much smaller and are far more powerful than they were only a few years ago—and they are much cheaper to produce. The result has been a huge increase in the supply of computers, shifting the supply curve to the right.

While we usually think of technology as enhancing production, declines in production due to problems in technology are also possible. Outlawing the use of certain equipment without pollution-control devices has increased the cost of production for many goods and services, thereby reducing profits available at any price and shifting these supply curves to the left.

Seller Expectations

All supply curves are based in part on seller expectations about future market conditions. Many decisions about production and selling are typically made long before a product is ready for sale. Those decisions necessarily depend on expectations. Changes in seller expectations can have important effects on price and quantity.

Consider, for example, the owners of oil deposits. Oil pumped out of the ground and used today will be unavailable in the future. If a change in the international political climate leads many owners to expect that oil prices will rise in the future, they may decide to leave their oil in the ground, planning to sell it later when the price is higher. Thus, there will be a decrease in supply; the supply curve for oil will shift to the left.

Natural Events

Storms, insect infestations, and drought affect agricultural production and thus the supply of agricultural goods. If something destroys a substantial part of an agricultural crop, the supply curve will shift to the left. The terrible cyclone that killed more than 50,000 people in Myanmar in 2008 also destroyed some of the country's prime rice growing land. That shifted the supply curve for rice to the left. If there is an unusually good harvest, the supply curve will shift to the right.

The Number of Sellers

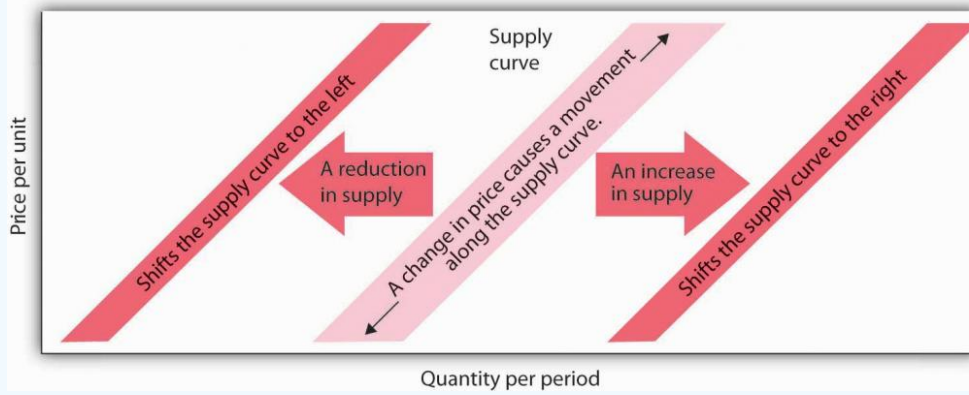
The supply curve for an industry, such as coffee, includes all the sellers in the industry. A change in the number of sellers in an industry changes the quantity available at each price and thus changes supply. An increase in the number of sellers supplying a good or service shifts the supply curve to the right; a reduction in the number of sellers shifts the supply curve to the left.

The market for cellular phone service has been affected by an increase in the number of firms offering the service. Over the past decade, new cellular phone companies emerged, shifting the supply curve for cellular phone service to the right.

In Summary

It is crucial to distinguish between a change in quantity supplied, which is a movement along the supply curve caused by a change in price, and a change in supply, which implies a shift of the supply curve itself. A change in supply is caused by a change in a supply shifter. An increase in supply is a shift of the supply curve to the right. A decrease in supply is a shift in the supply curve to the left. Figure 3.9 highlights the difference.

Figure 3.9 Movements vs. Shifters



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3.3: Demand, Supply, and Equilibrium

Learning Objective

1. Use demand and supply to explain how equilibrium price and quantity are determined in a market.
2. Understand the concepts of surpluses and shortages and the pressures on price they generate.
3. Explain the impact of a change in demand or supply on equilibrium price and quantity.
4. Explain how the circular flow model provides an overview of demand and supply in product and factor markets and how the model suggests ways in which these markets are linked.

In this section we combine the demand and supply curves we have just studied into a new model. The model of demand and supply uses demand and supply curves to explain the determination of price and quantity in a market.

The Determination of Price and Quantity

The logic of the model of demand and supply is simple. The demand curve shows the quantities of a particular good or service that buyers will be willing and able to purchase at each price during a specified period. The supply curve shows the quantities that sellers will offer for sale at each price during that same period. By putting the two curves together, we should be able to find a price at which the quantity buyers are willing and able to purchase equals the quantity sellers will offer for sale.

Figure 3.10 combines the demand and supply data introduced in Figure 3.1 and Figure 3.6. Notice that the two curves intersect at a price of \$6 per pound—at this price the quantities demanded and supplied are equal. Buyers want to purchase, and sellers are willing to offer for sale, 25 million pounds of coffee per month. The market for coffee is in equilibrium. Unless the demand or supply curve shifts, there will be no tendency for price to change. The equilibrium price in any market is the price at which quantity demanded equals quantity supplied. The equilibrium price in the market for coffee is thus \$6 per pound. The equilibrium quantity is the quantity demanded and supplied at the equilibrium price.



Figure 3.10 The Determination of Equilibrium Price and Quantity: When we combine the demand and supply curves for a good in a single graph, the point at which they intersect identifies the equilibrium price and equilibrium quantity. Here, the equilibrium price is \$6 per pound. Consumers demand, and suppliers supply, 25 million pounds of coffee per month at this price.

With an upward-sloping supply curve and a downward-sloping demand curve, there is only a single price at which the two curves intersect. This means there is only one price at which equilibrium is achieved. It follows that at any price other than the equilibrium price, the market will not be in equilibrium. We next examine what happens at prices other than the equilibrium price.

Surpluses

Figure 3.11 shows the same demand and supply curves we have just examined, but this time the initial price is \$8 per pound of coffee. Because we no longer have a balance between quantity demanded and quantity supplied, this price is not the equilibrium price. At a price of \$8, we read over to the demand curve to determine the quantity of coffee consumers will be willing to buy—15 million pounds per month. The supply curve tells us what sellers will offer for sale—35 million pounds per month. The difference, 20 million pounds of coffee per month, is called a surplus. More generally, a surplus is the amount by which the quantity supplied exceeds the quantity demanded at the current price. There is, of course, no surplus at the equilibrium price; a surplus occurs only if the current price exceeds the equilibrium price.

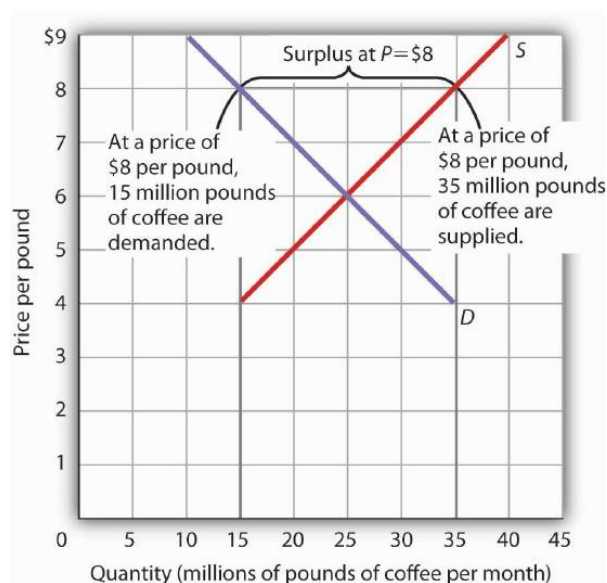


Figure 3.11 A Surplus in the Market for Coffee At a price of \$8, the quantity supplied is 35 million pounds of coffee per month and the quantity demanded is 15 million pounds per month; there is a surplus of 20 million pounds of coffee per month. Given a surplus, the price will fall quickly toward the equilibrium level of \$6.

A surplus in the market for coffee will not last long. With unsold coffee on the market, sellers will begin to reduce their prices to clear out unsold coffee. As the price of coffee begins to fall, the quantity of coffee supplied begins to decline. At the same time, the quantity of coffee demanded begins to rise. Remember that the reduction in quantity supplied is a movement *along* the supply curve—the curve itself does not shift in response to a reduction in price. Similarly, the increase in quantity demanded is a movement *along* the demand curve—the demand curve does not shift in response to a reduction in price. Price will continue to fall until it reaches its equilibrium level, at which the demand and supply curves intersect. At that point, there will be no tendency for price to fall further. In general, surpluses in the marketplace are short-lived. The prices of most goods and services adjust quickly, eliminating the surplus. Later on, we will discuss some markets in which adjustment of price to equilibrium may occur only very slowly or not at all.

Shortages

Just as a price above the equilibrium price will cause a surplus, a price below equilibrium will cause a shortage. A shortage is the amount by which the quantity demanded exceeds the quantity supplied at the current price.

Figure 3.12 shows a shortage in the market for coffee. Suppose the price is \$4 per pound. At that price, 15 million pounds of coffee would be supplied per month, and 35 million pounds would be demanded per month. When more coffee is demanded than supplied, there is a shortage.

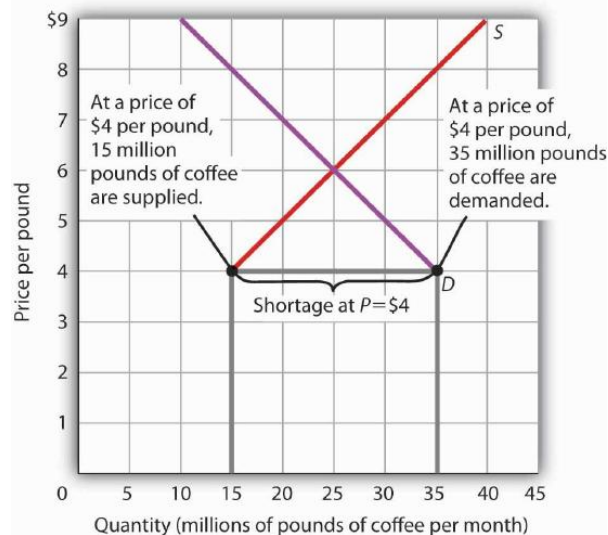


Figure 3.12 A Shortage in the Market for Coffee: At a price of \$4 per pound, the quantity of coffee demanded is 35 million pounds per month and the quantity supplied is 15 million pounds per month. The result is a shortage of 20 million pounds of coffee per month.

In the face of a shortage, sellers are likely to begin to raise their prices. As the price rises, there will be an increase in the quantity supplied (but not a change in supply) and a reduction in the quantity demanded (but not a change in demand) until the equilibrium price is achieved.

Shifts in Demand and Supply

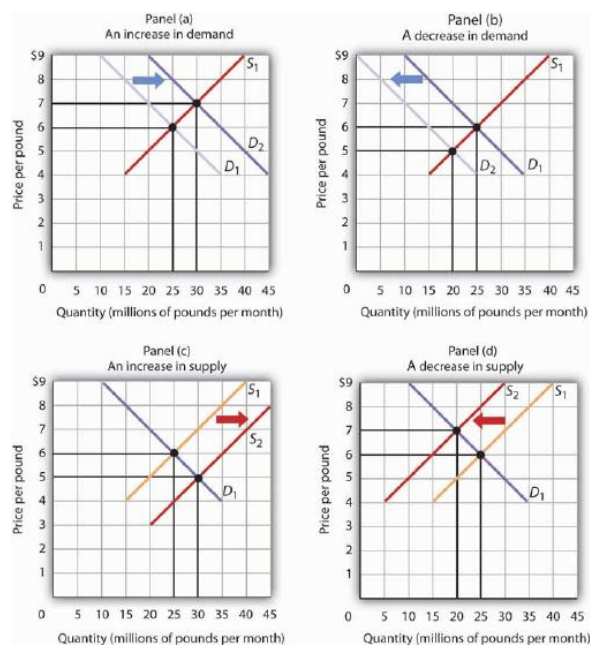


Figure 3.13 Changes in Demand and Supply: A change in demand or in supply changes the equilibrium solution in the model. Panels (a) and (b) show an increase and a decrease in demand, respectively; Panels (c) and (d) show an increase and a decrease in supply, respectively.

A change in one of the variables (shifters) held constant in any model of demand and supply will create a change in demand or supply. A shift in a demand or supply curve changes the equilibrium price and equilibrium quantity for a good or service. Figure 3.13 combines the information about changes in the demand and supply of coffee presented in Figure 3.2Figure 3.3Figure 3.7 and

Figure 3.8 In each case, the original equilibrium price is \$6 per pound, and the corresponding equilibrium quantity is 25 million pounds of coffee per month. Figure 3.13 shows what happens with an increase in demand, a reduction in demand, an increase in supply, and a reduction in supply. We then look at what happens if both curves shift simultaneously. Each of these possibilities is discussed in turn below.

An Increase in Demand

An increase in demand for coffee shifts the demand curve to the right, as shown in Panel (a) of Figure 3.13. The equilibrium price rises to \$7 per pound. As the price rises to the new equilibrium level, the quantity supplied increases to 30 million pounds of coffee per month. Notice that the supply curve does not shift; rather, there is a movement along the supply curve.

Demand shifters that could cause an increase in demand include a shift in preferences that leads to greater coffee consumption; a lower price for a complement to coffee, such as doughnuts; a higher price for a substitute for coffee, such as tea; an increase in income; and an increase in population. A change in buyer expectations, perhaps due to predictions of bad weather lowering expected yields on coffee plants and increasing future coffee prices, could also increase current demand.

A Decrease in Demand

Panel (b) of Figure 3.13 shows that a decrease in demand shifts the demand curve to the left. The equilibrium price falls to \$5 per pound. As the price falls to the new equilibrium level, the quantity supplied decreases to 20 million pounds of coffee per month.

Demand shifters that could reduce the demand for coffee include a shift in preferences that makes people want to consume less coffee; an increase in the price of a complement, such as doughnuts; a reduction in the price of a substitute, such as tea; a reduction in income; a reduction in population; and a change in buyer expectations that leads people to expect lower prices for coffee in the future.

An Increase in Supply

An increase in the supply of coffee shifts the supply curve to the right, as shown in Panel (c) of Figure 3.13. The equilibrium price falls to \$5 per pound. As the price falls to the new equilibrium level, the quantity of coffee demanded increases to 30 million pounds of coffee per month. Notice that the demand curve does not shift; rather, there is movement along the demand curve.

Possible supply shifters that could increase supply include a reduction in the price of an input such as labor, a decline in the returns available from alternative uses of the inputs that produce coffee, an improvement in the technology of coffee production, good weather, and an increase in the number of coffee-producing firms.

A Decrease in Supply

Panel (d) of Figure 3.13 shows that a decrease in supply shifts the supply curve to the left. The equilibrium price rises to \$7 per pound. As the price rises to the new equilibrium level, the quantity demanded decreases to 20 million pounds of coffee per month.

Possible supply shifters that could reduce supply include an increase in the prices of inputs used in the production of coffee, an increase in the returns available from alternative uses of these inputs, a decline in production because of problems in technology (perhaps caused by a restriction on pesticides used to protect coffee beans), a reduction in the number of coffee-producing firms, or a natural event, such as excessive rain.

Simultaneous Shifts

As we have seen, when *either* the demand or the supply curve shifts, the results are unambiguous; that is, we know what will happen to both equilibrium price and equilibrium quantity, so long as we know whether demand or supply increased or decreased. However, in practice, several events may occur at around the same time that cause *both* the demand and supply curves to shift. To figure out what happens to equilibrium price and equilibrium quantity, we must know not only in which direction the demand and supply curves have shifted but also the relative amount by which each curve shifts. Of course, the demand and supply curves could shift in the same direction or in opposite directions, depending on the specific events causing them to shift.

For example, all three panels of Figure 3.14 show a decrease in demand for coffee (caused perhaps by a decrease in the price of a substitute good, such as tea) and a simultaneous decrease in the supply of coffee (caused perhaps by bad weather). Since reductions in demand and supply, considered separately, each cause the equilibrium quantity to fall, the impact of both curves shifting simultaneously to the left means that the new equilibrium quantity of coffee is less than the old equilibrium quantity. The effect on

the equilibrium price, though, is ambiguous. Whether the equilibrium price is higher, lower, or unchanged depends on the extent to which each curve shifts.

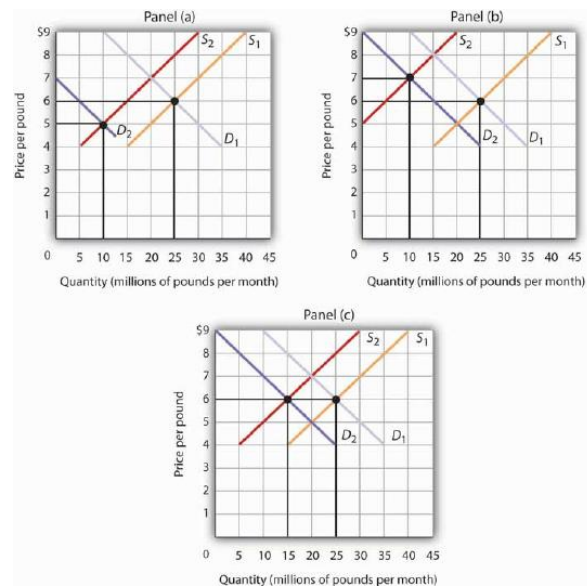


Figure 3.14 Simultaneous Decreases in Demand and Supply: Both the demand and the supply of coffee decrease. Since decreases in demand and supply, considered separately, each cause equilibrium quantity to fall, the impact of both decreasing simultaneously means that a new equilibrium quantity of coffee must be less than the old equilibrium quantity. In Panel (a), the demand curve shifts farther to the left than does the supply curve, so equilibrium price falls. In Panel (b), the supply curve shifts farther to the left than does the demand curve, so the equilibrium price rises. In Panel (c), both curves shift to the left by the same amount, so equilibrium price stays the same.

If the demand curve shifts farther to the left than does the supply curve, as shown in Panel (a) of Figure 3.14, then the equilibrium price will be lower than it was before the curves shifted. In this case the new equilibrium price falls from \$6 per pound to \$5 per pound. If the shift to the left of the supply curve is greater than that of the demand curve, the equilibrium price will be higher than it was before, as shown in Panel (b). In this case, the new equilibrium price rises to \$7 per pound. In Panel (c), since both curves shift to the left by the same amount, equilibrium price does not change; it remains \$6 per pound.

Regardless of the scenario, changes in equilibrium price and equilibrium quantity resulting from two different events need to be considered separately. If both events cause equilibrium price or quantity to move in the same direction, then clearly price or quantity can be expected to move in that direction. If one event causes price or quantity to rise while the other causes it to fall, the extent by which each curve shifts is critical to figuring out what happens. Figure 3.15 summarizes what may happen to equilibrium price and quantity when demand and supply both shift.

		Shift in supply	
		Decrease in supply	Increase in supply
Shift in demand	Decrease in demand	Equilibrium price ? Equilibrium quantity ↓	Equilibrium price ↓ Equilibrium quantity ?
	Increase in demand	Equilibrium price ↑ Equilibrium quantity ?	Equilibrium price ? Equilibrium quantity ↑

Figure 3.15 Simultaneous Shifts in Demand and Supply If simultaneous shifts in demand and supply cause equilibrium price or quantity to move in the same direction, then equilibrium price or quantity clearly moves in that direction. If the shift in one of the curves causes equilibrium price or quantity to rise while the shift in the other curve causes equilibrium price or quantity to fall, then the relative amount by which each curve shifts is critical to figuring out what happens to that variable.

As demand and supply curves shift, prices adjust to maintain a balance between the quantity of a good demanded and the quantity supplied. If prices did not adjust, this balance could not be maintained.

Notice that the demand and supply curves that we have examined in this chapter have all been drawn as linear. This simplification of the real world makes the graphs a bit easier to read without sacrificing the essential point: whether the curves are linear or nonlinear, demand curves are downward sloping and supply curves are generally upward sloping. As circumstances that shift the demand curve or the supply curve change, we can analyze what will happen to price and what will happen to quantity.

An Overview of Demand and Supply: The Circular Flow Model

Implicit in the concepts of demand and supply is a constant interaction and adjustment that economists illustrate with the circular flow model. The circular flow model provides a look at how markets work and how they are related to each other. It shows flows of spending and income through the economy.

A great deal of economic activity can be thought of as a process of exchange between households and firms. Firms supply goods and services to households. Households buy these goods and services from firms. Households supply factors of production—labor, capital, and natural resources—that firms require. The payments firms make in exchange for these factors represent the incomes households earn.

The flow of goods and services, factors of production, and the payments they generate is illustrated in Figure 3.16. This circular flow model of the economy shows the interaction of households and firms as they exchange goods and services and factors of production. For simplicity, the model here shows only the private domestic economy; it omits the government and foreign sectors.

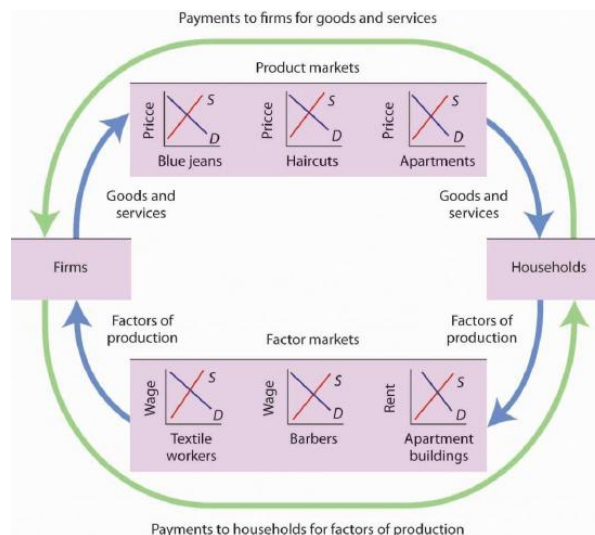


Figure 3.16 The Circular Flow of Economic Activity: This simplified circular flow model shows flows of spending between households and firms through product and factor markets. The inner arrows show goods and services flowing from firms to households and factors of production flowing from households to firms. The outer flows show the payments for goods, services, and factors of production. These flows, in turn, represent millions of individual markets for products and factors of production.

The circular flow model shows that goods and services that households demand are supplied by firms in product markets. The exchange for goods and services is shown in the top half of Figure 3.16. The bottom half of the exhibit illustrates the exchanges that take place in factor markets. factor markets are markets in which households supply factors of production—labor, capital, and natural resources—demanded by firms.

Our model is called a circular flow model because households use the income they receive from their supply of factors of production to buy goods and services from firms. Firms, in turn, use the payments they receive from households to pay for their factors of production.

The demand and supply model developed in this chapter gives us a basic tool for understanding what is happening in each of these product or factor markets and also allows us to see how these markets are interrelated. In Figure 3.16, markets for three goods and services that households want—blue jeans, haircuts, and apartments—create demands by firms for textile workers, barbers, and apartment buildings. The equilibrium of supply and demand in each market determines the price and quantity of that item. Moreover, a change in equilibrium in one market will affect equilibrium in related markets. For example, an increase in the demand for haircuts would lead to an increase in demand for barbers. Equilibrium price and quantity could rise in both markets. For some purposes, it will be adequate to simply look at a single market, whereas at other times we will want to look at what happens in related markets as well.

In either case, the model of demand and supply is one of the most widely used tools of economic analysis. That widespread use is no accident. The model yields results that are, in fact, broadly consistent with what we observe in the marketplace. Your mastery of this model will pay big dividends in your study of economics.

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3.4: Government Intervention - Price Floors and Price Ceilings

Learning Objective

1. Use the model of demand and supply to explain what happens when the government imposes price floors or price ceilings.
2. Discuss the reasons why governments sometimes choose to control prices and the consequences of price control policies.

So far, we have learned that markets tend to move toward their equilibrium prices and quantities. Surpluses and shortages of goods are short-lived as prices adjust to equate quantity demanded with quantity supplied.

In some markets, however, governments have been called on by groups of citizens to intervene to keep prices of certain items higher or lower than what would result from the market finding its own equilibrium price. In this section we will examine agricultural markets and apartment rental markets—two markets that have often been subject to price controls. Through these examples, we will identify the effects of controlling prices. In each case, we will look at reasons why governments have chosen to control prices in these markets and the consequences of these policies.

Agricultural Price Floors

Governments often seek to assist farmers by setting price floors in agricultural markets. A minimum allowable price set above the equilibrium price is a price floor. With a price floor, the government forbids a price below the minimum. (Notice that, if the price floor were for whatever reason set below the equilibrium price, it would be irrelevant to the determination of the price in the market since nothing would prohibit the price from rising to equilibrium.) A price floor that is set above the equilibrium price creates a surplus.

Figure 3.17 shows the market for wheat. Suppose the government sets the price of wheat at P_F . Notice that P_F is above the equilibrium price of P_E . At P_F , we read over to the demand curve to find that the quantity of wheat that buyers will be willing and able to purchase is W_1 bushels. Reading over to the supply curve, we find that sellers will offer W_2 bushels of wheat at the price floor of P_F . Because P_F is above the equilibrium price, there is a surplus of wheat equal to $(W_2 - W_1)$ bushels. The surplus persists because the government does not allow the price to fall.

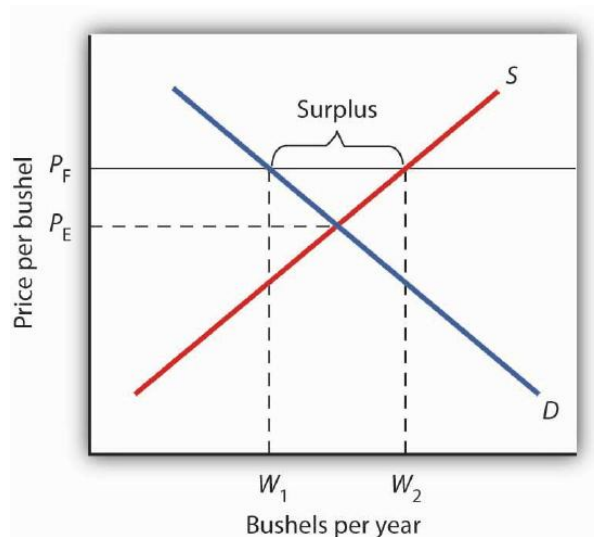


Figure 3.17 Price Floors in Wheat Markets: A price floor for wheat creates a surplus of wheat equal to $(W_2 - W_1)$ bushels.

Why have many governments around the world set price floors in agricultural markets? Farming has changed dramatically over the past two centuries. Technological improvements in the form of new equipment, fertilizers, pesticides, and new varieties of crops have led to dramatic increases in crop output per acre. Worldwide production capacity has expanded markedly. As we have learned, technological improvements cause the supply curve to shift to the right, reducing the price of food. While such price reductions

have been celebrated in, for example, computer markets, farmers have successfully lobbied for government programs aimed at keeping their prices from falling.

While the supply curve for agricultural goods has shifted to the right, the demand has increased with rising population and with rising income. But as incomes rise, people spend a smaller and smaller fraction of their incomes on food. While the demand for food has increased, that increase has not been nearly as great as the increase in supply. Figure 3.18 shows that the supply curve has shifted much farther to the right, from S_1 to S_2 , than the demand curve has, from D_1 to D_2 . As a result, equilibrium quantity has risen dramatically, from Q_1 to Q_2 , and equilibrium price has fallen, from P_1 to P_2 .

On top of this long-term historical trend in agriculture, agricultural prices are subject to wide swings over shorter periods. Droughts or freezes can sharply reduce supplies of particular crops, causing sudden increases in prices. Demand for agricultural goods of one country can suddenly dry up if the government of another country imposes trade restrictions against its products, and prices can fall. Such dramatic shifts in prices and quantities make incomes of farmers unstable.

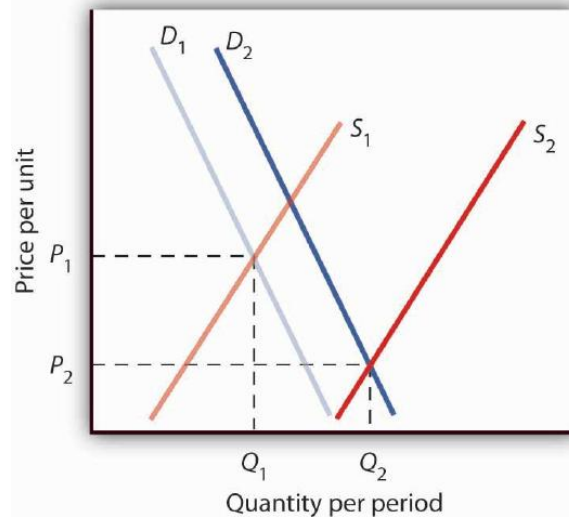


Figure 3.18 Supply and Demand Shifts for Agricultural Products: A relatively large increase in the supply of agricultural products, accompanied by a relatively small increase in demand, has reduced the price received by farmers and increased the quantity of agricultural goods.

The Great Depression of the 1930s led to a major federal role in agriculture. The Depression affected the entire economy, but it hit farmers particularly hard. Prices received by farmers plunged nearly two-thirds from 1930 to 1933. Many farmers had a tough time keeping up mortgage payments. By 1932, more than half of all farm loans were in default.

Farm legislation passed during the Great Depression has been modified many times, but the federal government has continued its direct involvement in agricultural markets. This has meant a variety of government programs that guarantee a minimum price for some types of agricultural products. These programs have been accompanied by government purchases of any surplus, by requirements to restrict acreage in order to limit those surpluses, by crop or production restrictions, and the like.

To see how such policies work, look back at Figure 3.17. At P_F , W_2 bushels of wheat will be supplied. With that much wheat on the market, there is market pressure on the price of wheat to fall. To prevent price from falling, the government buys the surplus of $(W_2 - W_1)$ bushels of wheat, so that only W_1 bushels are actually available to private consumers for purchase on the market. The government can store the surpluses or find special uses for them. For example, surpluses generated in the United States have been shipped to developing countries as grants-in-aid or distributed to local school lunch programs. As a variation on this program, the government can require farmers who want to participate in the price support program to reduce acreage in order to limit the size of the surpluses.

After 1973, the government stopped buying the surpluses (with some exceptions) and simply guaranteed farmers a “target price.” If the average market price for a crop fell below the crop’s target price, the government paid the difference. If, for example, a crop had a market price of \$3 per unit and a target price of \$4 per unit, the government would give farmers a payment of \$1 for each unit sold. Farmers would thus receive the market price of \$3 plus a government payment of \$1 per unit. For farmers to receive these

payments, they had to agree to remove acres from production and to comply with certain conservation provisions. These restrictions sought to reduce the size of the surplus generated by the target price, which acted as a kind of price floor.

What are the effects of such farm support programs? The intention is to boost and stabilize farm incomes. But, with price floors, consumers pay more for food than they would otherwise, and governments spend heavily to finance the programs. With the target price approach, consumers pay less, but government financing of the program continues. U.S. federal spending for agriculture averaged well over \$22 billion per year between 2003 and 2007, roughly \$70 per person.

Help to farmers has sometimes been justified on the grounds that it boosts incomes of “small” farmers. However, since farm aid has generally been allotted on the basis of how much farms produce rather than on a per-farm basis, most federal farm support has gone to the largest farms. If the goal is to eliminate poverty among farmers, farm aid could be redesigned to supplement the incomes of small or poor farmers rather than to undermine the functioning of agricultural markets.

In 1996, the U.S. Congress passed the Federal Agriculture Improvement and Reform Act of 1996, or FAIR. The thrust of the new legislation was to do away with the various programs of price support for most crops and hence provide incentives for farmers to respond to market price signals. To protect farmers through a transition period, the act provided for continued payments that were scheduled to decline over a seven-year period. However, with prices for many crops falling in 1998, the U.S. Congress passed an emergency aid package that increased payments to farmers. In 2008, as farm prices reached record highs, Congress passed a farm bill that increased subsidy payments to \$40 billion. It did, however, for the first time limit payments to the wealthiest farmers. Individual farmers whose farm incomes exceed \$750,000 (or \$1.5 million for couples) would be ineligible for some subsidy programs.

Rental Price Ceilings

The purpose of rent control is to make rental units cheaper for tenants than they would otherwise be. Unlike agricultural price controls, rent control in the United States has been largely a local phenomenon, although there were national rent controls in effect during World War II. Currently, about 200 cities and counties have some type of rent control provisions, and about 10% of rental units in the United States are now subject to price controls. New York City’s rent control program, which began in 1943, is among the oldest in the country. Many other cities in the United States adopted some form of rent control in the 1970s. Rent controls have been pervasive in Europe since World War I, and many large cities in poorer countries have also adopted rent controls.

Rent controls in different cities differ in terms of their flexibility. Some cities allow rent increases for specified reasons, such as to make improvements in apartments or to allow rents to keep pace with price increases elsewhere in the economy. Often, rental housing constructed after the imposition of the rent control ordinances is exempted. Apartments that are vacated may also be decontrolled. For simplicity, the model presented here assumes that apartment rents are controlled at a price that does not change.

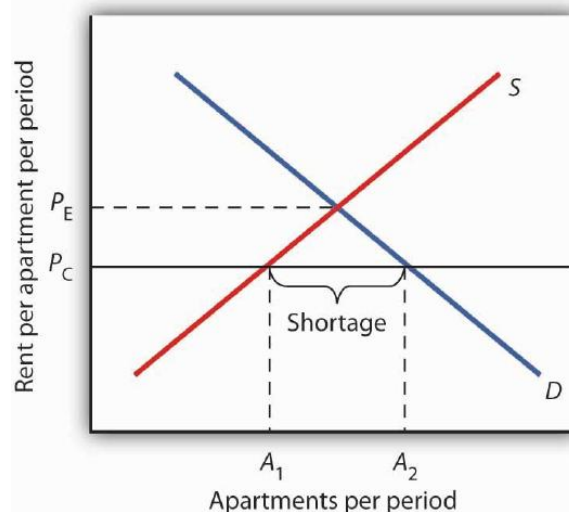


Figure 3.19 Effect of a Price Ceiling on the Market for Apartments A price ceiling on apartment rents that is set below the equilibrium rent creates a shortage of apartments equal to $(A_2 - A_1)$ apartments.

Figure 3.19 shows the market for rental apartments. Notice that the demand and supply curves are drawn to look like all the other demand and supply curves you have encountered so far in this text: the demand curve is downward-sloping and the supply curve is upward-sloping.

The demand curve shows that a higher price (rent) reduces the quantity of apartments demanded. For example, with higher rents, more young people will choose to live at home with their parents. With lower rents, more will choose to live in apartments. Higher rents may encourage more apartment sharing; lower rents would induce more people to live alone.

The supply curve is drawn to show that as rent increases, property owners will be encouraged to offer more apartments to rent. Even though an aerial photograph of a city would show apartments to be fixed at a point in time, owners of those properties will decide how many to rent depending on the amount of rent they anticipate. Higher rents may also induce some homeowners to rent out apartment space. In addition, renting out apartments implies a certain level of service to renters, so that low rents may lead some property owners to keep some apartments vacant.

Rent control is an example of a price ceiling, a maximum allowable price. With a price ceiling, the government forbids a price above the maximum. A price ceiling that is set below the equilibrium price creates a shortage that will persist.

Suppose the government sets the price of an apartment at P_C in Figure 3.19. Notice that P_C is below the equilibrium price of P_E . At P_C , we read over to the supply curve to find that sellers are willing to offer A_1 apartments. Reading over to the demand curve, we find that consumers would like to rent A_2 apartments at the price ceiling of P_C . Because P_C is below the equilibrium price, there is a shortage of apartments equal to $(A_2 - A_1)$. (Notice that if the price ceiling were set above the equilibrium price it would have no effect on the market since the law would not prohibit the price from settling at an equilibrium price that is lower than the price ceiling.)

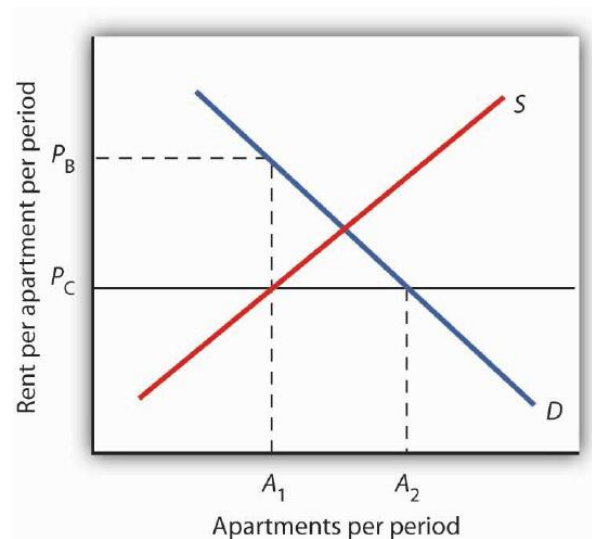


Figure 3.20 The Unintended Consequences of Rent Control Controlling apartment rents at P_C creates a shortage of $(A_2 - A_1)$ apartments. For A_1 apartments, consumers are willing and able to pay P_B , which leads to various “backdoor” payments to apartment owners.

If rent control creates a shortage of apartments, why do some citizens nonetheless clamor for rent control and why do governments often give in to the demands? The reason generally given for rent control is to keep apartments affordable for low- and middle-income tenants.

But the reduced quantity of apartments supplied must be rationed in some way, since, at the price ceiling, the quantity demanded would exceed the quantity supplied. Current occupants may be reluctant to leave their dwellings because finding other apartments will be difficult. As apartments do become available, there will be a line of potential renters waiting to fill them, any of whom is willing to pay the controlled price of P_C or more. In fact, reading up to the demand curve in Figure 3.20 from A_1 apartments, the quantity available at P_C , you can see that for A_1 apartments, there are potential renters willing and able to pay P_B . This often leads to various “backdoor” payments to apartment owners, such as large security deposits, payments for things renters may not want (such as furniture), so-called “key” payments (“The monthly rent is \$500 and the key price is \$3,000”), or simple bribes.

In the end, rent controls and other price ceilings often end up hurting some of the people they are intended to help. Many people will have trouble finding apartments to rent. Ironically, some of those who do find apartments may actually end up paying more than they would have paid in the absence of rent control. And many of the people that the rent controls do help (primarily current occupants, regardless of their income, and those lucky enough to find apartments) are not those they are intended to help (the poor). There are also costs in government administration and enforcement.

Because New York City has the longest history of rent controls of any city in the United States, its program has been widely studied. There is general agreement that the rent control program has reduced tenant mobility, led to a substantial gap between rents on controlled and uncontrolled units, and favored long-term residents at the expense of newcomers to the city (Arnott, R., 1995). These distortions have grown over time, another frequent consequence of price controls.

A more direct means of helping poor tenants, one that would avoid interfering with the functioning of the market, would be to subsidize their incomes. As with price floors, interfering with the market mechanism may solve one problem, but it creates many others at the same time.

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CHAPTER OVERVIEW

4: Macroeconomics - The Big Picture

[4.1: Growth of Real GDP and Business Cycles](#)

[4.2: Price-Level Changes](#)

[4.3: Unemployment](#)

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4.1: Growth of Real GDP and Business Cycles

Learning Objective

1. Define real gross domestic product and explain how its calculation avoids both double-counting and the effects of changes in the price level.
2. Identify the phases of a business cycle.
3. Relate business cycles to the overall long-run trend in real GDP in the United States.

To determine whether the economy of a nation is growing or shrinking in size, economists use a measure of total output called real GDP. Real GDP, short for real gross domestic product, is the total value of all final goods and services produced during a particular year or period, adjusted to eliminate the effects of changes in prices. Let us break that definition up into parts.

Notice that only “final” goods and services are included in GDP. Many goods and services are purchased for use as inputs in producing something else. For example, a pizza parlor buys flour to make pizzas. If we counted the value of the flour and the value of the pizza, we would end up counting the flour twice and thus overstating the value of total production. Including only final goods avoids double-counting. If the flour is produced during a particular period but has not been sold, then it is a “final good” for that period and is counted.

We want to determine whether the economy’s output is growing or shrinking. If each final good or service produced, from hammers to haircuts, were valued at its current market price, and then we were to add the values of all such items produced, we would not know if the total had changed because output changed or because prices changed or both. The market value of all final goods and services produced can rise even if total output falls. To isolate the behavior of total output only, we must hold prices constant at some level. For example, if we measure the value of basketball output over time using a fixed price for valuing the basketballs, then only an increase in the number of basketballs produced could increase the value of the contribution made by basketballs to total output. By making such an adjustment for basketballs and all other goods and services, we obtain a value for real GDP. In contrast, nominal GDP, usually just referred to as gross domestic product (GDP), is the total value of final goods and services for a particular period valued in terms of prices for that period.

In this section, our goal is to use the concept of real GDP to look at the business cycle—the economy’s pattern of expansion, then contraction, then expansion again—and at growth of real GDP.

Phases of the Business Cycle

Figure 4.1 shows a stylized picture of a typical business cycle. It shows that economies go through periods of increasing and decreasing real GDP, but that over time they generally move in the direction of increasing levels of real GDP. A sustained period in which real GDP is rising is an expansion; a sustained period in which real GDP is falling is a recession. Typically, an economy is said to be in a recession when real GDP drops for two consecutive quarters, but in the United States, the responsibility of defining precisely when the economy is in recession is left to the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER).

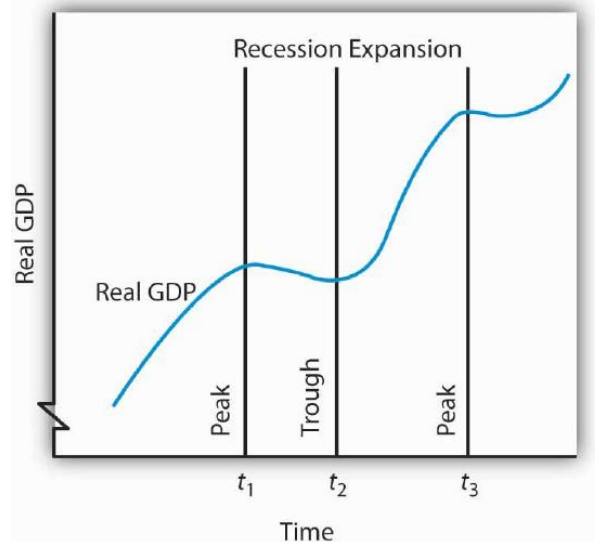


Figure 4.1 Phases of the Business Cycle: The business cycle is a series of expansions and contractions in real GDP. The cycle begins at a peak and continues through a recession, a trough, and an expansion. A new cycle begins at the next peak. Here, the first peak occurs at time t_1 , the trough at time t_2 , and the next peak at time t_3 . Notice that there is a tendency for real GDP to rise over time.

At time t_1 in Figure 4.1, an expansion ends and real GDP turns downward. The point at which an expansion ends and a recession begins is called the peak of the business cycle. Real GDP then falls during a period of recession. Eventually it starts upward again (at time t_2). The point at which a recession ends and an expansion begins is called the trough of the business cycle. The expansion continues until another peak is reached at time t_3 . A complete business cycle is defined by the passage from one peak to the next.

Because the Business Cycle Dating Committee dates peaks and troughs by specific months, and because real GDP is estimated only on a quarterly basis by the Bureau of Economic Analysis, the committee relies on a variety of other indicators that are published monthly, including real personal income, employment, industrial production, and real wholesale and retail sales. The committee typically determines that a recession has happened long after it has actually begun and sometimes ended! In large part, that avoids problems when data released about the economy are revised, and the committee avoids having to reverse itself on its determination of when a recession begins or ends, something it has never done. In December 2008, the Committee announced that a recession in the United States had begun in December 2007. Interestingly, real GDP fell in the fourth quarter of 2007, grew in the first and second quarters of 2008, and shrank in the third quarter of 2008, so clearly the Committee was not using the two consecutive quarters of declining GDP rule-of-thumb. Rather, it was taking into account the behavior of a variety of other variables, such as employment and personal income.

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4.2: Price-Level Changes

Learning Objective

1. Define inflation and deflation, explain how their rates are determined, and articulate why price-level changes matter.
2. Explain what a price index is and outline the general steps in computing a price index.
3. Describe and compare different price indexes.
4. Explain how to convert nominal values to real values and explain why it is useful to make this calculation.
5. Discuss the biases that may arise from price indexes that employ fixed market baskets of goods and services.

Inflation is an increase in the average level of prices, and **deflation** is a decrease in the average level of prices. In an economy experiencing inflation, most prices are likely to be rising, whereas in an economy experiencing deflation, most prices are likely to be falling.

There are two key points in these definitions:

1. Inflation and deflation refer to changes in the average level of prices, not to changes in particular prices. An increase in medical costs is not inflation. A decrease in gasoline prices is not deflation. Inflation means the average level of prices is rising, and deflation means the average level of prices is falling.
2. Inflation and deflation refer to *rising* prices and *falling* prices, respectively; therefore, they do not have anything to do with the *level* of prices at any one time. “High” prices do not imply the presence of inflation, nor do “low” prices imply deflation. Inflation means a positive *rate of change* in average prices, and deflation means a negative *rate of change* in average prices.

Why Do We Care?

Whether one regards inflation as a “good” thing or a “bad” thing depends very much on one’s economic situation. If you are a borrower, unexpected inflation is a good thing—it reduces the value of money that you must repay. If you are a lender, it is a bad thing because it reduces the value of future payments you will receive. Whatever any particular person’s situation may be, inflation always produces the following effects on the economy: it reduces the value of money and it reduces the value of future monetary obligations. It can also create uncertainty about the future.

Suppose that you have just found a \$10 bill you stashed away in 1990. Prices have increased by about 50% since then; your money will buy less than what it would have purchased when you put it away. Your money has thus lost value.

Money loses value when its purchasing power falls. Since inflation is a rise in the level of prices, the amount of goods and services a given amount of money can buy falls with inflation.

Just as inflation reduces the value of money, it reduces the value of future claims on money. Suppose you have borrowed \$100 from a friend and have agreed to pay it back in one year. During the year, however, prices double. That means that when you pay the money back, it will buy only half as much as it could have bought when you borrowed it. That is good for you but tough on the person who lent you the money. Of course, if you and your friend had anticipated such rapid inflation, you might have agreed to pay back a larger sum to adjust for it. When people anticipate inflation, they can adjust for its consequences in determining future obligations. But *unanticipated* inflation helps borrowers and hurts lenders.

Inflation’s impact on future claims can be particularly hard on people who must live on a fixed income, that is, on an income that is predetermined through some contractual arrangement and does not change with economic conditions. An annuity, for example, typically provides a fixed stream of money payments. Retirement pensions sometimes generate fixed income. Inflation erodes the value of such payments.

Given the danger posed by inflation for people on fixed incomes, many retirement plans provide for indexed payments. An indexed payment is one whose dollar amount changes with the rate of change in the price level. If a payment changes at the same rate as the rate of change in the price level, the purchasing power of the payment remains constant. Social Security payments, for example, are indexed to maintain their purchasing power.

Because inflation reduces the purchasing power of money, the threat of future inflation can make people reluctant to lend for long periods. From a lender’s point of view, the danger of a long-term commitment of funds is that future inflation will wipe out the value of the amount that will eventually be paid back. Lenders are reluctant to make such commitments.

Uncertainty can be particularly pronounced in countries where extremely high inflation is a threat. Hyperinflation is generally defined as an inflation rate in excess of 200% per year. Inflation of that magnitude erodes the value of money very quickly. Hyperinflations occurred in Germany in the 1920s and in Yugoslavia in the early 1990s. There are stories about how people in Germany during the hyperinflation brought wheelbarrows full of money to stores to pay for ordinary items. In Yugoslavia in 1993 there was a report of a shop owner barring the entrance to his store with a mop while he changed his prices.

The inflation rate rose to an astronomical rate in 2008 in Zimbabwe. As the government printed more money and put it in circulation, prices rose. When inflation began to accelerate, the government found it “necessary” to print more and more money, causing prices to rise very fast. The inflation rate in Zimbabwe reached an astonishing 11.2 million percent in July of 2008, according to Zimbabwe’s Central Statistics Office. A loaf of bread cost 200,000 Zimbabwe dollars in February 2008. That same loaf cost 1.6 trillion Zimbabwe dollars by August (CNN, 2008).

Do the problems associated with inflation imply that deflation would be a good thing? The answer is simple: no. Like inflation, deflation changes the value of money and the value of future obligations. It also creates uncertainty about the future.

If there is deflation, the real value of a given amount of money rises. In other words, if there had been deflation since 2000, a \$10 bill you had stashed away in 2000 would buy more goods and services today. That sounds good, but should you buy \$10 worth of goods and services now when you would be able to buy even more for your \$10 in the future if the deflation continues? When Japan experienced deflation in the late 1990s and early 2000s, Japanese consumers seemed to be doing just that—waiting to see if prices would fall further. They were spending less per person and, as we will see throughout our study of macroeconomics, less consumption often meant less output, fewer jobs, and the prospect of a recurring recessions.

And, if you had to use the \$10 to pay back a debt you owed, the purchasing power of your money would be higher than when you borrowed the money. The lender would feel good about being able to buy more with the \$10 than you were able to, but you would feel like you had gotten a raw deal.

Unanticipated deflation hurts borrowers and helps lenders. If the parties anticipate the deflation, a loan agreement can be written to reflect expected changes in the price level.

The threat of deflation can make people reluctant to borrow for long periods. Borrowers become reluctant to enter into long-term contracts because they fear that deflation will raise the value of the money they must pay back in the future. In such an environment, firms may be reluctant to borrow to build new factories, for example. This is because they fear that the prices at which they can sell their output will drop, making it difficult for them to repay their loans.

Deflation was common in the United States in the latter third of the 19th century. In the 20th century, there was a period of deflation after World War I and again during the Great Depression in the 1930s.

Price Indexes

How do we actually measure inflation and deflation (that is, changes in the price level)? Price-level change is measured as the percentage rate of change in the level of prices. But how do we find a price level?

Economists measure the price level with a price index. A price index is a number whose movement reflects movement in the average level of prices. If a price index rises 10%, it means the average level of prices has risen 10%.

There are four steps one must take in computing a price index:

1. Select the kinds and quantities of goods and services to be included in the index. A list of these goods and services, and the quantities of each, is the “market basket” for the index.
2. Determine what it would cost to buy the goods and services in the market basket in some period that is the base period for the index. A base period is a time period against which costs of the market basket in other periods will be compared in computing a price index. Most often, the base period for an index is a single year. If, for example, a price index had a base period of 2020, costs of the basket in other periods would be compared to the cost of the basket in 2020. We will encounter one index, however, whose base period stretches over three years.
3. Compute the cost of the market basket in the current period.
4. Compute the price index. It equals the current cost divided by the base-period cost of the market basket.

Equation:

$$\text{Priceindex} = (\text{current cost of basket} / \text{base-period cost of basket}) * 100$$

Suppose that we want to compute a price index for movie fans, and a survey of movie watchers tells us that a typical fan rents 4 movies on DVD and sees 3 movies in theaters each month. At the theater, this viewer consumes a medium-sized soft drink and a medium-sized box of popcorn. Our market basket thus might include 4 DVD rentals, 3 movie admissions, 3 medium soft drinks, and 3 medium servings of popcorn.

Our next step in computing the movie price index is to determine the cost of the market basket. Suppose we surveyed movie theaters and DVD-rental stores in 2007 to determine the average prices of these items, finding the values given in Table 4.2 “Pricing a Market Basket”. At those prices, the total monthly cost of our movie market basket in 2007 was \$48. Now suppose that in 2008 the prices of movie admissions and DVD rentals rise, soft-drink prices at movies fall, and popcorn prices remain unchanged. The combined effect of these changes pushes the 2008 cost of the basket to \$50.88.

Table 4.2 Pricing a Market Basket

Item	Quantity in Basket	2007 Price	Cost in 2007 Basket	2008 Price	Cost in 2008 Basket
DVD rental	4	\$2.25	\$9.00	\$2.97	\$11.88
Movie admission	3	7.75	23.25	8.00	24.00
Popcorn	3	2.25	6.75	2.25	6.75
Soft drink	3	3.00	9.00	2.75	8.25
Total cost of basket		2007	\$48.00	2008	\$50.88

To compute a price index, we need to define a market basket and determine its price. The table gives the composition of the movie market basket and prices for 2007 and 2008. The cost of the entire basket rises from \$48 in 2007 to \$50.88 in 2008.

Using the data in Table 4.2 “Pricing a Market Basket”, we could compute price indexes for each year. Recall that a price index is the ratio of the current cost of the basket to the base-period cost. We can select any year we wish as the base year; take 2007. The 2008 movie price index (MPI) is thus

$$\text{MPI}_{2008} = (50.88/48) \times 100 = 106$$

The value of any price index in the base period is always 100. In the case of our movie price index, the 2007 index would be the current (2007) cost of the basket, \$48, divided by the base-period cost, and multiply by 100, which is: $(\$48/\$48) \times 100 = 100$.

The Consumer Price Index (CPI)

One widely used price index in the United States is the consumer price index (CPI), a price index whose movement reflects changes in the prices of goods and services typically purchased by consumers. When the media report the U.S. inflation rate, the number cited is usually a rate computed using the CPI. The CPI is also used to determine whether people’s incomes are keeping up with the costs of the things they buy. The CPI is often used to measure changes in the cost of living, though as we shall see, there are problems in using it for this purpose.

The market basket for the CPI contains thousands of goods and services. The composition of the basket is determined by the Bureau of Labor Statistics (BLS), an agency of the Department of Labor, based on Census Bureau surveys of household buying behavior. Surveyors tally the prices of the goods and services in the basket each month in cities all over the United States to determine the current cost of the basket. The major categories of items in the CPI are food and beverages, housing, apparel, transportation, medical care, recreation, education and communication, and other goods and services.

The current cost of the basket of consumer goods and services is then compared to the base-period cost of that same basket. The base period for the CPI is 1982–1984; the base-period cost of the basket is its average cost over this period. Each month’s CPI thus reflects the ratio of the current cost of the basket divided by its base-period cost.

Equation

$$\text{CPI} = (\text{current cost of basket} / 1982\text{-}1984 \text{ cost of basket}) * 100$$

Like many other price indexes, the CPI is computed with a fixed market basket. The composition of the basket generally remains unchanged from one period to the next. Because buying patterns change, however, the basket is revised accordingly and periodically.

The Implicit Price Deflator or GDP Deflator

Values for nominal and real GDP, described earlier in this chapter, provide us with the information to calculate the most broad-based price index available. The implicit price deflator or GDP deflator, a price index for all final goods and services produced, is the ratio of nominal GDP to real GDP.

In computing the implicit price deflator for a particular period, economists define the market basket quite simply: it includes all the final goods and services produced during that period. The nominal GDP gives the current cost of that basket; the real GDP adjusts the nominal GDP for changes in prices. The implicit price deflator is thus given by

Equation:

$$\text{Implicit price deflator} = (\text{nominal GDP} / \text{real GDP}) * 100$$

For example, in 2007, nominal GDP in the United States was \$13,807.5 billion, and real GDP was \$11,523.9 billion. Thus, the implicit price deflator was 1.198. Following the convention of multiplying price indexes by 100, the published number for the implicit price deflator was 119.8.

In our analysis of the determination of output and the price level in subsequent chapters, we will use the implicit price deflator as the measure of the price level in the economy.

The PCE Price Index

The Bureau of Economic Analysis also produces price index information for each of the components of GDP (that is, a separate price index for consumer prices, prices for different components of gross private domestic investment, and government spending). The personal consumption expenditures price index, or PCE price index, includes durable goods, nondurable goods, and services and is provided along with estimates for prices of each component of consumption spending. Because prices for food and energy can be volatile, the price measure that excludes food and energy is often used as a measure of underlying, or “core,” inflation. Note that the PCE price index differs substantially from the consumer price index, primarily because it is not a “fixed basket” index¹. The PCE price index has become a politically important measure of inflation since the Federal Reserve (discussed in detail in later chapters) uses it as its primary measure of price levels in the United States.

Computing the Rate of Inflation or Deflation

The rate of inflation or deflation is the percentage rate of change in a price index between two periods. Given price-index values for two periods, we can calculate the rate of inflation or deflation as the change in the index divided by the initial value of the index, stated as a percentage:

Equation

$$\text{Rate of inflation or deflation} = (\text{percentage change in index} / \text{initial value of index}) * 100$$

The CPI is often used for calculating price-level change for the economy. For example, the rate of inflation in 2007 can be computed from the December 2006 price level (2.016) and the December 2007 level (2.073):

$$\text{Inflation rate} = (2.073 - 2.016) / 2.016 = 0.028 * 100 = 2.8\%$$

Computing Real Values Using Price Indexes

Suppose your uncle started college in 1998 and had a job busing dishes that paid \$5 per hour. In 2008 you had the same job; it paid \$6 per hour. Which job paid more?

At first glance, the answer is straightforward: \$6 is a higher wage than \$5. But \$1 had greater purchasing power in 1998 than in 2008 because prices were lower in 1998 than in 2008. To obtain a valid comparison of the two wages, we must use dollars of

equivalent purchasing power. A value expressed in units of constant purchasing power is a real value. A value expressed in dollars of the current period is called a nominal value. The \$5 wage in 1998 and the \$6 wage in 2008 are nominal wages.

To convert nominal values to real values, we divide by a price index. The real value for a given period is the nominal value for that period divided by the price index for that period. This procedure gives us a value in dollars that have the purchasing power of the base period for the price index used. Using the CPI, for example, yields values expressed in dollars of 1982–1984 purchasing power, the base period for the CPI. The real value of a nominal amount X at time t , X_t , is found using the price index for time t :

Equation

$$\text{Real value of } X_t = (X_t / \text{price index at time } t) * 100$$

Let us compute the real value of the \$6 wage for busing dishes in 2008 versus the \$5 wage paid to your uncle in 1998. The CPI in 1998 was 163.0; in 2008 it was 216.5. Real wages for the two years were thus

$$\text{Real wage in 1998} = (\$5 / 163.0) = \$3.07$$

$$\text{Real wage in 2008} = (\$6 / 216.5) = \$2.77$$

Given the nominal wages in our example, you earned about 10% less in real terms in 2008 than your uncle did in 1998.

Price indexes are useful. They allow us to see how the general level of prices has changed. They allow us to estimate the rate of change in prices, which we report as the rate of inflation or deflation. And they give us a tool for converting nominal values to real values so we can make better comparisons of economic performance across time.

Are Price Indexes Accurate Measures of Price-Level Changes?

Price indexes that employ fixed market baskets are likely to overstate inflation (and understate deflation) for four reasons:

1. Because the components of the market basket are fixed, the index does not incorporate consumer responses to changing relative prices.
2. A fixed basket excludes new goods and services.
3. Quality changes may not be completely accounted for in computing price-level changes.
4. The type of store in which consumers choose to shop can affect the prices they pay, and the price indexes do not reflect changes consumers have made in where they shop.

To see how these factors can lead to inaccurate measures of price-level changes, suppose the price of chicken rises and the price of beef falls. The law of demand tells us that people will respond by consuming less chicken and more beef. But if we use a fixed market basket of goods and services in computing a price index, we will not be able to make these adjustments. The market basket holds constant the quantities of chicken and beef consumed. The importance in consumer budgets of the higher chicken price is thus overstated, while the importance of the lower beef price is understated. More generally, a fixed market basket will overstate the importance of items that rise in price and understate the importance of items that fall in price. This source of bias is referred to as the substitution bias.

The new-product bias, a second source of bias in price indexes, occurs because it takes time for new products to be incorporated into the market basket that makes up the CPI. A good introduced to the market after the basket has been defined will not, of course, be included in it. But a new good, once successfully introduced, is likely to fall in price. When VCRs were first introduced, for example, they generally cost more than \$1,000. Within a few years, an equivalent machine cost less than \$200. But when VCRs were introduced, the CPI was based on a market basket that had been defined in the early 1970s. There was no VCR in the basket, so the impact of this falling price was not reflected in the index. The DVD player was introduced into the CPI within a year of its availability.

A third price index bias, the quality-change bias, comes from improvements in the quality of goods and services. Suppose, for example, that Ford introduces a new car with better safety features and a smoother ride than its previous model. Suppose the old model cost \$20,000 and the new model costs \$24,000, a 20% increase in price. Should economists at the Bureau of Labor Statistics (BLS) simply record the new model as being 20% more expensive than the old one? Clearly, the new model is not the same product

as the old model. BLS economists faced with such changes try to adjust for quality. To the extent that such adjustments understate quality change, they overstate any increase in the price level.

The fourth source of bias is called the outlet bias. Households can reduce some of the impact of rising prices by shopping at superstores or outlet stores (such as T.J. Maxx, Wal-Mart, or factory outlet stores), though this often means they get less customer service than at traditional department stores or at smaller retail stores. However, since such shopping has increased in recent years, it must be that for their customers, the reduction in prices has been more valuable to them than loss of service. Prior to 1998, the CPI did not account for a change in the number of households shopping at these newer kinds of stores in a timely manner, but the BLS now does quarterly surveys and updates its sample of stores much more frequently. Another form of this bias arises because the government data collectors do not collect price data on weekends and holidays, when many stores run sales.

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4.3: Unemployment

Learning Objective

1. Explain how unemployment is measured in the United States.
2. Define four different types of unemployment.
3. Define and illustrate graphically what is meant by the natural level of employment. Relate the natural level of employment to the natural rate of unemployment.

For an economy to produce all it can and achieve a solution on its production possibilities curve, the factors of production in the economy must be fully employed. Failure to fully employ these factors leads to a solution inside the production possibilities curve in which society is not achieving the output it is capable of producing.

In thinking about the employment of society's factors of production, we place special emphasis on labor. The loss of a job can wipe out a household's entire income; it is a more compelling human problem than, say, unemployed capital, such as a vacant apartment. In measuring unemployment, we thus focus on labor rather than on capital and natural resources.

Measuring Unemployment

The Bureau of Labor Statistics defines a person as unemployed if he or she is not working but is looking for and available for work. The labor force is the total number of people working or unemployed. The unemployment rate is the percentage of the labor force that is unemployed.

To estimate the unemployment rate, government surveyors fan out across the country each month to visit roughly 60,000 households. At each of these randomly selected households, the surveyor asks about the employment status of each adult (everyone age 16 or over) who lives there. Many households include more than one adult; the survey gathers information on about roughly 100,000 adults. The surveyor asks if each adult is working. If the answer is yes, the person is counted as employed. If the answer is no, the surveyor asks if that person has looked for work at some time during the previous four weeks and is available for work at the time of the survey. If the answer to that question is yes, the person is counted as unemployed. If the answer is no, that person is not counted as a member of the labor force. The unemployment rate is then computed as the number of people unemployed divided by the labor force—the sum of the number of people not working but available and looking for work plus the number of people working.

There are several difficulties with the survey. The old survey, designed during the 1930s, put the “Are you working?” question differently depending on whether the respondent was a man or woman. A man was asked, “Last week, did you do any work for pay or profit?” A woman was asked, “What were you doing for work last week, keeping house or something else?” Consequently, many women who were looking for paid work stated that they were “keeping house”; those women were not counted as unemployed. The BLS did not get around to fixing the survey—asking women the same question it asked men—until 1994. The first time the new survey question was used, the unemployment rate among women rose by 0.5 percentage point. More than 50 million women are in the labor force; the change added more than a quarter of a million workers to the official count of the unemployed ¹.

The problem of understating unemployment among women has been fixed, but others remain. A worker who has been cut back to part-time work still counts as employed, even if that worker would prefer to work full time. A person who is out of work, would like to work, has looked for work in the past year, and is available for work, but who has given up looking, is considered a discouraged worker. Discouraged workers are not counted as unemployed, but a tally is kept each month of the number of discouraged workers.

The official measures of employment and unemployment can yield unexpected results. For example, when firms expand output, they may be reluctant to hire additional workers until they can be sure the demand for increased output will be sustained. They may respond first by extending the hours of employees previously reduced to part-time work or by asking full-time personnel to work overtime. None of that will increase employment, because people are simply counted as “employed” if they are working, regardless of how much or how little they are working. In addition, an economic expansion may make discouraged workers more optimistic about job prospects, and they may resume their job searches. Engaging in a search makes them unemployed again—and increases unemployment. Thus, an economic expansion may have little effect initially on employment and may even increase unemployment.

Types of Unemployment

Workers may find themselves unemployed for different reasons. Each source of unemployment has quite different implications, not only for the workers it affects but also for public policy.

Figure 4.3 below applies the demand and supply model to the labor market. The price of labor is taken as the real wage, which is the nominal wage divided by the price level; the symbol used to represent the real wage is the Greek letter omega, ω . The supply curve is drawn as upward sloping, though steep, to reflect studies showing that the quantity of labor supplied at any one time is nearly fixed. Thus, an increase in the real wage induces a relatively small increase in the quantity of labor supplied. The demand curve shows the quantity of labor demanded at each real wage. The lower the real wage, the greater the quantity of labor firms will demand. In the case shown here, the real wage, ω_e , equals the equilibrium solution defined by the intersection of the demand curve D_1 and the supply curve S_1 . The quantity of labor demanded, L_e , equals the quantity supplied. The employment level at which the quantity of labor demanded equals the quantity supplied is called the natural level of employment. It is sometimes referred to as full employment.

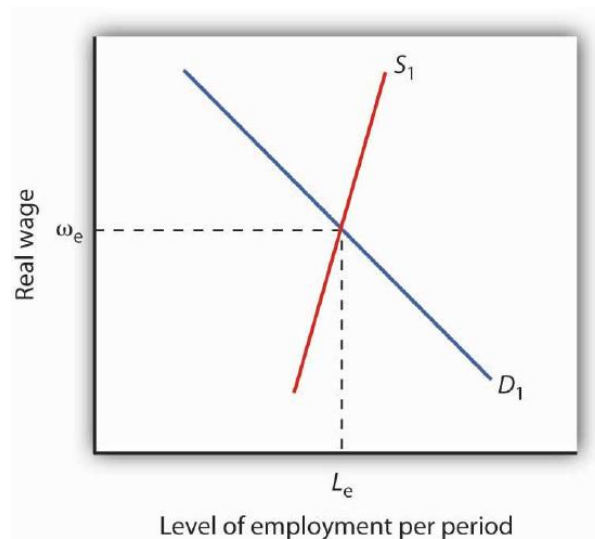


Figure 4.3: The Natural Level of Employment The employment level at which the quantity of labor demanded equals the quantity supplied is called the natural level of employment. Here, the natural level of employment is L_e , which is achieved at a real wage ω_e .

Even if the economy is operating at its natural level of employment, there will still be some unemployment. The rate of unemployment consistent with the natural level of employment is called the natural rate of unemployment. Business cycles may generate additional unemployment. We discuss these various sources of unemployment below.

Frictional Unemployment

Even when the quantity of labor demanded equals the quantity of labor supplied, not all employers and potential workers have found each other. Some workers are looking for jobs, and some employers are looking for workers. During the time it takes to match them up, the workers are unemployed. Unemployment that occurs because it takes time for employers and workers to find each other is called frictional unemployment.

The case of college graduates engaged in job searches is a good example of frictional unemployment. Those who did not land a job while still in school will seek work. Most of them will find jobs, but it will take time. During that time, these new graduates will be unemployed. If information about the labor market were costless, firms and potential workers would instantly know everything they needed to know about each other and there would be no need for searches on the part of workers and firms. There would be no frictional unemployment. But information is costly. Job searches are needed to produce this information, and frictional unemployment exists while the searches continue.

The government may attempt to reduce frictional unemployment by focusing on its source: information costs. Many state agencies, for example, serve as clearinghouses for job market information. They encourage firms seeking workers and workers seeking jobs

to register with them. To the extent that such efforts make labor-market information more readily available, they reduce frictional unemployment.

Structural Unemployment

Another reason there can be unemployment even if employment equals its natural level stems from potential mismatches between the skills employers seek and the skills potential workers offer. Every worker is different; every job has its special characteristics and requirements. The qualifications of job seekers may not match those that firms require. Even if the number of employees firms demand equals the number of workers available, people whose qualifications do not satisfy what firms are seeking will find themselves without work. Unemployment that results from a mismatch between worker qualifications and the characteristics employers require is called structural unemployment.

Structural unemployment emerges for several reasons. Technological change may make some skills obsolete or require new ones. The widespread introduction of personal computers since the 1980s, for example, has lowered demand for typists who lacked computer skills.

Structural unemployment can occur if too many or too few workers seek training or education that matches job requirements. Students cannot predict precisely how many jobs there will be in a particular category when they graduate, and they are not likely to know how many of their fellow students are training for these jobs. Structural unemployment can easily occur if students guess wrong about how many workers will be needed or how many will be supplied.

Structural unemployment can also result from geographical mismatches. Economic activity may be booming in one region and slumping in another. It will take time for unemployed workers to relocate and find new jobs. And poor or costly transportation may block some urban residents from obtaining jobs only a few miles away.

Public policy responses to structural unemployment generally focus on job training and education to equip workers with the skills firms demand. The government publishes regional labor-market information, helping to inform unemployed workers of where jobs can be found. The North American Free Trade Agreement (NAFTA), which created a free trade region encompassing Mexico, the United States, and Canada, has created some structural unemployment in the three countries. In the United States, the legislation authorizing the pact also provided for job training programs for displaced U.S. workers.

Although government programs may reduce frictional and structural unemployment, they cannot eliminate it. Information in the labor market will always have a cost, and that cost creates frictional unemployment. An economy with changing demands for goods and services, changing technology, and changing production costs will always have some sectors expanding and others contracting—structural unemployment is inevitable. An economy at its natural level of employment will therefore have frictional and structural unemployment.

Cyclical Unemployment

Of course, the economy may not be operating at its natural level of employment, so unemployment may be above or below its natural level. In a later chapter we will explore what happens when the economy generates employment greater or less than the natural level. Cyclical unemployment is unemployment in excess of the unemployment that exists at the natural level of employment.

Seasonal Unemployment

Seasonal unemployment is associated with seasonal changes in labor supply and labor demand. Seasonal peaks and dips that are predictable are not reported in official statistics. Official statistics are seasonally adjusted.

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CHAPTER OVERVIEW

5: Aggregate Demand and Aggregate Supply

[5.1: Aggregate Demand](#)

[5.2: Aggregate Demand and Aggregate Supply- The Long Run and the Short Run](#)

[5.3: Recessionary and Inflationary Gaps and Long-Run Macroeconomic Equilibrium](#)

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5.1: Aggregate Demand

Learning Objective

1. Define aggregate demand, represent it using a hypothetical aggregate demand curve, and identify and explain the three effects that cause this curve to slope downward.
2. Distinguish between a change in the aggregate quantity of goods and services demanded and a change in aggregate demand.
3. Use examples to explain how each component of aggregate demand can be a possible aggregate demand shifter.

Firms face four sources of demand: households (personal consumption), other firms (investment), government agencies (government purchases), and foreign markets (net exports). Aggregate demand is the relationship between the total quantity of goods and services demanded (from all the four sources of demand) and the price level, all other determinants of spending unchanged. The aggregate demand curve is a graphical representation of aggregate demand.

The Slope of the Aggregate Demand Curve

We will use the implicit price deflator as our measure of the price level; the aggregate quantity of goods and services demanded is measured as real GDP. The table in Figure 5.1 below gives values for each component of aggregate demand at each price level for a hypothetical economy. Various points on the aggregate demand curve are found by adding the values of these components at different price levels. The aggregate demand curve for the data given in the table is plotted on the graph in Figure 5.1. At point A, at a price level of 1.18, \$11,800 billion worth of goods and services will be demanded; at point C, a reduction in the price level to 1.14 increases the quantity of goods and services demanded to \$12,000 billion; and at point E, at a price level of 1.10, \$12,200 billion will be demanded.

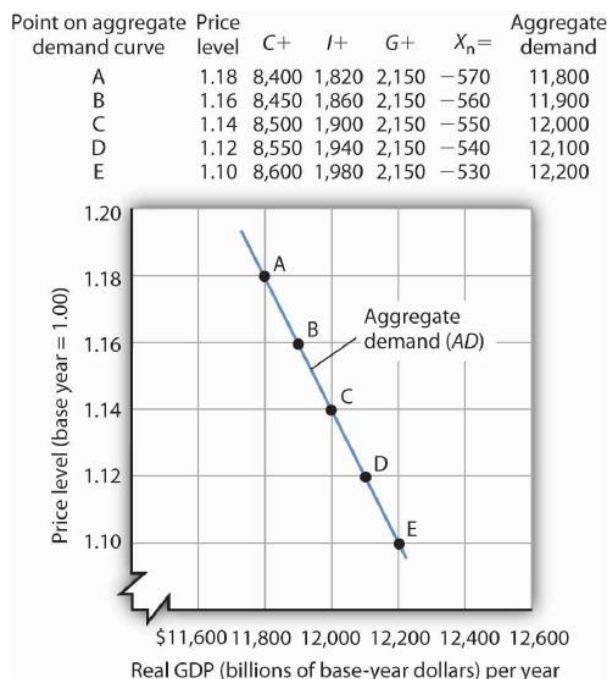


Figure 5.1 Aggregate Demand: An aggregate demand curve (AD) shows the relationship between the total quantity of output demanded (measured as real GDP) and the price level (measured as the implicit price deflator). At each price level, the total quantity of goods and services demanded is the sum of the components of real GDP, as shown in the table. There is a negative relationship between the price level and the total quantity of goods and services demanded, all other things unchanged.

The negative slope of the aggregate demand curve suggests that it behaves in the same manner as an ordinary demand curve. But we *cannot* apply the reasoning we use to explain downward-sloping demand curves in individual markets to explain the downward-sloping aggregate demand curve. There are two reasons for a negative relationship between price and quantity demanded in

individual markets. First, a lower price induces people to substitute more of the good whose price has fallen for other goods, increasing the quantity demanded. Second, the lower price creates a higher real income. This normally increases quantity demanded further.

Neither of these effects is relevant to a change in prices in the aggregate. When we are dealing with the average of all prices—the price level—we can no longer say that a fall in prices will induce a change in relative prices that will lead consumers to buy more of the goods and services whose prices have fallen and less of the goods and services whose prices have not fallen. The price of corn may have fallen, but the prices of wheat, sugar, tractors, steel, and most other goods or services produced in the economy are likely to have fallen as well.

Furthermore, a reduction in the price level means that it is not just the prices consumers pay that are falling. It means the prices people receive—their wages, the rents they may charge as landlords, the interest rates they earn—are likely to be falling as well. A falling price level means that goods and services are cheaper, but incomes are lower, too. There is no reason to expect that a change in real income will boost the quantity of goods and services demanded—indeed, no change in real income would occur. If nominal incomes and prices all fall by 10%, for example, real incomes do not change.

Why, then, does the aggregate demand curve slope downward? One reason for the downward slope of the aggregate demand curve lies in the relationship between real wealth (the stocks, bonds, and other assets that people have accumulated) and consumption (one of the four components of aggregate demand). When the price level falls, the real value of wealth increases—it packs more purchasing power. For example, if the price level falls by 25%, then \$10,000 of wealth could purchase more goods and services than it would have if the price level had not fallen. An increase in wealth will induce people to increase their consumption. The consumption component of aggregate demand will thus be greater at lower price levels than at higher price levels. The tendency for a change in the price level to affect real wealth and thus alter consumption is called the wealth effect; it suggests a negative relationship between the price level and the real value of consumption spending.

A second reason the aggregate demand curve slopes downward lies in the relationship between interest rates and investment. A lower price level lowers the demand for money, because less money is required to buy a given quantity of goods. What economists mean by money demand will be explained in more detail in a later chapter. But, as we learned in studying demand and supply, a reduction in the demand for something, all other things unchanged, lowers its price. In this case, the “something” is money and its price is the interest rate. A lower price level thus reduces interest rates. Lower interest rates make borrowing by firms to build factories or buy equipment and other capital more attractive. A lower interest rate means lower mortgage payments, which tends to increase investment in residential houses. Investment thus rises when the price level falls. The tendency for a change in the price level to affect the interest rate and thus to affect the quantity of investment demanded is called the interest rate effect. John Maynard Keynes, a British economist whose analysis of the Great Depression and what to do about it led to the birth of modern macroeconomics, emphasized this effect. For this reason, the interest rate effect is sometimes called the Keynes effect.

A third reason for the rise in the total quantity of goods and services demanded as the price level falls can be found in changes in the net export component of aggregate demand. All other things unchanged, a lower price level in an economy reduces the prices of its goods and services relative to foreign-produced goods and services. A lower price level makes that economy’s goods more attractive to foreign buyers, increasing exports. It will also make foreign-produced goods and services less attractive to the economy’s buyers, reducing imports. The result is an increase in net exports. The international trade effect is the tendency for a change in the price level to affect net exports.

Taken together, then, a fall in the price level means that the quantities of consumption, investment, and net export components of aggregate demand may all rise. Since government purchases are determined through a political process, we assume there is no causal link between the price level and the real volume of government purchases. Therefore, this component of GDP does not contribute to the downward slope of the curve.

In general, a change in the price level, with all other determinants of aggregate demand unchanged, causes a movement along the aggregate demand curve. A movement along an aggregate demand curve is a change in the aggregate quantity of goods and services demanded. A movement from point A to point B on the aggregate demand curve in Figure 5.1 is an example. Such a change is a response to a change in the price level.

Notice that the axes of the aggregate demand curve graph are drawn with a break near the origin to remind us that the plotted values reflect a relatively narrow range of changes in real GDP and the price level. We do not know what might happen if the price level or output for an entire economy approached zero. Such a phenomenon has never been observed.

Changes in Aggregate Demand

Aggregate demand changes in response to a change in any of its components. An increase in the total quantity of consumer goods and services demanded at every price level, for example, would shift the aggregate demand curve to the right. A change in the aggregate quantity of goods and services demanded at every price level is a change in aggregate demand, which shifts the aggregate demand curve. Increases and decreases in aggregate demand are shown in Figure 5.2 below:

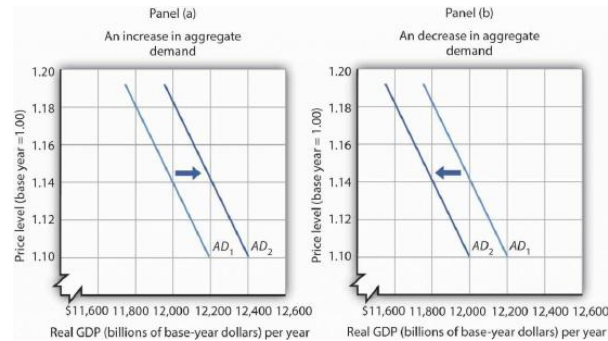


Figure 5.2 Changes in Aggregate Demand: An increase in consumption, investment, government purchases, or net exports shifts the aggregate demand curve AD_1 to the right as shown in Panel (a). A reduction in one of the components of aggregate demand shifts the curve to the left, as shown in Panel (b).

What factors might cause the aggregate demand curve to shift? Each of the components of aggregate demand is a possible aggregate demand shifter. We shall look at some of the events that can trigger changes in the components of aggregate demand and thus shift the aggregate demand curve.

Changes in Consumption

Several events could change the quantity of consumption at each price level and thus shift aggregate demand. One determinant of consumption is consumer confidence. If consumers expect good economic conditions and are optimistic about their economic prospects, they are more likely to buy major items such as cars or furniture. The result would be an increase in the real value of consumption at each price level and an increase in aggregate demand. In the second half of the 1990s, sustained economic growth and low unemployment fueled high expectations and consumer optimism. Surveys revealed consumer confidence to be very high. That consumer confidence translated into increased consumption and increased aggregate demand. In contrast, a decrease in consumption would accompany diminished consumer expectations and a decrease in consumer confidence, as happened after the stock market crash of 1929. The same problem has plagued the economies of most Western nations in 2008 as declining consumer confidence has tended to reduce consumption. A survey by the Conference Board in September of 2008 showed that just 13.5% of consumers surveyed expected economic conditions in the United States to improve in the next six months. Similarly pessimistic views prevailed in the previous two months. That contributed to the decline in consumption that occurred in the third quarter of the year.

Another factor that can change consumption and shift aggregate demand is tax policy. A cut in personal income taxes leaves people with more after-tax income, which may induce them to increase their consumption. The federal government in the United States cut taxes in 1964, 1981, 1986, 1997, 2003 and 2017; each of those tax cuts tended to increase consumption and aggregate demand at each price level.

In the United States, another government policy aimed at increasing consumption and thus aggregate demand has been the use of rebates in which taxpayers are simply sent checks in hopes that those checks will be used for consumption. Rebates have been used in 1975, 2001, 2008 and 2020/2021. In each case the rebate was a one-time payment.

Transfer payments such as welfare and Social Security also affect the income people have available to spend. At any given price level, an increase in transfer payments raises consumption and aggregate demand, and a reduction lowers consumption and aggregate demand.

Changes in Investment

Investment is the production of new capital that will be used for future production of goods and services. Firms make investment choices based on what they think they will be producing in the future. The expectations of firms thus play a critical role in determining investment. If firms expect their sales to go up, they are likely to increase their investment so that they can increase production and meet consumer demand. Such an increase in investment raises the aggregate quantity of goods and services demanded at each price level; it increases aggregate demand.

Changes in interest rates also affect investment and thus affect aggregate demand. We must be careful to distinguish such changes from the interest rate effect, which causes a movement along the aggregate demand curve. A change in interest rates that results from a change in the price level affects investment in a way that is already captured in the downward slope of the aggregate demand curve; it causes a movement along the curve. A change in interest rates for some other reason shifts the curve. We examine reasons interest rates might change in another chapter.

Investment can also be affected by tax policy. One provision of the Job and Growth Tax Relief Reconciliation Act of 2003 was a reduction in the tax rate on certain capital gains. Capital gains result when the owner of an asset, such as a house or a factory, sells the asset for more than its purchase price (less any depreciation claimed in earlier years). The lower capital gains tax could stimulate investment, because the owners of such assets know that they will lose less to taxes when they sell those assets, thus making assets subject to the tax more attractive.

Changes in Government Purchases

Any change in government purchases, all other things unchanged, will affect aggregate demand. An increase in government purchases increases aggregate demand; a decrease in government purchases decreases aggregate demand.

Many economists argued that reductions in defense spending in the wake of the collapse of the Soviet Union in 1991 tended to reduce aggregate demand. Similarly, increased defense spending for the wars in Afghanistan and Iraq increased aggregate demand. Dramatic increases in defense spending to fight World War II accounted in large part for the rapid recovery from the Great Depression.

Changes in Net Exports

A change in the value of net exports at each price level shifts the aggregate demand curve. A major determinant of net exports is foreign demand for a country's goods and services; that demand will vary with foreign incomes. An increase in foreign incomes increases a country's net exports and aggregate demand; a slump in foreign incomes reduces net exports and aggregate demand. For example, several major U.S. trading partners in Asia suffered recessions in 1997 and 1998. Lower real incomes in those countries reduced U.S. exports and tended to reduce aggregate demand.

Exchange rates also influence net exports, all other things unchanged. A country's exchange rate is the price of its currency in terms of another currency or currencies. A rise in the U.S. exchange rate means that it takes more Japanese yen, for example, to purchase one dollar. That also means that U.S. traders get more yen per dollar. Since prices of goods produced in Japan are given in yen and prices of goods produced in the United States are given in dollars, a rise in the U.S. exchange rate increases the price to foreigners for goods and services produced in the United States, thus reducing U.S. exports; it reduces the price of foreign-produced goods and services for U.S. consumers, thus increasing imports to the United States. A higher exchange rate tends to reduce net exports, reducing aggregate demand. A lower exchange rate tends to increase net exports, increasing aggregate demand.

Foreign price levels can affect aggregate demand in the same way as exchange rates. For example, when foreign price levels fall relative to the price level in the United States, U.S. goods and services become relatively more expensive, reducing exports and boosting imports in the United States. Such a reduction in net exports reduces aggregate demand. An increase in foreign prices relative to U.S. prices has the opposite effect.

The trade policies of various countries can also affect net exports. A policy by Japan to increase its imports of goods and services from India, for example, would increase net exports in India.

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5.2: Aggregate Demand and Aggregate Supply- The Long Run and the Short Run

Learning Objective

1. Distinguish between the short run and the long run, as these terms are used in macroeconomics.
2. Draw a hypothetical long-run aggregate supply curve and explain what it shows about the natural levels of employment and output at various price levels, given changes in aggregate demand.
3. Draw a hypothetical short-run aggregate supply curve, explain why it slopes upward, and explain why it may shift; that is, distinguish between a change in the aggregate quantity of goods and services supplied and a change in short-run aggregate supply.
4. Discuss various explanations for wage and price stickiness.
5. Explain and illustrate what is meant by equilibrium in the short run and relate the equilibrium to potential output.

In macroeconomics, we seek to understand two types of equilibria, one corresponding to the short run and the other corresponding to the long run. The short run in macroeconomic analysis is a period in which wages and some other prices do not respond to changes in economic conditions. In certain markets, as economic conditions change, prices (including wages) may not adjust quickly enough to maintain equilibrium in these markets. A sticky price is a price that is slow to adjust to its equilibrium level, creating sustained periods of shortage or surplus. Wage and price stickiness prevent the economy from achieving its natural level of employment and its potential output. In contrast, the long run in macroeconomic analysis is a period in which wages and prices are flexible. In the long run, employment will move to its natural level and real GDP to potential.

We begin with a discussion of long-run macroeconomic equilibrium, because this type of equilibrium allows us to see the macroeconomy after full market adjustment has been achieved. In contrast, in the short run, price or wage stickiness is an obstacle to full adjustment. Why these deviations from the potential level of output occur and what the implications are for the macroeconomy will be discussed in the section on short-run macroeconomic equilibrium.

The Long Run

As explained in a previous chapter, the natural level of employment occurs where the real wage adjusts so that the quantity of labor demanded equals the quantity of labor supplied. When the economy achieves its natural level of employment, it achieves its potential level of output. We will see that real GDP eventually moves to potential, because all wages and prices are assumed to be flexible in the long run.

Long-Run Aggregate Supply

The long-run aggregate supply (LRAS) curve relates the level of output produced by firms to the price level in the long run. In Panel (b) of Figure 5.3, the long-run aggregate supply curve is a vertical line at the economy's potential level of output. There is a single real wage at which employment reaches its natural level. In Panel (a) of Figure 5.3, only a real wage of ω_e generates natural employment L_e . The economy could, however, achieve this real wage with any of an infinitely large set of nominal wage and price-level combinations. Suppose, for example, that the equilibrium real wage (the ratio of wages to the price level) is 1.5. We could have that with a nominal wage level of 1.5 and a price level of 1.0, a nominal wage level of 1.65 and a price level of 1.1, a nominal wage level of 3.0 and a price level of 2.0, and so on.

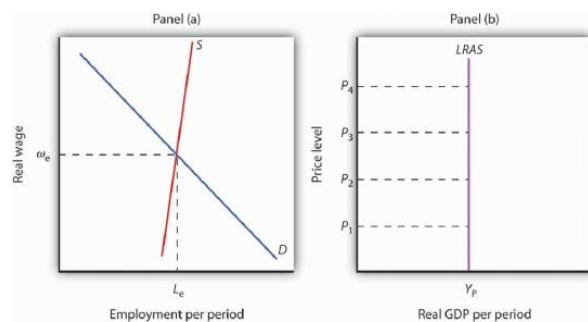


Figure 5.3 Natural Employment and Long-Run Aggregate Supply When the economy achieves its natural level of employment, as shown in Panel (a) at the intersection of the demand and supply curves for labor, it achieves its potential output, as shown in Panel (b) by the vertical long-run aggregate supply curve $LRAS$ at Y_p .

In Panel (b) we see price levels ranging from P_1 to P_4 . Higher price levels would require higher nominal wages to create a real wage of w_e , and flexible nominal wages would achieve that in the long run.

In the long run, then, the economy can achieve its natural level of employment and potential output at any price level. This conclusion gives us our long-run aggregate supply curve. With only one level of output at any price level, the long-run aggregate supply curve is a vertical line at the economy's potential level of output of Y_p .

Equilibrium Levels of Price and Output in the Long Run

The intersection of the economy's aggregate demand curve and the long-run aggregate supply curve determines its equilibrium real GDP and price level in the long run. Figure 5.4 depicts an economy in long-run equilibrium. With aggregate demand at AD_1 and the long-run aggregate supply curve as shown, real GDP is \$12,000 billion per year and the price level is 1.14. If aggregate demand increases to AD_2 , long-run equilibrium will be reestablished at real GDP of \$12,000 billion per year, but at a higher price level of 1.18. If aggregate demand decreases to AD_3 , long-run equilibrium will still be at real GDP of \$12,000 billion per year, but with the now lower price level of 1.10.

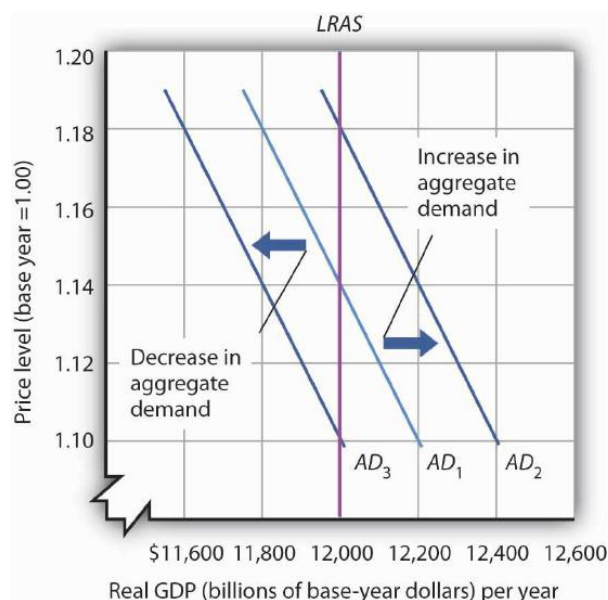


Figure 5.4 Long-Run Equilibrium Long-run equilibrium occurs at the intersection of the aggregate demand curve and the long-run aggregate supply curve. For the three aggregate demand curves shown, long-run equilibrium occurs at three different price levels, but always at an output level of \$12,000 billion per year, which corresponds to potential output.

The Short Run

Analysis of the macroeconomy in the short run—a period in which stickiness of wages and prices may prevent the economy from operating at potential output—helps explain how deviations of real GDP from potential output can and do occur. We will explore the effects of changes in aggregate demand and in short-run aggregate supply in this section.

Short-Run Aggregate Supply

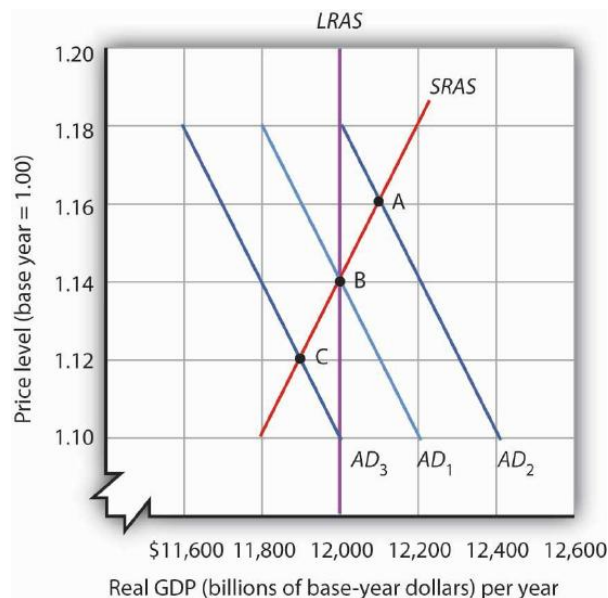


Figure 5.5 Deriving the Short-Run Aggregate Supply Curve The economy shown here is in long-run equilibrium at the intersection of AD_1 with the long-run aggregate supply curve. If aggregate demand increases to AD_2 , in the short run, both real GDP and the price level rise. If aggregate demand decreases to AD_3 , in the short run, both real GDP and the price level fall. A line drawn through points A, B, and C traces out the short-run aggregate supply curve SRAS.

The model of aggregate demand and long-run aggregate supply predicts that the economy will eventually move toward its potential output. To see how nominal wage and price stickiness can cause real GDP to be either above or below potential in the short run, consider the response of the economy to a change in aggregate demand. Figure 5.5 shows an economy that has been operating at potential output of \$12,000 billion and a price level of 1.14. This occurs at the intersection of AD_1 with the long-run aggregate supply curve at point B. Now suppose that the aggregate demand curve shifts to the right (to AD_2). This could occur as a result of an increase in exports. (The shift from AD_1 to AD_2 includes the multiplied effect of the increase in exports.) At the price level of 1.14, there is now excess demand and pressure on prices to rise. If all prices in the economy adjusted quickly, the economy would quickly settle at potential output of \$12,000 billion, but at a higher price level (1.18 in this case).

Is it possible to expand output above potential? Yes. It may be the case, for example, that some people who were in the labor force but were frictionally or structurally unemployed find work because of the ease of getting jobs at the going nominal wage in such an environment. The result is an economy operating at point A in Figure 5.5 at a higher price level and with output temporarily above potential.

Consider next the effect of a reduction in aggregate demand (to AD_3), possibly due to a reduction in investment. As the price level starts to fall, output also falls. The economy finds itself at a price level–output combination at which real GDP is below potential, at point C. Again, price stickiness is to blame. The prices firms receive are falling with the reduction in demand. Without corresponding reductions in nominal wages, there will be an increase in the real wage. Firms will employ less labor and produce less output.

By examining what happens as aggregate demand shifts over a period when price adjustment is incomplete, we can trace out the short-run aggregate supply curve by drawing a line through points A, B, and C. The short-run aggregate supply (SRAS) curve is a graphical representation of the relationship between production and the price level in the short run. Among the factors held constant

in drawing a short-run aggregate supply curve are the capital stock, the stock of natural resources, the level of technology, and the prices of factors of production.

A change in the price level produces a change in the aggregate quantity of goods and services supplied and is illustrated by the movement along the short-run aggregate supply curve. This occurs between points A, B, and C in Figure 5.5.

A change in the quantity of goods and services supplied at every price level in the short run is a change in short-run aggregate supply. Changes in the factors held constant in drawing the short-run aggregate supply curve shift the curve.

One type of event that would shift the short-run aggregate supply curve is an increase in the price of a natural resource such as oil. An increase in the price of natural resources or any other factor of production, all other things unchanged, raises the cost of production and leads to a reduction in short-run aggregate supply. In Panel (a) of Figure 5.6, $SRAS_1$ shifts leftward to $SRAS_2$. A decrease in the price of a natural resource would lower the cost of production and, other things unchanged, would allow greater production from the economy's stock of resources and would shift the short-run aggregate supply curve to the right; such a shift is shown in Panel (b) by a shift from $SRAS_1$ to $SRAS_3$.

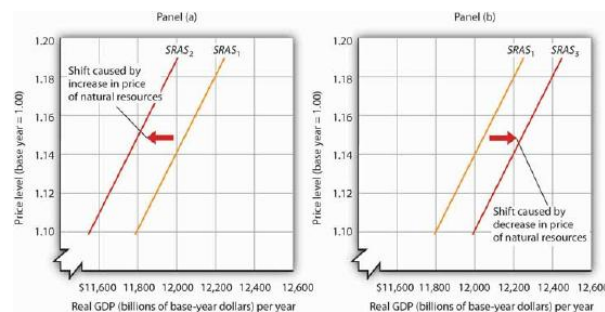


Figure 5.6 Changes in Short-Run Aggregate Supply A reduction in short-run aggregate supply shifts the curve from $SRAS_1$ to $SRAS_2$ in Panel (a). An increase shifts it to the right to $SRAS_3$, as shown in Panel (b).

Reasons for Wage and Price Stickiness

Wage or price stickiness means that the economy may not always be operating at potential. Rather, the economy may operate either above or below potential output in the short run. Correspondingly, the overall unemployment rate will be below or above the natural level.

Many prices observed throughout the economy do adjust quickly to changes in market conditions so that equilibrium, once lost, is quickly regained. Prices for fresh food and shares of common stock are two such examples.

Other prices, though, adjust more slowly. Nominal wages, the price of labor, adjust very slowly. We will first look at why nominal wages are sticky, due to their association with the unemployment rate, a variable of great interest in macroeconomics, and then at other prices that may be sticky.

Wage Stickiness

Wage contracts fix nominal wages for the life of the contract. The length of wage contracts varies from one week or one month for temporary employees, to one year (teachers and professors often have such contracts), to three years (for most union workers employed under major collective bargaining agreements). The existence of such explicit contracts means that both workers and firms accept some wage at the time of negotiating, even though economic conditions could change while the agreement is still in force.

Think about your own job or a job you once had. Chances are you go to work each day knowing what your wage will be. Your wage does not fluctuate from one day to the next with changes in demand or supply. You may have a formal contract with your employer that specifies what your wage will be over some period. Or you may have an informal understanding that sets your wage. Whatever the nature of your agreement, your wage is “stuck” over the period of the agreement. Your wage is an example of a sticky price.

One reason workers and firms may be willing to accept long-term nominal wage contracts is that negotiating a contract is a costly process. Both parties must keep themselves adequately informed about market conditions. Where unions are involved, wage

negotiations raise the possibility of a labor strike, an eventuality that firms may prepare for by accumulating additional inventories, also a costly process. Even when unions are not involved, time and energy spent discussing wages takes away from time and energy spent producing goods and services. In addition, workers may simply prefer knowing that their nominal wage will be fixed for some period of time.

Some contracts do attempt to take into account changing economic conditions, such as inflation, through cost-of-living adjustments, but even these relatively simple contingencies are not as widespread as one might think. One reason might be that a firm is concerned that while the aggregate price level is rising, the prices for the goods and services it sells might not be moving at the same rate. Also, cost-of-living or other contingencies add complexity to contracts that both sides may want to avoid.

Even markets where workers are not employed under explicit contracts seem to behave as if such contracts existed. In these cases, wage stickiness may stem from a desire to avoid the same uncertainty and adjustment costs that explicit contracts avert.

Finally, minimum wage laws prevent wages from falling below a legal minimum, even if unemployment is rising. Unskilled workers are particularly vulnerable to shifts in aggregate demand.

Price Stickiness

Rigidity of other prices becomes easier to explain in light of the arguments about nominal wage stickiness. Since wages are a major component of the overall cost of doing business, wage stickiness may lead to output price stickiness. With nominal wages stable, at least some firms can adopt a “wait and see” attitude before adjusting their prices. During this time, they can evaluate information about why sales are rising or falling (Is the change in demand temporary or permanent?) and try to assess likely reactions by consumers or competing firms in the industry to any price changes they might make (Will consumers be angered by a price increase, for example? Will competing firms match price changes?).

In the meantime, firms may prefer to adjust output and employment in response to changing market conditions, leaving product price alone. Quantity adjustments have costs, but firms may assume that the associated risks are smaller than those associated with price adjustments.

Another possible explanation for price stickiness is the notion that there are adjustment costs associated with changing prices. In some cases, firms must print new price lists and catalogs, and notify customers of price changes. Doing this too often could jeopardize customer relations.

Yet another explanation of price stickiness is that firms may have explicit long-term contracts to sell their products to other firms at specified prices. For example, electric utilities often buy their inputs of coal or oil under long-term contracts.

Taken together, these reasons for wage and price stickiness explain why aggregate price adjustment may be incomplete in the sense that the change in the price level is insufficient to maintain real GDP at its potential level. These reasons do not lead to the conclusion that no price adjustments occur. But the adjustments require some time. During this time, the economy may remain above or below its potential level of output.

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5.3: Recessionary and Inflationary Gaps and Long-Run Macroeconomic Equilibrium

Learning Objective

Explain and illustrate graphically recessionary and inflationary gaps and relate these gaps to what is happening in the labor market.

The intersection of the economy's aggregate demand and short-run aggregate supply curves determines equilibrium real GDP and price level in the short run. The intersection of aggregate demand and long-run aggregate supply determines its long-run equilibrium. In this section we will examine the process through which an economy moves from equilibrium in the short run to equilibrium in the long run.

The long run puts a nation's macroeconomic house in order: only frictional and structural unemployment remain, and the price level is stabilized. In the short run, stickiness of nominal wages and other prices can prevent the economy from achieving its potential output. Actual output may exceed or fall short of potential output. In such a situation the economy operates with a gap. When output is above potential, employment is above the natural level of employment. When output is below potential, employment is below the natural level.

Recessionary and Inflationary Gaps

At any time, real GDP and the price level are determined by the intersection of the aggregate demand and short-run aggregate supply curves. If employment is below the natural level of employment, real GDP will be below potential. The aggregate demand and short-run aggregate supply curves will intersect to the left of the long-run aggregate supply curve.

Suppose an economy's natural level of employment is L_e , shown in Panel (a) of Figure 5.7. This level of employment is achieved at a real wage of ω_e . Suppose, however, that the initial real wage ω_1 exceeds this equilibrium value. Employment at L_1 falls short of the natural level. A lower level of employment produces a lower level of output; the aggregate demand and short-run aggregate supply curves, AD and $SRAS$, intersect to the left of the long-run aggregate supply curve $LRAS$ in Panel (b). The gap between the level of real GDP and potential output, when real GDP is less than potential, is called a recessionary gap.

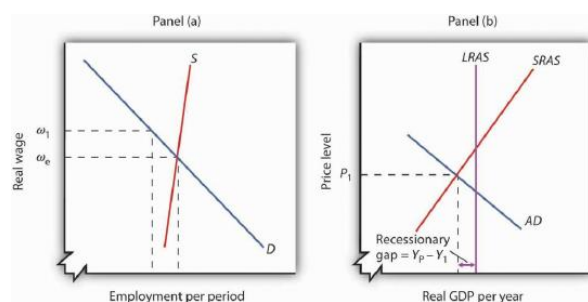


Figure 5.7 A Recessionary Gap If employment is below the natural level, as shown in Panel (a), then output must be below potential. Panel (b) shows the recessionary gap $Y_P - Y_1$, which occurs when the aggregate demand curve AD and the short-run aggregate supply curve $SRAS$ intersect to the left of the long-run aggregate supply curve $LRAS$.

Just as employment can fall short of its natural level, it can also exceed it. If employment is greater than its natural level, real GDP will also be greater than its potential level. Figure 5.8 shows an economy with a natural level of employment of L_e in Panel (a) and potential output of Y_P in Panel (b). If the real wage ω_1 is less than the equilibrium real wage ω_e , then employment L_1 will exceed the natural level. As a result, real GDP, Y_1 , exceeds potential. The gap between the level of real GDP and potential output, when real GDP is greater than potential, is called an inflationary gap. In Panel (b), the inflationary gap equals $Y_1 - Y_P$.

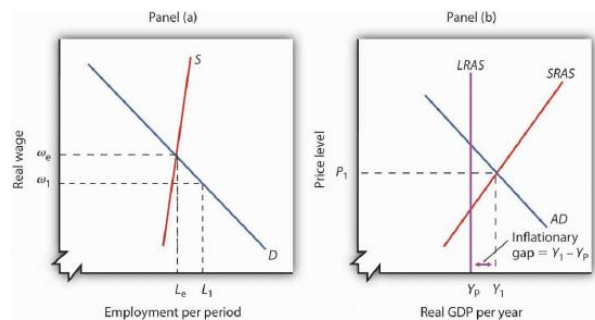


Figure 5.8 An Inflationary Gap Panel (a) shows that if employment is above the natural level, then output must be above potential. The inflationary gap, shown in Panel (b), equals $Y_1 - Y_p$. The aggregate demand curve AD and the short-run aggregate supply curve $SRAS$ intersect to the right of the long-run aggregate supply curve $LRAS$.

Please note that while the previous examples used output and employment to illustrate the relationship between economic activity and the labor market, it is crucial to recognize that discussions surrounding labor markets often center on the unemployment rate as the primary metric. Generally speaking, when economic output is high, it tends to correlate with lower unemployment, as increased demand for goods and services leads to businesses hiring more workers to meet production needs. Conversely, when output declines, the unemployment rate typically rises, as reduced economic activity often results in job cuts and slower hiring. This relationship underscores the broader economic principle that fluctuations in output directly influence labor market conditions, with periods of growth leading to lower unemployment and recessions or slowdowns resulting in higher unemployment

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CHAPTER OVERVIEW

6: The Neoclassical Perspective

[6.1: Introduction to the Neoclassical Perspective](#)

[6.2: The Building Blocks of Neoclassical Analysis](#)

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6.1: Introduction to the Neoclassical Perspective

Learning Objectives

By the end of this section, you will learn about:

1. The Building Blocks of Neoclassical Analysis
2. The Policy Implications of the Neoclassical Perspective

In Chicago, Illinois, the highest recorded temperature was 105° in July 1995, while the lowest recorded temperature was 27° below zero in January 1958. Understanding why these extreme weather patterns occurred would be interesting. However, if you wanted to understand the typical weather pattern in Chicago, instead of focusing on one-time extremes, you would need to look at the entire pattern of data over time.

A similar lesson applies to the study of macroeconomics. It is interesting to study extreme situations, like the 1930s Great Depression, the 2008–2009 Great Recession, or the pandemic-induced recession of 2020. If you want to understand the whole picture, however, you need to look at the long term. Consider the unemployment rate. The unemployment rate has fluctuated from as low as 3.5% in 1969 to as high as 9.7% in 1982 and 8.1% in 2020. Even as the U.S. unemployment rate rose during recessions and declined during expansions, it kept returning to the general neighborhood of 5.0%. When the nonpartisan Congressional Budget Office carried out its long-range economic forecasts in 2010, it assumed that from 2015 to 2020, after the recession has passed, the unemployment rate would be 5.0%. In February 2020, before the COVID-19 pandemic, the unemployment rate reached a historic low of 3.5% and is back to below 5% as of early 2022. From a long-run perspective, the economy seems to keep adjusting back to this rate of unemployment.

As the name “neoclassical” implies, this perspective of how the macroeconomy works is a “new” view of the “old” classical model of the economy. The classical view, the predominant economic philosophy until the Great Depression, was that short-term fluctuations in economic activity would rather quickly, with flexible prices, adjust back to full employment. This view of the economy implied a vertical aggregate supply curve at full employment GDP, and prescribed a “hands off” policy approach. For example, if the economy were to slip into recession (a leftward shift of the aggregate demand curve), it would temporarily exhibit a surplus of goods. Falling prices would eliminate this surplus, and the economy would return to full employment level of GDP. No active fiscal or monetary policy was needed. In fact, the classical view was that expansionary fiscal or monetary policy would only cause inflation, rather than increase GDP. The deep and lasting impact of the Great Depression changed this thinking and Keynesian economics (which will be covered in the following chapter), prescribed active fiscal policy to alleviate weak aggregate demand, became the more mainstream perspective.

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6.2: The Building Blocks of Neoclassical Analysis

Learning Objectives

By the end of this section, you will be able to:

1. Explain the importance of potential GDP in the long run
2. Analyze the role of flexible prices
3. Interpret a neoclassical model of aggregate demand and aggregate supply
4. Evaluate different ways for measuring the speed of macroeconomic adjustment

The neoclassical perspective on macroeconomics holds that, in the long run, the economy will fluctuate around its potential GDP and its natural rate of unemployment. This section begins with two building blocks of neoclassical economics: (1) potential GDP determines the economy's size and (2) wages and prices will adjust in a flexible manner so that the economy will adjust back to its potential GDP level of output. The key policy implication is this: The government should focus more on long-term growth and on controlling inflation than on worrying about recession or cyclical unemployment. This focus on long-run growth rather than the short-run fluctuations in the business cycle means that neoclassical economics is more useful for long-run macroeconomic analysis and Keynesian economics, which is covered in the following chapter, is more useful for analyzing the macroeconomic short run. Let's consider the two neoclassical building blocks in turn, and how we can embody them in the aggregate demand/aggregate supply model.

The Importance of Potential GDP in the Long Run

Over the long run, the level of potential GDP determines the size of real GDP. When economists refer to “potential GDP” they are referring to that level of output that an economy can achieve when all resources (land, labor, capital, and entrepreneurial ability) are fully employed. While the unemployment rate in labor markets will never be zero, full employment in the labor market refers to zero cyclical unemployment. There will still be some level of unemployment due to frictional or structural unemployment, but when the economy is operating with zero cyclical unemployment, economists say that the economy is at the natural rate of unemployment or at full employment.

Economists benchmark actual or real GDP against the potential GDP to determine how well the economy is performing. Change in potential GDP represents Economic Growth, we can explain GDP growth by increases in investment in physical capital and human capital per person as well as advances in technology. Physical capital per person refers to the amount and kind of machinery and equipment available to help people get work done. Compare, for example, your productivity in typing a term paper on a typewriter to working on your laptop with word processing software. Clearly, you will be able to be more productive using word processing software. The technology and level of capital of your laptop and software has increased your productivity. More broadly, the development of GPS technology and Universal Product Codes (those barcodes on every product we buy) has made it much easier for firms to track shipments, tabulate inventories, and sell and distribute products. These two technological innovations, and many others, have increased a nation's ability to produce goods and services for a given population. Likewise, increasing human capital involves increasing levels of knowledge, education, and skill sets per person through vocational or higher education. Physical and human capital improvements with technological advances will increase overall productivity and, thus, GDP.

To see how these improvements have increased productivity and output at the national level, we should examine evidence from the United States. The United States experienced significant growth in the twentieth century due to phenomenal changes in infrastructure, equipment, and technological improvements in physical capital and human capital. The population more than tripled in the twentieth century, from 76 million in 1900 to over 300 million in 2016. The human capital of modern workers is far higher today because the education and skills of workers have risen dramatically. In 1900, only about one-eighth of the U.S. population had completed high school and just one person in 40 had completed a four-year college degree. By 2010, about 85% of Americans age 25 or older had a high school degree and about 28% had a four-year college degree as well. In 2019, 33% of Americans age 25 or older had a four-year college degree. In 2024, 91.4% of Americans age 25 or older have a high school degree and about 38% have a four-year college degree as well. The average amount of physical capital per worker has grown dramatically. The technology available to modern workers is extraordinarily better than a century ago: cars, airplanes, electrical machinery, smartphones, computers, chemical and biological advances, materials science, health care—the list of technological advances could

run on and on. More workers, higher skill levels, larger amounts of physical capital per worker, and amazingly better technology, and potential GDP for the U.S. economy has clearly increased a great deal since 1900.

This growth has fallen below its potential GDP and, at times, has exceeded its potential. For example from 2008 to 2009, the U.S. economy tumbled into recession and remained below its potential until 2018. At other times, like in the late 1990s or from 2018 to 2020, the economy ran at potential GDP—or even slightly ahead. Figure 6.1 below shows the actual data for the increase in real GDP since 1960. The slightly smoother line shows the potential GDP since 1960 as estimated by the nonpartisan Congressional Budget Office. Most economic recessions and upswings are times when the economy is 1–3% below or above potential GDP in a given year. Clearly, short-run fluctuations around potential GDP do exist, but over the long run, the upward trend of potential GDP determines the size of the economy.

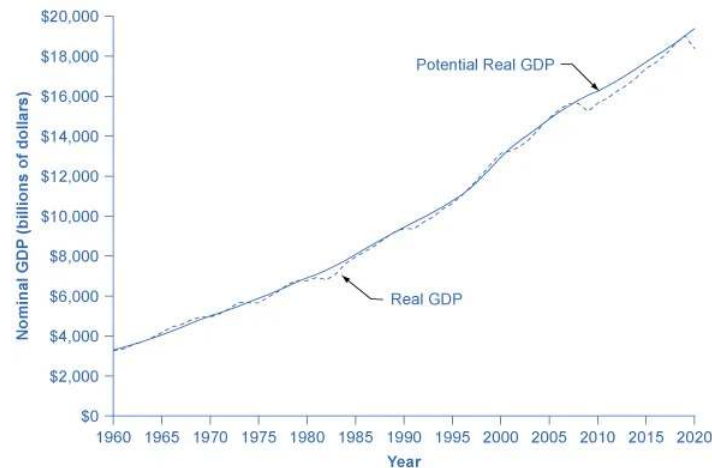


Figure 6.1 Potential and Actual GDP (in 2012 Dollars), 1958–2020 Actual GDP falls below potential GDP during and after recessions, like the recessions of 1980 and 1981–82, 1990–91, 2001, and 2008–2009 and continues below potential GDP until 2019, when it goes slightly above potential. In other cases, actual GDP can be above potential GDP for a time, as in the late 1990s.

In the aggregate demand/aggregate supply model, we show potential GDP as a vertical line as shown in Figure 6.2.. Neoclassical economists who focus on potential GDP as the primary determinant of real GDP argue that the long-run aggregate supply curve is located at potential GDP—that is, we draw the long-run aggregate supply curve as a vertical line at the level of potential GDP, as Figure below shows. A vertical LRAS curve means that the level of aggregate supply (or potential GDP) will determine the economy's real GDP, regardless of the level of aggregate demand. Over time, increases in the quantity and quality of physical capital, increases in human capital, and technological advancements shift potential GDP and the vertical LRAS curve gradually to the right. Economists often describe this gradual increase in an economy's potential GDP as a nation's long-term economic growth.

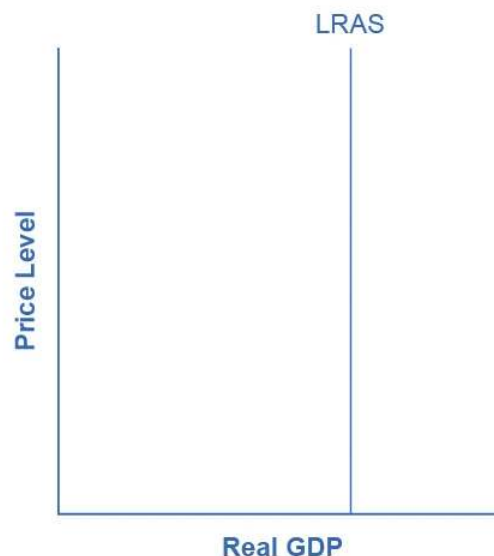


Figure 6.2: A Vertical LRAS Curve In the neoclassical model, we draw the aggregate supply curve as a vertical line at the level of potential GDP. If LRAS is vertical, then it determines the level of real output, no matter where we draw the aggregate demand curve. Over time, the LRAS curve shifts to the right as productivity increases and potential GDP expands.

The Role of Flexible Prices

How does the macroeconomy adjust back to its level of potential GDP in the long run? What if aggregate demand increases or decreases? Economists base the neoclassical view of how the macroeconomy adjusts on the insight that even if wages and prices are “sticky”, or slow to change, in the short run, they are flexible over time. To understand this better, let's follow the connections from the short-run to the long-run macroeconomic equilibrium.

The aggregate demand and aggregate supply diagram in Figure 6.3 below shows two aggregate supply curves. We draw the original upward sloping aggregate supply curve ($SRAS_0$). The vertical aggregate supply curve ($LRAS_n$) which is located at potential GDP. The original aggregate demand curve, labeled AD_0 , so that the original equilibrium occurs at point E_0 , at which point the economy is producing at its potential GDP.

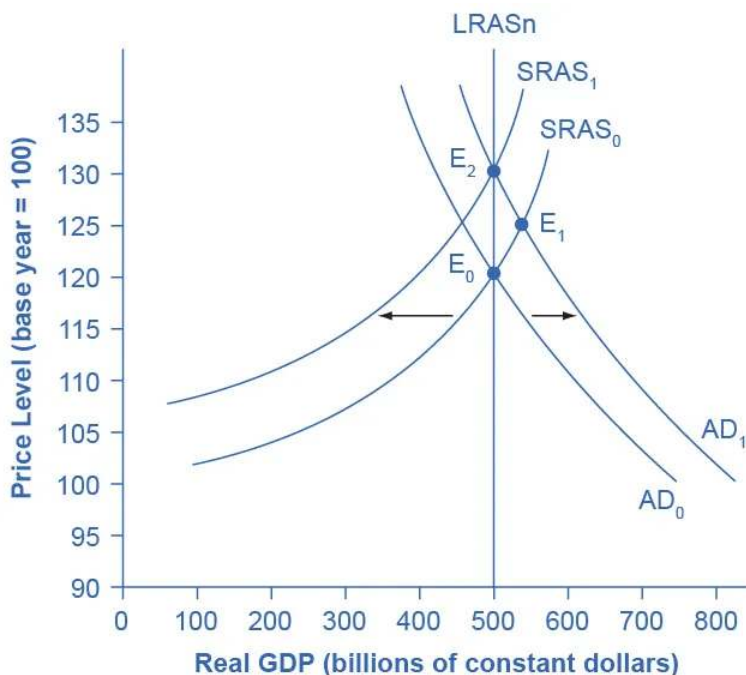


Figure 6.3: The Rebound to Potential GDP after AD Increases: The original equilibrium (E_0), at an output level of 500 and a price level of 120, happens at the intersection of the aggregate demand curve (AD_0) and the short-run aggregate supply curve ($SRAS_0$). The output at E_0 is equal to potential GDP. Aggregate demand shifts right from AD_0 to AD_1 . The new equilibrium is E_1 , with a higher output level of 550 and an increase in the price level to 125. With unemployment rates unsustainably low, eager employers bid up wages, which shifts short-run aggregate supply to the left, from $SRAS_0$ to $SRAS_1$. The new equilibrium (E_2) is at the same original level of output, 500, but at a higher price level of 130. Thus, the long-run aggregate supply curve ($LRAS_n$), which is vertical at the level of potential GDP, determines the level of real GDP in this economy in the long run.

Now, imagine that some economic event boosts aggregate demand: perhaps a surge of export sales or a rise in business confidence that leads to more investment, perhaps a policy decision like higher government spending, or perhaps a tax cut that leads to additional aggregate demand. The short-run analysis is that the rise in aggregate demand will shift the aggregate demand curve out to the right, from AD_0 to AD_1 , leading to a new equilibrium at point E_1 with higher output, lower unemployment, and pressure for an inflationary rise in the price level.

In the long-run neoclassical analysis, however, the chain of economic events is just beginning. As economic output rises above potential GDP, the level of unemployment falls. The economy is now above full employment and there is a labor shortage. Eager employers are trying to bid workers away from other companies and to encourage their current workers to exert more effort and to work longer hours. This high demand for labor will drive up wages. Most employers review their workers salaries only once or twice a year, and so it will take time before the higher wages filter through the economy. As wages do rise, it will mean a leftward shift in the short-run aggregate supply curve back to $SRAS_1$, because the price of a major input to production has increased. The

economy moves to a new equilibrium (E_2). The new equilibrium has the same level of real GDP as did the original equilibrium (E_0), but there has been an inflationary increase in the price level.

This description of the short-run shift from E_0 to E_1 and the long-run shift from E_1 to E_2 is a step-by-step way of making a simple point: the economy cannot sustain production above its potential GDP in the long run. An economy may produce above its level of potential GDP in the short run, under pressure from a surge in aggregate demand. Over the long run, however, that surge in aggregate demand ends up as an increase in the price level, not as a rise in output.

The rebound of the economy back to potential GDP also works in response to a shift to the left in aggregate demand. Figure 6.4 below again starts with two aggregate supply curves, with $SRAS_0$ showing the original upward sloping short-run AS curve and $LRAS_n$ showing the vertical long-run aggregate supply curve. A decrease in aggregate demand—for example, because of a decline in consumer confidence that leads to less consumption and more saving—causes the original aggregate demand curve AD_0 to shift back to AD_1 . The shift from the original equilibrium (E_0) to the new equilibrium (E_1) results in a decline in output. The economy is now below full employment and there is a surplus of labor. As output falls below potential GDP, unemployment rises. While a lower price level (i.e., deflation) is rare in the United States, it does happen occasionally during very weak periods of economic activity. For practical purposes, we might consider a lower price level in the AD–AS model as indicative of disinflation, which is a decline in the inflation rate. Thus, the long-run aggregate supply curve $LRAS_n$, which is vertical at the level of potential GDP, ultimately determines this economy's real GDP.

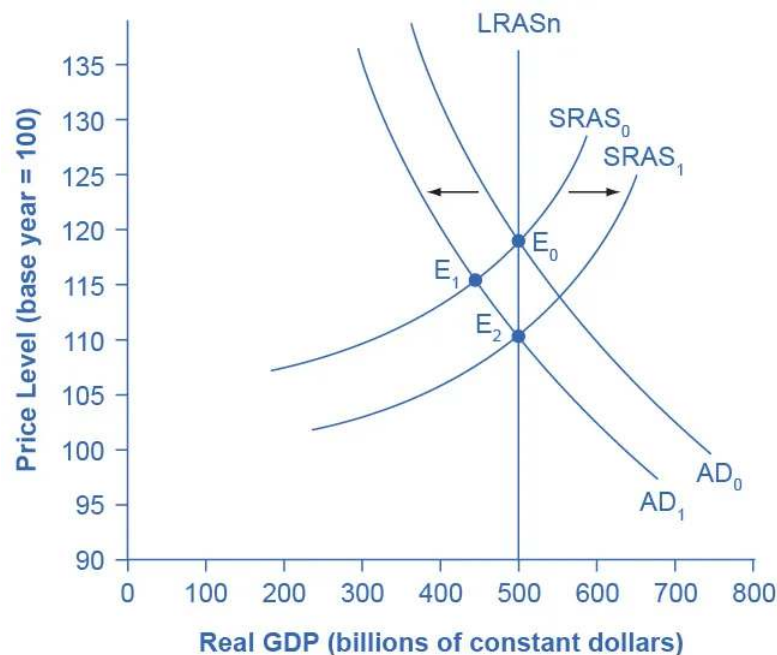


Figure 6.4: A Rebound Back to Potential GDP from a Shift to the Left in Aggregate Demand The original equilibrium (E_0), at an output level of 500 and a price level of 120, happens at the intersection of the aggregate demand curve (AD_0) and the short-run aggregate supply curve ($SRAS_0$). The output at E_0 is equal to potential GDP. Aggregate demand shifts left, from AD_0 to AD_1 . The new equilibrium is at E_1 , with a lower output level of 450 and downward pressure on the price level of 115. With high unemployment rates, wages are held down. Lower wages are an economy-wide decrease in the price of a key input, which shifts short-run aggregate supply to the right, from $SRAS_0$ to $SRAS_1$. The new equilibrium (E_2) is at the same original level of output, 500, but at a lower price level of 110.

Again, from the neoclassical perspective, this short-run scenario is only the beginning of the chain of events. The higher level of unemployment means more workers looking for jobs. As a result, employers can hold down on pay increases—or perhaps even replace some of their higher-paid workers with unemployed people willing to accept a lower wage. As wages stagnate or fall, this decline in the price of a key input means that the short-run aggregate supply curve shifts to the right from its original ($SRAS_0$ to $SRAS_1$). The overall impact in the long run, as the macroeconomic equilibrium shifts from E_0 to E_1 to E_2 , is that the level of output returns to potential GDP, where it started. There is, however, downward pressure on the price level. Thus, in the neoclassical view, changes in aggregate demand can have a short-run impact on output and on unemployment—but only a short-run impact. In the long run, when wages and prices are flexible, potential GDP and aggregate supply determine real GDP's size.

How Fast Is the Speed of Macroeconomic Adjustment?

How long does it take for wages and prices to adjust, and for the economy to rebound to its potential GDP? This subject is highly contentious. The neoclassical economists argue that even if the adjustment takes as long as, say, ten years the neoclassical perspective remains of central importance in understanding the economy.

One subset of neoclassical economists holds that wage and price adjustment in the macroeconomy might be quite rapid. The theory of rational expectations holds that people form the most accurate possible expectations about the future that they can, using all information available to them. In an economy where most people have rational expectations, economic adjustments may happen very quickly.

To understand how rational expectations may affect the speed of price adjustments, think about a situation in the real estate market. Imagine that several events seem likely to push up home values in the neighborhood. Perhaps a local employer announces that it plans to hire many more people or the city announces that it will build a local park or a library in that neighborhood. The theory of rational expectations points out that even though none of the changes will happen immediately, home prices in the neighborhood will rise immediately, because the expectation that homes will be worth more in the future will lead buyers to be willing to pay more in the present. The amount of the immediate increase in home prices will depend on how likely it seems that the announcements about the future will actually happen and on how distant the local jobs and neighborhood improvements are in the future. The key point is that, because of rational expectations, prices do not wait on events, but adjust immediately.

At a macroeconomic level, the theory of rational expectations points out that if the aggregate supply curve is vertical over time, then people should rationally expect this pattern. When a shift in aggregate demand occurs, people and businesses with rational expectations will know that its impact on output and employment will be temporary, while its impact on the price level will be permanent. If firms and workers perceive the outcome of the process in advance, and if all firms and workers know that everyone else is perceiving the process in the same way, then they have no incentive to go through an extended series of short-run scenarios, like a firm first hiring more people when aggregate demand shifts out and then firing those same people when aggregate supply shifts back. Instead, everyone will recognize where this process is heading—toward a change in the price level—and then will act on that expectation. In this scenario, the expected long-run change in the price level may happen very quickly, without a drawn-out zigzag of output and employment first moving one way and then the other.

The theory that people and firms have rational expectations can be a useful simplification, but as a statement about how people and businesses actually behave, the assumption seems too strong. After all, many people and firms are not especially well informed, either about what is happening in the economy or about how the economy works. An alternate assumption is that people and firms act with adaptive expectations: they look at past experience and gradually adapt their beliefs and behavior as circumstances change, but are not perfect synthesizers of information and accurate predictors of the future in the sense of rational expectations theory. If most people and businesses have some form of adaptive expectations, then the adjustment from the short run and long run will be traced out in incremental steps that occur over time.

The empirical evidence on the speed of macroeconomic adjustment of prices and wages is not clear-cut. The speed of macroeconomic adjustment probably varies among different countries and time periods. A reasonable guess is that the initial short-run effect of a shift in aggregate demand might last two to five years, before the adjustments in wages and prices cause the economy to adjust back to potential GDP.

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CHAPTER OVERVIEW

7: The Keynesian Perspective

- [7.1: Aggregate Demand in Keynesian Analysis](#)
- [7.2: The Building Blocks of Keynesian Analysis](#)
- [7.3: The Keynesian Perspective on Market Forces](#)
- [7.4: Balancing Keynesian and Neoclassical Models](#)

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7.1: Aggregate Demand in Keynesian Analysis

Learning Objectives

By the end of this section, you will be able to:

1. Explain real GDP, recessionary gaps, and inflationary gaps
2. Recognize the Keynesian AD/AS model
3. Identify the determining factors of both consumption expenditure and investment expenditure
4. Analyze the factors that determine government spending and net exports

The Keynesian perspective focuses on aggregate demand. The idea is simple: firms produce output only if they expect it to sell. Thus, while the availability of the factors of production determines a nation's potential GDP, the amount of goods and services that actually sell, known as real GDP, depends on how much demand exists across the economy. Figure 7.1 below illustrates this point.

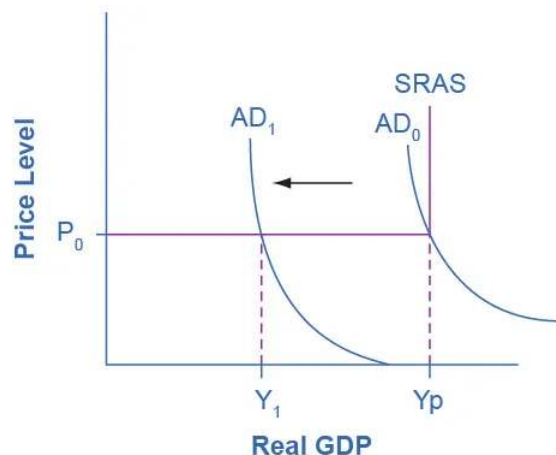


Figure 7.1 The Keynesian AD/AS Model The Keynesian View of the AD/AS Model uses an SRAS curve, which is horizontal at levels of output below potential and vertical at potential output. Thus, when beginning from potential output, any decrease in AD affects only output, but not prices. Any increase in AD affects only prices, not output.

Keynes argued that, for reasons we explain shortly, aggregate demand is not stable—that it can change unexpectedly. Suppose the economy starts where AD intersects SRAS at P_0 and Y_p . Because Y_p is potential output, the economy is at full employment. Because AD is volatile, it can easily fall. Thus, even if we start at Y_p , if AD falls, then we find ourselves in what Keynes termed a recessionary gap. The economy is in equilibrium but with less than full employment, as Y_1 in Figure above shows. Keynes believed that the economy would tend to stay in a recessionary gap, with its attendant unemployment, for a significant period of time.

In the same way (although we do not show it in the figure), if AD increases, the economy could experience an inflationary gap, where demand is attempting to push the economy past potential output. Consequently, the economy experiences inflation. The key policy implication for either situation is that government needs to step in and close the gap, increasing spending during recessions and decreasing spending during booms to return aggregate demand to match potential output.

Recall from The Aggregate Supply-Aggregate Demand Model that aggregate demand is total spending, economy-wide, on domestic goods and services. (Aggregate demand (AD) is actually what economists call total planned expenditure.) You may also remember that aggregate demand is the sum of four components: consumption expenditure, investment expenditure, government spending, and spending on net exports (exports minus imports). In the following sections, we will examine each component through the Keynesian perspective.

What Determines Consumption Expenditure?

Consumption expenditure is spending by households and individuals on durable goods, nondurable goods, and services. Durable goods are items that last and provide value over time, such as automobiles. Nondurable goods are things like groceries—once you consume them, they are gone. Services are intangible things consumers buy, like healthcare or entertainment.

Keynes identified three factors that affect consumption:

- Disposable income: For most people, the single most powerful determinant of how much they consume is how much income they have in their take-home pay, also known as disposable income, which is income after taxes.
- Expected future income: Consumer expectations about future income also are important in determining consumption. If consumers feel optimistic about the future, they are more likely to spend and increase overall aggregate demand. News of recession and troubles in the economy will make them pull back on consumption.
- Wealth or credit: When households experience a rise in wealth, they may be willing to consume a higher share of their income and to save less. When the U.S. stock market rose dramatically in the late 1990s, for example, U.S. savings rates declined, probably in part because people felt that their wealth had increased and there was less need to save. How do people spend beyond their income, when they perceive their wealth increasing? The answer is borrowing. On the other side, when the U.S. stock market declined about 40% from March 2008 to March 2009, people felt far greater uncertainty about their economic future, so savings rates increased while consumption declined.

Finally, Keynes noted that a variety of other factors combine to determine how much people save and spend. If household preferences about saving shift in a way that encourages consumption rather than saving, then AD will shift out to the right.

What Determines Investment Expenditure?

We call spending on new capital goods investment expenditure. Investment falls into four categories: producer's durable equipment and software, nonresidential structures (such as factories, offices, and retail locations), changes in inventories, and residential structures (such as single-family homes, townhouses, and apartment buildings). Businesses conduct the first three types of investment, while households conduct the last.

Keynes's treatment of investment focuses on the key role of expectations about the future in influencing business decisions. When a business decides to make an investment in physical assets, like plants or equipment, or in intangible assets, like skills or a research and development project, that firm considers both the expected investment benefits (future profit expectations) and the investment costs (interest rates).

- Expectations of future profits: The clearest driver of investment benefits is expectations for future profits. When we expect an economy to grow, businesses perceive a growing market for their products. Their higher degree of business confidence will encourage new investment. For example, in the second half of the 1990s, U.S. investment levels surged from 18% of GDP in 1994 to 21% in 2000. However, when a recession started in 2001, U.S. investment levels quickly sank back to 18% of GDP by 2002.
- Interest rates also play a significant role in determining how much investment a firm will make. Just as individuals need to borrow money to purchase homes, so businesses need financing when they purchase big ticket items. The cost of investment thus includes the interest rate. Even if the firm has the funds, the interest rate measures the opportunity cost of purchasing business capital. Lower interest rates stimulate investment spending and higher interest rates reduce it.

Many factors can affect the expected profitability on investment. For example, if the energy prices decline, then investments that use energy as an input will yield higher profits. If government offers special incentives for investment (for example, through the tax code), then investment will look more attractive; conversely, if government removes special investment incentives from the tax code, or increases other business taxes, then investment will look less attractive. As Keynes noted, business investment is the most variable of all the components of aggregate demand.

What Determines Government Spending?

The third component of aggregate demand is federal, state, and local government spending. Although we usually view the United States as a market economy, government still plays a significant role in the economy. Government provides important public services such as national defense, transportation infrastructure, and education.

Keynes recognized that the government budget offered a powerful tool for influencing aggregate demand. Not only could more government spending stimulate AD (or less government spending reduce it), but lowering or raising tax rates could influence consumption and investment spending. Keynes concluded that during extreme times like deep recessions, only the government had the power and resources to move aggregate demand. For example, during the 2020 pandemic-induced recession, the federal government gave money to state and local governments and to households to support the economy when many firms and governments needed to shut down or suffered a large decline in revenue and needed to lay off workers.

What Determines Net Exports?

Recall that exports are domestically produced products that sell abroad while imports are foreign produced products that consumers purchase domestically. Since we define aggregate demand as spending on domestic goods and services, export expenditures add to AD, while import expenditures subtract from AD.

Two sets of factors can cause shifts in export and import demand: changes in relative growth rates between countries and changes in relative prices between countries. What is happening in the countries' economies that would be purchasing those exports heavily affects the level of demand for a nation's exports. For example, if major importers of American-made products like Canada, Japan, and Germany have recessions, exports of U.S. products to those countries are likely to decline. Conversely, the amount of income in the domestic economy directly affects the quantity of a nation's imports: more income will bring a higher level of imports.

Relative prices of goods in domestic and international markets can also affect exports and imports. If U.S. goods are relatively cheaper compared with goods made in other places, perhaps because a group of U.S. producers has mastered certain productivity breakthroughs, then U.S. exports are likely to rise. If U.S. goods become relatively more expensive, perhaps because a change in the exchange rate between the U.S. dollar and other currencies has pushed up the price of inputs to production in the United States, then exports from U.S. producers are likely to decline.

Table below summarizes the reasons we have explained for changes in aggregate demand.

Reasons for a Decrease in Aggregate Demand	Reasons for an Increase in Aggregate Demand
Consumption • Rise in taxes • Fall in income • Rise in interest rates • Desire to save more • Decrease in wealth • Fall in future expected income	Consumption • Decrease in taxes • Increase in income • Fall in interest rates • Desire to save less • Rise in wealth • Rise in future expected income
Investment • Fall in expected rate of return • Rise in interest rates • Drop in business confidence	Investment • Rise in expected rate of return • Drop in interest rates • Rise in business confidence
Government • Reduction in government spending • Increase in taxes	Government • Increase in government spending • Decrease in taxes
Net Exports • Decrease in foreign demand • Relative price increase of U.S. goods	Net Exports • Increase in foreign demand • Relative price drop of U.S. goods

Table Determinants of Aggregate Demand

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7.2: The Building Blocks of Keynesian Analysis

Learning Objectives

By the end of this section, you will be able to:

1. Evaluate the Keynesian view of recessions through an understanding of sticky wages and prices and the importance of aggregate demand
2. Explain the coordination argument, menu costs, and macroeconomic externality
3. Analyze the impact of the expenditure multiplier

Now that we have a clear understanding of what constitutes aggregate demand, we return to the Keynesian argument using the model of aggregate demand/aggregate supply (AD/AS).

Keynesian economics focuses on explaining why recessions and depressions occur and offering a policy prescription for minimizing their effects. The Keynesian view of recession is based on two key building blocks. First, aggregate demand is not always automatically high enough to provide firms with an incentive to hire enough workers to reach full employment. Second, the macroeconomy may adjust only slowly to shifts in aggregate demand because of sticky wages and prices, which are wages and prices that do not respond to decreases or increases in demand. We will consider these two claims in turn, and then see how they are represented in the AD/AS model.

The first building block of the Keynesian diagnosis is that recessions occur when the level of demand for goods and services is less than what is produced when labor is fully employed. In other words, the intersection of aggregate supply and aggregate demand occurs at a level of output less than the level of GDP consistent with full employment. Suppose the stock market crashes, as in 1929, or suppose the housing market collapses, as in 2008. In either case, household wealth will decline, and consumption expenditure will follow. Suppose businesses see that consumer spending is falling or face restrictions from a pandemic that curtail their operations. That will reduce expectations of the profitability of investment, so businesses will decrease investment expenditure.

This seemed to be the case during the Great Depression, since the physical capacity of the economy to supply goods did not alter much. No flood or earthquake or other natural disaster ruined factories in 1929 or 1930. No outbreak of disease decimated the ranks of workers. No key input price, like the price of oil, soared on world markets. The U.S. economy in 1933 had just about the same factories, workers, and state of technology as it had had four years earlier in 1929—and yet the economy had shrunk dramatically. This also seems to be what happened in 2008.

As Keynes recognized, the events of the Depression contradicted Say's law that "supply creates its own demand." Although production capacity existed, the markets were not able to sell their products. As a result, real GDP was less than potential GDP/

Wage and Price Stickiness

Keynes also pointed out that although AD fluctuated, prices and wages did not immediately respond as economists often expected. Instead, prices and wages are "sticky," making it difficult to restore the economy to full employment and potential GDP. Keynes emphasized one particular reason why wages were sticky: the coordination argument. This argument points out that, even if most people would be willing—at least hypothetically—to see a decline in their own wages in bad economic times as long as everyone else also experienced such a decline, a market-oriented economy has no obvious way to implement a plan of coordinated wage reductions. Unemployment proposed a number of reasons why wages might be sticky downward, most of which center on the argument that businesses avoid wage cuts because they may in one way or another depress morale and hurt the productivity of the existing workers.

Some modern economists have argued in a Keynesian spirit that, along with wages, other prices may be sticky, too. Many firms do not change their prices every day or even every month. When a firm considers changing prices, it must consider two sets of costs. First, changing prices uses company resources: managers must analyze the competition and market demand and decide the new prices, they must update sales materials, change billing records, and redo product and price labels. Second, frequent price changes may leave customers confused or angry—especially if they discover that a product now costs more than they expected. These costs of changing prices are called menu costs—like the costs of printing a new set of menus with different prices in a restaurant. Prices

do respond to forces of supply and demand, but from a macroeconomic perspective, the process of changing all prices throughout the economy takes time.

To understand the effect of sticky wages and prices in the economy, consider Figure 7.2 below (a) illustrating the overall labor market, while Figure below (b) illustrates a market for a specific good or service. The original equilibrium (E_0) in each market occurs at the intersection of the demand curve (D_0) and supply curve (S_0). When aggregate demand declines, the demand for labor shifts to the left (to D_1) in Figure 7.2 below (a) and the demand for goods shifts to the left (to D_1) in Figure 7.2 below (b). However, because of sticky wages and prices, the wage remains at its original level (W_0) for a period of time and the price remains at its original level (P_0).

As a result, a situation of excess supply—where the quantity supplied exceeds the quantity demanded at the existing wage or price—exists in markets for both labor and goods, and Q_1 is less than Q_0 in both Figure below (a) and (b). When many labor markets and many goods markets all across the economy find themselves in this position, the economy is in a recession; that is, firms cannot sell what they wish to produce at the existing market price and do not wish to hire all who are willing to work at the existing market wage.

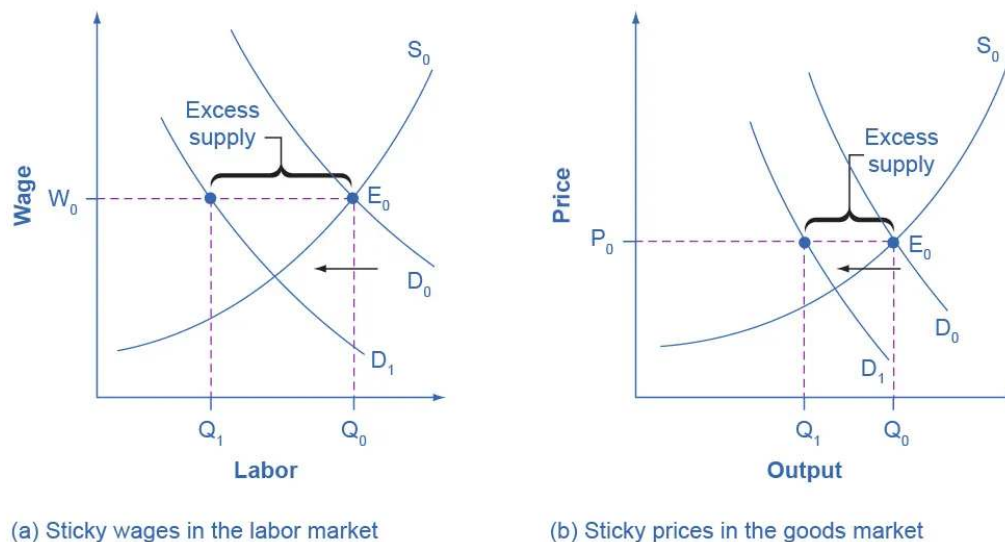


Figure 7.2 Sticky Prices and Falling Demand in the Labor and Goods Market In both (a) and (b), demand shifts left from D_0 to D_1 . However, the wage in (a) and the price in (b) do not immediately decline. In (a), the quantity demanded of labor at the original wage (W_0) is Q_0 , but with the new demand curve for labor (D_1), it will be Q_1 . Similarly, in (b), the quantity demanded of goods at the original price (P_0) is Q_0 , but at the new demand curve (D_1) it will be Q_1 . An excess supply of labor will exist, which we call unemployment. An excess supply of goods will also exist, where the quantity demanded is substantially less than the quantity supplied. Thus, sticky wages and sticky prices, combined with a drop in demand, bring about unemployment and recession.

The Two Keynesian Assumptions in the AD/AS Model

Figure 7.3 below is the AD/AS diagram which illustrates these two Keynesian assumptions—the importance of aggregate demand in causing recession and the stickiness of wages and prices. Note that because of the stickiness of wages and prices, the aggregate supply curve is flatter than either supply curve (labor or specific good). In fact, if wages and prices were so sticky that they did not fall at all, the aggregate supply curve would be completely flat below potential GDP. This outcome is an important example of a macroeconomic externality, where what happens at the macro level is different from and inferior to what happens at the micro level. For example, a firm should respond to a decrease in demand for its product by cutting its price to increase sales. However, if all firms experience a decrease in demand for their products, sticky prices in the aggregate prevent aggregate demand from rebounding (which we would show as a movement along the AD curve in response to a lower price level).

The original equilibrium of this economy occurs where the aggregate demand function (AD_0) intersects with AS. Since this intersection occurs at potential GDP (Y_p), the economy is operating at full employment. When aggregate demand shifts to the left, all the adjustment occurs through decreased real GDP. There is no decrease in the price level. Since the equilibrium occurs at Y_1 , the economy experiences substantial unemployment.

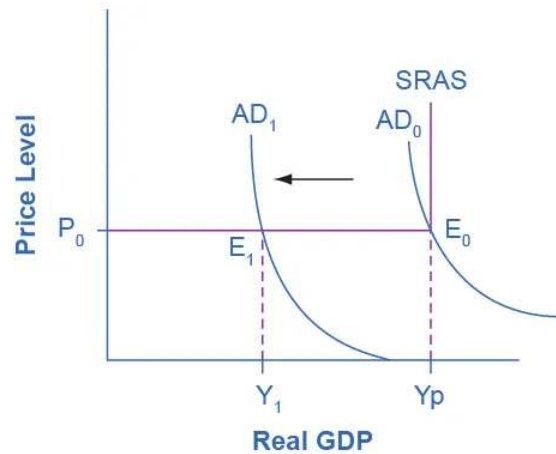


Figure 7.3 A Keynesian Perspective of Recession This figure illustrates the two key assumptions behind Keynesian economics. A recession begins when aggregate demand declines from AD_0 to AD_1 . The recession persists because of the assumption of fixed wages and prices, which makes the SRAS flat below potential GDP. If that were not the case, the price level would fall also, raising GDP and limiting the recession. Instead the intersection E_1 occurs in the flat portion of the SRAS curve where GDP is less than potential.

The Expenditure Multiplier

A key concept in Keynesian economics is the expenditure multiplier. The expenditure multiplier is the idea that not only does spending affect the equilibrium level of GDP, but that spending is powerful. More precisely, it means that a change in spending causes a more than proportionate change in GDP.

$$\frac{\Delta Y}{\Delta \text{Spending}} > 1$$

The reason for the expenditure multiplier is that one person's spending becomes another person's income, which leads to additional spending and additional income so that the cumulative impact on GDP is larger than the initial increase in spending. Additionally, the multiplier operates in a negative as well as a positive direction. Thus, when investment spending collapsed during the Great Depression, it caused a much larger decrease in real GDP. The size of the multiplier is critical and was a key element in discussions of the effectiveness of the Obama administration's fiscal stimulus package, officially titled the American Recovery and Reinvestment Act of 2009.

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7.3: The Keynesian Perspective on Market Forces

Learning Objectives

By the end of this section, you will be able to:

1. Explain the Keynesian perspective on market forces
2. Analyze the role of government policy in economic management

Ever since the birth of Keynesian economics in the 1930s, controversy has simmered over the extent to which government should play an active role in managing the economy. In the aftermath of the human devastation and misery of the Great Depression, many people—including many economists—became more aware of vulnerabilities within the market-oriented economic system. Some supporters of Keynesian economics advocated a high degree of government planning in all parts of the economy.

However, Keynes himself was careful to separate the issue of aggregate demand from the issue of how well individual markets worked. He argued that individual markets for goods and services were appropriate and useful, but that sometimes that level of aggregate demand was just too low. When 10 million people are willing and able to work, but one million of them are unemployed, he argued, individual markets may be doing a perfectly good job of allocating the efforts of the nine million workers—the problem is that insufficient aggregate demand exists to support jobs for all 10 million. Thus, he believed that, while government should ensure that overall level of aggregate demand is sufficient for an economy to reach full employment, this task did not imply that the government should attempt to set prices and wages throughout the economy, nor to take over and manage large corporations or entire industries directly.

Even if one accepts the Keynesian economic theory, a number of practical questions remain. In the real world, can government economists identify potential GDP accurately? Is a desired increase in aggregate demand better accomplished by a tax cut or by an increase in government spending? Given the inevitable delays and uncertainties as governments enact policies into law, is it reasonable to expect that the government can implement Keynesian economics? Can fixing a recession really be just as simple as pumping up aggregate demand? Government Budgets and Fiscal Policy will probe these issues. The Keynesian approach, with its focus on aggregate demand and sticky prices, has proved useful in understanding how the economy fluctuates in the short run and why recessions and cyclical unemployment occur.

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7.4: Balancing Keynesian and Neoclassical Models

Learning Objectives

By the end of this section, you will be able to:

1. Evaluate how neoclassical economists and Keynesian economists react to recessions
2. Analyze the interrelationship between the neoclassical and Keynesian economic models

We can compare finding the balance between Keynesian and Neoclassical models to the challenge of riding two horses simultaneously. When a circus performer stands on two horses, with a foot on each one, much of the excitement for the viewer lies in contemplating the gap between the two. As modern macroeconomists ride into the future on two horses—with one foot on the short-term Keynesian perspective and one foot on the long-term neoclassical perspective—the balancing act may look uncomfortable, but there does not seem to be any way to avoid it. Each approach, Keynesian and neoclassical, has its strengths and weaknesses.

The short-term Keynesian model, built on the importance of aggregate demand as a cause of business cycles and a degree of wage and price rigidity, does a sound job of explaining many recessions and why cyclical unemployment rises and falls. By focusing on the short-run aggregate demand adjustments, Keynesian economics risks overlooking the long-term causes of economic growth or the natural rate of unemployment that exist even when the economy is producing at potential GDP.

The neoclassical model, with its emphasis on aggregate supply, focuses on the underlying determinants of output and employment in markets, and thus tends to put more emphasis on economic growth and how labor markets work. However, the neoclassical view is not especially helpful in explaining why unemployment moves up and down over short time horizons of a few years. Nor is the neoclassical model especially helpful when the economy is mired in an especially deep and long-lasting recession, like the 1930s Great Depression. Keynesian economics tends to view inflation as a price that might sometimes be paid for lower unemployment; neoclassical economics tends to view inflation as a cost that offers no offsetting gains in terms of lower unemployment.

Macroeconomics cannot, however, be summed up as an argument between one group of economists who are pure Keynesians and another group who are pure neoclassicists. Instead, many mainstream economists believe both the Keynesian and neoclassical perspectives. Robert Solow, the Nobel laureate in economics in 1987, described the dual approach in this way:

At short time scales, I think, something sort of ‘Keynesian’ is a good approximation, and surely better than anything straight ‘neoclassical.’ At very long time scales, the interesting questions are best studied in a neoclassical framework, and attention to the Keynesian side of things would be a minor distraction. At the five-to-ten-year time scale, we have to piece things together as best we can, and look for a hybrid model that will do the job.

Many modern macroeconomists spend considerable time and energy trying to construct models that blend the most attractive aspects of the Keynesian and neoclassical approaches. It is possible to construct a somewhat complex mathematical model where aggregate demand and sticky wages and prices matter in the short run, but wages, prices, and aggregate supply adjust in the long run. However, creating an overall model that encompasses both short-term Keynesian and long-term neoclassical models is not easy.

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CHAPTER OVERVIEW

8: Government and Fiscal Policy

[8.1: Government and the Economy](#)

[8.2: The Use of Fiscal Policy to Stabilize the Economy](#)

[8.3: Issues in Fiscal Policy](#)

Thumbnail: <https://www.pexels.com/photo/american-flag-with-rolled-dollar-bills-4386346/>

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8.1: Government and the Economy

Learning Objective

1. Understand the major components of U.S. government spending and sources of government revenues.
2. Define the terms *budget surplus*, *budget deficit*, *balanced budget*, and *national debt*, and discuss their trends over time in the United States.

We begin our analysis of fiscal policy with an examination of government purchases, transfer payments, and taxes in the U.S. economy.

Government Purchases

The government-purchases component of aggregate demand includes all purchases by government agencies of goods and services produced by firms, as well as direct production by government agencies themselves. When the federal government buys staples and staplers, the transaction is part of government purchases. The production of educational and research services by public colleges and universities is also counted in the government-purchases component of GDP.

While government spending has grown over time, government purchases as a share of GDP generally declined from over 20% until the early 1990s to under 18% in 2001. Since then, though, the percentage of government purchases in GDP began to increase back toward 20%, first as military spending picked up and then more recently to over 20% during the 2007-2009 recession.

Figure 8.1 shows federal as well as state and local government purchases as a percentage of GDP from 1960 to 2009. Notice the changes that have occurred over this period. In 1960, the federal government accounted for the majority share of total purchases. Since then, however, federal purchases have fallen by almost half relative to GDP, while state and local purchases relative to GDP have risen.

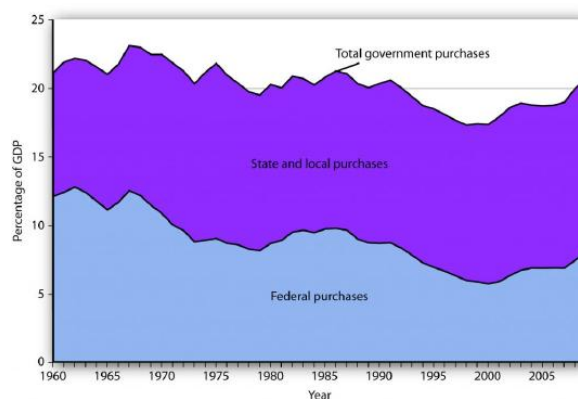


Figure 8.1 Federal, State, and Local Purchases Relative to GDP, 1960–2009 Government purchases were generally above 20% of GDP from 1960 until the early 1990s and then below 20% of GDP until the 2007-2009 recession. The share of government purchases in GDP began rising again in the 21st century.

Source: Bureau of Economic Analysis, NIPA Table 1.1 and 3.1 (November 23, 2010 revision).

Transfer Payments

A transfer payment is the provision of aid or money to an individual who is not required to provide anything in exchange. Social Security and welfare benefits are examples of transfer payments. During the 2007-2009 recession, transfers again rose.

A number of changes have influenced transfer payments over the past several decades. First, they increased rapidly during the late 1960s and early 1970s. This was the period in which federal programs such as Medicare (health insurance for the elderly) and Medicaid (health insurance for the poor) were created and other programs were expanded.

Figure 8.2 shows that transfer payment spending by the federal government and by state and local governments has risen as a percentage of GDP. In 1960, such spending totaled about 6% of GDP; by 2009, it had risen to about 18%. The federal government

accounts for the bulk of transfer payment spending in the United States.

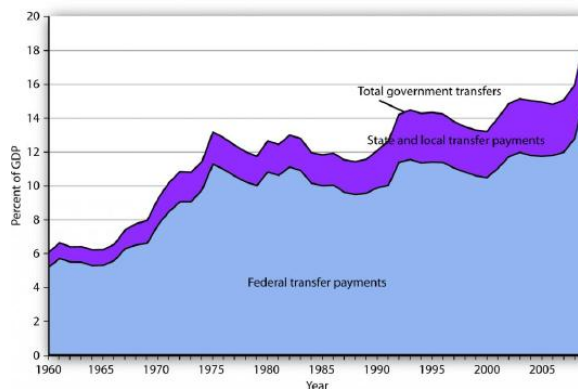


Figure 8.2 Federal, State, and Local Transfer Payments as a Percentage of GDP, 1960–2009 The chart shows transfer payment spending as a percentage of GDP from 1960 through 2009. This spending rose dramatically relative to GDP during the late 1960s and the 1970s as federal programs expanded. More recently, sharp increases in health-care costs have driven upward the spending for transfer payment programs such as Medicare and Medicaid. Transfer payments fluctuate with the business cycle, rising in times of recession and falling during times of expansion. As such, they rose sharply during the deep 2007–2009 recession.

Source: Bureau of Economic Analysis, NIPA Table 1.1, 3.2, and 3.3 (November 23, 2010 revision).

Transfer payment spending relative to GDP tends to fluctuate with the business cycle. Transfer payments fell during the late 1970s, a period of expansion, then rose as the economy slipped into a recessionary gap during the 1979–1982 period. Transfer payments fell during the expansion that began late in 1982, then began rising in 1989 as the expansion began to slow. Transfer payments continued to rise relative to GDP during the recessions of 1990–1991 and 2001–2002 and then fell as the economy entered expansionary phases after each of those recessions. During the 2007–2009 recession, transfers again rose.

When economic activity falls, incomes fall, people lose jobs, and more people qualify for aid. People qualify to receive welfare benefits, such as cash, food stamps, or Medicaid, only if their income falls below a certain level. They qualify for unemployment compensation by losing their jobs. More people qualify for transfer payments during recessions. When the economy expands, incomes and employment rise, and fewer people qualify for welfare or unemployment benefits. Spending for those programs therefore tends to fall during an expansion.

Figure 8.3 summarizes trends in government spending since 1960. It shows three categories of government spending relative to GDP: government purchases, transfer payments, and net interest. Net interest includes payments of interest by governments at all levels on money borrowed, less interest earned on saving.

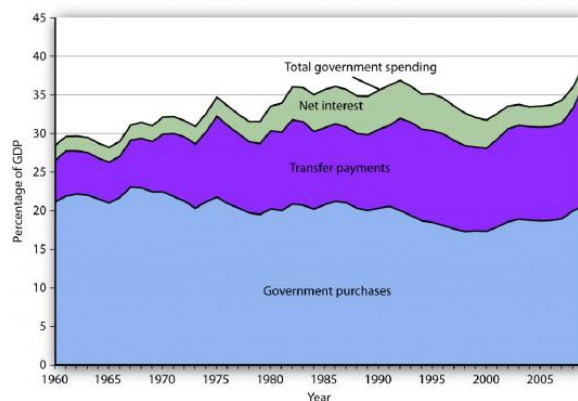


Figure 8.3 Government Spending as a Percentage of GDP, 1960–2009 This chart shows three major categories of government spending as percentages of GDP: government purchases, transfer payments, and net interest.

Source: Bureau of Economic Analysis, NIPA Table 1.1 and 3.1 (November 23, 2010 revision).

Taxes

Taxes affect the relationship between real GDP and personal disposable income; they therefore affect consumption. They also influence investment decisions. Taxes imposed on firms affect the profitability of investment decisions and therefore affect the levels of investment firms will choose. Payroll taxes imposed on firms affect the costs of hiring workers; they therefore have an impact on employment and on the real wages earned by workers.

The bulk of federal receipts come from the personal income tax and from payroll taxes. State and local tax receipts are dominated by property taxes and sales taxes. The federal government, as well as state and local governments, also collects taxes imposed on business firms, such as taxes on corporate profits. Figure 8.4 shows the composition of federal, state, and local receipts in a recent year.

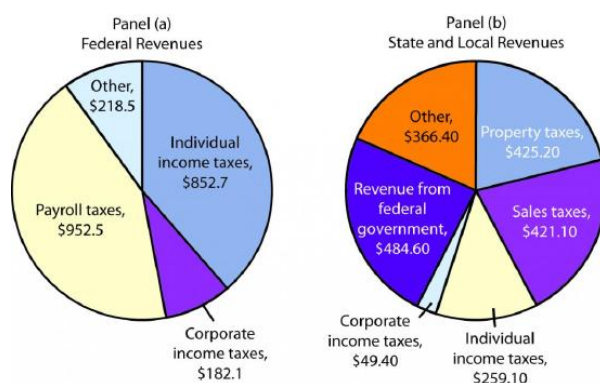


Figure 8.4 The Composition of Federal, State, and Local Revenues Federal receipts come primarily from payroll taxes and from personal taxes such as the personal income tax. State and local tax receipts come from a variety of sources; the most important are property taxes, sales taxes, income taxes, and grants from the federal government. Revenue shares are for 2009.

Source: Bureau of Economic Analysis, NIPA Table 3.2 and 3.3 (November 23, 2010 revision).

The Government Budget Balance

The government's budget balance is the difference between the government's revenues and its expenditures. A budget surplus occurs if government revenues exceed expenditures. A budget deficit occurs if government expenditures exceed revenues. The minus sign is often omitted when reporting a deficit. If the budget surplus equals zero, we say the government has a balanced budget.

Figure 8.5 compares federal, state, and local government revenues to expenditures relative to GDP since 1960. The government's budget was generally in surplus in the 1960s, then mostly in deficit since, except for a brief period between 1998 and 2001. Bear in mind that these data are for all levels of government.

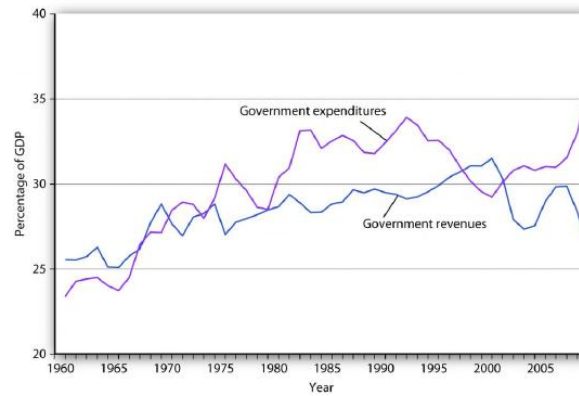


Figure 8.5 Government Revenue and Expenditure as a Percentage of GDP, 1960–2009 The government’s budget was generally in surplus in the 1960s, then mostly in deficit since, except for a brief period between 1998 and 2001.

Source: Bureau of Economic Analysis, NIPA Table 1.1 and 3.1 (November 23, 2010 revision).

The administration of George W. Bush saw a large increase in the federal deficit. In part, this is the result of the government’s response to the terrorist attacks in 2001. It also results, however, from large increases in federal spending at all levels together with tax cuts in 2001, 2002, and 2003.

The National Debt

The national debt is the sum of all past federal deficits, minus any surpluses. Figure 8.6 shows the national debt as a percentage of GDP. It suggests that, relative to the level of economic activity, the debt is well below the levels reached during World War II. The ratio of debt to GDP rose from 1981 to 1996 and fell in the last years of the 20th century; it began rising again in 2002.



Figure 8.6 The National Debt and the Economy, 1929–2009 The national debt relative to GDP is much smaller today than it was during World War II. The ratio of debt to GDP rose from 1981 to 1996 and fell in the last years of the 20th century; it began rising again in 2002.

Sources: Data for 1929–1938 from *Historical Statistics of the United States, Colonial Times to 1957*—not strictly comparable with later data. Data for remaining years from Office of Management and Budget, *Budget of the United States Government, Fiscal Year 2011, Historical Tables*.

Judged by international standards, the U.S. national debt relative to its GDP is somewhat above average among developed nations. Figure 8.7 shows national debt as a percentage of GDP for 26 countries in 2008. It also shows deficits or surpluses as a percentage of GDP.

Country	National Debt as percentage of GDP	Deficit (–) or surplus as percentage of GDP
Japan	172.1	–2.7
Italy	114.4	–2.7
Greece	102.6	–7.8
Iceland	96.3	–13.6
Belgium	93.5	–1.2
Hungary	77.0	–3.7
France	75.7	–3.4
Portugal	75.2	–2.8
United States	70.0	–6.5
Canada	69.7	0.1
Germany	68.8	–0.2
Austria	66.2	–0.5
Netherlands	65.8	0.7
United Kingdom	56.8	–5.3
Norway	56.0	18.8
Poland	54.0	–3.7
Sweden	47.1	2.5
Spain	47.0	–4.1
Switzerland	44.0	1.6
Finland	40.7	4.4
Denmark	39.8	3.4
Slovak Republic	30.8	–2.3
Korea	26.8	3.3
New Zealand	25.3	3.1
Luxembourg	16.3	2.5
Australia	14.3	1.0
Average	63.3	

Figure 8.7 Debts and Deficits for 26 Nations, 2008 The chart shows national debt as a percentage of GDP and deficits or surpluses as a percentage of GDP in 2008. The national debt of the United States relative to its GDP was somewhat above average among these nations.

Source: Organisation for Economic Co-operation and Development (OECD). *Factbook 2010*. OECD Publishing, May 25, 2010.

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8.2: The Use of Fiscal Policy to Stabilize the Economy

Learning Objective

1. Define automatic stabilizers and explain how they work.
2. Explain and illustrate graphically how discretionary fiscal policy works and compare the changes in aggregate demand that result from changes in government purchases, income taxes, and transfer payments.

Fiscal policy—the use of government expenditures and taxes to influence the level of economic activity. It can be used in an effort to close a recessionary or an inflationary gap.

Some tax and expenditure programs change automatically with the level of economic activity. We will examine these first. Then we will look at how discretionary fiscal policies work. Four examples of discretionary fiscal policy choices were the tax cuts introduced by the Kennedy, Reagan, and George W. Bush administrations and the increase in government purchases proposed by President Clinton in 1993. The 2009 fiscal stimulus bill passed in the first months of the administration of Barack Obama included both tax cuts and spending increases. All were designed to stimulate aggregate demand and close recessionary gaps.

Automatic Stabilizers

Certain government expenditure and taxation policies tend to insulate individuals from the impact of shocks to the economy. Transfer payments have this effect. Because more people become eligible for income supplements when income is falling, transfer payments reduce the effect of a change in real GDP on disposable personal income and thus help to insulate households from the impact of the change. Income taxes also have this effect. As incomes fall, people pay less in income taxes.

Any government program that tends to reduce fluctuations in GDP automatically is called an automatic stabilizer. Automatic stabilizers tend to increase GDP when it is falling and reduce GDP when it is rising.

To see how automatic stabilizers work, consider the decline in real GDP that occurred during the recession of 1990–1991. Real GDP fell 1.6% from the peak to the trough of that recession. The reduction in economic activity automatically reduced tax payments, reducing the impact of the downturn on disposable personal income. Furthermore, the reduction in incomes increased transfer payment spending, boosting disposable personal income further. Real disposable personal income thus fell by only 0.9% during the 1990–1991 recession, a much smaller percentage than the reduction in real GDP. Rising transfer payments and falling tax collections helped cushion households from the impact of the recession and kept real GDP from falling as much as it would have otherwise.

Automatic stabilizers have emerged as key elements of fiscal policy. Increases in income tax rates and unemployment benefits have enhanced their importance as automatic stabilizers. The introduction in the 1960s and 1970s of means-tested federal transfer payments, in which individuals qualify depending on their income, added to the nation's arsenal of automatic stabilizers. The advantage of automatic stabilizers is suggested by their name. As soon as income starts to change, they go to work. Because they affect disposable personal income directly, and because changes in disposable personal income are closely linked to changes in consumption, automatic stabilizers act swiftly to reduce the degree of changes in real GDP.

Discretionary Fiscal Policy Tools

As we begin to look at deliberate government efforts to stabilize the economy through fiscal policy choices, we note that most of the government's taxing and spending is for purposes other than economic stabilization. For example, the increase in defense spending in the early 1980s under President Ronald Reagan and in the administration of George W. Bush were undertaken primarily to promote national security. That the increased spending affected real GDP and employment was a by-product. The effect of such changes on real GDP and the price level is secondary, but it cannot be ignored. Our focus here, however, is on discretionary fiscal policy that is undertaken with the intention of stabilizing the economy. As we have seen, the tax cuts introduced by the Bush administration were justified as expansionary measures.

Discretionary government spending and tax policies can be used to shift aggregate demand. Expansionary fiscal policy might consist of an increase in government purchases or transfer payments, a reduction in taxes, or a combination of these tools to shift the aggregate demand curve to the right. A contractionary fiscal policy might involve a reduction in government purchases or transfer payments, an increase in taxes, or a mix of all three to shift the aggregate demand curve to the left.

Figure 8.8 illustrates the use of fiscal policy to shift aggregate demand in response to a recessionary gap and an inflationary gap. In Panel (a), the economy produces a real GDP of Y_1 , which is below its potential level of Y_p . An expansionary fiscal policy seeks to shift aggregate demand to AD_2 in order to close the gap. In Panel (b), the economy initially has an inflationary gap at Y_1 . A contractionary fiscal policy seeks to reduce aggregate demand to AD_2 and close the gap. Now we shall look at how specific fiscal policy options work. In our preliminary analysis of the effects of fiscal policy on the economy, we will assume that at a given price level these policies do not affect interest rates or exchange rates. We will relax that assumption later in the chapter.

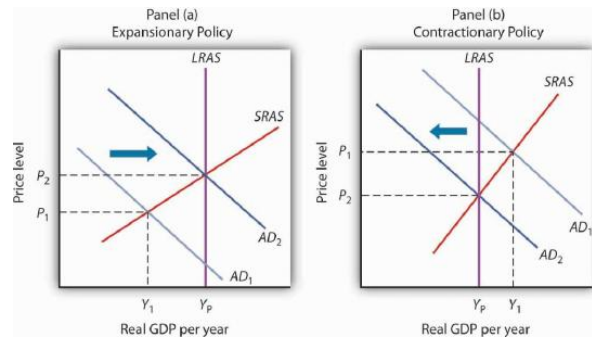


Figure 8.8 Expansionary and Contractionary Fiscal Policies to Shift Aggregate Demand In Panel (a), the economy faces a recessionary gap ($Y_p - Y_1$). An expansionary fiscal policy seeks to shift aggregate demand to AD_2 to close the gap. In Panel (b), the economy faces an inflationary gap ($Y_1 - Y_p$). A contractionary fiscal policy seeks to reduce aggregate demand to AD_2 to close the gap.

Changes in Government Purchases

One policy through which the government could seek to shift the aggregate demand curve is a change in government purchases. We learned that the aggregate demand curve shifts to the right by an amount equal to the initial change in government purchases times the multiplier. This multiplied effect of a change in government purchases occurs because the increase in government purchases increases income, which in turn increases consumption. Then, part of the impact of the increase in aggregate demand is absorbed by higher prices, preventing the full increase in real GDP that would have occurred if the price level did not rise.

Figure 8.9 shows the effect of an increase in government purchases of \$200 billion. The initial price level is P_1 and the initial equilibrium real GDP is \$12,000 billion. Suppose the multiplier is 2. The \$200 billion increase in government purchases increases the total quantity of goods and services demanded, at a price level of P_1 , by \$400 billion (the \$200 billion increase in government purchases times the multiplier) to \$12,400 billion. The aggregate demand thus shifts to the right by that amount to AD_2 . The equilibrium level of real GDP rises to \$12,300 billion, and the price level rises to P_2 .

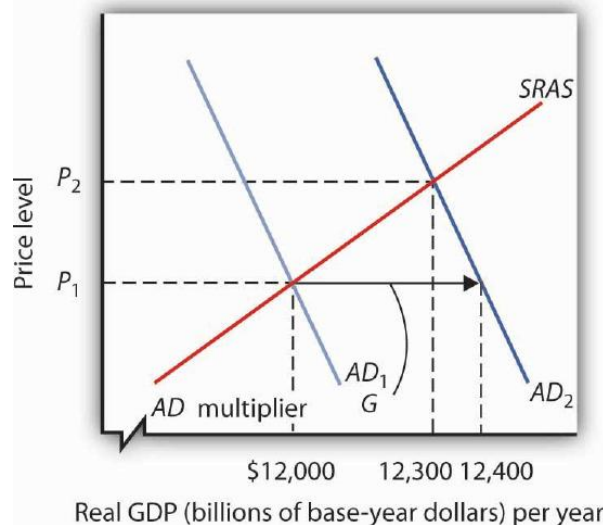


Figure 8.9 An Increase in Government Purchases The economy shown here is initially in equilibrium at a real GDP of \$12,000 billion and a price level of P_1 . An increase of \$200 billion in the level of government purchases (ΔG) shifts the aggregate demand curve to the right by \$400 billion to AD_2 . The equilibrium level of real GDP rises to \$12,300 billion, while the price level rises to P_2 .

A reduction in government purchases would have the opposite effect. The aggregate demand curve would shift to the left by an amount equal to the initial change in government purchases times the multiplier. Real GDP and the price level would fall.

Changes in Business Taxes

One of the first fiscal policy measures undertaken by the Kennedy administration in the 1960s was an investment tax credit. An investment tax credit allows a firm to reduce its tax liability by a percentage of the investment it undertakes during a particular period. With an investment tax credit of 10%, for example, a firm that engaged in \$1 million worth of investment during a year could reduce its tax liability for that year by \$100,000. The investment tax credit introduced by the Kennedy administration was later repealed. It was reintroduced during the Reagan administration in 1981, then abolished by the Tax Reform Act of 1986. President Clinton called for a new investment tax credit in 1993 as part of his job stimulus proposal, but that proposal was rejected by Congress. The Bush administration reinstated the investment tax credit as part of its tax cut package.

An investment tax credit is intended, of course, to stimulate additional private sector investment. A reduction in the tax rate on corporate profits would be likely to have a similar effect. Conversely, an increase in the corporate income tax rate or a reduction in an investment tax credit could be expected to reduce investment.

A change in investment affects the aggregate demand curve in precisely the same manner as a change in government purchases. It shifts the aggregate demand curve by an amount equal to the initial change in investment times the multiplier.

An increase in the investment tax credit, or a reduction in corporate income tax rates, will increase investment and shift the aggregate demand curve to the right. Real GDP and the price level will rise. A reduction in the investment tax credit, or an increase in corporate income tax rates, will reduce investment and shift the aggregate demand curve to the left. Real GDP and the price level will fall¹.

Changes in Income Taxes

Income taxes affect the consumption component of aggregate demand. An increase in income taxes reduces disposable personal income and thus reduces consumption (but by less than the change in disposable personal income). That shifts the aggregate demand curve leftward by an amount equal to the initial change in consumption that the change in income taxes produces times the multiplier². A reduction in income taxes increases disposable personal income, increases consumption (but by less than the change in disposable personal income), and increases aggregate demand.

Suppose, for example, that income taxes are reduced by \$200 billion. Only some of the increase in disposable personal income will be used for consumption and the rest will be saved. Suppose the initial increase in consumption is \$180 billion. Then the shift in the aggregate demand curve will be a multiple of \$180 billion; if the multiplier is 2, aggregate demand will shift to the right by \$360

billion. Thus, as compared to the \$200-billion increase in government purchases that we saw in Figure 8.9, the shift in the aggregate demand curve due to an income tax cut is somewhat less, as is the effect on real GDP and the price level.

Changes in Transfer Payments

Changes in transfer payments, like changes in income taxes, alter the disposable personal income of households and thus affect their consumption, which is a component of aggregate demand. A change in transfer payments will thus shift the aggregate demand curve because it will affect consumption. Because consumption will change by less than the change in disposable personal income, a change in transfer payments of some amount will result in a smaller change in real GDP than would a change in government purchases of the same amount. As with income taxes, a \$200-billion increase in transfer payments will shift the aggregate demand curve to the right by less than the \$200-billion increase in government purchases that we saw in Figure 8.9.

Table below “Fiscal Policy in the United States Since 1964” summarizes U.S. fiscal policies undertaken to shift aggregate demand since the 1964 tax cuts. We see that expansionary policies have been chosen in response to recessionary gaps and that contractionary policies have been chosen in response to inflationary gaps. Changes in government purchases and in taxes have been the primary tools of fiscal policy in the United States.

Table: Fiscal Policy in the United States Since 1964

Year	Situation	Policy response
1968	Inflationary gap	A temporary tax increase, first recommended by President Johnson’s Council of Economic Advisers in 1965, goes into effect. This one-time surcharge of 10% is added to individual income tax liabilities.
1969	Inflationary gap	President Nixon, facing a continued inflationary gap, orders cuts in government purchases.
1975	Recessionary gap	President Ford, facing a recession induced by an OPEC oil-price increase, proposes a temporary 10% tax cut. It is passed almost immediately and goes into effect within two months.
1981	Recessionary gap	President Reagan had campaigned on a platform of increased defense spending and a sharp cut in income taxes. The tax cuts are approved in 1981 and are implemented over a period of three years. The increased defense spending begins in 1981. While the Reagan administration rejects the use of fiscal policy as a stabilization tool, its policies tend to increase aggregate demand early in the 1980s.

Year	Situation	Policy response
1992	Recessionary gap	President Bush had rejected the use of expansionary fiscal policy during the recession of 1990–1991. Indeed, he agreed late in 1990 to a cut in government purchases and a tax increase. In a campaign year, however, he orders a cut in withholding rates designed to increase disposable personal income in 1992 and to boost consumption.
1993	Recessionary gap	President Clinton calls for a \$16-billion jobs package consisting of increased government purchases and tax cuts aimed at stimulating investment. The president says the plan will create 500,000 new jobs. The measure is rejected by Congress.
2001	Recessionary gap	President Bush campaigned to reduce taxes in order to reduce the size of government and encourage long-term growth. When he took office in 2001, the economy was weak and the \$1.35-billion tax cut was aimed at both long-term tax relief and at stimulating the economy in the short term. It included, for example, a personal income tax rebate of \$300 to \$600 per household. With unemployment still high a couple of years into the expansion, another tax cut was passed in 2003.
2008	Recessionary gap	Fiscal stimulus package of \$150 billion to spur economy. It included \$100 billion in tax rebates and \$50 in tax cuts for businesses.
2009	Recessionary gap	Fiscal stimulus package of \$787 billion included tax cuts and increased government spending passed in early days of President Obama's administration

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8.3: Issues in Fiscal Policy

Learning Objective

1. Explain how the various kinds of lags influence the effectiveness of discretionary fiscal policy.
2. Explain and illustrate graphically how crowding out (and its reverse) influences the impact of expansionary or contractionary fiscal policy.
3. Discuss the controversy concerning which types of fiscal policies to use, including the arguments from supply-side economics.

The discussion in the previous section about the use of fiscal policy to close gaps suggests that economies can be easily stabilized by government actions to shift the aggregate demand curve. However, government attempts at stabilization are fraught with difficulties.

Lags

Discretionary fiscal policy is subject to the policy lags. It takes some time for policy makers to realize that a recessionary or an inflationary gap exists—the *recognition lag*. Recognition lags stem largely from the difficulty of collecting economic data in a timely and accurate fashion. Then, more time elapses before a fiscal policy, such as a change in government purchases or a change in taxes, is agreed to and put into effect—the *implementation lag*. Finally, still more time goes by before the policy has its full effect on aggregate demand—the *impact lag*.

Changes in fiscal policy are likely to involve a particularly long implementation lag. A tax cut was proposed to presidential candidate John F. Kennedy in 1960 as a means of ending the recession that year. He recommended it to Congress in 1962. It was not passed until 1964, three years after the recession had ended. Some economists have concluded that the long implementation lag for discretionary fiscal policy makes this stabilization tool ineffective. Fortunately, automatic stabilizers respond automatically to changes in the economy. They thus avoid not only the implementation lag but also the recognition lag.

Crowding Out

Because an expansionary fiscal policy either increases government spending or reduces revenues, it increases the government budget deficit or reduces the surplus. A contractionary policy is likely to reduce a deficit or increase a surplus. In either case, fiscal policy thus affects the bond market.

Figure 8.10 shows the impact of an expansionary fiscal policy: an increase in government purchases. The increase in government purchases increases the deficit or reduces the surplus. In either case, the Treasury will sell more bonds than it would have otherwise, shifting the supply curve for bonds to the right in Panel (a). That reduces the price of bonds, raising the interest rate. The increase in the interest rate reduces the quantity of private investment demanded. The higher interest rate increases the demand for and reduces the supply of dollars in the foreign exchange market, raising the exchange rate in Panel (b). A higher exchange rate reduces net exports. Panel (c) shows the effects of all these changes on the aggregate demand curve. Before the change in government purchases, the economy is in equilibrium at a real GDP of Y_1 , determined by the intersection of AD_1 and the short-run aggregate supply curve. The increase in government expenditures would shift the curve outward to AD_2 if there were no adverse impact on investment and net exports. But the reduction in investment and net exports partially offsets this increase. Taking the reduction in investment and net exports into account means that the aggregate demand curve shifts only to AD_3 . The tendency for an expansionary fiscal policy to reduce other components of aggregate demand is called crowding out. In the short run, this policy leads to an increase in real GDP to Y_2 and a higher price level, P_2 .

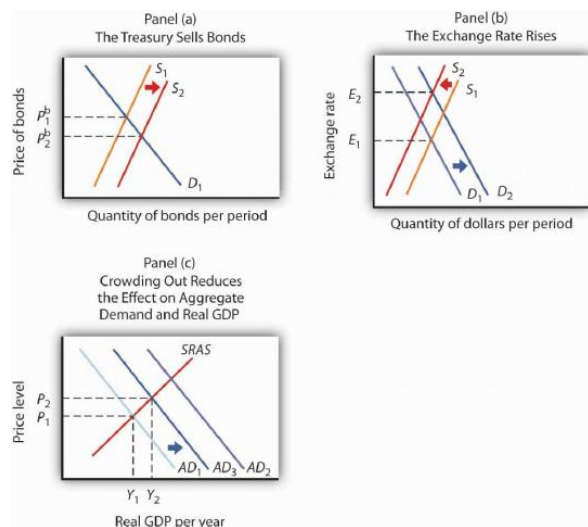


Figure 8.10 An Expansionary Fiscal Policy and Crowding Out In Panel (a), increased government purchases are financed through the sale of bonds, lowering their price to P^b_2 . In Panel (b), the higher interest rate causes the exchange rate to rise, reducing net exports. Increased government purchases would shift the aggregate demand curve to AD_2 in Panel (c) if there were no crowding out. Crowding out of investment and net exports, however, causes the aggregate demand curve to shift only to AD_3 . Then a higher price level means that GDP rises only to Y_2 .

Crowding out reduces the effectiveness of any expansionary fiscal policy, whether it be an increase in government purchases, an increase in transfer payments, or a reduction in income taxes. Each of these policies increases the deficit and thus increases government borrowing. The supply of bonds increases, interest rates rise, investment falls, the exchange rate rises, and net exports fall.

Note, however, that it is private investment that is crowded out. The expansionary fiscal policy could take the form of an increase in the investment component of government purchases. As we have learned, some government purchases are for goods, such as office supplies, and services. But the government can also purchase investment items, such as roads and schools. In that case, government investment may be crowding out private investment.

The reverse of crowding out occurs with a contractionary fiscal policy—a cut in government purchases or transfer payments, or an increase in taxes. Such policies reduce the deficit (or increase the surplus) and thus reduce government borrowing, shifting the supply curve for bonds to the left. Interest rates drop, inducing a greater quantity of investment. Lower interest rates also reduce the demand for and increase the supply of dollars, lowering the exchange rate and boosting net exports. This phenomenon is known as “crowding in.”

Crowding out and crowding in clearly weaken the impact of fiscal policy. An expansionary fiscal policy has less punch; a contractionary policy puts less of a damper on economic activity. Some economists argue that these forces are so powerful that a change in fiscal policy will have no effect on aggregate demand. Because empirical studies have been inconclusive, the extent of crowding out (and its reverse) remains a very controversial area of study.

Also, the fact that government deficits today may reduce the capital stock that would otherwise be available to future generations does not imply that such deficits are wrong. If, for example, the deficits are used to finance public sector investment, then the reduction in private capital provided to the future is offset by the increased provision of public sector capital. Future generations may have fewer office buildings but more schools.

Choice of Policy

Suppose Congress and the president agree that something needs to be done to close a recessionary gap. We have learned that fiscal policies that increase government purchases, reduce taxes, or increase transfer payments—or do a combination of these—all have the potential, theoretically, to raise real GDP. The government must decide which kind of fiscal policy to employ. Because the decision makers who determine fiscal policy are all elected politicians, the choice among the policy options available is an intensely political matter, often reflecting the ideology of the politicians.

For example, those who believe that government is too big would argue for tax cuts to close recessionary gaps and for spending cuts to close inflationary gaps. Those who believe that the private sector has failed to provide adequately a host of services that would benefit society, such as better education or public transportation systems, tend to advocate increases in government purchases to close recessionary gaps and tax increases to close inflationary gaps.

Another area of contention comes from those who believe that fiscal policy should be constructed primarily so as to promote long-term growth. Supply-side economics is the school of thought that promotes the use of fiscal policy to stimulate long-run aggregate supply. Supply-side economists advocate reducing tax rates in order to encourage people to work more or more individuals to work and providing investment tax credits to stimulate capital formation.

While there is considerable debate over how strong the supply-side effects are in relation to the demand-side effects, such considerations may affect the choice of policies. Supply-siders tend to favor tax cuts over increases in government purchases or increases in transfer payments. President Reagan advocated tax cuts in 1981 on the basis of their supply-side effects. Coupled with increased defense spending in the early 1980s, fiscal policy under Mr. Reagan clearly stimulated aggregate demand by increasing both consumption and investment. Falling inflation and accelerated growth are signs that supply-side factors may also have been at work during that period. President George W. Bush's chief economic adviser, N. Gregory Mankiw, argued that the Bush tax cuts would encourage economic growth, a supply-side argument. Mr. Bush's next chief economic adviser, Ben Bernanke, who became the next chairman of the Federal Reserve Board in 2006, made a similar argument and urged that the Bush tax cuts be made permanent.

Finally, even when there is agreement to stimulate the economy, say through increasing government expenditures on highways, the *how* question remains. How should the expenditures be allocated? Specifically, which states should the highways run through? Each member of Congress has a political stake in the outcome. These types of considerations make the implementation lag particularly long for fiscal policy.

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CHAPTER OVERVIEW

9: Money and Banking

9.1: Defining Money by Its Functions

9.2: Measuring Money- Currency, M1, and M2

9.3: The Role of Banks

9.4: How Banks Create Money

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9.1: Defining Money by Its Functions

Learning Objectives

By the end of this section, you will be able to:

- Explain the various functions of money
- Contrast commodity money and fiat money

Money for the sake of money is not an end in itself. You cannot eat dollar bills or wear your bank account. Ultimately, the usefulness of money rests in exchanging it for goods or services. As the American writer and humorist Ambrose Bierce (1842–1914) wrote in 1911, money is a “blessing that is of no advantage to us excepting when we part with it.” Money is what people regularly use when purchasing or selling goods and services, and thus both buyers and sellers must widely accept money. This concept of money is intentionally flexible, because money has taken a wide variety of forms in different cultures.

Barter and the Double Coincidence of Wants

To understand the usefulness of money, we must consider what the world would be like without money. How would people exchange goods and services? Economies without money typically engage in the barter system. Barter—literally trading one good or service for another—is highly inefficient for trying to coordinate the trades in a modern advanced economy. In an economy without money, an exchange between two people would involve a double coincidence of wants, a situation in which two people each want some good or service that the other person can provide. For example, if an accountant wants a pair of shoes, this accountant must find someone who has a pair of shoes in the correct size and who is willing to exchange the shoes for some hours of accounting services. Such a trade is likely to be difficult to arrange. Think about the complexity of such trades in a modern economy, with its extensive division of labor that involves thousands upon thousands of different jobs and goods.

Another problem with the barter system is that it does not allow us to easily enter into future contracts for purchasing many goods and services. For example, if the goods are perishable it may be difficult to exchange them for other goods in the future. Imagine a farmer wanting to buy a tractor in six months using a fresh crop of strawberries. Additionally, while the barter system might work adequately in small economies, it will keep these economies from growing. The time that individuals would otherwise spend producing goods and services and enjoying leisure time they spend bartering.

Functions for Money

Money solves the problems that the barter system creates. (We will get to its definition soon.) First, money serves as a medium of exchange, which means that money acts as an intermediary between the buyer and the seller. Instead of exchanging accounting services for shoes, the accountant now exchanges accounting services for money. The accountant then uses this money to buy shoes. To serve as a medium of exchange, people must widely accept money as a method of payment in the markets for goods, labor, and financial capital.

Second, money must serve as a store of value. In a barter system, we saw the example of the shoemaker trading shoes for accounting services. However, she risks having her shoes go out of style, especially if she keeps them in a warehouse for future use—their value will decrease with each season. Shoes are not a good store of value. Holding money is a much easier way of storing value. You know that you do not need to spend it immediately because it will still hold its value the next day, or the next year. This function of money does not require that money is a *perfect* store of value. In an economy with inflation, money loses some buying power each year, but it remains money.

Third, money serves as a unit of account, which means that it is the ruler by which we measure values. For example, an accountant may charge \$100 to file your tax return. That \$100 can purchase two pair of shoes at \$50 a pair. Money acts as a common denominator, an accounting method that simplifies thinking about trade-offs.

Commodity versus Fiat Money

Money has taken a wide variety of forms in different cultures. People have used gold, silver, cowrie shells, cigarettes, and even cocoa beans as money. Although we use these items as commodity money, they also have a value from use as something other than money. For example, people have used gold throughout the ages as money although today we do not use it as money but rather value it for its other attributes. Gold is a good conductor of electricity and the electronics and aerospace industry use it. Other

industries use gold too, such as to manufacture energy efficient reflective glass for skyscrapers and is used in the medical industry as well. Of course, gold also has value because of its beauty and malleability in creating jewelry.

As commodity money, gold has historically served its purpose as a medium of exchange, a store of value, and as a unit of account. Commodity-backed currencies are dollar bills or other currencies with values backed up by gold or other commodities held at a bank. During much of its history, gold and silver backed the money supply in the United States. Interestingly, antique dollars dated as late as 1957, have “Silver Certificate” printed over the portrait of George Washington, as Figure 9.1 shows. This meant that the holder could take the bill to the appropriate bank and exchange it for a dollar’s worth of silver.



Figure 9.1 A Silver Certificate and a Modern U.S. Bill Until 1958, silver certificates were commodity-backed money—backed by silver, as indicated by the words “Silver Certificate” printed on the bill. Today, The Federal Reserve backs U.S. bills, but as fiat money (inconvertible paper money made legal tender by a government decree). (Credit: “One Dollar Bills” by “The.Comedian”/Flickr Creative Commons, CC BY 2.0)

As economies grew and became more global in nature, the use of commodity monies became more cumbersome. Countries moved towards the use of fiat money. Fiat money has no intrinsic value, but is declared by a government to be a country's legal tender. The United States’ paper money, for example, carries the statement: “THIS NOTE IS LEGAL TENDER FOR ALL DEBTS, PUBLIC AND PRIVATE.” In other words, by government decree, if you owe a debt, then legally speaking, you can pay that debt with the U.S. currency, even though it is not backed by a commodity. The only backing of our money is universal faith and trust that the currency has value, and nothing more.

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9.2: Measuring Money- Currency, M1, and M2

Learning Objectives

By the end of this section, you will be able to:

- Contrast M1 money supply and M2 money supply
- Classify monies as M1 money supply or M2 money supply

Cash in your pocket certainly serves as money; however, what about checks or credit cards? Are they money, too? Rather than trying to state a single way of measuring money, economists offer broader definitions of money based on liquidity. Liquidity refers to how quickly you can use a financial asset to buy a good or service. For example, cash is very liquid. You can use your \$10 bill easily to buy a hamburger at lunchtime. However, \$10 that you have in your savings account is not so easy to use. You must go to the bank or ATM machine and withdraw that cash to buy your lunch. Thus, \$10 in your savings account is *less* liquid.

The Federal Reserve Bank (The FED - US Central Bank), which is the central bank of the United States, is a bank regulator and is responsible for monetary policy and defines money according to its liquidity. There are two definitions of money: M1 and M2 money supply. Historically, M1 money supply included those monies that are very liquid such as cash, checkable (demand) deposits, and traveler's checks, while M2 money supply included those monies that are less liquid in nature; M2 included M1 plus savings and time deposits, certificates of deposits, and money market funds. Beginning in May 2020, the Federal Reserve changed the definition of both M1 and M2. The biggest change is that savings moved to be part of M1. M1 money supply now includes cash, checkable (demand) deposits, and savings. M2 money supply is now measured as M1 plus time deposits, certificates of deposits, and money market funds.

M1 money supply includes coins and currency in circulation—the coins and bills that circulate in an economy that the U.S. Treasury does not hold at the Federal Reserve Bank, or in bank vaults. Closely related to currency are checkable deposits, also known as demand deposits. These are the amounts held in checking accounts. They are called demand deposits or checkable deposits because the banking institution must give the deposit holder his money “on demand” when the customer writes a check or uses a debit card. These items together—currency, and checking accounts in banks—comprise the definition of money known as M1, which the Federal Reserve System measures daily.

As mentioned, M1 now includes savings deposits in banks, which are bank accounts on which you cannot write a check directly, but from which you can easily withdraw the money at an automatic teller machine or bank.

A broader definition of money, M2 includes everything in M1 but also adds other types of deposits. Many banks and other financial institutions also offer a chance to invest in money market funds, where they pool together the deposits of many individual investors and invest them in a safe way, such as short-term government bonds. Another ingredient of M2 are the relatively small (that is, less than about \$100,000) certificates of deposit (CDs) or time deposits, which are accounts that the depositor has committed to leaving in the bank for a certain period of time, ranging from a few months to a few years, in exchange for a higher interest rate. In short, all these types of M2 are money that you can withdraw and spend, but which require a greater effort to do so than the items in M1. Figure 9.2 should help in visualizing the relationship between M1 and M2. Note that M1 is included in the M2 calculation.

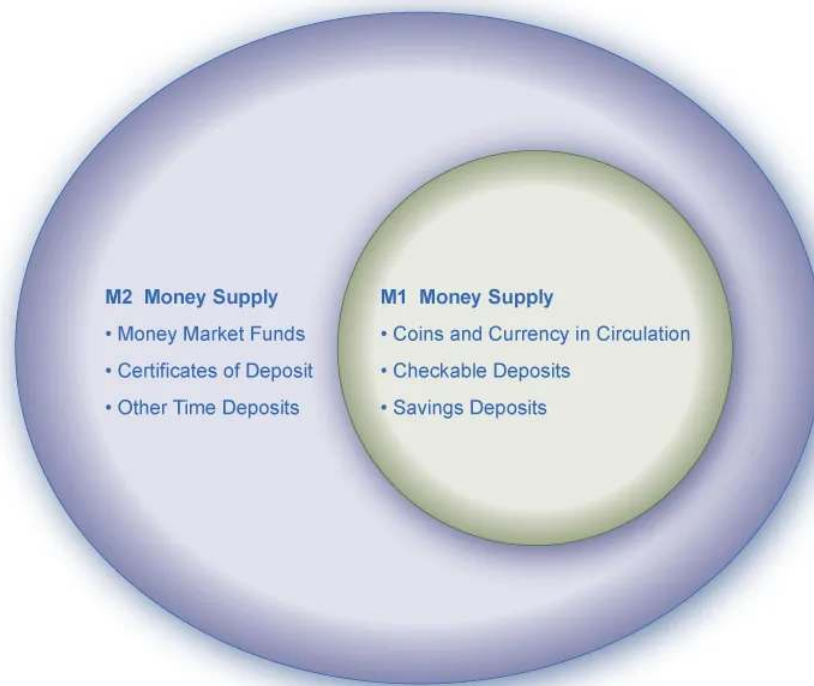


Figure 9.2 The Relationship between M1 and M2 Money M1 and M2 money have several definitions, ranging from narrow to broad. M1 = coins and currency in circulation + checkable (demand) deposit + savings deposits. M2 = M1 + money market funds + certificates of deposit + other time deposits.

The lines separating M1 and M2 can become a little blurry. Sometimes businesses do not treat elements of M1 alike. For example, some businesses will not accept personal checks for large amounts, but will accept traveler's checks or cash. Changes in banking practices and technology have made the savings accounts in M2 more similar to the checking accounts in M1. For example, some savings accounts will allow depositors to write checks, use automatic teller machines, and pay bills over the internet, which has made it easier to access savings accounts. As with many other economic terms and statistics, the important point is to know the strengths and limitations of the various definitions of money, not to believe that such definitions are as clear-cut to economists as, say, the definition of nitrogen is to chemists.

Where does "plastic money" like debit cards, credit cards, and smart money fit into this picture? A debit card, like a check, is an instruction to the user's bank to transfer money directly and immediately from your bank account to the seller. It is important to note that in our definition of money, it is *checkable deposits* that are money, not the paper check or the debit card. Although you can make a purchase with a credit card, the financial institution does not consider it money but rather a short term loan from the credit card company to you. When you make a credit card purchase, the credit card company immediately transfers money from its checking account to the seller, and at the end of the month, the credit card company sends you a bill for what you have charged that

month. Until you pay the credit card bill, you have effectively borrowed money from the credit card company. With a smart card, you can store a certain value of money on the card and then use the card to make purchases. Some “smart cards” used for specific purposes, like long-distance phone calls or making purchases at a campus bookstore and cafeteria, are not really all that smart, because you can only use them for certain purchases or in certain places.

In short, credit cards, debit cards, and smart cards are different ways to move money when you make a purchase. However, having more credit cards or debit cards does not change the quantity of money in the economy, any more than printing more checks increases the amount of money in your checking account.

One key message underlying this discussion of M1 and M2 is that money in a modern economy is not just paper bills and coins. Instead, money is closely linked to bank accounts. The banking system largely conducts macroeconomic policies concerning money.

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9.3: The Role of Banks

Learning Objectives

By the end of this section, you will be able to:

- Explain how banks act as intermediaries between savers and borrowers
- Evaluate the relationship between banks, savings and loans, and credit unions

Somebody once asked the late bank robber named Willie Sutton why he robbed banks. He answered: “That’s where the money is.” While this may have been true at one time, from the perspective of modern economists, Sutton is both right and wrong. He is wrong because the overwhelming majority of money in the economy is not in the form of currency sitting in vaults or drawers at banks, waiting for a robber to appear. Most money is in the form of bank accounts, which exist only as electronic records on computers. From a broader perspective, however, the bank robber was more right than he may have known. Banking is intimately interconnected with money and consequently, with the broader economy.

Banks make it far easier for a complex economy to carry out the extraordinary range of transactions that occur in goods, labor, and financial capital markets. Imagine for a moment what the economy would be like if everybody had to make all payments in cash. When shopping for a large purchase or going on vacation you might need to carry hundreds of dollars in a pocket or purse. Even small businesses would need stockpiles of cash to pay workers and to purchase supplies. A bank allows people and businesses to store this money in either a checking account or savings account, for example, and then withdraw this money as needed through the use of a direct withdrawal, writing a check, or using a debit card.

Banks are a critical intermediary in what we call the payment system, which helps an economy exchange goods and services for money or other financial assets. Also, those with extra money that they would like to save can store their money in a bank rather than look for an individual who is willing to borrow it from them and then repay them at a later date. Those who want to borrow money can go directly to a bank rather than trying to find someone to lend them cash. Transaction costs are the costs associated with finding a lender or a borrower for this money. Thus, banks lower transactions costs and act as financial intermediaries—they bring savers and borrowers together. Along with making transactions much safer and easier, banks also play a key role in creating money.

Banks as Financial Intermediaries

An “intermediary” is one who stands between two other parties. Banks are a financial intermediary—that is, an institution that operates between a saver who deposits money in a bank and a borrower who receives a loan from that bank. Financial intermediaries include other institutions in the financial market such as insurance companies and pension funds, but we will not include them in this discussion because they are not depository institutions, which are institutions that accept money *deposits* and then use these to make loans. All the deposited funds mingle in one big pool, which the financial institution then lends. Figure 9.3 illustrates the position of banks as financial intermediaries, with deposits flowing into a bank and loans flowing out. Of course, when banks make loans to firms, the banks will try to funnel financial capital to healthy businesses that have good prospects for repaying the loans, not to firms that are suffering losses and may be unable to repay.

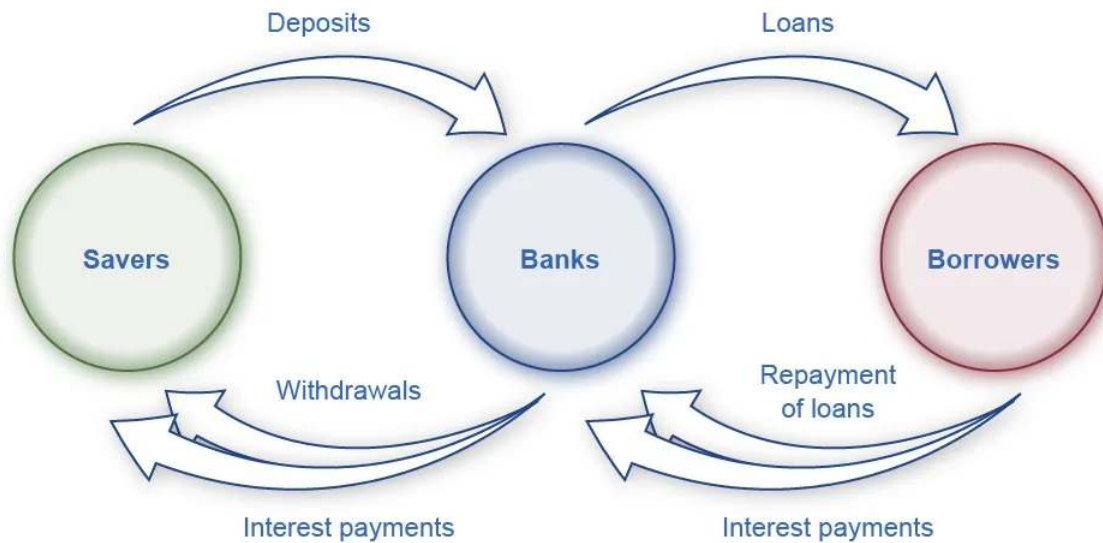


Figure 9.3 Banks as Financial Intermediaries Banks act as financial intermediaries because they stand between savers and borrowers. Savers place deposits with banks, and then receive interest payments and withdraw money. Borrowers receive loans from banks and repay the loans with interest. In turn, banks return money to savers in the form of withdrawals, which also include interest payments from banks to savers.

How are banks, savings and loans, and credit unions related?

Banks have a couple of close cousins: savings institutions and credit unions. Banks, as we explained, receive deposits from individuals and businesses and make loans with the money. Savings institutions are also sometimes called “savings and loans” or “thrifts.” They also take loans and make deposits. However, from the 1930s until the 1980s, federal law limited how much interest savings institutions were allowed to pay to depositors. They were also required to make most of their loans in the form of housing-related loans, either to homebuyers or to real-estate developers and builders.

A credit union is a nonprofit financial institution that its members own and run. Members of each credit union decide who is eligible to be a member. Usually, potential members would be everyone in a certain community, or groups of employees, or members of a certain organization. The credit union accepts deposits from members and focuses on making loans back to its members. While there are more credit unions than banks and more banks than savings and loans, the total assets of credit unions are growing.

In 2008, there were 7,085 banks. Due to the bank failures of 2007–2009 and bank mergers, there were 5,571 banks in the United States at the end of the fourth quarter in 2014. By 2020, there were 4,374 commercial banks and 627 savings institutions. According to the National Credit Union Association, as of September 2021 there were 4,990 credit unions with assets totaling \$2.0

trillion. A day of “Transfer Your Money” took place in 2009 out of general public disgust with big bank bailouts. People were encouraged to transfer their deposits to credit unions. This has grown into the ongoing Move Your Money Project. Consequently, some now hold assets with a total value as large as \$111 billion.

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9.4: How Banks Create Money

Learning Objectives

By the end of this section, you will be able to:

- Utilize the money multiplier formula to determine how banks create money
- Analyze and create T-account balance sheets
- Evaluate the risks and benefits of money and banks

Banks and money are intertwined. It is not just that most money is in the form of bank accounts. The banking system can literally create money through the process of making loans. Let's see how.

Money Creation by a Single Bank

Start with a hypothetical bank called Singleton Bank. The bank has \$10 million in deposits. The T-account balance sheet for Singleton Bank, when it holds all of the deposits in its vaults, is in Figure 9.4. At this stage, Singleton Bank is simply storing money for depositors and is using these deposits to make loans. In this simplified example, Singleton Bank cannot earn any interest income from these loans and cannot pay its depositors an interest rate either.

Assets		Liabilities + Net Worth	
Reserves	\$10 million	Deposits	\$10 million

Figure 9.4 Singleton Bank's Balance Sheet: Receives \$10 million in Deposits

Now, Let's say that the Federal Reserve requires Singleton Bank to keep \$1 million on reserve (10% of total deposits). It will loan out the remaining \$9 million. By loaning out the \$9 million and charging interest, it will be able to make interest payments to depositors and earn interest income for Singleton Bank (for now, we will keep it simple and not put interest income on the balance sheet). Instead of becoming just a storage place for deposits, Singleton Bank can become a financial intermediary between savers and borrowers.

This change in business plan alters Singleton Bank's balance sheet, as Figure 9.5 shows. Singleton's assets have changed. It now has \$1 million in reserves and a loan to Hank's Auto Supply of \$9 million. The bank still has \$10 million in deposits.

Assets		Liabilities + Net Worth	
Reserves	\$1 million	Deposits	\$10 million
Loan to Hank's Auto Supply	\$9 million		

Figure 9.5 Singleton Bank's Balance Sheet: 10% Reserves, One Round of Loans

Singleton Bank lends \$9 million to Hank's Auto Supply. The bank records this loan by making an entry on the balance sheet to indicate that it has made a loan. This loan is an asset, because it will generate interest income for the bank. Of course, the loan officer will not let Hank to walk out of the bank with \$9 million in cash. The bank issues Hank's Auto Supply a cashier's check for the \$9 million. Hank deposits the loan in his regular checking account with First National. The deposits at First National rise by \$9 million and its reserves also rise by \$9 million, as Figure 9.6 shows. First National must hold 10% of additional deposits as required reserves but is free to loan out the rest

Assets		Liabilities + Net Worth	
Reserves	+ \$9 million	Deposits	+ \$9 million

Figure 9.6 First National Balance Sheet

Making loans that are deposited into a demand deposit account increases the M1 money supply. Remember the definition of M1 includes checkable (demand) deposits, which one can easily use as a medium of exchange to buy goods and services. Notice that the money supply is now \$19 million: \$10 million in deposits in Singleton bank and \$9 million in deposits at First National. Obviously as Hank's Auto Supply writes checks to pay its bills the deposits will draw down. However, the bigger picture is that a

bank must hold enough money in reserves to meet its liabilities. The rest the bank loans out. In this example so far, bank lending has expanded the money supply by \$9 million.

Now, First National must hold only 10% as required reserves (\$900,000) but can lend out the other 90% (\$8.1 million) in a loan to Jack's Chevy Dealership as Figure 9.7 shows.

Assets		Liabilities + Net Worth	
Reserves	\$900,000	Deposits	+ \$9 million
Loans	\$8.1 million		

Figure 9.7 First National Balance Sheet

If Jack's deposits the loan in its checking account at Second National, the money supply just increased by an additional \$8.1 million, as Figure 9.8 shows.

Assets		Liabilities + Net Worth	
Reserves	+ \$8.1 million	Deposits	+ \$8.1 million

Figure 9.8 Second National Bank's Balance Sheet

How is this money creation possible? It is possible because there are multiple banks in the financial system, they are required to hold only a fraction of their deposits, and loans end up deposited in other banks, which increases deposits and, in essence, the money supply.

The Simple Deposit Multiplier and a Multi-Bank System

In a system with multiple banks, Singleton Bank deposited the initial excess reserve amount that it decided to lend to Hank's Auto Supply into First National Bank, which is free to loan out \$8.1 million. If all banks loan out their excess reserves, the money supply will expand. In a multi-bank system, institutions determine the amount of money that the system can create by using the simple deposit multiplier. This tells us by how many times a loan will be "multiplied" as it is spent in the economy and then re-deposited in other banks.

Using the Simple Deposit Multiplier Formula

Using the simple deposit multiplier for the example in this text:

Step 1. In the case of Singleton Bank, for whom the reserve requirement is 10% (or 0.10), the money multiplier is 1 divided by .10, which is equal to 10.

Step 2. We have identified that the excess reserves are \$9 million, so, using the formula we can determine the total change in the M1 money supply:

Total Change in the M1 Money Supply = $1 \text{ Reserve Requirement} \times \text{Excess Requirement} = 1 \text{ } 0.10 \times \$9 \text{ million} = 10 \times \$9 \text{ million} = \$90 \text{ million}$
 Total Change in the M1 Money Supply = $1 \text{ Reserve Requirement} \times \text{Excess Requirement} = 1 \text{ } 0.10 \times \$9 \text{ million} = 10 \times \$9 \text{ million} = \$90 \text{ million}$

Step 3. Thus, we can say that, in this example, the total quantity of money generated in this economy after all rounds of lending are completed will be \$90 million. Given the original 10 million in circulation, the total money supply will be 100 million.

Cautions about the Simple Deposit Multiplier

The simple deposit multiplier will depend on the proportion of reserves that the Federal Reserve Bank requires banks to hold. Additionally, a bank can also choose to hold extra reserves. Banks may decide to vary how much they hold in reserves for two reasons: macroeconomic conditions and government rules. When an economy is in recession, banks are likely to hold a higher proportion of reserves because they fear that customers are less likely to repay loans when the economy is slow. The Federal Reserve may also raise or lower the required reserves held by banks as a policy move to affect the quantity of money in an economy.

The process of how banks create money shows how the quantity of money in an economy is closely linked to the quantity of lending or credit in the economy. All the money in the economy, except for the original reserves, is a result of bank loans that institutions repeatedly re-deposit and loan.

Finally, the simple deposit multiplier depends on people re-depositing the money that they receive in the banking system. If people instead store their cash in safe-deposit boxes or in shoe boxes hidden in their closets, then banks cannot recirculate the money in the form of loans. Central banks have an incentive to assure that bank deposits are safe because if people worry that they may lose their bank deposits, they may start holding more money in cash, instead of depositing it in banks, and the quantity of loans in an economy will decline. Low-income countries have what economists sometimes refer to as “mattress savings,” or money that people are hiding in their homes because they do not trust banks. When mattress savings in an economy are substantial, banks cannot lend out those funds and the simple deposit multiplier cannot operate as effectively. The overall quantity of money and loans in such an economy will decline.

Money and Banks—Benefits and Dangers

Money and banks are marvelous social inventions that help a modern economy to function. Compared with the alternative of barter, money makes market exchanges vastly easier in goods, labor, and financial markets. Banking makes money still more effective in facilitating exchanges in goods and labor markets. Moreover, the process of banks making loans in financial capital markets is intimately tied to the creation of money.

However, the extraordinary economic gains that are possible through money and banking also suggest some possible corresponding dangers. If banks are not working well, it sets off a decline in convenience and safety of transactions throughout the economy. If the banks are under financial stress, because of a widespread decline in the value of their assets, loans may become far less available, which can deal a crushing blow to sectors of the economy that depend on borrowed money like business investment, home construction, and car manufacturing. The 2008–2009 Great Recession illustrated this pattern.

The Many Disguises of Money: From Cowries to Crypto

The global economy has come a long way since it started using cowrie shells as currency. We have moved away from commodity and commodity-backed paper money to fiat currency. As technology and global integration increases, the need for paper currency is diminishing, too. Every day, we witness the increased use of debit and credit cards.

The latest creation and a new form of money is cryptocurrency. Cryptocurrency is digital currency that is not controlled by any single entity, such as a company or country. In this sense, it is not a fiat currency because it is not issued by a central bank and is not necessarily supported by governments as legal tender. Instead, transactions and ownership are maintained in a decentralized manner, and the value (vis-à-vis, say, the U.S. dollar) is determined primarily by market forces—i.e., supply and demand. Governments can affect the value of a cryptocurrency by regulating its use within their country's boundaries, but in the end, the price of a cryptocurrency comes down to supply and demand. Cryptocurrencies have come a long way since 2009 when Bitcoin was first invented, and the recent two to three years has seen an explosion of different cryptocurrencies being used across the globe.

It is important to note that in order to be considered as money, cryptocurrency still needs to satisfy the three requirements: it needs to be valid as a store of value, it needs to be valid as a unit of account, and it must be able to be used as a medium of exchange. While the first two of these requirements can be satisfied easily by expressing the currency in terms of another, such as the U.S. dollar, and through its secure ownership rules, its use as a medium of exchange—to be used to buy and sell goods and services—is more complicated. While cryptocurrencies are used in many illicit transactions, it is less common to see them accepted as forms of payment for regular things like groceries or your rent.

Bitcoin is the most popular cryptocurrency, and thus the one most likely to be considered real money since it can be used to purchase the most goods and services. Many other cryptocurrencies exist, but their more widespread adoption as a medium of exchange is yet to be seen.

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CHAPTER OVERVIEW

10: Monetary Policy and the Fed

[10.1: Monetary Policy in the United States](#)

[10.2: Problems and Controversies of Monetary Policy](#)

[10.3: Monetary Policy and the Equation of Exchange](#)

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10.1: Monetary Policy in the United States

Learning Objective

1. Discuss the Fed's primary and secondary goals and relate these goals to the legislation that created the Fed as well as to subsequent legislation that affects the Fed.
2. State and show graphically how expansionary and contractionary monetary policy can be used to close gaps.

In many respects, the Fed is the most powerful maker of economic policy in the United States. Congress can pass laws, but the president must execute them; the president can propose laws, but only Congress can pass them. The Fed, however, both sets and carries out monetary policy. Deliberations about fiscal policy can drag on for months, even years, but the Federal Open Market Committee (FOMC) can, behind closed doors, set monetary policy in a day—and see that policy implemented within hours. The Board of Governors can change the discount rate or reserve requirements at any time. The impact of the Fed's policies on the economy can be quite dramatic. The Fed can push interest rates up or down. It can promote a recession or an expansion. It can cause the inflation rate to rise or fall. The Fed wields enormous power.

But to what ends should all this power be directed? With what tools are the Fed's policies carried out? And what problems exist in trying to achieve the Fed's goals? This section reviews the goals of monetary policy, the tools available to the Fed in pursuing those goals, and the way in which monetary policy affects macroeconomic variables.

Goals of Monetary Policy

When we think of the goals of monetary policy, we naturally think of standards of macroeconomic performance that seem desirable—a low unemployment rate, a stable price level, and economic growth. It thus seems reasonable to conclude that the goals of monetary policy should include the maintenance of full employment, the avoidance of inflation or deflation, and the promotion of economic growth.

But these goals, each of which is desirable in itself, may conflict with one another. A monetary policy that helps to close a recessionary gap and thus promotes full employment may accelerate inflation. A monetary policy that seeks to reduce inflation may increase unemployment and weaken economic growth. You might expect that in such cases, monetary authorities would receive guidance from legislation spelling out goals for the Fed to pursue and specifying what to do when achieving one goal means not achieving another. But as we shall see, that kind of guidance does not exist.

The Federal Reserve Act

When Congress established the Federal Reserve System in 1913, it said little about the policy goals the Fed should seek. The closest it came to spelling out the goals of monetary policy was in the first paragraph of the Federal Reserve Act, the legislation that created the Fed:

“An Act to provide for the establishment of Federal reserve banks, to furnish an elastic currency, [to make loans to banks], to establish a more effective supervision of banking in the United States, and for other purposes.”

In short, nothing in the legislation creating the Fed anticipates that the institution will act to close recessionary or inflationary gaps, that it will seek to spur economic growth, or that it will strive to keep the price level steady. There is no guidance as to what the Fed should do when these goals conflict with one another.

The Employment Act of 1946

The first U.S. effort to specify macroeconomic goals came after World War II. The Great Depression of the 1930s had instilled in people a deep desire to prevent similar calamities in the future. That desire, coupled with the 1936 publication of John Maynard Keynes's prescription for avoiding such problems through government policy (*The General Theory of Employment, Interest and Money*), led to the passage of the Employment Act of 1946, which declared that the federal government should “use all practical means . . . to promote maximum employment, production and purchasing power.” The act also created the Council of Economic Advisers (CEA) to advise the president on economic matters.

The Fed might be expected to be influenced by this specification of federal goals, but because it is an independent agency, it is not required to follow any particular path. Furthermore, the legislation does not suggest what should be done if the goals of achieving

full employment and maximum purchasing power conflict.

The Full Employment and Balanced Growth Act of 1978

The clearest, and most specific, statement of federal economic goals came in the Full Employment and Balanced Growth Act of 1978. This act, generally known as the Humphrey–Hawkins Act, specified that by 1983 the federal government should achieve an unemployment rate among adults of 3% or less, a civilian unemployment rate of 4% or less, and an inflation rate of 3% or less. Although these goals have the virtue of specificity, they offer little in terms of practical policy guidance.

The Humphrey-Hawkins Act requires that the chairman of the Fed's Board of Governors report twice each year to Congress about the Fed's monetary policy. These sessions provide an opportunity for members of the House and Senate to express their views on monetary policy.

Federal Reserve Policy and Goals

Perhaps the clearest way to see the Fed's goals is to observe the policy choices it makes. Since 1979, following a bout of double-digit inflation, its actions have suggested that the Fed's primary goal is to keep inflation under control. Provided that the inflation rate falls within acceptable limits, however, the Fed will also use stimulative measures to close recessionary gaps.

In 1979, the Fed, then led by Paul Volcker, launched a deliberate program of reducing the inflation rate. It stuck to that effort through the early 1980s, even in the face of a major recession. That effort achieved its goal: the annual inflation rate fell from 13.3% in 1979 to 3.8% in 1982. The cost, however, was great. Unemployment soared past 9% during the recession. With the inflation rate below 4%, the Fed shifted to a stimulative policy early in 1983.

In 1990, when the economy slipped into a recession, the Fed, with Alan Greenspan at the helm, engaged in aggressive open-market operations to stimulate the economy, despite the fact that the inflation rate had jumped to 6.1%. Much of that increase in the inflation rate, however, resulted from an oil-price boost that came in the wake of Iraq's invasion of Kuwait that year. A jump in prices that occurs at the same time as real GDP is slumping suggests a leftward shift in short-run aggregate supply, a shift that creates a recessionary gap. Fed officials concluded that the upturn in inflation in 1990 was a temporary phenomenon and that an expansionary policy was an appropriate response to a weak economy. Once the recovery was clearly under way, the Fed shifted to a neutral policy, seeking neither to boost nor to reduce aggregate demand. Early in 1994, the Fed shifted to a contractionary policy, selling bonds to reduce the money supply and raise interest rates. Then Fed Chairman Greenspan indicated that the move was intended to head off any possible increase in inflation from its 1993 rate of 2.7%. Although the economy was still in a recessionary gap when the Fed acted, Greenspan indicated that any acceleration of the inflation rate would be unacceptable.

By March 1997 the inflation rate had fallen to 2.4%. The Fed became concerned that inflationary pressures were increasing and tightened monetary policy, raising the goal for the federal funds interest rate to 5.5%. Inflation remained well below 2.0% throughout the rest of 1997 and 1998. In the fall of 1998, with inflation low, the Fed was concerned that the economic recession in much of Asia and slow growth in Europe would reduce growth in the United States. In quarter-point steps it reduced the goal for the federal funds rate to 4.75%. With real GDP growing briskly in the first half of 1999, the Fed became concerned that inflation would increase, even though the inflation rate at the time was about 2%, and in June 1999, it raised its goal for the federal funds rate to 5% and continued raising the rate until it reached 6.5% in May 2000.

With inflation under control, it then began lowering the federal funds rate to stimulate the economy. It continued lowering through the brief recession of 2001 and beyond. There were 11 rate cuts in 2001, with the rate at the end of that year at 1.75%; in late 2002 the rate was cut to 1.25%, and in mid-2003 it was cut to 1.0%.

Then, with growth picking up and inflation again a concern, the Fed began again in the middle of 2004 to increase rates. By the end of 2006, the rate stood at 5.25% as a result of 17 quarter-point rate increases.

Starting in September 2007, the Fed, since 2006 led by Ben Bernanke, shifted gears and began lowering the federal funds rate, mostly in larger steps or 0.5 to 0.75 percentage points. Though initially somewhat concerned with inflation, it sensed that the economy was beginning to slow down. It moved aggressively to lower rates over the course of the next 15 months, and by the end of 2008, the rate was targeted at between 0% and 0.25%. In late 2008 and for at least the following two years, with inflation running quite low and deflation threatening, the Fed seemed quite willing to use all of its options to try to keep financial markets running smoothly and to moderate the recession.

What can we infer from these episodes in the 1980s, 1990s, and the first years of this century? It seems clear that the Fed is determined not to allow the high inflation rates of the 1970s to occur again. When the inflation rate is within acceptable limits, the

Fed will undertake stimulative measures in response to a recessionary gap or even in response to the possibility of a growth slowdown. Those limits seem to have tightened over time. In the late 1990s and early 2000s, it appeared that an inflation rate above 3%—or any indication that inflation might rise above 3%—would lead the Fed to adopt a contractionary policy. While on the Federal Reserve Board in the early 2000s, Ben Bernanke had been an advocate of inflation targeting. Under that system, the central bank announces its inflation target and then adjusts the federal funds rate if the inflation rate moves above or below the central bank's target. Mr. Bernanke indicated his preferred target to be an expected increase in the price level, as measured by the price index for consumer goods and services excluding food and energy, of between 1% and 2%. Thus, the inflation goal appears to have tightened even more—to a rate of 2% or less. If inflation were expected to remain below 2%, however, the Fed would undertake stimulative measures to close a recessionary gap. Whether the Fed will hold to that goal will not really be tested until further macroeconomic experiences unfold.

Monetary Policy and Macroeconomic Variables

The Fed has three tools at its command to try to change aggregate demand and thus to influence the level of economic activity. It can buy or sell federal government bonds through open-market operations, it can change the discount rate, or it can change reserve requirements. It can also use these tools in combination. In the next section of this chapter, where we discuss the notion of a liquidity trap, we will also introduce more extraordinary measures that the Fed has at its disposal.

Most economists agree that these tools of monetary policy affect the economy, but they sometimes disagree on the precise mechanisms through which this occurs, on the strength of those mechanisms, and on the ways in which monetary policy should be used. Before we address some of these issues, we shall review the ways in which monetary policy affects the economy in the context of the model of aggregate demand and aggregate supply. Our focus will be on open-market operations, the purchase or sale by the Fed of federal bonds.

Expansionary Monetary Policy

The Fed might pursue an expansionary monetary policy in response to the initial situation shown in Panel (a) of Figure 10.1. An economy with a potential output of Y_p is operating at Y_1 ; there is a recessionary gap. One possible policy response is to allow the economy to correct this gap on its own, waiting for reductions in nominal wages and other prices to shift the short-run aggregate supply curve $SRAS_1$ to the right until it intersects the aggregate demand curve AD_1 at Y_p . An alternative is a stabilization policy that seeks to increase aggregate demand to AD_2 to close the gap. An expansionary monetary policy is one way to achieve such a shift.

To carry out an expansionary monetary policy, the Fed will buy bonds, thereby increasing the money supply. That shifts the demand curve for bonds to D_2 , as illustrated in Panel (b). Bond prices rise to P^b_2 . The higher price for bonds reduces the interest rate. These changes in the bond market are consistent with the changes in the money market, shown in Panel (c), in which the greater money supply leads to a fall in the interest rate to r_2 . The lower interest rate stimulates investment. In addition, the lower interest rate reduces the demand for and increases the supply of dollars in the currency market, reducing the exchange rate to E_2 in Panel (d). The lower exchange rate will stimulate net exports. The combined impact of greater investment and net exports will shift the aggregate demand curve to the right. The curve shifts by an amount equal to the multiplier times the sum of the initial changes in investment and net exports. In Panel (a), this is shown as a shift to AD_2 , and the recessionary gap is closed.

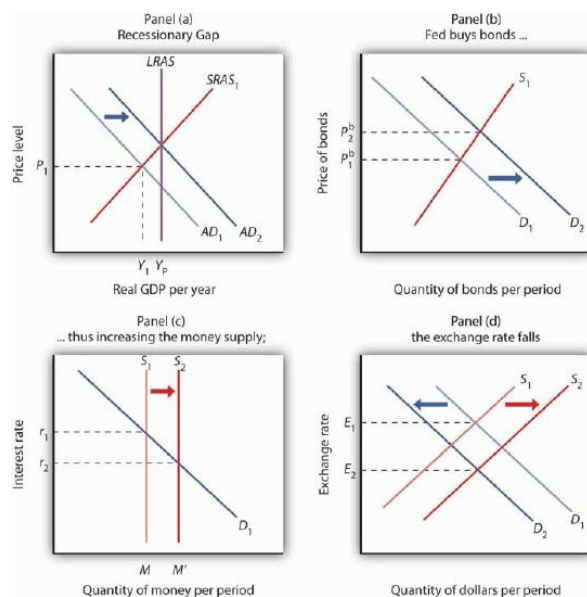


Figure 10.1 Expansionary Monetary Policy to Close a Recessionary Gap In Panel (a), the economy has a recessionary gap $Y_p - Y_1$. An expansionary monetary policy could seek to close this gap by shifting the aggregate demand curve to AD_2 . In Panel (b), the Fed buys bonds, shifting the demand curve for bonds to D_2 and increasing the price of bonds to P^b_2 . By buying bonds, the Fed increases the money supply to M' in Panel (c). The Fed's action lowers interest rates to r_2 . The lower interest rate also reduces the demand for and increases the supply of dollars, reducing the exchange rate to E_2 in Panel (d). The resulting increases in investment and net exports shift the aggregate demand curve in Panel (a).

Contractionary Monetary Policy

The Fed will generally pursue a contractionary monetary policy when it considers inflation a threat. Suppose, for example, that the economy faces an inflationary gap; the aggregate demand and short-run aggregate supply curves intersect to the right of the long-run aggregate supply curve, as shown in Panel (a) of Figure 10.2.

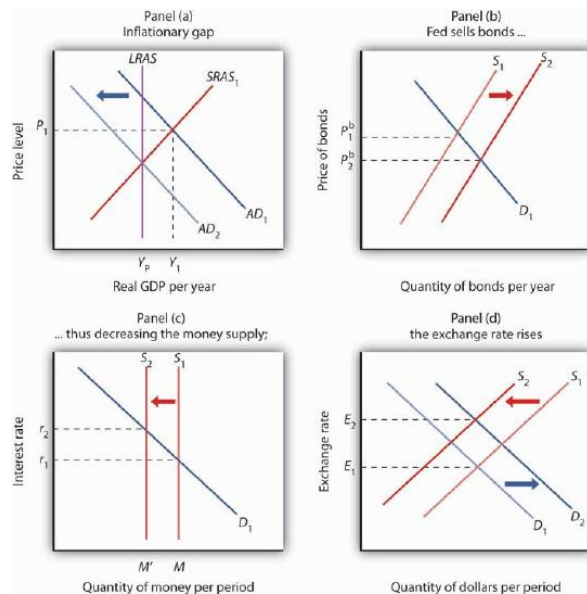


Figure 10.2 A Contractionary Monetary Policy to Close an Inflationary Gap In Panel (a), the economy has an inflationary gap $Y_1 - Y_p$. A contractionary monetary policy could seek to close this gap by shifting the aggregate demand curve to AD_2 . In Panel (b), the Fed sells bonds, shifting the supply curve for bonds to S_2 and lowering the price of bonds to P^b_2 . The lower price of bonds means a higher interest rate, r_2 , as shown in Panel (c). The higher interest rate also increases the demand for and decreases the supply of dollars, raising the exchange rate to E_2 in Panel (d), which will increase net exports. The decreases in investment and net exports are responsible for decreasing aggregate demand in Panel (a).

To carry out a contractionary policy, the Fed sells bonds. In the bond market, shown in Panel (b) of Figure 10.2, the supply curve shifts to the right, lowering the price of bonds and increasing the interest rate. In the money market, shown in Panel (c), the Fed's bond sales reduce the money supply and raise the interest rate. The higher interest rate reduces investment. The higher interest rate also induces a greater demand for dollars as foreigners seek to take advantage of higher interest rates in the United States. The supply of dollars falls; people in the United States are less likely to purchase foreign interest-earning assets now that U.S. assets are paying a higher rate. These changes boost the exchange rate, as shown in Panel (d), which reduces exports and increases imports and thus causes net exports to fall. The contractionary monetary policy thus shifts aggregate demand to the left, by an amount equal to the multiplier times the combined initial changes in investment and net exports, as shown in Panel (a).

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10.2: Problems and Controversies of Monetary Policy

Learning Objective

1. Explain the three kinds of lags that can influence the effectiveness of monetary policy.
2. Identify the macroeconomic targets at which the Fed can aim in managing the economy, and discuss the difficulties inherent in using each of them as a target.
3. Discuss how each of the following influences a central bank's ability to achieve its desired macroeconomic outcomes: political pressures, the degree of impact on the economy (including the situation of a liquidity trap), and the rational expectations hypothesis.

The Fed has some obvious advantages in its conduct of monetary policy. The two policy-making bodies, the Board of Governors and the Federal Open Market Committee (FOMC), are small and largely independent from other political institutions. These bodies can thus reach decisions quickly and implement them immediately. Their relative independence from the political process, together with the fact that they meet in secret, allows them to operate outside the glare of publicity that might otherwise be focused on bodies that wield such enormous power.

Despite the apparent ease with which the Fed can conduct monetary policy, it still faces difficulties in its efforts to stabilize the economy. We examine some of the problems and uncertainties associated with monetary policy in this section.

Lags

Perhaps the greatest obstacle facing the Fed, or any other central bank, is the problem of lags. It is easy enough to show a recessionary gap on a graph and then to show how monetary policy can shift aggregate demand and close the gap. In the real world, however, it may take several months before anyone even realizes that a particular macroeconomic problem is occurring. When monetary authorities become aware of a problem, they can act quickly to inject reserves into the system or to withdraw reserves from it. Once that is done, however, it may be a year or more before the action affects aggregate demand.

The delay between the time a macroeconomic problem arises and the time at which policy makers become aware of it is called a recognition lag. The 1990–1991 recession, for example, began in July 1990. It was not until late October that members of the FOMC noticed a slowing in economic activity, which prompted a stimulative monetary policy.

Recognition lags stem largely from problems in collecting economic data. First, data are available only after the conclusion of a particular period. Preliminary estimates of real GDP, for example, are released about a month after the end of a quarter. Thus, a change that occurs early in a quarter will not be reflected in the data until several months later. Second, estimates of economic indicators are subject to revision. The first estimates of real GDP in the third quarter of 1990, for example, showed it increasing. Not until several months had passed did revised estimates show that a recession had begun. And finally, different indicators can lead to different interpretations. Data on employment and retail sales might be pointing in one direction while data on housing starts and industrial production might be pointing in another. It is one thing to look back after a few years have elapsed and determine whether the economy was expanding or contracting. It is quite another to decipher changes in real GDP when one is right in the middle of events. Even in a world brimming with computer-generated data on the economy, recognition lags can be substantial.

Only after policy makers recognize there is a problem can they take action to deal with it. The delay between the time at which a problem is recognized and the time at which a policy to deal with it is enacted is called the implementation lag. For monetary policy changes, the implementation lag is quite short. The FOMC meets eight times per year, and its members may confer between meetings through conference calls. Once the FOMC determines that a policy change is in order, the required open-market operations to buy or sell federal bonds can be put into effect immediately.

Policy makers at the Fed still have to contend with the impact lag, the delay between the time a policy is enacted and the time that policy has its impact on the economy.

The impact lag for monetary policy occurs for several reasons. First, it takes some time for the simple deposit multiplier process to work itself out. The Fed can inject new reserves into the economy immediately, but the deposit expansion process of bank lending will need time to have its full effect on the money supply. Interest rates are affected immediately, but the money supply grows more slowly. Second, firms need some time to respond to the monetary policy with new investment spending—if they respond at all. Third, a monetary change is likely to affect the exchange rate, but that translates into a change in net exports only after some delay.

Thus, the shift in the aggregate demand curve due to initial changes in investment and in net exports occurs after some delay. Finally, the multiplier process of an expenditure change takes time to unfold. It is only as incomes start to rise that consumption spending picks up.

The problem of lags suggests that monetary policy should respond not to statistical reports of economic conditions in the recent past but to conditions *expected* to exist in the future. In justifying the imposition of a contractionary monetary policy early in 1994, when the economy still had a recessionary gap, Greenspan indicated that the Fed expected a one-year impact lag. The policy initiated in 1994 was a response not to the economic conditions thought to exist at the time but to conditions expected to exist in 1995. When the Fed used contractionary policy in the middle of 1999, it argued that it was doing so to forestall a possible increase in inflation. When the Fed began easing in September 2007, it argued that it was doing so to forestall adverse effects to the economy of falling housing prices. In these examples, the Fed appeared to be looking forward. It must do so with information and forecasts that are far from perfect.

Estimates of the length of time required for the impact lag to work itself out range from six months to two years. Worse, the length of the lag can vary—when they take action, policy makers cannot know whether their choices will affect the economy within a few months or within a few years. Because of the uncertain length of the impact lag, efforts to stabilize the economy through monetary policy could be destabilizing. Suppose, for example, that the Fed responds to a recessionary gap with an expansionary policy but that by the time the policy begins to affect aggregate demand, the economy has already returned to potential GDP. The policy designed to correct a recessionary gap could create an inflationary gap. Similarly, a shift to a contractionary policy in response to an inflationary gap might not affect aggregate demand until after a self-correction process had already closed the gap. In that case, the policy could plunge the economy into a recession.

Choosing Targets

In attempting to manage the economy, on what macroeconomic variables should the Fed base its policies? It must have some target, or set of targets, that it wants to achieve. The failure of the economy to achieve one of the Fed's targets would then trigger a shift in monetary policy. The choice of a target, or set of targets, is a crucial one for monetary policy. Possible targets include interest rates, money growth rates, and the price level or expected changes in the price level.

Interest Rates

Interest rates, particularly the federal funds rate, played a key role in recent Fed policy. The FOMC does not decide to increase or decrease the money supply. Rather, it engages in operations to nudge the federal funds rate up or down.

Up until August 1997, it had instructed the trading desk at the New York Federal Reserve Bank to conduct open-market operations in a way that would either maintain, increase, or ease the current “degree of pressure” on the reserve positions of banks. That degree of pressure was reflected by the federal funds rate; if existing reserves were less than the amount banks wanted to hold, then the bidding for the available supply would send the federal funds rate up. If reserves were plentiful, then the federal funds rate would tend to decline. When the Fed increased the degree of pressure on reserves, it sold bonds, thus reducing the supply of reserves and increasing the federal funds rate. The Fed decreased the degree of pressure on reserves by buying bonds, thus injecting new reserves into the system and reducing the federal funds rate.

The current operating procedures of the Fed focus explicitly on interest rates. At each of its eight meetings during the year, the FOMC sets a specific target or target range for the federal funds rate. When the Fed lowers the target for the federal funds rate, it buys bonds. When it raises the target for the federal funds rate, it sells bonds.

Money Growth Rates

Until 2000, the Fed was required to announce to Congress at the beginning of each year its target for money growth that year and each report dutifully did so. At the same time, the Fed report would mention that its money growth targets were benchmarks based on historical relationships rather than guides for policy. As soon as the legal requirement to report targets for money growth ended, the Fed stopped doing so. Since in recent years the Fed has placed more importance on the federal funds rate, it must adjust the money supply in order to move the federal funds rate to the level it desires. As a result, the money growth targets tended to fall by the wayside, even over the last decade in which they were being reported. Instead, as data on economic conditions unfolded, the Fed made, and continues to make, adjustments in order to affect the federal funds interest rate.

Price Level or Expected Changes in the Price Level

Some economists argue that the Fed's primary goal should be price stability. If so, an obvious possible target is the price level itself. The Fed could target a particular price level or a particular rate of change in the price level and adjust its policies accordingly. If, for example, the Fed sought an inflation rate of 2%, then it could shift to a contractionary policy whenever the rate rose above 2%. One difficulty with such a policy, of course, is that the Fed would be responding to past economic conditions with policies that are not likely to affect the economy for a year or more. Another difficulty is that inflation could be rising when the economy is experiencing a recessionary gap. An example of this, mentioned earlier, occurred in 1990 when inflation increased due to the seemingly temporary increase in oil prices following Iraq's invasion of Kuwait. The Fed was faced with a similar situation in the first half of 2008 when oil prices were again rising. If the Fed undertakes contractionary monetary policy at such times, then its efforts to reduce the inflation rate could worsen the recessionary gap.

The solution proposed by Chairman Bernanke, who is an advocate of inflation rate targeting, is to focus not on the past rate of inflation or even the current rate of inflation, but on the expected rate of inflation, as revealed by various indicators, over the next year.

Political Pressures

The institutional relationship between the leaders of the Fed and the executive and legislative branches of the federal government is structured to provide for the Fed's independence. Members of the Board of Governors are appointed by the president, with confirmation by the Senate, but the 14-year terms of office provide a considerable degree of insulation from political pressure. A president exercises greater influence in the choice of the chairman of the Board of Governors; that appointment carries a four-year term. Neither the president nor Congress has any direct say over the selection of the presidents of Federal Reserve district banks. They are chosen by their individual boards of directors with the approval of the Board of Governors.

The degree of independence that central banks around the world have varies. A central bank is considered to be more independent if it is insulated from the government by such factors as longer term appointments of its governors and fewer requirements to finance government budget deficits. Studies in the 1980s and early 1990s showed that, in general, greater central bank independence was associated with lower average inflation and that there was no systematic relationship between central bank independence and other indicators of economic performance, such as real GDP growth or unemployment¹. By the rankings used in those studies, the Fed was considered quite independent, second only to Switzerland and the German *Bundesbank* at the time. Perhaps as a result of such findings, a number of countries have granted greater independence to their central banks in the last decade. The charter for the European Central Bank, which began operations in 1998, was modeled on that of the German *Bundesbank*. Its charter states explicitly that its primary objective is to maintain price stability. Also, since 1998, central bank independence has increased in the United Kingdom, Canada, Japan, and New Zealand.

While the Fed is formally insulated from the political process, the men and women who serve on the Board of Governors and the FOMC are human beings. They are not immune to the pressures that can be placed on them by members of Congress and by the president. The chairman of the Board of Governors meets regularly with the president and the executive staff and also reports to and meets with congressional committees that deal with economic matters.

The Fed was created by the Congress; its charter could be altered—or even revoked—by that same body. The Fed is in the somewhat paradoxical situation of having to cooperate with the legislative and executive branches in order to preserve its independence.

The Degree of Impact on the Economy

The problem of lags suggests that the Fed does not know with certainty *when* its policies will work their way through the financial system to have an impact on macroeconomic performance. The Fed also does not know with certainty *to what extent* its policy decisions will affect the macroeconomy.

For example, investment can be particularly volatile. An effort by the Fed to reduce aggregate demand in the face of an inflationary gap could be partially offset by rising investment demand. But, generally, contractionary policies do tend to slow down the economy as if the Fed were “pulling on a rope.” That may not be the case with expansionary policies. Since investment depends crucially on expectations about the future, business leaders must be optimistic about economic conditions in order to expand production facilities and buy new equipment. That optimism might not exist in a recession. Instead, the pessimism that might prevail during an economic slump could prevent lower interest rates from stimulating investment. An effort to stimulate the

economy through monetary policy could be like “pushing on a string.” The central bank could push with great force by buying bonds and engaging in quantitative easing, but little might happen to the economy at the other end of the string.

What if the Fed cannot bring about a change in interest rates? A liquidity trap is said to exist when a change in monetary policy has no effect on interest rates. This would be the case if the money demand curve were horizontal at some interest rate, as shown in Figure 10.3. If a change in the money supply from M to M' cannot change interest rates, then, unless there is some other change in the economy, there is no reason for investment or any other component of aggregate demand to change. Hence, traditional monetary policy is rendered totally ineffective; its degree of impact on the economy is nil. At an interest rate of zero, since bonds cease to be an attractive alternative to money, which is at least useful for transactions purposes, there would be a liquidity trap.

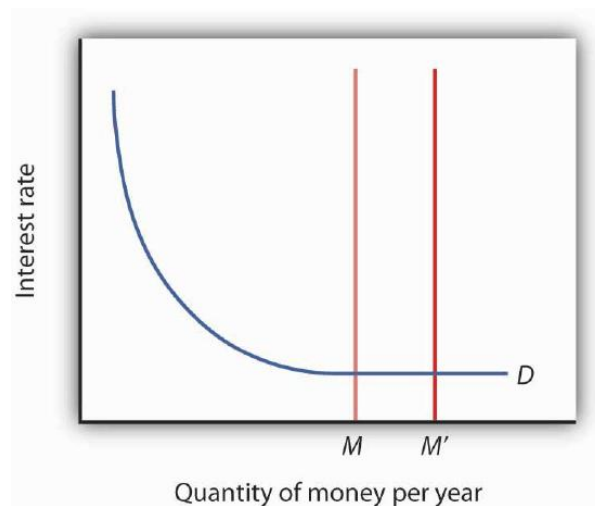


Figure 10.3 A Liquidity Trap When a change in the money supply has no effect on the interest rate, the economy is said to be in a liquidity trap.

With the federal funds rate in the United States close to zero at the end of 2008, the possibility that the country was in or nearly in a liquidity trap cannot be dismissed. As discussed in the introduction to the chapter, at the same time the Fed lowered the federal funds rate to close to zero, it mentioned that it intended to pursue additional, nontraditional measures. What the Fed seeks to do is to make firms and consumers want to spend now by using a tool not aimed at reducing the interest rate, since it cannot reduce the interest rate below zero. It thus shifts its focus to the price level and to avoiding expected deflation. For example, if the public expects the price level to fall by 2% and the interest rate is zero, by holding money, the money is actually earning a positive *real* interest rate of 2%—the difference between the *nominal* interest rate and the expected deflation rate. Since the nominal rate of interest cannot fall below zero (Who would, for example, want to lend at an interest rate below zero when lending is risky whereas cash is not? In short, it does not make sense to lend \$10 and get less than \$10 back.), expected deflation makes holding cash very attractive and discourages spending since people will put off purchases because goods and services are expected to get cheaper.

To combat this “wait-and-see” mentality, the Fed or other central bank, using a strategy referred to as quantitative easing, must convince the public that it will keep interest rates very low by providing substantial reserves for as long as is necessary to avoid deflation. In other words, it is aimed at creating expected inflation. For example, at the Fed’s October 2003 meeting, it announced that it would keep the federal funds rate at 1% for “a considerable period.” When the Fed lowered the rate to between 0% and 0.25% in December 2008, it added that “the Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate for some time.” After working so hard to convince economic players that it will not tolerate inflation above 2%, the Fed must now convince the public that it will, but of course not too much! If it is successful, this extraordinary form of expansionary monetary policy would lead to increased purchases of goods and services, compared to what they would have been with expected deflation. Also, by providing banks with lots of liquidity, it is hoping to encourage them to lend.

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10.3: Monetary Policy and the Equation of Exchange

Learning Objective

1. Explain the meaning of the equation of exchange, $MV = PY$, and tell why it must hold true.
2. Discuss the usefulness of the quantity theory of money in explaining the behavior of nominal GDP and inflation in the long run.
3. Discuss why the quantity theory of money is less useful in analyzing the short run.

So far we have focused on how monetary policy affects real GDP and the price level in the short run. That is, we have examined how it can be used—however imprecisely—to close recessionary or inflationary gaps and to stabilize the price level. In this section, we will explore the relationship between money and the economy in the context of an equation that relates the money supply directly to nominal GDP. As we shall see, it also identifies circumstances in which changes in the price level are directly related to changes in the money supply.

The Equation of Exchange

We can relate the money supply to the aggregate economy by using the equation of exchange:

Equation 10.1

$$MV = \text{nominal GDP}$$

The equation of exchange shows that the money supply M times its velocity V equals nominal GDP. Velocity is the number of times the money supply is spent to obtain the goods and services that make up GDP during a particular time period.

To see that nominal GDP is the price level multiplied by real GDP, recall from an earlier chapter that the implicit price deflator P equals nominal GDP divided by real GDP:

Equation 10.2

$$P = \frac{\text{Nominal GDP}}{\text{Real GDP}}$$

Multiplying both sides by real GDP, we have

Equation 10.3

$$\text{Nominal GDP} = P \times \text{real GDP}$$

Letting Y equal real GDP, we can rewrite the equation of exchange as

Equation 10.4

$$MV = PY$$

We shall use the equation of exchange to see how it represents spending in a hypothetical economy that consists of 50 people, each of whom has a car. Each person has \$10 in cash and no other money. The money supply of this economy is thus \$500. Now suppose that the sole economic activity in this economy is car washing. Each person in the economy washes one other person's car once a month, and the price of a car wash is \$10. In one month, then, a total of 50 car washes are produced at a price of \$10 each. During that month, the money supply is spent once.

Applying the equation of exchange to this economy, we have a money supply M of \$500 and a velocity V of 1. Because the only good or service produced is car washing, we can measure real GDP as the number of car washes. Thus Y equals 50 car washes. The price level P is the price of a car wash: \$10. The equation of exchange for a period of 1 month is

$$\$500 \times 1 = \$10 \times 50$$

Now suppose that in the second month everyone washes someone else's car again. Over the full two-month period, the money supply has been spent twice—the velocity over a period of two months is 2. The total output in the economy is \$1,000—100 car

washes have been produced over a two-month period at a price of \$10 each. Inserting these values into the equation of exchange, we have

$$\$500 \times 2 = \$10 \times 100$$

Suppose this process continues for one more month. For the three-month period, the money supply of \$500 has been spent three times, for a velocity of 3. We have

$$\$500 \times 3 = \$10 \times 150$$

The essential thing to note about the equation of exchange is that it always holds. That should come as no surprise. The left side, MV , gives the money supply times the number of times that money is spent on goods and services during a period. It thus measures total spending. The right side is nominal GDP. But that is a measure of total spending on goods and services as well. Nominal GDP is the value of all final goods and services produced during a particular period. Those goods and services are either sold or added to inventory. If they are sold, then they must be part of total spending. If they are added to inventory, then some firm must have either purchased them or paid for their production; they thus represent a portion of total spending. In effect, the equation of exchange says simply that total spending on goods and services, measured as MV , equals total spending on goods and services, measured as PY (or nominal GDP). The equation of exchange is thus an identity, a mathematical expression that is true by definition.

To apply the equation of exchange to a real economy, we need measures of each of the variables in it. Three of these variables are readily available. The Department of Commerce reports the price level (that is, the implicit price deflator) and real GDP. The Federal Reserve Board reports M2, a measure of the money supply. For the second quarter of 2008, the values of these variables at an annual rate were

$M = \$7,635.4$ billion

$P = 1.22$

$Y = 11,727.4$ billion

To solve for the velocity of money, V , we divide both sides of Equation 10.4 by M :

Equation 10.5

$$V = \frac{PY}{M}$$

Using the data for the second quarter of 2008 to compute velocity, we find that V then was equal to 1.87. A velocity of 1.87 means that the money supply was spent 1.87 times in the purchase of goods and services in the second quarter of 2008.

Money, Nominal GDP, and Price-Level Changes

Assume for the moment that velocity is constant, expressed as $\bar{V}$. Our equation of exchange is now written as

Equation 10.6

$$M\bar{V} = PY$$

A constant value for velocity would have two important implications:

1. Nominal GDP could change *only* if there were a change in the money supply. Other kinds of changes, such as a change in government purchases or a change in investment, could have no effect on nominal GDP.
2. A change in the money supply would always change nominal GDP, and by an equal percentage.

In short, if velocity were constant, a course in macroeconomics would be quite simple. The quantity of money would determine nominal GDP; nothing else would matter.

Indeed, when we look at the behavior of economies over long periods of time, the prediction that the quantity of money determines nominal output holds rather well. Figure 10.4 compares long-term averages in the growth rates of M2 and nominal GNP in the

United States for more than a century. The lines representing the two variables do seem to move together most of the time, suggesting that velocity is constant when viewed over the long run.

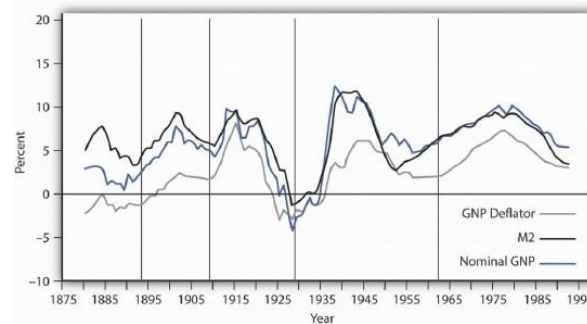


Figure 10.4 Inflation, M2 Growth, and GDP Growth The chart shows the behavior of price-level changes, the growth of M2, and the growth of nominal GDP using 10-year moving averages. Viewed in this light, the relationship between money growth and nominal GDP seems quite strong.

Source: William G. Dewald, “Historical U.S. Money Growth, Inflation, and Inflation Credibility,” Federal Reserve Bank of St. Louis Review 80:6 (November/December 1998): 13-23.

Moreover, price-level changes also follow the same pattern that changes in M2 and nominal GNP do. Why is this?

We can rewrite the equation of exchange, $M\bar{V} = PY$, in terms of percentage rates of change. When two products, such as $M\bar{V}$ and PY , are equal, and the variables themselves are changing, then the sums of the percentage rates of change are approximately equal:

Equation 10.7

$$\% \Delta M + \% \Delta V \cong \% \Delta P + \% \Delta Y$$

The Greek letter Δ (delta) means “change in.” Assume that velocity is constant in the long run, so that $\% \Delta V = 0$. We also assume that real GDP moves to its potential level, Y_p , in the long run. With these assumptions, we can rewrite Equation 10.7 as follows:

Equation 10.8

$$\% \Delta M \cong \% \Delta P + \% \Delta Y_p$$

Subtracting $\% \Delta Y_p$ from both sides of Equation 10.8, we have the following:

Equation 10.9

$$\% \Delta M - \% \Delta Y_p \cong \% \Delta P$$

Equation 10.9 has enormously important implications for monetary policy. It tells us that, in the long run, the rate of inflation, $\% \Delta P$, equals the difference between the rate of money growth and the rate of increase in potential output, $\% \Delta Y_p$, given our assumption of constant velocity. Because potential output is likely to rise by at most a few percentage points per year, the rate of money growth will be close to the rate of inflation in the long run.

Several recent studies that looked at all the countries on which they could get data on inflation and money growth over long periods found a very high correlation between growth rates of the money supply and of the price level for countries with high inflation rates, but the relationship was much weaker for countries with inflation rates of less than 10%¹. These findings support the quantity theory of money, which holds that in the long run the price level moves in proportion with changes in the money supply, at least for high-inflation countries.

Why the Quantity Theory of Money Is Less Useful in Analyzing the Short Run

The stability of velocity in the long run underlies the close relationship we have seen between changes in the money supply and changes in the price level. But velocity is not stable in the short run; it varies significantly from one period to the next. Figure 10.5 shows annual values of the velocity of M2 from 1970 through 2009. Velocity is quite variable, so other factors must affect economic activity. Any change in velocity implies a change in the demand for money. For analyzing the effects of monetary policy

from one period to the next, we apply the framework that emphasizes the impact of changes in the money market on aggregate demand.

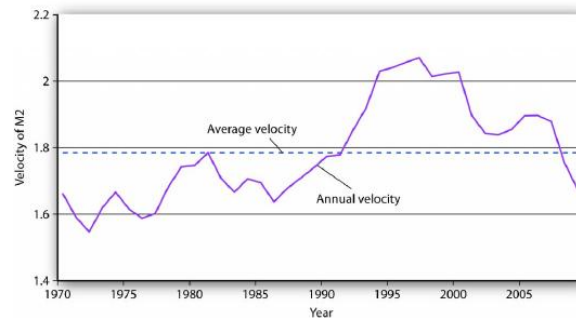


Figure 10.5 The Velocity of M2, 1970–2009 The annual velocity of M2 varied about an average of 1.78 between 1970 and 2009.

Source: Economic Report of the President, 2010, Tables B-1 and B-69.

The factors that cause velocity to fluctuate are those that influence the demand for money, such as the interest rate and expectations about bond prices and future price levels. We can gain some insight about the demand for money and its significance by rearranging terms in the equation of exchange so that we turn the equation of exchange into an equation for the demand for money. If we multiply both sides of Equation 10.1 by the reciprocal of velocity, $1/V$, we have this equation for money demand:

Equation 10.10

$$M = \frac{1}{V}PY$$

The equation of exchange can thus be rewritten as an equation that expresses the demand for money as a percentage, given by $1/V$, of nominal GDP. With a velocity of 1.87, for example, people wish to hold a quantity of money equal to 53.4% ($1/1.87$) of nominal GDP. Other things unchanged, an increase in money demand reduces velocity, and a decrease in money demand increases velocity.

If people wanted to hold a quantity of money equal to a larger percentage of nominal GDP, perhaps because interest rates were low, velocity would be a smaller number. Suppose, for example, that people held a quantity of money equal to 80% of nominal GDP. That would imply a velocity of 1.25. If people held a quantity of money equal to a smaller fraction of nominal GDP, perhaps owing to high interest rates, velocity would be a larger number. If people held a quantity of money equal to 25% of nominal GDP, for example, the velocity would be 4.

As another example, in the chapter on financial markets and the economy, we learned that money demand falls when people expect inflation to increase. In essence, they do not want to hold money that they believe will only lose value, so they turn it over faster, that is, velocity rises. Expectations of deflation lower the velocity of money, as people hold onto money because they expect it will rise in value.

In our first look at the equation of exchange, we noted some remarkable conclusions that would hold if velocity were constant: a given percentage change in the money supply M would produce an equal percentage change in nominal GDP, and no change in nominal GDP could occur without an equal percentage change in M . We have learned, however, that velocity varies in the short run. Thus, the conclusions that would apply if velocity were constant must be changed.

First, we do not expect a given percentage change in the money supply to produce an equal percentage change in nominal GDP. Suppose, for example, that the money supply increases by 10%. Interest rates drop, and the quantity of money demanded goes up. Velocity is likely to decline, though not by as large a percentage as the money supply increases. The result will be a reduction in the degree to which a given percentage increase in the money supply boosts nominal GDP.

Second, nominal GDP could change even when there is no change in the money supply. Suppose government purchases increase. Such an increase shifts the aggregate demand curve to the right, increasing real GDP and the price level. That effect would be impossible if velocity were constant. The fact that velocity varies, and varies positively with the interest rate, suggests that an increase in government purchases could boost aggregate demand and nominal GDP. To finance increased spending, the government borrows money by selling bonds. An increased supply of bonds lowers their price, and that means higher interest rates. The higher

interest rates produce the increase in velocity that must occur if increased government purchases are to boost the price level and real GDP.

Just as we cannot assume that velocity is constant when we look at macroeconomic behavior period to period, neither can we assume that output is at potential. With both V and Y in the equation of exchange variable, in the short run, the impact of a change in the money supply on the price level depends on the degree to which velocity and real GDP change.

In the short run, it is not reasonable to assume that velocity and output are constants. Using the model in which interest rates and other factors affect the quantity of money demanded seems more fruitful for understanding the impact of monetary policy on economic activity in that period. However, the empirical evidence on the long-run relationship between changes in money supply and changes in the price level that we presented earlier gives us reason to pause. As Federal Reserve Governor from 1996 to 2002 Laurence H. Meyer put it: “I believe monitoring money growth has value, even for central banks that follow a disciplined strategy of adjusting their policy rate to ongoing economic developments. The value may be particularly important at the extremes: during periods of very high inflation, as in the late 1970s and early 1980s in the United States ... and in deflationary episodes” (Meyer, 2001).

It would be a mistake to allow short-term fluctuations in velocity and output to lead policy makers to completely ignore the relationship between money and price level changes in the long run.

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CHAPTER OVERVIEW

11: Globalization and Protectionism

11.1: Protectionism- An Indirect Subsidy from Consumers to Producers

11.2: International Trade and Its Effects on Jobs, Wages, and Working Conditions

11.3: Arguments in Support of Restricting Imports

11.4: How Governments Enact Trade Policy- Globally, Regionally, and Nationally

11.5: The Tradeoffs of Trade Policy

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11.1: Protectionism- An Indirect Subsidy from Consumers to Producers

Learning Objectives

By the end of this section, you will be able to:

- Explain protectionism and its three main forms
- Analyze protectionism through concepts of demand and supply, noting its effects on equilibrium
- Calculate the effects of trade barriers

When a government legislates policies to reduce or block international trade it is engaging in protectionism. Protectionist policies often seek to shield domestic producers and domestic workers from foreign competition. Protectionism takes three main forms: tariffs, import quotas, and nontariff barriers.

Tariffs are taxes that governments impose on imported goods and services. This makes imports more expensive for consumers, discouraging imports. For example, in 2018, President Trump increased tariffs on Chinese-manufactured goods by 2–25%, including TVs, monitors, desktop PCs, smartwatches, and many other consumer goods. The intention behind the policy was to shelter U.S. manufacturers from competition, helping companies that operate domestically. China responded with tariffs on American goods, launching a trade war. President Biden retained these tariffs and considered additional ones, but as of August 2022, the administration was considering changes designed to reduce inflation.

Another way to control trade is through import quotas, which are numerical limitations on the quantity of products that a country can import. For instance, during the early 1980s, the Reagan Administration imposed a quota on the import of Japanese automobiles. In the 1970s, many developed countries, including the United States, found themselves with declining textile industries. Textile production does not require highly skilled workers, so producers were able to set up lower-cost factories in developing countries. In order to “manage” this loss of jobs and income, the developed countries established an international Multifiber Agreement that essentially divided the market for textile exports between importers and the remaining domestic producers. The agreement, which ran from 1974 to 2004, specified the exact quota of textile imports that each developed country would accept from each low-income country. A similar story exists for sugar imports into the United States, which are still governed by quotas.

Nontariff barriers are all the other ways that a nation can draw up rules, regulations, inspections, and paperwork to make it more costly or difficult to import products. A rule requiring certain safety standards can limit imports just as effectively as high tariffs or low import quotas, for instance. There are also nontariff barriers in the form of “rules-of-origin” regulations; these rules describe the “Made in Country X” label as the one in which the last substantial change in the product took place. A manufacturer wishing to evade import restrictions may try to change the production process so that the last big change in the product happens in their own country. For example, certain textiles are made in the United States, shipped to other countries, combined with textiles made in those other countries to make apparel—and then re-exported back to the United States for a final assembly, to escape paying tariffs or to obtain a “Made in the USA” label.

Despite import quotas, tariffs, and nontariff barriers, the share of apparel sold in the United States that is imported rose from about half in 1999 to about three-quarters today. According to the U.S. Bureau of Labor Statistics (BLS), estimated the number of U.S. jobs in textiles and apparel fell 44% from 2007 to 2014, and will fall by another 25% by 2024. Even more U.S. textile industry jobs would have been lost without tariffs. However, domestic jobs that are saved by import quotas come at a cost. Because textile and apparel protectionism adds to the costs of imports, consumers end up paying billions of dollars more for clothing each year.

When the United States eliminates trade barriers in one area, consumers spend the money they save on that product elsewhere in the economy. Thus, while eliminating trade barriers in one sector of the economy will likely result in some job loss in that sector, consumers will spend the resulting savings in other sectors of the economy and hence increase the number of jobs in those other sectors. Of course, workers in some of the poorest countries of the world who would otherwise have jobs producing textiles, would gain considerably if the United States reduced its barriers to trade in textiles. That said, there are good reasons to be wary about reducing barriers to trade. The 2012 and 2013 Bangladeshi fires in textile factories, which resulted in a horrific loss of life, present complications that our simplified analysis in the chapter will not capture.

Realizing the compromises between nations that come about due to trade policy, many countries came together in 1947 to form the General Agreement on Tariffs and Trade (GATT). (We’ll cover the GATT in more detail later in the chapter.) This agreement has

since been superseded by the World Trade Organization (WTO), whose membership includes about 150 nations and most of the world's economies. It is the primary international mechanism through which nations negotiate their trade rules—including rules about tariffs, quotas, and nontariff barriers. The next section examines the results of such protectionism and develops a simple model to show the impact of trade policy.

Demand and Supply Analysis of Protectionism

To the non-economist, restricting imports may appear to be nothing more than taking sales from foreign producers and giving them to domestic producers. Other factors are at work, however, because firms do not operate in a vacuum. Instead, firms sell their products either to consumers or to other firms (if they are business suppliers), who are also affected by the trade barriers. A demand and supply analysis of protectionism shows that it is not just a matter of domestic gains and foreign losses, but a policy that imposes substantial domestic costs as well.

Consider two countries, Brazil and the United States, who produce sugar. Each country has a domestic supply and demand for sugar, as Table 11.1 details and Figure 11.1 illustrates. In Brazil, without trade, the equilibrium price of sugar is 12 cents per pound and the equilibrium output is 30 tons. When there is no trade in the United States, the equilibrium price of sugar is 24 cents per pound and the equilibrium quantity is 80 tons. We label these equilibrium points as point E in each part of the figure.

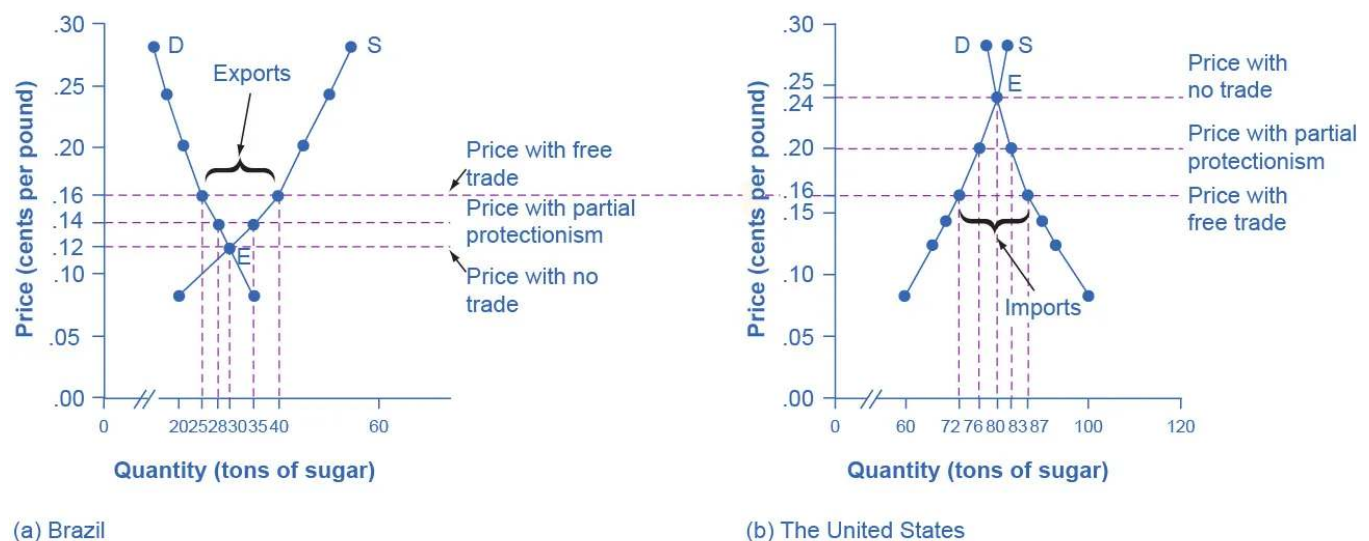


Figure 11.1 The Sugar Trade between Brazil and the United States Before trade, the equilibrium price of sugar in Brazil is 12 cents a pound and it is 24 cents per pound in the United States. When trade is allowed, businesses will buy cheap sugar in Brazil and sell it in the United States. This will result in higher prices in Brazil and lower prices in the United States. Ignoring transaction costs, prices should converge to 16 cents per pound, with Brazil exporting 15 tons of sugar and the United States importing 15 tons of sugar. If trade is only partly open between the countries, it will lead to an outcome between the free-trade and no-trade possibilities.

Price	Brazil: Quantity Supplied (tons)	Brazil: Quantity Demanded (tons)	U.S.: Quantity Supplied (tons)	U.S.: Quantity Demanded (tons)
8 cents	20	35	60	100
12 cents	30	30	66	93
14 cents	35	28	69	90
16 cents	40	25	72	87
20 cents	45	21	76	83
24 cents	50	18	80	80
28 cents	55	15	82	78

Table 11.1 The Sugar Trade between Brazil and the United States

If international trade between Brazil and the United States now becomes possible, profit-seeking firms will spot an opportunity: buy sugar cheaply in Brazil, and sell it at a higher price in the United States. As sugar is shipped from Brazil to the United States, the quantity of sugar produced in Brazil will be greater than Brazilian consumption (with the extra production exported), and the amount produced in the United States will be less than the amount of U.S. consumption (with the extra consumption imported). Exports to the United States will reduce the sugar supply in Brazil, raising its price. Imports into the United States will increase the sugar supply, lowering its price. When the sugar price is the same in both countries, there is no incentive to trade further. As Figure 11.1 shows, the equilibrium with trade occurs at a price of 16 cents per pound. At that price, the sugar farmers of Brazil supply a quantity of 40 tons, while the consumers of Brazil buy only 25 tons.

The extra 15 tons of sugar production, shown by the horizontal gap between the demand curve and the supply curve in Brazil, is exported to the United States. In the United States, at a price of 16 cents, the farmers produce a quantity of 72 tons and consumers demand a quantity of 87 tons. The excess demand of 15 tons by American consumers, shown by the horizontal gap between demand and domestic supply at the price of 16 cents, is supplied by imported sugar. Free trade typically results in income distribution effects, but the key is to recognize the overall gains from trade, as Figure 11.2 shows. Building on the concepts that we outlined in Demand and Supply and Demand, Supply, and Efficiency in terms of consumer and producer surplus, Figure 11.2 (a) shows that producers in Brazil gain by selling more sugar at a higher price, while Figure 11.2 (b) shows consumers in the United States benefit from the lower price and greater availability of sugar. Consumers in Brazil are worse off (compare their no-trade consumer surplus with the free-trade consumer surplus) and U.S. producers of sugar are worse off. There are gains from trade—an increase in social surplus in each country. That is, both the United States and Brazil are better off than they would be without trade. The following Clear It Up feature explains how trade policy can influence low-income countries.

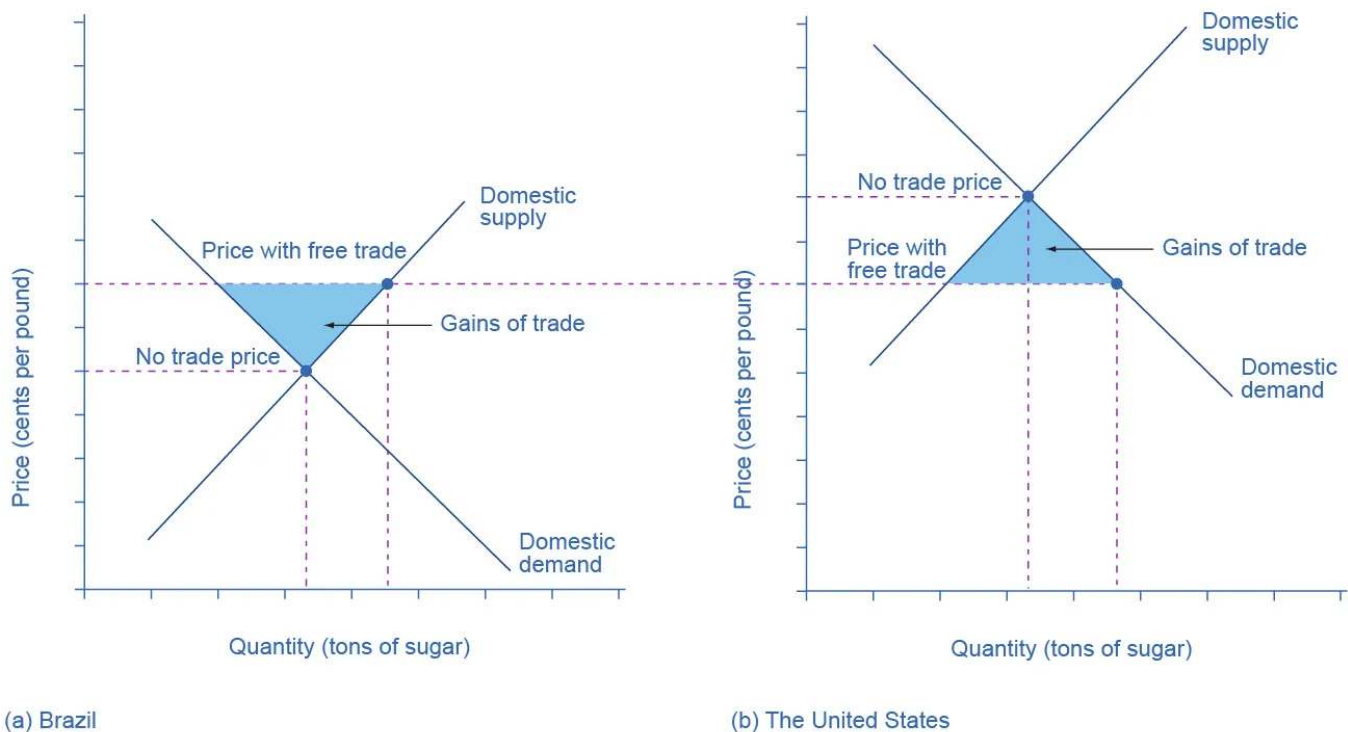


Figure 11.2 Free Trade of Sugar Free trade results in gains from trade. Total surplus increases in both countries, as the two blue-shaded areas show. However, there are clear income distribution effects. Producers gain in the exporting country, while consumers lose; and in the importing country, consumers gain and producers lose.

Now, let's look at what happens with protectionism. U.S. sugar farmers are likely to argue that, if only they could be protected from sugar imported from Brazil, the United States would have higher domestic sugar production, more jobs in the sugar industry, and American sugar farmers would receive a higher price. If the United States government sets a high-enough tariff on imported sugar, or sets an import quota at zero, the result will be that the quantity of sugar traded between countries could be reduced to zero, and the prices in each country will return to the levels before trade was allowed.

Blocking only some trade is also possible. Suppose that the United States passed a sugar import quota of seven tons. The United States will import no more than seven tons of sugar, which means that Brazil can export no more than seven tons of sugar to the United States. As a result, the price of sugar in the United States will be 20 cents, which is the price where the quantity demanded is seven tons greater than the domestic quantity supplied. Conversely, if Brazil can export only seven tons of sugar, then the price of sugar in Brazil will be 14 cents per pound, which is the price where the domestic quantity supplied in Brazil is seven tons greater than domestic demand.

In general, when a country sets a low or medium tariff or import quota, the equilibrium price and quantity will be somewhere between those that prevail with no trade and those with completely free trade.

The fact that protectionism pushes up prices for consumers in the country enacting such protectionism is not always acknowledged openly, but it is not disputed. After all, if protectionism did not benefit domestic producers, there would not be much point in enacting such policies in the first place. Protectionism is simply a method of requiring consumers to subsidize producers. The subsidy is indirect, since consumers pay for it through higher prices, rather than a direct government subsidy paid with money collected from taxpayers. However, protectionism works like a subsidy, nonetheless. The American satirist Ambrose Bierce defined “tariff” this way in his 1911 book, *The Devil’s Dictionary*: “Tariff, n. A scale of taxes on imports, designed to protect the domestic producer against the greed of his consumer.”

The effect of protectionism on producers and consumers in the foreign country is complex. When a government uses an import quota to impose partial protectionism, Brazilian sugar producers receive a lower price for the sugar they sell in Brazil—but a higher price for the sugar they are allowed to export to the United States. Notice that some of the burden of protectionism, paid by domestic consumers, ends up in the hands of foreign producers in this case. Brazilian sugar consumers seem to benefit from U.S. protectionism, because it reduces the price of sugar that they pay (compared to the free-trade situation). On the other hand, at least some of these Brazilian sugar consumers also work as sugar farmers, so protectionism reduces their incomes and jobs. Moreover, if trade between the countries vanishes, Brazilian consumers would miss out on better prices for imported goods—which do not appear in our single-market example of sugar protectionism.

The effects of protectionism on foreign countries notwithstanding, protectionism requires domestic consumers of a product (consumers may include either households or other firms) to pay higher prices to benefit domestic producers of that product. In addition, when a country enacts protectionism, it loses the economic gains it would have been able to achieve through a combination of comparative advantage, specialized learning, and economies of scale, concepts that we discuss in International Trade.

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11.2: International Trade and Its Effects on Jobs, Wages, and Working Conditions

Learning Objectives

By the end of this section, you will be able to:

- Discuss how international trade influences the job market
- Analyze the opportunity cost of protectionism
- Explain how international trade impacts wages, labor standards, and working conditions

In theory at least, imports might injure workers in several different ways: fewer jobs, lower wages, or poor working conditions. Let's consider these in turn.

Fewer Jobs?

In the early 1990s, the United States was negotiating the North American Free Trade Agreement (NAFTA)¹ with Mexico, an agreement that reduced tariffs, import quotas, and nontariff barriers to trade between the United States, Mexico, and Canada. H. Ross Perot, a 1992 candidate for U.S. president, claimed, in prominent campaign arguments, that if the United States expanded trade with Mexico, there would be a “giant sucking sound” as U.S. employers relocated to Mexico to take advantage of lower wages. After all, average wages in Mexico were, at that time, about one-eighth of those in the United States. NAFTA passed Congress, President Bill Clinton signed it into law, and it took effect in 1995. For the next six years, the United States economy had some of the most rapid job growth and low unemployment in its history. Those who feared that open trade with Mexico would lead to a dramatic decrease in jobs were proven wrong.

This result was no surprise to economists. After all, the trend toward globalization has been going on for decades, not just since NAFTA. If trade reduced the number of available jobs, then the United States should have been seeing a steady loss of jobs for decades. While the United States economy does experience rises and falls in unemployment rates, the number of jobs is not falling over extended periods of time. The number of U.S. jobs rose from 71 million in 1970 to 150 million in 2021.

Protectionism certainly saves jobs in the specific industry being protected but, for two reasons, it costs jobs in other unprotected industries. First, if consumers are paying higher prices to the protected industry, they inevitably have less money to spend on goods from other industries, and so jobs are lost in those other industries. Second, if a firm sells the protected product to other firms, so that other firms must now pay a higher price for a key input, then those firms will lose sales to foreign producers who do not need to pay the higher price. Lost sales translate into lost jobs. The hidden opportunity cost of using protectionism to save jobs in one industry is jobs sacrificed in other industries. This is why the United States International Trade Commission, in its study of barriers to trade, predicts that reducing trade barriers would not lead to an overall loss of jobs. Protectionism reshuffles jobs from industries without import protections to industries that are protected from imports, but it does not create more jobs.

Moreover, the costs of saving jobs through protectionism can be very high. A number of different studies have attempted to estimate the cost to consumers in higher prices per job saved through protectionism. Table 11.2 shows a sample of results, compiled by economists at the Federal Reserve Bank of Dallas. Saving a job through protectionism typically costs much more than the actual worker's salary. For example, a study published in 2002 compiled evidence that using protectionism to save an average job in the textile and apparel industry would cost \$199,000 per job saved. In other words, those workers could have been paid \$100,000 per year to be unemployed and the cost would only be half of what it is to keep them working in the textile and apparel industry. This result is not unique to textiles and apparel.

Industry Protected with Import Tariffs or Quotas	Annual Cost per Job Saved
Sugar	\$826,000
Polyethylene resins	\$812,000
Dairy products	\$685,000
Frozen concentrated orange juice	\$635,000
Ball bearings	\$603,000
Machine tools	\$479,000

Industry Protected with Import Tariffs or Quotas	Annual Cost per Job Saved
Women's handbags	\$263,000
Glassware	\$247,000
Apparel and textiles	\$199,000
Rubber footwear	\$168,000
Women's nonathletic footwear	\$139,000

Table 11.2 Cost to U.S. Consumers of Saving a Job through Protectionism (Source: Federal Reserve Bank of Dallas)

Why does it cost so much to save jobs through protectionism? The basic reason is that not all of the extra money that consumers pay because of tariffs or quotas goes to save jobs. For example, if the government imposes tariffs on steel imports so that steel buyers pay a higher price, U.S. steel companies earn greater profits, buy more equipment, pay bigger bonuses to managers, give pay raises to existing employees—and also avoid firing some additional workers. Only part of the higher price of protected steel goes toward saving jobs. Also, when an industry is protected, the economy as a whole loses the benefits of playing to its comparative advantage—in other words, producing what it is best at. Therefore, part of the higher price that consumers pay for protected goods is lost economic efficiency, which we can measure as another deadweight loss, like what we discussed in Labor and Financial Markets.

There's a bumper sticker that speaks to the threat some U.S. workers feel from imported products: "Buy American—Save U.S. Jobs." If an economist were driving the car, the sticker might declare: "Block Imports—Save Jobs for Some Americans, Lose Jobs for Other Americans, and Also Pay High Prices."

Trade and Wages

Even if trade does not reduce the number of jobs, it could affect wages. Here, it is important to separate issues about the average level of wages from issues about whether the wages of certain workers may be helped or hurt by trade.

Because trade raises the amount that an economy can produce by letting firms and workers play to their comparative advantage, trade will also cause the average level of wages in an economy to rise. Workers who can produce more will be more desirable to employers, which will shift the demand for their labor out to the right, and increase wages in the labor market. By contrast, barriers to trade will reduce the average level of wages in an economy.

However, even if trade increases the overall wage level, it will still benefit some workers and hurt others. Workers in industries that are confronted by competition from imported products may find that demand for their labor decreases and shifts back to the left, so that their wages decline with a rise in international trade. Conversely, workers in industries that benefit from selling in global markets may find that demand for their labor shifts out to the right, so that trade raises their wages.

One concern is that while globalization may be benefiting high-skilled, high-wage workers in the United States, it may also impose costs on low-skilled, low-wage workers. After all, high-skilled U.S. workers presumably benefit from increased sales of sophisticated products like computers, machinery, and pharmaceuticals in which the United States has a comparative advantage. Meanwhile, low-skilled U.S. workers must now compete against extremely low-wage workers worldwide for making simpler products like toys and clothing. As a result, the wages of low-skilled U.S. workers are likely to fall. There are, however, a number of reasons to believe that while globalization has helped some U.S. industries and hurt others, it has not focused its negative impact on the wages of low-skilled Americans. First, about half of U.S. trade is intra-industry trade. That means the U.S. trades similar goods with other high-wage economies like Canada, Japan, Germany, and the United Kingdom. For instance, in 2014 the U.S. exported over 2 million cars, from all the major automakers, and also imported several million cars from other countries.

Most U.S. workers in these industries have above-average skills and wages—and many of them do quite well in the world of globalization. Some evidence suggested that intra-industry trade between similar countries had a small impact on domestic workers but later evidence indicates that it all depends on how flexible the labor market is. In other words, the key is how flexible workers are in finding jobs in different industries. The effect of trade on low-wage workers depends considerably on the structure of labor markets and indirect effects felt in other parts of the economy. For example, in the United States and the United Kingdom, because labor market frictions are low, the impact of trade on low income workers is small.

Second, many low-skilled U.S. workers hold service jobs that imports from low-wage countries cannot replace. For example, we cannot import lawn care services or moving and hauling services or hotel maids from countries long distances away like China or Bangladesh. Competition from imported products is not the primary determinant of their wages.

Finally, while the focus of the discussion here is on wages, it is worth pointing out that low-wage U.S. workers suffer due to protectionism in all the industries—even those in which they do not work. For example, food and clothing are protected industries. These low-wage workers therefore pay higher prices for these basic necessities and as such their dollar stretches over fewer goods.

The benefits and costs of increased trade in terms of its effect on wages are not distributed evenly across the economy. However, the growth of international trade has helped to raise the productivity of U.S. workers as a whole—and thus helped to raise the average level of wages.

Labor Standards and Working Conditions

Workers in many low-income countries around the world labor under conditions that would be illegal for a worker in the United States. Workers in countries like China, Thailand, Brazil, South Africa, and Poland are often paid less than the United States minimum wage. For example, in the United States, the national minimum wage is \$7.25 per hour. A typical wage in many low-income countries might be more like \$7.25 per day, or often much less. Moreover, working conditions in low-income countries may be extremely unpleasant, or even unsafe. In the worst cases, production may involve the child labor or even workers who are mistreated, abused, or entrapped in their jobs. These concerns over foreign labor standards do not affect most of U.S. trade, which is intra-industry and carried out with other high-income countries that have labor standards similar to the United States, but it is, nonetheless, morally and economically important.

In thinking about labor standards in other countries, it is important to draw some distinctions between what is truly unacceptable and what is painful to think about. Most people, economists included, have little difficulty with the idea that production by six-year-olds confined in factories, by people who are abused or mistreated, or by slave labor is morally unacceptable. They would support aggressive efforts to eliminate such practices—including shutting out imported products made with such labor. Many cases, however, are less clear-cut. An opinion article in the *New York Times* several years ago described the case of Ahmed Zia, a 14-year-old boy from Pakistan. He earned \$2 per day working in a carpet factory. He dropped out of school in second grade. Should the United States and other countries refuse to purchase rugs made by Ahmed and his co-workers? If the carpet factories were to close, the likely alternative job for Ahmed is farm work, and as Ahmed says of his carpet-weaving job: “This makes much more money and is more comfortable.”

Other workers may have even less attractive alternative jobs, perhaps scavenging garbage or prostitution. The real problem for Ahmed and many others in low-income countries is not that globalization has made their lives worse, but rather that they have so few good life alternatives. The United States went through similar situations during the nineteenth and early twentieth centuries.

In closing, there is some irony when the United States government or U.S. citizens take issue with labor standards in low-income countries, because the United States is not a world leader in government laws to protect employees. According to a recent study by the Organization for Economic Cooperation and Development (OECD), the U.S. is the only one of 41 countries that does not provide mandated paid leave for new parents, and among the 40 countries that do mandate paid leave, the minimum duration is about two months. Many European workers receive six weeks or more of paid vacation per year. In the United States, vacations are often one to three weeks per year. If European countries accused the United States of using unfair labor standards to make U.S. products cheaply, and announced that they would shut out all U.S. imports until the United States adopted paid parental leave, added more national holidays, and doubled vacation time, Americans would be outraged. Yet when U.S. protectionists start talking about restricting imports from poor countries because of low wage levels and poor working conditions, they are making a very similar argument. This is not to say that labor conditions in low-income countries are not an important issue. They are. However, linking labor conditions in low-income countries to trade deflects the emphasis from the real question to ask: “What are acceptable and enforceable minimum labor standards and protections to have the world over?”

Footnotes

- 1As of July 1, 2020, NAFTA was officially replaced with the United States-Mexico-Canada (USMCA) free trade agreement. It is broadly similar to the original NAFTA.

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11.3: Arguments in Support of Restricting Imports

Learning Objectives

By the end of this section, you will be able to:

- Explain and analyze various arguments that are in support of restricting imports, including the infant industry argument, the anti-dumping argument, the environmental protection argument, the unsafe consumer products argument, and the national interest argument
- Explain dumping and race to the bottom
- Evaluate the significance of countries' perceptions on the benefits of growing trade

As we previously noted, protectionism requires domestic consumers of a product to pay higher prices to benefit domestic producers of that product. Countries that institute protectionist policies lose the economic gains achieved through a combination of comparative advantage, specialized learning, and economies of scale. With these overall costs in mind, let us now consider, one by one, a number of arguments that support restricting imports.

The Infant Industry Argument

Imagine Bhutan wants to start its own computer industry, but it has no computer firms that can produce at a low enough price and high enough quality to compete in world markets. However, Bhutanese politicians, business leaders, and workers hope that if the local industry had a chance to get established, before it needed to face international competition, then a domestic company or group of companies could develop the skills, management, technology, and economies of scale that it needs to become a successful profit-earning domestic industry. Thus, the infant industry argument for protectionism is to block imports for a limited time, to give the infant industry time to mature, before it starts competing on equal terms in the global economy. (Revisit Macroeconomic Policy Around the World for more information on the infant industry argument.)

The infant industry argument is theoretically possible, even sensible: give an industry a short-term indirect subsidy through protection, and then reap the long-term economic benefits of having a vibrant, healthy industry. Implementation, however, is tricky. In many countries, infant industries have gone from babyhood to senility and obsolescence without ever having reached the profitable maturity stage. Meanwhile, the protectionism that was supposed to be short-term often took a very long time to be repealed.

As one example, Brazil treated its computer industry as an infant industry from the late 1970s until about 1990. In an attempt to establish its computer industry in the global economy, Brazil largely barred imports of computer products for several decades. This policy guaranteed increased sales for Brazilian computers. However, by the mid-1980s, due to lack of international competition, Brazil had a backward and out-of-date industry, typically lagging behind world standards for price and performance by three to five years—a long time in this fast-moving industry. After more than a decade, during which Brazilian consumers and industries that would have benefited from up-to-date computers paid the costs and Brazil's computer industry never competed effectively on world markets, Brazil phased out its infant industry policy for the computer industry.

Protectionism for infant industries always imposes costs on domestic users of the product, and typically has provided little benefit in the form of stronger, competitive industries. However, several countries in East Asia offer an exception. Japan, Korea, Thailand, and other countries in this region have sometimes provided a package of indirect and direct subsidies targeted at certain industries, including protection from foreign competition and government loans at interest rates below the market equilibrium. In Japan and Korea, for example, subsidies helped get their domestic steel and auto industries up and running.

Why did the infant industry policy of protectionism and other subsidies work fairly well in East Asia? An early 1990 World Bank study offered three guidelines to countries thinking about infant industry protection:

1. Do not hand out protectionism and other subsidies to all industries, but focus on a few industries where your country has a realistic chance to be a world-class producer.
2. Be very hesitant about using protectionism in areas like computers, where many other industries rely on having the best products available, because it is not useful to help one industry by imposing high costs on many other industries.
3. Have clear guidelines for when the infant industry policy will end.

In Korea in the 1970s and 1980s, a common practice was to link protectionism and subsidies to export sales in global markets. If export sales rose, then the infant industry had succeeded and the government could phase out protectionism. If export sales did not rise, then the infant industry policy had failed and the government could phase out protectionism. Either way, the protectionism would be temporary.

Following these rules is easier said than done. Politics often intrudes, both in choosing which industries will receive the benefits of treatment as “infants” and when to phase out import restrictions and other subsidies. Also, if the country's government wishes to impose costs on its citizens so that it can provide subsidies to a few key industries, it has many tools for doing such as direct government payments, loans, targeted tax reductions, and government support of research and development of new technologies. In other words, protectionism is not the only or even the best way to support key industries.

The Anti-Dumping Argument

Dumping refers to selling goods below their cost of production. Anti-dumping laws block imports that are sold below the cost of production by imposing tariffs that increase the price of these imports to reflect their cost of production. Since dumping is not allowed under World Trade Organization (WTO) rules, nations that believe they are on the receiving end of dumped goods can file a complaint with the WTO. According to the WTO, between 1995 and 2020, it oversaw 137 anti-dumping disputes. Note that dumping cases are countercyclical. During recessions, case filings increase. During economic booms, case filings go down. Individual countries have also frequently started their own anti-dumping investigations. The U.S. government has dozens of anti-dumping orders in place from past investigations. In 2022, for example, some U.S. imports that were under anti-dumping orders included olives from Spain, steel from South Korea, coated paper from Indonesia, light commercial vehicles from Germany and Italy, fish fillets from Vietnam, and cellulose pulp from Canada.

Why Might Dumping Occur?

Why would foreign firms export a product at less than its cost of production—which presumably means taking a loss? This question has two possible answers, one innocent and one more sinister.

The innocent explanation is that demand and supply set market prices, not the cost of production. Perhaps demand for a product shifts back to the left or supply shifts out to the right, which drives the market price to low levels—even below the cost of production. When a local store has a going-out-of-business sale, for example, it may sell goods at below the cost of production. If international companies find that there is excess supply of steel or computer chips or machine tools that is driving the market price down below their cost of production—this may be the market in action.

The sinister explanation is that dumping is part of a long-term strategy. Foreign firms sell goods at prices below the cost of production for a short period of time, and when they have driven out the domestic U.S. competition, they then raise prices. Economists sometimes call this scenario predatory pricing, which we discuss in the Monopoly chapter.

Should Anti-Dumping Cases Be Limited?

Anti-dumping cases pose two questions. How much sense do they make in economic theory? How much sense do they make as practical policy?

In terms of economic theory, the case for anti-dumping laws is weak. In a market governed by demand and supply, the government does not guarantee that firms will be able to make a profit. After all, low prices are difficult for producers, but benefit consumers. Moreover, although there are plenty of cases in which foreign producers have driven out domestic firms, there are zero documented cases in which the foreign producers then jacked up prices. Instead, foreign producers typically continue competing hard against each other and providing low prices to consumers. In short, it is difficult to find evidence of predatory pricing by foreign firms exporting to the United States.

Even if one could make a case that the government should sometimes enact anti-dumping rules in the short term, and then allow free trade to resume shortly thereafter, there is a growing concern that anti-dumping investigations often involve more politics than careful analysis. The U.S. Commerce Department is charged with calculating the appropriate “cost of production,” which can be as much an art as a science.

For example, if a company built a new factory two years ago, should it count part of the factory's cost in this year's cost of production? When a company is in a country where the government controls prices, like China for example, how can one measure the true cost of production? When a domestic industry complains loudly enough, government regulators seem very likely to find that unfair dumping has occurred. A common pattern has arisen where a domestic industry files an anti-dumping complaint, the

governments meet and negotiate a reduction in imports, and then the domestic producers drop the anti-dumping suit. In such cases, anti-dumping cases often appear to be little more than a cover story for imposing tariffs or import quotas.

In the 1980s, the United States, Canada, the European Union, Australia, and New Zealand implemented almost all the anti-dumping cases. By the 2000s, countries like Argentina, Brazil, South Korea, South Africa, Mexico, and India were filing the majority of the anti-dumping cases before the WTO. As the number of anti-dumping cases has increased, and as countries such as the United States and the European Union feel targeted by the anti-dumping actions of others, the WTO may well propose some additional guidelines to limit the reach of anti-dumping laws.

The Environmental Protection Argument

The potential for global trade to affect the environment has become controversial. A president of the Sierra Club, an environmental lobbying organization, once wrote: “The consequences of globalization for the environment are not good. ... Globalization, if we are lucky, will raise average incomes enough to pay for cleaning up some of the mess that we have made. But before we get there, globalization could also destroy enough of the planet’s basic biological and physical systems that prospects for life itself will be radically compromised.”

If free trade meant the destruction of life itself, then even economists would convert to protectionism! While globalization—and economic activity of all kinds—can pose environmental dangers, it seems quite possible that, with the appropriate safeguards in place, we can minimize the environmental impacts of trade. In some cases, trade may even bring environmental benefits.

In general, high-income countries such as the United States, Canada, Japan, the United Kingdom, and the nations of the European Union have relatively strict environmental standards. In contrast, middle- and low-income countries like Brazil, Nigeria, India, and China have lower environmental standards. The general view of the governments of such countries is that environmental protection is a luxury: as soon as their people have enough to eat, decent healthcare, and longer life expectancies, then they will spend more money on items such as sewage treatment plants, scrubbers to reduce air pollution from factory smokestacks, and national parks to protect wildlife.

This gap in environmental standards between high-income and low-income countries raises two worrisome possibilities in a world of increasing global trade: the “race to the bottom” scenario and the question of how quickly environmental standards will improve in low-income countries.

The Race to the Bottom Scenario

The race to the bottom scenario of global environmental degradation runs like this. Profit-seeking multinational companies shift their production from countries with strong environmental standards to countries with weak standards, thus reducing their costs and increasing their profits. Faced with such behavior, countries reduce their environmental standards to attract multinational firms, which, after all, provide jobs and economic clout. As a result, global production becomes concentrated in countries where firms can pollute the most and environmental laws everywhere “race to the bottom.”

Although the race-to-the-bottom scenario sounds plausible, it does not appear to describe reality. In fact, the financial incentive for firms to shift production to poor countries to take advantage of their weaker environmental rules does not seem especially powerful. When firms decide where to locate a new factory, they look at many different factors: the costs of labor and financial capital; whether the location is close to a reliable suppliers of the inputs that they need; whether the location is close to customers; the quality of transportation, communications, and electrical power networks; the level of taxes; and the competence and honesty of the local government. The cost of environmental regulations is a factor, too, but typically environmental costs are no more than 1 to 2% of the costs that a large industrial plant faces. The other factors that determine location are much more important to these companies than trying to skimp on environmental protection costs.

When an international company does choose to build a plant in a low-income country with lax environmental laws, it typically builds a plant similar to those that it operates in high-income countries with stricter environmental standards. Part of the reason for this decision is that designing an industrial plant is a complex and costly task, and so if a plant works well in a high-income country, companies prefer to use the same design everywhere. Also, companies realize that if they create an environmental disaster in a low-income country, it is likely to cost them a substantial amount of money in paying for damages, lost trust, and reduced sales—by building up-to-date plants everywhere they minimize such risks. As a result of these factors, foreign-owned plants in low-income countries often have a better record of compliance with environmental laws than do locally-owned plants.

Pressuring Low-Income Countries for Higher Environmental Standards

In some cases, the issue is not so much whether globalization will pressure low-income countries to reduce their environmental standards, but instead whether the threat of blocking international trade can pressure these countries into adopting stronger standards. For example, restrictions on ivory imports in high-income countries, along with stronger government efforts to catch elephant poachers, have been credited with helping to reduce the illegal poaching of elephants in certain African countries.

However, it would be highly undemocratic for the well-fed citizens of high-income countries to attempt to dictate to the ill-fed citizens of low-income countries what domestic policies and priorities they must adopt, or how they should balance environmental goals against other priorities for their citizens. Furthermore, if high-income countries want stronger environmental standards in low-income countries, they have many options other than the threat of protectionism. For example, high-income countries could pay for anti-pollution equipment in low-income countries, or could help to pay for national parks. High-income countries could help pay for and carry out the scientific and economic studies that would help environmentalists in low-income countries to make a more persuasive case for the economic benefits of protecting the environment.

After all, environmental protection is vital to two industries of key importance in many low-income countries—agriculture and tourism. Environmental advocates can set up standards for labeling products, like “this tuna caught in a net that kept dolphins safe” or “this product made only with wood not taken from rainforests,” so that consumer pressure can reinforce environmentalist values. The United Nations also reinforces these values, by sponsoring treaties to address issues such as climate change and global warming, the preservation of biodiversity, the spread of deserts, and the environmental health of the seabed. Countries that share a national border or are within a region often sign environmental agreements about air and water rights, too. The WTO is also becoming more aware of environmental issues and more careful about ensuring that increases in trade do not inflict environmental damage.

Finally, note that these concerns about the race to the bottom or pressuring low-income countries for more strict environmental standards do not apply very well to the roughly half of all U.S. trade that occurs with other high-income countries. Many European countries have stricter environmental standards in certain industries than the United States.

The Unsafe Consumer Products Argument

One argument for shutting out certain imported products is that they are unsafe for consumers. Consumer rights groups have sometimes warned that the World Trade Organization would require nations to reduce their health and safety standards for imported products. However, the WTO explains its current agreement on the subject in this way: “It allows countries to set their own standards.” It also says “regulations must be based on science. . . . And they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail.” Thus, for example, under WTO rules it is perfectly legitimate for the United States to pass laws requiring that *all* food products or cars sold in the United States meet certain safety standards approved by the United States government, whether or not other countries choose to pass similar standards. However, such standards must have some scientific basis. It is improper to impose one set of health and safety standards for domestically produced goods but a different set of standards for imports, or one set of standards for imports from Europe and a different set of standards for imports from Latin America.

In 2007, Mattel recalled nearly two million toys imported from China due to concerns about high levels of lead in the paint, as well as some loose parts. It is unclear if other toys were subject to similar standards. In 2013, Japan blocked imports of U.S. wheat because of concerns that genetically modified (GMO) wheat might be included in the shipments. The science on the impact of GMOs on health is still developing.

The National Interest Argument

Some argue that a nation should not depend too heavily on other countries for supplies of certain key products, such as oil, or for special materials or technologies that might have national security applications. On closer consideration, this argument for protectionism proves rather weak.

As an example, in the United States, oil provides about 36% of all the energy and 21% of the oil used in the United States economy is imported. Several times in the last few decades, when disruptions in the Middle East have shifted the supply curve of oil back to the left and sharply raised the price, the effects have been felt across the United States economy. This is not, however, a very convincing argument for restricting oil imports. If the United States needs to be protected from a possible cutoff of foreign oil, then a more reasonable strategy would be to import 100% of the petroleum supply now, and save U.S. domestic oil resources for when or if the foreign supply is cut off. It might also be useful to import extra oil and put it into a stockpile for use in an emergency, as the United States government did by starting a Strategic Petroleum Reserve in 1977. Moreover, it may be necessary to discourage people from using oil, and to start a high-powered program to seek out alternatives to oil. A straightforward way to do this would

be to raise taxes on oil. Additionally, it makes no sense to argue that because oil is highly important to the United States economy, then the United States should shut out oil imports and use up its domestic supplies more quickly. U.S. domestic oil production is increasing. Shale oil is adding to domestic supply using fracking extraction techniques.

Whether or not to limit certain kinds of imports of key technologies or materials that might be important to national security and weapons systems is a slightly different issue. If weapons' builders are not confident that they can continue to obtain a key product in wartime, they might decide to avoid designing weapons that use this key product, or they can go ahead and design the weapons and stockpile enough of the key high-tech components or materials to last through an armed conflict. There is a U.S. Defense National Stockpile Center that has built up reserves of many materials, from aluminum oxides, antimony, and bauxite to tungsten, vegetable tannin extracts, and zinc (although many of these stockpiles have been reduced and sold in recent years). Think every country is pro-trade? How about the U.S.? The following Clear It Up might surprise you.

One final reason why economists often treat the national interest argument skeptically is that lobbyists and politicians can tout almost any product as vital to national security. In 1954, the United States became worried that it was importing half of the wool required for military uniforms, so it declared wool and mohair to be "strategic materials" and began to give subsidies to wool and mohair farmers. Although the government removed wool from the official list of "strategic" materials in 1960, the subsidies for mohair continued for almost 40 years until the government repealed them in 1993, and then reinstated them in 2002. All too often, the national interest argument has become an excuse for handing out the indirect subsidy of protectionism to certain industries or companies. After all, politicians, not nonpartisan analysts make decisions about what constitutes a key strategic material.

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11.4: How Governments Enact Trade Policy- Globally, Regionally, and Nationally

Learning Objectives

By the end of this section, you will be able to:

- Explain the origin and role of the World Trade Organization (WTO) and General Agreement on Tariffs and Trade (GATT)
- Discuss the significance and provide examples of regional trading agreements
- Analyze trade policy at the national level
- Evaluate long-term trends in barriers to trade

These public policy arguments about how nations should react to globalization and trade are fought out at several levels: at the global level through the World Trade Organization and through regional trade agreements between pairs or groups of countries.

The World Trade Organization

The World Trade Organization (WTO) was officially born in 1995, but its history is much longer. In the years after the Great Depression and World War II, there was a worldwide push to build institutions that would tie the nations of the world together. The United Nations officially came into existence in 1945. The World Bank, which assists the poorest people in the world, and the International Monetary Fund, which addresses issues raised by international financial transactions, were both created in 1946. The third planned organization was to be an International Trade Organization, which would manage international trade. The United Nations was unable to agree to this. Instead, 27 nations signed the General Agreement on Tariffs and Trade (GATT) in Geneva, Switzerland on October 30, 1947 to provide a forum in which nations could come together to negotiate reductions in tariffs and other barriers to trade. In 1995, the GATT transformed into the WTO.

The GATT process was to negotiate an agreement to reduce barriers to trade, sign that agreement, pause for a while, and then start negotiating the next agreement. Table 11.3 shows rounds of talks in the GATT, and now the WTO. Notice that the early rounds of GATT talks took a relatively short time, included a small number of countries, and focused almost entirely on reducing tariffs. Since the mid-1960s, however, rounds of trade talks have taken years, included a large number of countries, and have included an ever-broadening range of issues.

Year	Place or Name of Round	Main Subjects	Number of Countries Involved
1947	Geneva	Tariff reduction	23
1949	Annecy	Tariff reduction	13
1951	Torquay	Tariff reduction	38
1956	Geneva	Tariff reduction	26
1960–61	Dillon round	Tariff reduction	26
1964–67	Kennedy round	Tariffs, anti-dumping measures	62
1973–79	Tokyo round	Tariffs, nontariff barriers	102
1986–94	Uruguay round	Tariffs, nontariff barriers, services, intellectual property, dispute settlement, textiles, agriculture, creation of WTO	123
2001–	Doha round	Agriculture, services, intellectual property, competition, investment, environment, dispute settlement	147

Table 11.3 The Negotiating Rounds of GATT and the World Trade Organization

The sluggish pace of GATT negotiations led to an old joke that GATT really stood for Gentleman's Agreement to Talk and Talk. The slow pace of international trade talks, however, is understandable, even sensible. Having dozens of nations agree to any treaty is a lengthy process. GATT often set up separate trading rules for certain industries, like agriculture, and separate trading rules for certain countries, like the low-income countries. There were rules, exceptions to rules, opportunities to opt out of rules, and precise wording to be fought over in every case. Like the GATT before it, the WTO is not a world government, with power to impose its decisions on others. The total staff of the WTO Secretariat in 2021 is 625 people and its annual budget (as of 2020) is \$197 million, which makes it smaller in size than many large universities.

Regional Trading Agreements

There are different types of economic integration across the globe, ranging from free trade agreements, in which participants allow each other's imports without tariffs or quotas, to common markets, in which participants have a common external trade policy as well as free trade within the group, to full economic unions, in which, in addition to a common market, monetary and fiscal policies are coordinated. Many nations belong both to the World Trade Organization and to regional trading agreements.

The best known of these regional trading agreements is the European Union. In the years after World War II, leaders of several European nations reasoned that if they could tie their economies together more closely, they might be more likely to avoid another devastating war. Their efforts began with a free trade association, evolved into a common market, and then transformed into what is now a full economic union, known as the European Union. The EU, as it is often called, has a number of goals. For example, in the early 2000s it introduced a common currency for Europe, the euro, and phased out most of the former national forms of money like the German mark and the French franc, though a few have retained their own currency. Another key element of the union is to eliminate barriers to the mobility of goods, labor, and capital across Europe. In 2016, Britain voted to leave the European Union—a move that was completed in January 2020.

For the United States, perhaps the best-known regional trading agreement is the North American Free Trade Agreement (NAFTA).² The United States also participates in some less-prominent regional trading agreements, like the Caribbean Basin Initiative, which offers reduced tariffs for imports from these countries, and a free trade agreement with Israel.

The world has seen a flood of regional trading agreements in recent years. About 100 such agreements are now in place. Table 11.4 lists a few of the more prominent ones. Some are just agreements to continue talking. Others set specific goals for reducing tariffs, import quotas, and nontariff barriers. One economist described the current trade treaties as a “spaghetti bowl,” which is what a map with lines connecting all the countries with trade treaties looks like.

There is concern among economists who favor free trade that some of these regional agreements may promise free trade, but actually act as a way for the countries within the regional agreement to try to limit trade from anywhere else. In some cases, the regional trade agreements may even conflict with the broader agreements of the World Trade Organization.

Trade Agreements	Participating Countries
Asia Pacific Economic Cooperation (APEC)	Australia, Brunei, Canada, Chile, People's Republic of China, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Chinese Taipei, Thailand, United States, Vietnam
European Union (EU)	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom*
North America Free Trade Agreement (NAFTA)	Canada, Mexico, United States
Latin American Integration Association (LAIA)	Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela, Panama
Association of Southeast Asian Nations (ASEAN)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam

Trade Agreements	Participating Countries
Southern African Development Community (SADC)	Angola, Botswana, Comoros, Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe

Table 11.4 Some Regional Trade Agreements * Following the 2016 referendum vote to leave the European Union, the UK government triggered the withdrawal process on March 29, 2017, setting the date for the UK to leave by April 2019. In January 2020, the withdrawal was complete and the United Kingdom is now no longer part of the EU trading bloc. Also, as of 2020, NAFTA has been replaced by the United States-Mexico-Canada (USMCA) free trade agreement.

Trade Policy at the National Level

Yet another dimension of trade policy, along with international and regional trade agreements, happens at the national level. The United States, for example, imposes import quotas on sugar, because of a fear that such imports would drive down the price of sugar and thus injure domestic sugar producers. One of the jobs of the United States Department of Commerce is to determine if there is import dumping from other countries. The United States International Trade Commission—a government agency—determines whether the dumping has substantially injured domestic industries, and if so, the president can impose tariffs that are intended to offset the unfairly low price.

In the arena of trade policy, the battle often seems to be between national laws that increase protectionism and international agreements that try to reduce protectionism, like the WTO. Why would a country pass laws or negotiate agreements to shut out certain foreign products, like sugar or textiles, while simultaneously negotiating to reduce trade barriers in general? One plausible answer is that international trade agreements offer a method for countries to restrain their own special interests. A member of Congress can say to an industry lobbying for tariffs or quotas on imports: “Sure would like to help you, but that pesky WTO agreement just won’t let me



Long-Term Trends in Barriers to Trade

In newspaper headlines, trade policy appears mostly as disputes and acrimony. Countries are almost constantly threatening to challenge other nations’ “unfair” trading practices. Cases are brought to the dispute settlement procedures of the WTO, the European Union, NAFTA, and other regional trading agreements. Politicians in national legislatures, goaded on by lobbyists, often threaten to pass bills that will “establish a fair playing field” or “prevent unfair trade”—although most such bills seek to accomplish these high-sounding goals by placing more restrictions on trade. Protesters in the streets may object to specific trade rules or to the entire practice of international trade.

Through all the controversy, the general trend in the last 60 years is clearly toward lower barriers to trade. The average level of tariffs on imported products charged by industrialized countries was 40% in 1946. By 1990, after decades of GATT negotiations, it was down to less than 5%. One of the reasons that GATT negotiations shifted from focusing on tariff reduction in the early rounds to a broader agenda was that tariffs had been reduced so dramatically there was not much more to do in that area. U.S. tariffs have followed this general pattern: After rising sharply during the Great Depression, tariffs dropped off to less than 2% by the end of the century. Although measures of import quotas and nontariff barriers are less exact than those for tariffs, they generally appear to be at lower levels than they had been previously, too.

Thus, the last half-century has seen both a dramatic reduction in government-created barriers to trade, such as tariffs, import quotas, and nontariff barriers, and also a number of technological developments that have made international trade easier, like advances in transportation, communication, and information management. The result has been the powerful surge of international trade.

These trends were altered by two important events in 2016: the UK vote to leave the EU and the election of President Trump in the United States, whose administration pursued a policy of raising trade barriers. In 2018, tariffs on a broad range of imports from China were raised by around 25%. As of 2022, the UK has been out of the EU for two years, and it remains unclear if President Biden’s administration will adjust or remove President Trump’s trade barriers.

Footnotes

- [2](#)As of July 1, 2020, NAFTA was officially replaced with the United States-Mexico-Canada (USMCA) free trade agreement. It is broadly similar to the original NAFTA.

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11.5: The Tradeoffs of Trade Policy

Learning Objectives

By the end of this section, you will be able to:

- Asses the complexity of international trade
- Discuss why a market-oriented economy is so affected by international trade
- Explain disruptive market change

Economists readily acknowledge that international trade is not all sunshine, roses, and happy endings. Over time, the average person gains from international trade, both as a worker who has greater productivity and higher wages because of the benefits of specialization and comparative advantage, and as a consumer who can benefit from shopping all over the world for a greater variety of quality products at attractive prices. The “average person,” however, is hypothetical, not real—representing a mix of those who have done very well, those who have done all right, and those who have done poorly. It is a legitimate concern of public policy to focus not just on the average or on the success stories, but also on those who have not been so fortunate. Workers in other countries, the environment, and prospects for new industries and materials that might be of key importance to the national economy are also all legitimate issues.

The common belief among economists is that it is better to embrace the gains from trade, and then deal with the costs and tradeoffs with other policy tools, than it is to cut off trade to avoid the costs and tradeoffs.

To gain a better intuitive understanding for this argument, consider a hypothetical American company called Technotron. Technotron invents a new scientific technology that allows the firm to increase the output and quality of its goods with a smaller number of workers at a lower cost. As a result of this technology, other U.S. firms in this industry will lose money and will also have to lay off workers—and some of the competing firms will even go bankrupt. Should the United States government protect the existing firms and their employees by making it illegal for Technotron to use its new technology? Most people who live in market-oriented economies would oppose trying to block better products that lower the cost of services. Certainly, there is a case for society providing temporary support and assistance for those who find themselves without work. Many would argue for government support of programs that encourage retraining and acquiring additional skills. Government might also support research and development efforts, so that other firms may find ways of outdoing Technotron. Blocking the new technology altogether, however, seems like a mistake. After all, few people would advocate giving up electricity because it caused so much disruption to the kerosene and candle business. Few would suggest holding back on improvements in medical technology because they might cause companies selling leeches and snake oil to lose money. In short, most people view disruptions due to technological change as a necessary cost that is worth bearing.

Now, imagine that Technotron’s new “technology” is as simple as this: the company imports what it sells from another country. In other words, think of foreign trade as a type of innovative technology. The objective situation is now exactly the same as before. Because of Technotron’s new technology—which in this case is importing goods from another country—other firms in this industry will lose money and lay off workers. Just as it would have been inappropriate and ultimately foolish to respond to the disruptions of new scientific technology by trying to shut it down, it would be inappropriate and ultimately foolish to respond to the disruptions of international trade by trying to restrict trade.

Some workers and firms will suffer because of international trade. In a living, breathing market-oriented economy, some workers and firms will always be experiencing disruptions, for a wide variety of reasons. Corporate management can be better or worse. Workers for a certain firm can be more or less productive. Tough domestic competitors can create just as much disruption as tough foreign competitors. Sometimes a new product is a hit with consumers; sometimes it is a flop. Sometimes a company is blessed by a run of good luck or stricken with a run of bad luck. For some firms, international trade will offer great opportunities for expanding productivity and jobs; for other firms, trade will impose stress and pain. The disruption caused by international trade is not fundamentally different from all the other disruptions caused by the other workings of a market economy.

In other words, the economic analysis of free trade does not rely on a belief that foreign trade is not disruptive or does not pose tradeoffs; indeed, the story of Technotron begins with a particular disruptive market change—a new technology—that causes real tradeoffs. In thinking about the disruptions of foreign trade, or any of the other possible costs and tradeoffs of foreign trade discussed in this chapter, the best public policy solutions typically do not involve protectionism, but instead involve finding ways

for public policy to address the particular issues resulting from these disruptions, costs, and tradeoffs, while still allowing the benefits of international trade to occur.

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