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Supply and Demand: The Basics of Economic Analysis

Learning Objectives

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

- Define demand and list the factors that influence it.
- Define supply and list the factors that influence it.
- Define equilibrium and disequilibrium and explain how market equilibrium is reached.
- Use the supply and demand model to illustrate price formation.
- Evaluate the function of prices in a free market.

Introduction

Consider this. . . In 2012, a concert at Madison Square Garden in New York sold out in less than 30 seconds. Madison Square Garden can accommodate 20,000 fans at concerts, and the artist was playing two dates, meaning that possibly more than 1,000 tickets were sold every second once sales opened. Fans were frustrated. They could not believe it. How could tickets sell out so quickly?

As soon as the concert sold out, tickets were instantly available on a variety of ticket resale sites, ranging from \$122 to \$4,139! Perhaps there was more to the story. Fans were angry and blamed ticket brokers, or scalpers. However, the secondary ticket market, now led by websites like StubHub and TicketsNow, is nothing new in the entertainment industry. What is really going on here? Are the ticket brokers terrible people? What is the real price of these tickets, and who is capturing the value of them? This chapter will help you make sense of what is going on with the speedy sale of tickets at Madison Square Garden and a host of similar interactions between demand and supply.

3.1 Demand

Markets are places where buyers and sellers meet to engage in exchange. In the process of exchanging, they determine prices and quantities produced. The supply and demand model explains how buyers and sellers interact to determine prices and quantities. It is the most basic and widely used model in economics.

The **quantity demanded** is the amount of a good or service consumers are willing and able to buy at a specific price during a certain time period. For example, how many donuts would you buy today if the price of a donut were \$1? Your answer is your quantity demanded at a price of \$1.

Demand is the relationship between the quantities demanded of a good or service at various prices over a certain time period. It is important to recognize that a consumer's demand is not the same as needs or wants, which can be measured in some social or biological way. Need is a concept reserved for policy makers and political decision making. For needs and wants to be demands, they must reflect what people will actually do when confronted with different prices. Many things affect the demand for a good or service. As you well know, price is a very important determinant of demand. Thus, we focus first on what happens when the price of a good or service changes relative to the prices of other goods and services. While looking at the relationship between price and quantity demanded, economists hold constant everything else that affects demand.

The **law of demand** states that the *quantity demanded* of a good or service in a given time period is negatively related to its price, *ceteris paribus*. In other words, if everything else is held constant, consumers will purchase more of a good or service at a lower price than at a higher price. As price rises, *ceteris paribus*, consumers will purchase less of a good

or service, because its opportunity cost in terms of other goods is higher. Note that we are saying that quantity demanded—not demand—is a function of price. This distinction is critical. *Demand* refers to a whole set of price–quantity combinations, whereas *quantity demanded* is the amount consumers want to buy at a particular price.

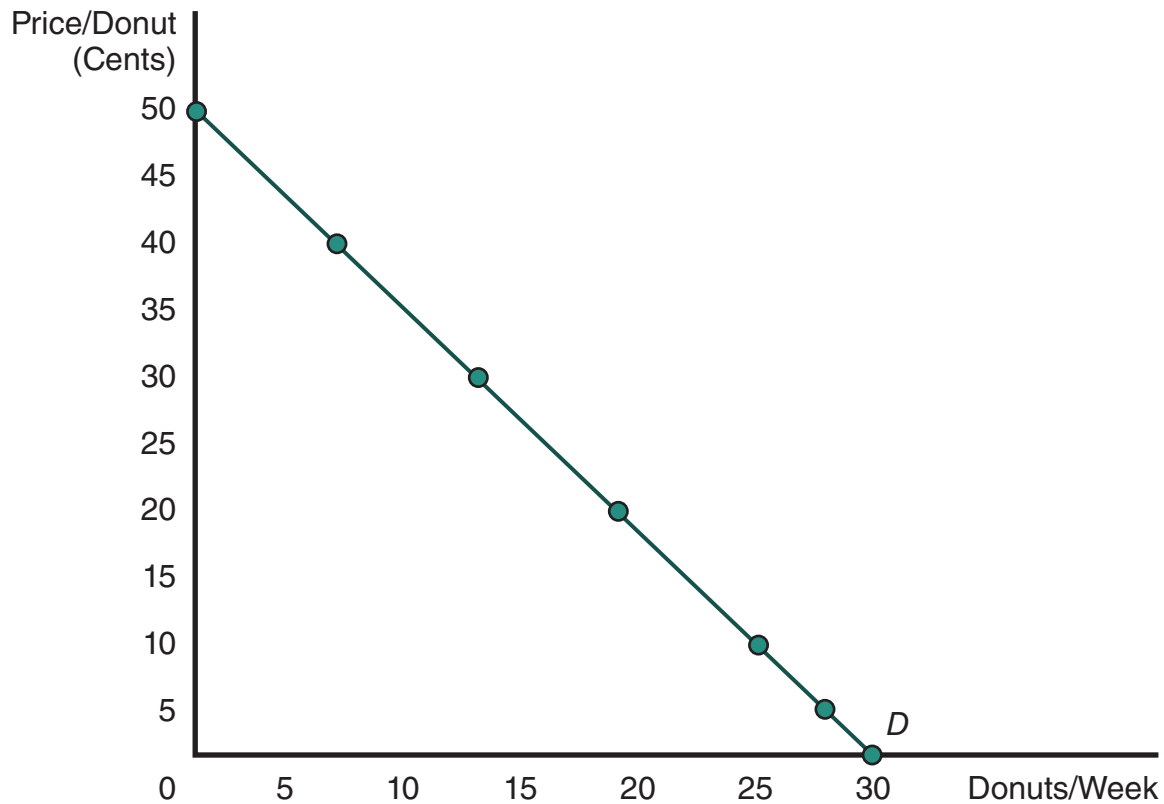
A **demand schedule** shows the various quantities demanded at various prices during a specified period of time. How can we generate a demand schedule for an individual? We could develop Judy’s demand schedule for potato chips by suggesting various prices and asking her how many bags of potato chips she would buy per week at each price. Actual experiments with a variety of subjects support the validity of the law of demand.

The demand schedule in Table 3.1 shows Fred’s demand for donuts. As price falls, Fred chooses to consume larger quantities of donuts per week, substituting donuts for other items he might purchase. Table 3.1 is consistent with the law of demand because Fred demands larger quantities of donuts at lower prices. Note that there is a time dimension—a week. We cannot determine how many donuts Fred will buy without specifying a time frame—per day, per week, per month, per year, or per lifetime.

We can represent the demand schedule of Table 3.1 on a graph called a **demand curve**, as shown in Figure 3.1. A demand curve is a graph representing a demand schedule. When we draw a demand curve, the vertical axis shows the price per unit and the horizontal axis shows the quantity per time period. Note that we usually draw linear curves for convenience.

Table 3.1: Fred’s demand schedule for donuts

Price per donut (in cents)	Quantity of donuts demanded (per week)
50	1
40	7
30	13
20	19
10	25
5	28

Figure 3.1: Fred's demand for donuts

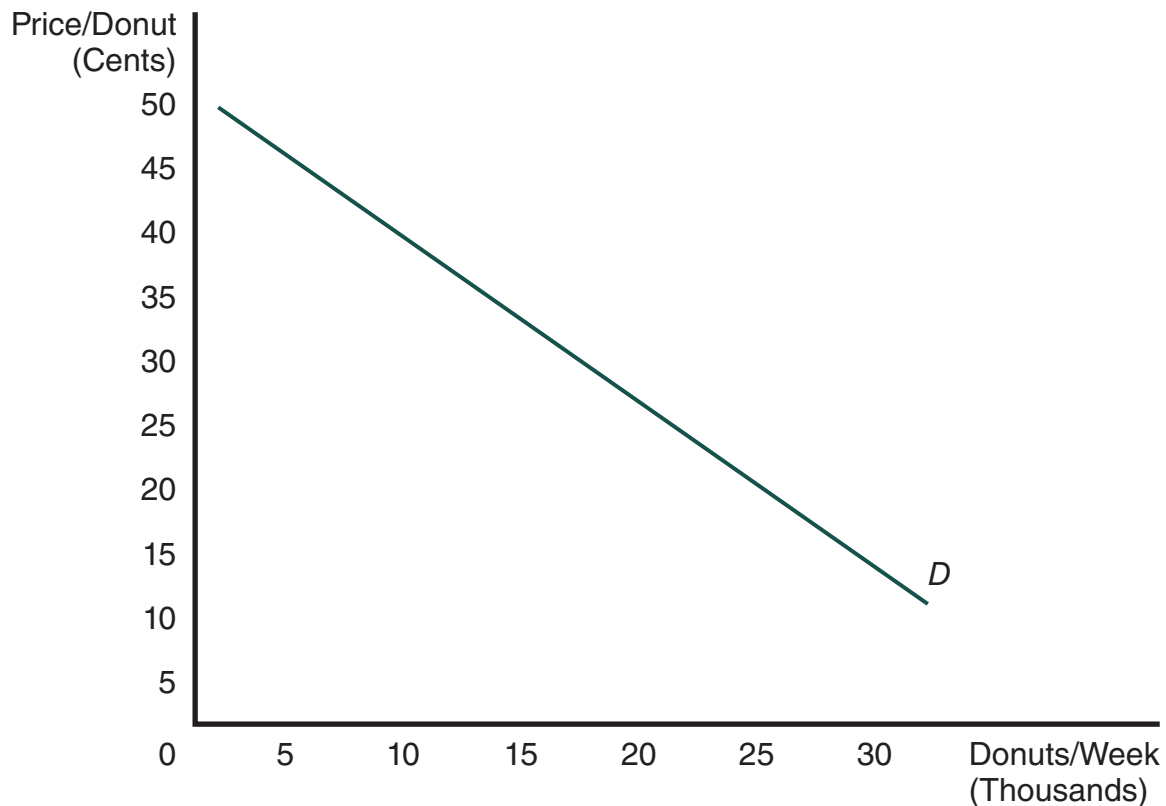
An individual's demand curve shows the quantity that he or she will purchase during a specific period at different prices.

Market Demand

Table 3.1 and Figure 3.1 show a demand schedule and a demand curve for a single consumer. Sellers, however, are more interested in the **market demand curve** for a brand of donuts or even for all donuts. A market demand curve shows what quantities will be demanded by all consumers in a certain market at various prices. The market demand curve is the sum of all of the individual demand curves. We add the demand curves for individual consumers horizontally. For example, to determine the market quantity of donuts demanded at a price of 40 cents per donut, we add the seven donuts demanded by Fred to two donuts demanded by Betty, a donut demanded by Joanna, and so on. We find a total (market) quantity demanded of 10,000 donuts at a price of 40 cents per donut. These two numbers represent one point on the market demand curve. We then repeat the addition of quantities demanded for every other price. The result is the downward-sloping market demand curve shown in Figure 3.2, showing a negative relationship between price and quantity. At higher prices, buyers want fewer donuts. At lower prices, they want more.

As price changes in the market, the quantity demanded changes in the opposite direction, just as it did for Fred. Figure 3.2 shows that 13,000 donuts are purchased at a price of 35 cents per donut. If the price falls to 20 cents per donut, the quantity demanded increases to 25,000 donuts. If the price rises to 45 cents per donut, the quantity demanded decreases to 5,000 donuts.

Figure 3.2: Market demand for donuts



A market demand curve is a graph depicting how much will be purchased in the market at various prices. It is the sum of all of the individual demand curves.

Ceteris Paribus Conditions and Shifts in Demand

Many things can affect the demand for a good or service. Economists separate these factors into two important categories: price and everything else. Because price is so important, economists express demand as a function of price. The price of a good affects the quantity demanded. Everything other than price affects demand. So far we have held the nonprice determinants of demand constant while we focused on price. Now we want to look at the nonprice determinants and how they affect the demand curve.

The nonprice determinants of demand are

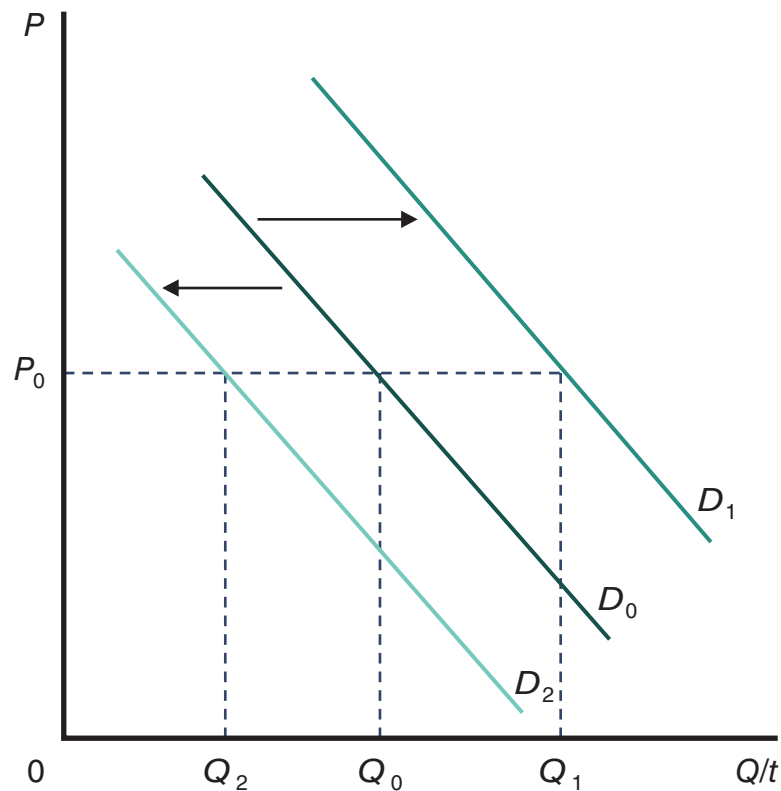
- the tastes of the group demanding the good or service,
- the size of the group demanding the good or service,
- the income and wealth of the group demanding the good or service,
- the prices of other goods and services, and
- expectations about future prices or income.

Nearly everything that affects demand does so by working through one of these determinants. Weather, for example, may affect demand for bread by changing tastes. People may eat more cold sandwiches instead of hot meals in warmer weather. Economists study demand by holding all but one of these determinants constant and identifying what happens when that one changes.

Changes in the *ceteris paribus* conditions change the demand for the good or service. Economists are careful to distinguish clearly between movements along a demand curve and changes (or shifts) of the curve itself. Movements along the curve are *changes in quantity demanded*, caused solely by a change in the *price* of the good. When the price of bread goes up, fewer loaves are demanded—a change in quantity demanded. Changes (or shifts) of the curve are *changes in demand* caused by changes in any of the *ceteris paribus* conditions. When the weather gets hot or population increases, more loaves are demanded at every possible price—a change in demand that causes the demand curve to shift.

Tastes

How do changes in the *ceteris paribus* conditions affect the market demand for a good? Suppose the top health magazine publishes an article touting the benefits of a high-fiber diet, causing people's interest in high-fiber diets to increase. The **increase in demand** causes the demand curve to shift to the right, from D_0 to D_1 in Figure 3.3. An increase in demand means that at every price, consumers demand a larger quantity than they did before. The opposite would occur if tastes changed away from bread. Such a change in tastes would cause a **decrease in demand**, represented by a shift from D_0 to D_2 . A decrease in demand means that at every price, consumers demand a smaller quantity than before.

Figure 3.3: Effects of changes in the ceteris paribus conditions on demand

If a change causes more of a good to be demanded at every price, the demand curve will shift to the right, as from D_0 to D_1 . A change that causes less to be demanded at every price causes a shift to the left, as from D_0 to D_2 .

Size of the Group

The market demand curve, as you saw earlier, is found by adding the individual demand curves. If the number of individuals in the group of potential consumers changes, market demand will also change. Suppose demand curve D_0 in Figure 3.3 represents the demand for automobiles in a state with a minimum driving age of 16 years. If the law is changed to allow 15-year-olds to drive, the group of potential consumers increases. Some of them, or their families, will want an extra car for the extra driver. The demand curve will shift from D_0 to D_2 . The size of the group has increased; therefore, there has been an increase in the demand for the good, or a larger quantity demanded at every price.

On the other hand, if the size of the group decreases, there will be a decrease in demand. If the minimum driving age were raised from 16 to 18 in the majority of states, the demand for cars could decrease, resulting in a shift from D_0 to D_2 in Figure 3.3.

Income and Wealth

Income changes can also shift the demand curve. You might expect that demand for all goods would increase as income increases; however, this is not always true. Whether demand increases in this case depends on whether the good is a **normal good** or an **inferior good**. A normal good is a good for which demand increases as income increases, *ceteris paribus*. If demand falls when income rises, the good is an inferior good. Most goods are normal goods, but there are a few inferior goods.



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Instant noodles are often referred to as an inferior good—one that is consumed by college students. If a person's income increases, he or she tends to consume fewer units of instant noodles.

Consider, for example, the difference between steak and hamburger. If, as an individual's income increases, the individual consumes less hamburger and more steak, then hamburger is an inferior good and steak is a normal good. However, beef or meat in general is still considered a normal good. Likewise, a mobile home might be considered inferior to a house, but housing in general is a normal good.

For a normal good, an increase in income would shift the demand curve in Figure 3.3 from D_0 to D_1 . For an inferior good, an increase in income would shift the demand curve from D_0 to D_2 , as buyers could afford the more expensive substitute. For a normal good, a decrease in income would shift the demand curve from D_0 to D_2 . For an inferior good, a decrease in income would shift the demand curve from D_0 to D_1 as buyers were forced to economize with less appealing goods.

Changes in wealth have the same effect as changes in income. If the value of assets falls, leaving people less wealthy, demand for normal goods will decline. When the U.S. stock market crashed in September 2008, the decline in wealth caused consumer spending on many goods and services to decrease.

Prices of Other Goods and Services

The fourth nonprice determinant of demand is the prices of other goods and services. There are two classes in this category: complements and substitutes. **Complementary goods** are goods that are jointly consumed. If consuming two goods together enhances the enjoyment of both, the goods are called complements. Examples are cereal and milk, lamps and light bulbs, and French fries and ketchup. Substitutes have the opposite relationship: Rather than enhancing each other's consumption, **substitute goods** replace each other. Orange juice and apple juice, Coca-Cola and Pepsi, and shoes from Reebok and Adidas are examples of substitute goods.

If two goods are complements, a rise in the price of one will decrease demand for the other. Referring again to Figure 3.3, consider D_0 as the demand curve for bagels. If the price of a complementary good—cream cheese—goes up, the demand for bagels will decrease, shifting the curve from D_0 to D_2 . Buyers will consume less cream cheese because its price is higher and will thus demand fewer bagels at every price. If the price of cream cheese fell, consumers would want to consume more cream cheese and thus would demand more bagels to go with it at every price. In Figure 3.3, demand for bagels would shift from D_0 to D_1 .

If two goods are substitutes, a rise in the price of one will increase demand for the other. Assume for a moment that Coca-Cola and Pepsi are substitutes. Suppose curve D_0 in Figure 3.3 represents the demand for Coca-Cola. What would happen if the price of Pepsi increased relative to the price of Coca-Cola? Since this makes the opportunity cost of Coca-Cola lower, consumers would demand more of it at every price. The demand for Coca-Cola would shift from D_0 to D_1 . Consumers would move from buying the higher priced good to the relatively lower priced substitute.

If the price of Pepsi decreased relative to the price of Coca-Cola, the opposite would happen: The opportunity cost of Coca-Cola would be higher, and consumers would demand less of it at every price as they shifted consumption to Pepsi. The decrease in demand for Coca-Cola is shown by a shift from D_0 to D_2 in Figure 3.3. The shift to substitutes as price rises means that the quantity demanded of the good falls, exactly as predicted by the law of demand.

In a broad sense, all goods are substitutes for each other because they are all alternatives on which people can spend income. Some goods are closer substitutes than others, however. The more easily that good A can be substituted for good B, the more a change in the price of one will affect the demand curve for the other. A rise in the price of watches, for example, would have much less impact on the demand for hot dogs than on the demand for clocks, bracelets, or other substitutes.

Expectations

The last *ceteris paribus* condition that affects demand is **expectations**. If individuals expect anything important to change in the future, they may take action now that they would otherwise postpone. For example, if you expect that the demand for cars will be so high next year that their prices will rise, you may decide to buy a car now to avoid paying a higher price. If you expect your income to be higher in the future, you may demand more goods and borrow to pay for them so that you do not have to delay consumption until your income actually rises. Expectations play a very important role in markets, since they can help economists predict future changes in market prices and quantities.

Check Point: Reasons for a Change in the Quantity Demanded and Reasons for a Change in Demand

Reasons for a Change in the Quantity Demanded

- The quantity demanded will *increase* if the price of the good or service *decreases*.
- The quantity demanded will *decrease* if the price of the good or service *increases*.

Reasons for a Change in Demand

The demand for a normal good or service will *increase* if

- buyers' tastes change to favor that good or service, the number of buyers in the market increases, the income or wealth of buyers increases, the prices of complementary goods fall, or the prices of substitute goods increase; or
- buyers' expectations for the future cause them to purchase more now.

The demand for a normal good or service will *decrease* if

- buyers' tastes change against that good or service, the number of buyers in the market decreases, the income or wealth of buyers decreases, the prices of complementary goods increase, or the prices of substitute goods decrease; or
- buyers' expectations of the future cause them to delay purchases.

3.2 Supply

The **quantity supplied** is the amount of a good or service sellers are willing and able to sell at a specific price during a certain time period. For example, how many glasses of lemonade would you sell today if the price per glass were 60 cents? Your answer is your quantity supplied at a price of 60 cents. **Supply** is the relationship between the quantities supplied of a good or service at various prices over a certain time period. A **supply schedule** shows the quantities offered for sale at various prices during a specific period of time.

Economics in Action: Limited Supply Yields Increased Prices

BBC News anchor Ben Godfrey toured a potato farm in November 2012. Godfrey learned that farmers had to increase their prices after rain reduced the quantity of potatoes able to be sold. Because the suppliers had to increase their prices, restaurants had to raise their prices on chips. Follow the journey from ground to store at <http://www.bbc.co.uk/news/business-20317781>.

The Law of Supply

We state the **law of supply** as follows: The *quantity supplied* of a good or service in a given time period is generally positively related to its price, *ceteris paribus*. With all else held constant, suppliers usually will supply less of a good or service at lower prices. As prices rise, the quantity supplied will increase, because it becomes more profitable to produce and sell the good. Note also the word *usually*. This relationship is not always true because of



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Susan supplies more glasses of lemonade when she can get a higher price per glass.

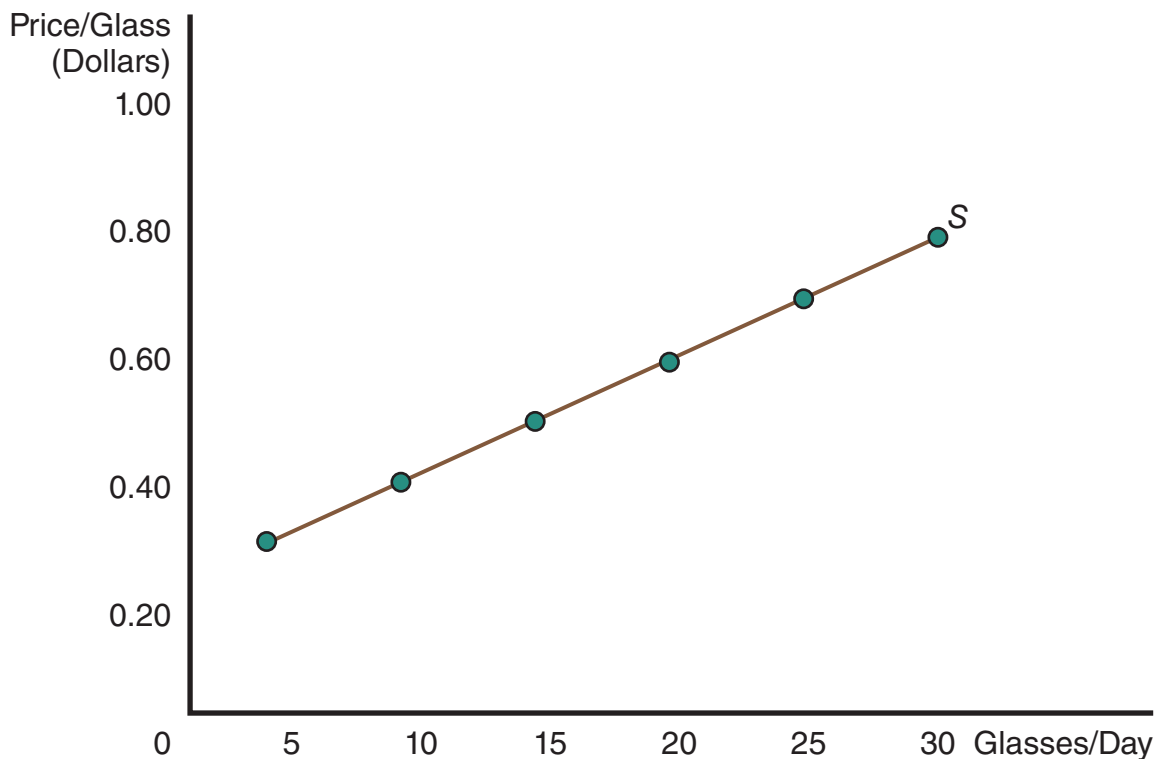
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two exceptions. The first exception occurs when there is no time to produce more units (for example, theater seats at a sold-out performance) or when a unique supplier no longer exists (for example, paintings by Picasso). In these unusual cases, quantity supplied does not respond to price at all. The second exception occurs for certain products for which increased volume allows costs per unit to fall. For example, as a software company increases its output of a certain program, its costs per unit typically fall. These lower costs may be passed on to customers in the form of lower prices.

Table 3.2 shows a hypothetical supply schedule for an individual supplier—Susan’s Lemonade Stand. A supply schedule shows the quantities supplied during a period of time at various prices. Like a demand schedule, a supply schedule includes a time frame—in this case, a day. Table 3.2 is consistent with the law of supply because Susan supplies larger quantities of lemonade at higher prices. The supply schedule of Table 3.2 can be drawn on a graph as shown in Figure 3.4. This **supply curve** is a diagram showing the quantity supplied in a particular time and at various prices. It shows a positive relationship—more will be offered for sale at higher prices. Price per unit is on the vertical axis and quantity per time period is on the horizontal axis, just as it was for the demand curve. Supply curves usually have a positive *y*-intercept, indicating that at some low price, suppliers may offer none of the good.

Table 3.2: Susan's supply schedule for lemonade

Price per glass (in dollars)	Quantity of glasses supplied (per day)
\$0.20	0
\$0.40	5
\$0.60	10
\$0.80	15
\$1.00	20
\$1.20	25

Figure 3.4: Susan's supply of lemonade

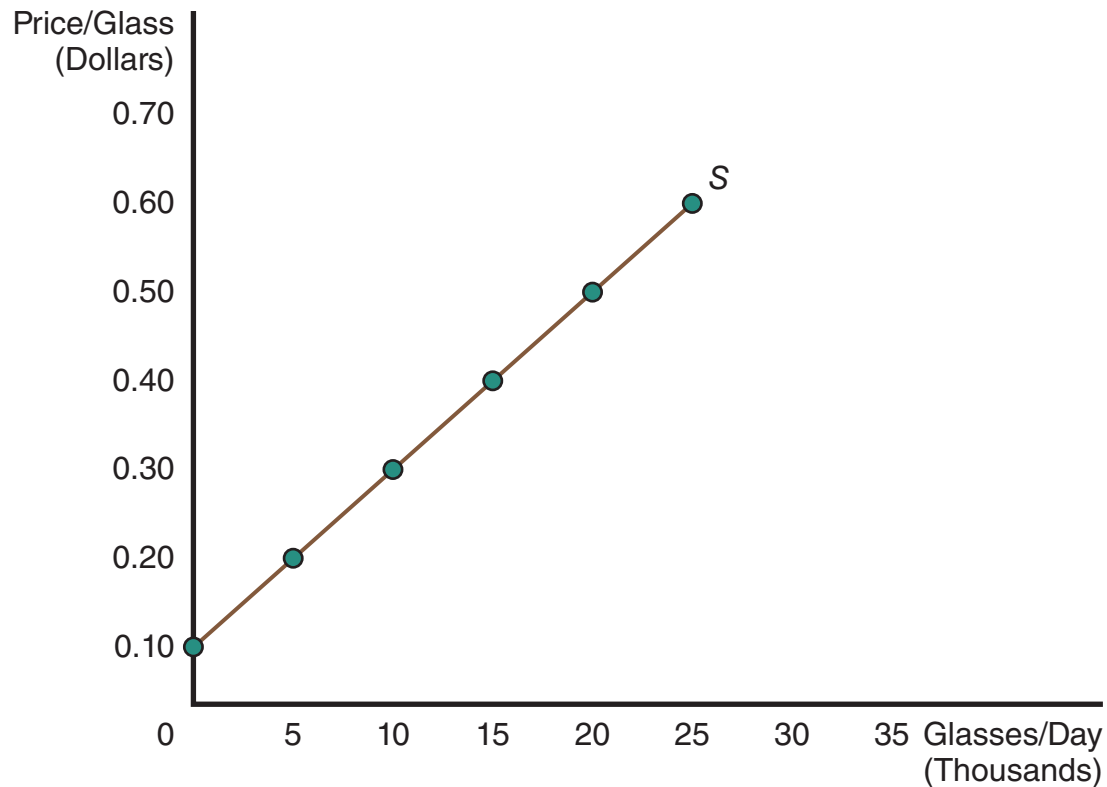
A supply curve for an individual (or firm) shows how much of a good will be offered for sale at various prices.

Market Supply

The **market supply curve** is the sum of all of the individual supply curves. Figure 3.5 is a market supply curve for lemonade, showing the total quantity supplied over a period of time at various prices. As price changes in the market, quantity supplied changes in the

same direction. Figure 3.5 shows that 5,000 glasses of lemonade per day are supplied at a price of 20 cents per glass. If price falls to 10 cents per glass, quantity supplied decreases to zero glasses. If price rises to 40 cents per glass, quantity supplied increases to 15,000 glasses. These changes occur because most producers are willing to sell more units if the price rises enough to cover the added costs of production.

Figure 3.5: Market supply of lemonade



A market supply curve shows how much of a good will be offered for sale in the market at various prices. It is the sum of all of the individual supply curves.

Changes in Supply and the Ceteris Paribus Conditions

A supply curve is drawn to show a relationship between price and quantity supplied, with everything else held constant. A change in one of the ceteris paribus conditions will cause the entire supply curve to shift. The most important of these are

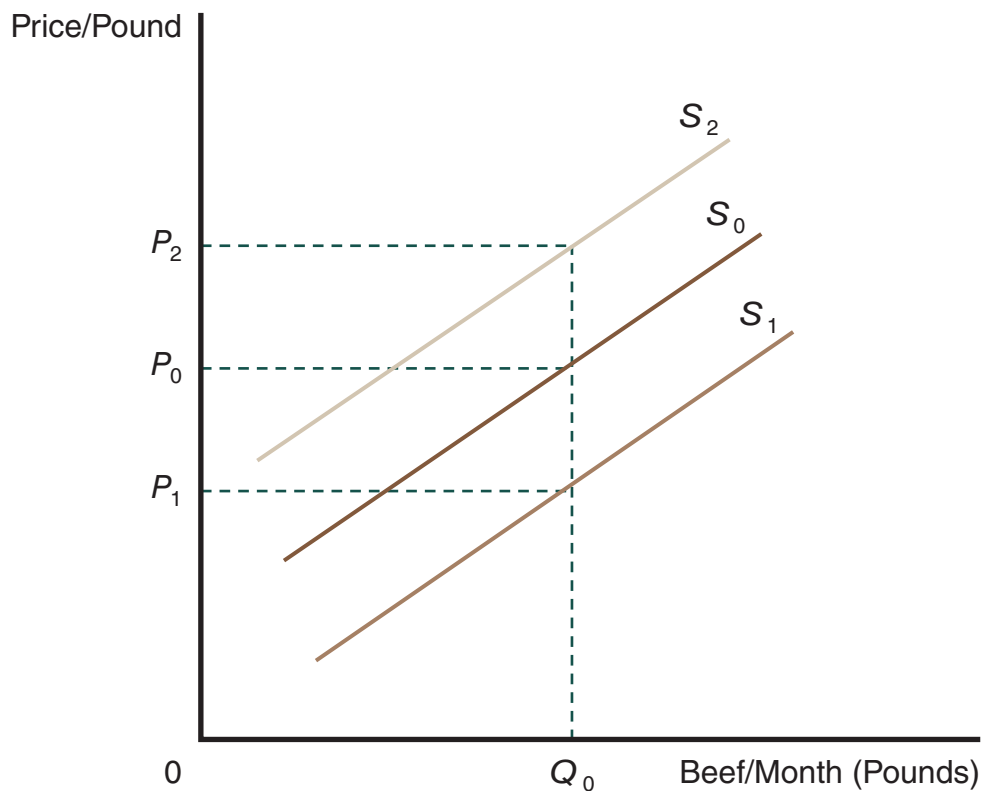
- the state of technology,
- the prices of the productive resources,
- the number of suppliers,
- expectations about the future, and
- the prices of related goods.

Everything that affects supply works through one of these determinants. For example, if a natural disaster destroys large amounts of capital, it will affect supply by increasing the price of that resource. If the price of corn rises relative to wheat, a farmer might decide to grow corn instead of wheat. If the number of sellers increases, the total supply will increase.

Technology

Suppose technology improves—for instance, agricultural researchers develop a low-cost drug that causes a young steer to double in weight rapidly. This advance in technology means that more beef will be supplied at each price. There is an **increase in supply**, or a shift in the supply curve, such that a larger quantity will be provided at every price. In Figure 3.6, an increase in supply is shown as a shift from S_0 to S_1 . A negative change in technology will have the opposite effect. Suppose the government discovers that the drug used to fatten steers has harmful effects on humans who eat the beef. Farmers are forbidden to continue using the drug. Less beef will be supplied at each price. There will be a **decrease in supply**, represented as a shift from S_0 to S_2 in Figure 3.6.

Figure 3.6: Changes in the ceteris paribus conditions and supply



Changes in a ceteris paribus condition can cause the supply curve to shift. A change that causes more to be supplied at each price is an increase in supply and is represented by the shift from S_0 to S_1 . A change that causes the supply to decrease is represented by a shift from S_0 to S_2 .

Prices of the Productive Resources

As you recall from Chapter 2, the productive resources are land, labor, capital, and entrepreneurship. The price paid for the use of land is rent. The price of labor's services is wages. The price for using capital is interest. The return to the entrepreneur is profit. If the price of a resource—such as wages for labor—goes up, the supply of products using that resource will be affected. Suppliers will offer less of the good at each price, because the costs of production have gone up.

Suppose S_0 in Figure 3.6 represents the market supply of beef. Assume that the wage rate of meatcutters increases. This will mean less beef will be supplied at each price. Supply will decrease from S_0 to S_2 . After the increase in wages, suppliers will supply the old amount (Q_0) only at a higher price (P_2). A rise in the price of a productive resource, *ceteris paribus*, causes a decrease in supply. The cost of supplying any particular quantity has increased; thus, less will be supplied at the old price, or the same amount will be supplied at a higher price. The opposite is also true: A decrease in the price of a productive resource will cause an increase in supply, shifting the curve from S_0 to S_1 in Figure 3.6.

Number of Suppliers

A change in the number of suppliers will also shift the supply curve. If the number of cattle ranchers declines, the supply curve will shift from S_0 to S_2 in Figure 3.6—a decrease in supply. In contrast, an increase in the number of ranchers will shift the supply curve from S_0 to S_1 —an increase in supply.

Expectations

Expectations about any of the *ceteris paribus* conditions or about market price can have an effect on supply. Assume that ranchers expect that the price of beef will fall next year because of an FDA policy statement that links beef consumption to colon cancer. What would this expectation cause ranchers to do? They would bring more cattle to market now, before the price falls. If enough ranchers share this expectation, the supply curve for this year will shift from S_0 to S_1 in Figure 3.6. The price of beef will fall from P_0 to P_1 because ranchers will be supplying more beef at all prices.

Prices of Related Goods

Changes in the prices of other goods can affect supply. If the price of a good that uses a similar production technique increases, a firm may switch production. A farmer may switch from corn to wheat when the price of wheat increases relative to the price of corn. A sewing factory might switch from men's shirts to babies' pajamas if the price of men's shirts fell and the price of babies' pajamas rose.

Check Point: Reasons for a Change in the Quantity Supplied and Reasons for a Change in Supply

Reasons for a Change in the Quantity Supplied

- The quantity supplied will *increase* if the price of the good or service *increases*.
- The quantity supplied will *decrease* if the price of the good or service *decreases*.

Reasons for a Change in Supply

The supply of a good or service will *increase* if

- new technology allows the good or service to be produced at lower cost, the prices of the productive resources decrease, or the number of suppliers increases; or
- the prices of other goods or services that can be produced with the same resources decrease or suppliers' expectations for the future cause them to produce more now.

The supply of a good or service will *decrease* if

- the prices of the productive resources increase or the number of suppliers decreases; or
- the prices of other goods or services that can be produced with the same resources increase or suppliers' expectations for the future cause them to produce less now.

3.3 Market Equilibrium

We can combine market supply and market demand schedules to determine the **market equilibrium**. Market equilibrium occurs at that price for which quantity demanded by consumers is equal to quantity supplied by producers. This equilibrium price is also called the **market-clearing price**.

Equilibrium and Disequilibrium

In Table 3.3, at a price of \$2.00, suppliers *want* to supply four million pounds of coffee and consumers *want* to purchase eight million pounds. A price of \$2.00 is not an equilibrium price, because quantity demanded exceeds quantity supplied by four million pounds at that price. This situation is one of disequilibrium, in which variables are moving toward equilibrium but are not yet there. This is an unstable position. Some consumers will not be able to purchase the amount they desire at a price of \$2.00. As they search for coffee, they will offer a higher price. As the price rises, quantity supplied will rise, and quantity demanded will fall. This process will continue until the price reaches \$3.00. At \$3.00, the amount consumers wish to purchase is exactly equal to the amount suppliers wish to sell. This quantity is the equilibrium quantity, and \$3.00 is the market-clearing price, because there is no tendency for price or quantity to change.

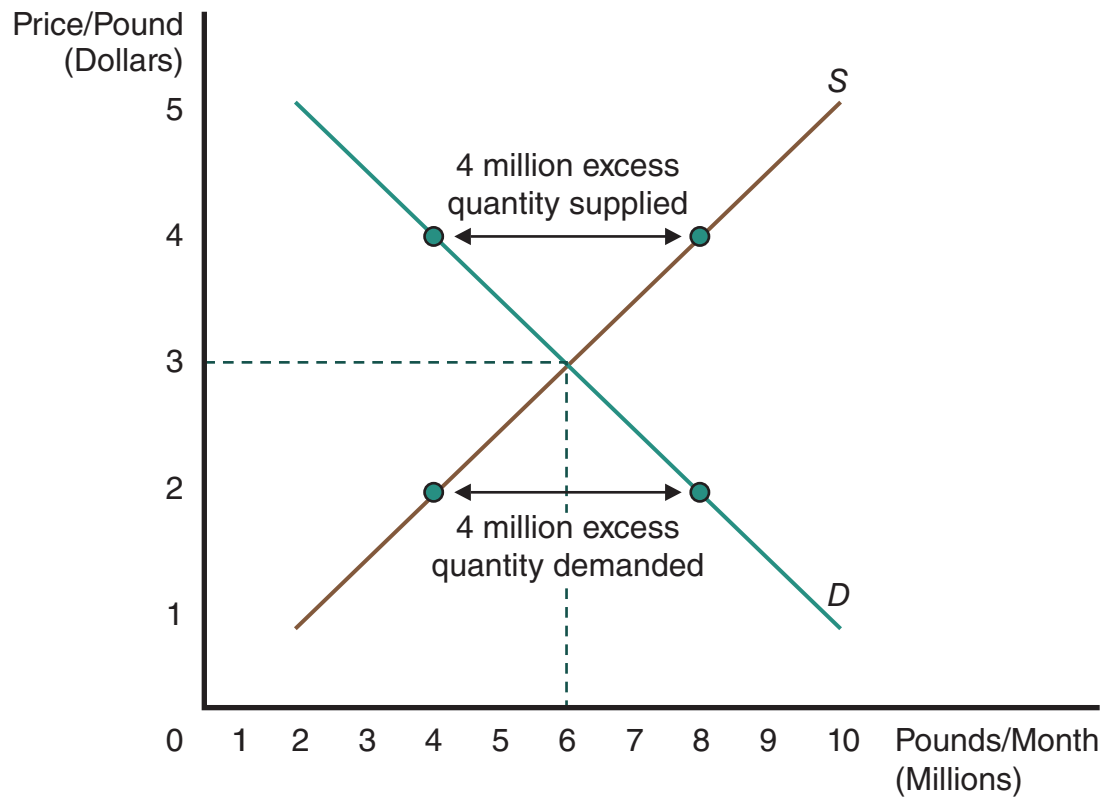
Table 3.3: Supply of and demand for coffee

Price per pound (in dollars)	Quantity supplied (in pounds per month)	Quantity demanded (in pounds per month)	Difference
\$1.00	2 million	10 million	8 million excess quantity demanded
\$2.00	4 million	8 million	4 million excess quantity demanded
\$3.00	6 million	6 million	None; equilibrium
\$4.00	8 million	4 million	4 million excess quantity supplied
\$5.00	10 million	2 million	8 million excess quantity supplied

If the price is \$4.00 per pound, suppliers will offer eight million pounds of coffee per month but consumers will only wish to purchase four million pounds. At this price, there is an excess quantity supplied of four million pounds per month. Suppliers with unsold coffee will accept a lower price to get rid of it. As price falls, some suppliers reduce their output (a movement along the supply curve) and some consumers buy more (a movement along the demand curve) until the equilibrium price of \$3.00 is reached. This \$3.00 price again clears the market.

Note that the equilibrium price and quantity do not simply represent the point where the amount sold equals the amount bought. Quantities bought and sold are *always* equal, even in disequilibrium. Four million pounds per month would be bought and sold at \$2.00 and at \$4.00. Equilibrium occurs at a price for which the *quantity supplied* and the *quantity demanded* are equal.

Figure 3.7 shows market supply and market demand curves for coffee, based on the supply and demand schedules in Table 3.3. The equilibrium price is \$3.00, and six million pounds per month is sold at equilibrium. At \$4.00, there is an excess quantity supplied and price will fall. This causes the quantity demanded to increase and the quantity supplied to decrease. The opposite happens at a price of \$2.00 per pound.

Figure 3.7: Supply of and demand for coffee

At equilibrium, the amount consumers wish to purchase is equal to the amount suppliers wish to sell. The price established at equilibrium is called the market-clearing price. At prices above the market-clearing price, quantity supplied exceeds quantity demanded. At prices below the market-clearing price, quantity demanded exceeds quantity supplied.

Supply, Demand, and Economic Models

As you learned in Chapter 1, the primary work of economists is to construct theories and models that explain and predict how the economy works and to use those theories and models to devise policies to make it work better. All theories and models share certain techniques and certain assumptions regarding how households and firms make decisions about using resources for production and consumption. The supply and demand model can be used to illustrate some of these techniques and assumptions.

Check Point: Markets in Equilibrium

- We combine market supply and market demand to determine the market equilibrium.
- Equilibrium occurs at a price where quantity supplied is equal to quantity demanded.
- At the market-clearing price, there is no tendency for price or quantity to change.

Equilibrium

In this model, equilibrium is found at that price for which the quantity demanded is equal to the quantity supplied. *Equilibrium* (and its counterpart, *disequilibrium*) is a term that you will encounter often. This book will discuss equilibrium prices, equilibrium quantities, equilibrium levels of employment, equilibrium levels of total output, or gross domestic product (GDP), and so forth. Almost every economic model includes a definition of equilibrium. If the model has an equilibrium position, it will have a set of forces that can change that position. There are also forces that move an economy toward a new equilibrium position. In the supply and demand model, sellers' and buyers' responses to price changes will move the economy toward a new equilibrium.

Comparative Statics

When a supply curve or a demand curve shifts, the diagram always identifies the original equilibrium and the new equilibrium. Economists are able to describe the process by which a market or economy moves from one equilibrium to another. This kind of analysis is called **comparative statics**. Comparative statics begins by describing the initial equilibrium position of the market (or the economy). This initial state is then compared to some later state in which some element has changed. For example, a change in technology has shifted the supply curve to the right, resulting in a larger quantity supplied and a lower price. That is, comparative statics looks at changes in equilibrium positions between two different times.

Another way of looking at comparative statics is to see the analysis as a comparison of two snapshots of the economy (or of a particular market). We take a snapshot and analyze the relationships that exist. We then change one variable, which causes the economy to move to a new equilibrium. Next we take another snapshot of the economy. We compare the two snapshots to see what has changed and why. We are comparing static pictures of the economy.

Marginal Analysis

Supply and demand is just one of many economic models that involve **marginal analysis**, a technique for analyzing problems by examining the results of small changes. *Marginal* refers to the extra, additional, or next unit of output, consumption, or any other measurable quantity that can be increased or decreased by incremental amounts. The concept of the margin is central to economic analysis, although it is probably new to you. Most economic decisions are made at the margin: Should I consume the extra slice of pizza or work the extra hour? Should we produce the extra unit or take on a new client at our accounting firm? These kinds of daily decisions made by households and firms determine prices, output, and other important economic quantities. In the supply and demand model, the supply curve reflects the decisions of suppliers to offer extra or additional (marginal) units for sale at higher prices. The demand curve reflects the decisions of buyers to purchase extra or additional (marginal) units at lower prices. When the price of a good falls, consumers decide at the margin whether to substitute a little more of that good for other goods whose prices have not changed.

Endogenous and Exogenous Variables

All economic models contain variables. Variables that a model attempts to explain or determine are called **endogenous variables** or dependent variables. Variables that have an impact on the endogenous variables but are themselves determined outside the model are called **exogenous variables** or independent variables.

In the supply and demand model, both price and quantity are endogenous or dependent variables that affect one another and are determined by the model. For example, the price of oranges is endogenous to this model. Some of the other variables in a supply and demand model are independent. For example, in the market for oranges, the weather in Florida is an exogenous variable. The weather affects the price of oranges, but the price of oranges does not affect the weather.

In the supply and demand model, the exogenous variables are the nonprice determinants that cause the position of the supply or demand curve to change. These nonprice determinants are technology, tastes, number of suppliers, income, prices of related goods, and so forth. Most economic models concentrate on just one or two endogenous or dependent variables and explain them by the behavior of a larger number of exogenous or independent variables.



iStockphoto/Thinkstock

Weather is an exogenous variable. In a high hurricane season, prices for oranges, and orange juice, will most likely rise.

Primary and Secondary Effects

Economists often analyze the effect of a change in one variable on other related variables. The **primary effect** is the dominant effect they seek to analyze. For instance, the demand curve shows how adding a tax that doubles the price of oranges would affect the quantity of oranges consumed. But there are also **secondary effects** in related markets. These effects may not be immediately apparent and may take time to work through the economy. For example, if the price of oranges doubled, the sales of cranberry juice might increase, or the consumption of bacon and eggs might decrease. These are complementary goods whose demand depends on the price of oranges (or orange juice). Such changes would not be as obvious or as immediately apparent as the primary effect.

3.4 A Theory of Price Formation

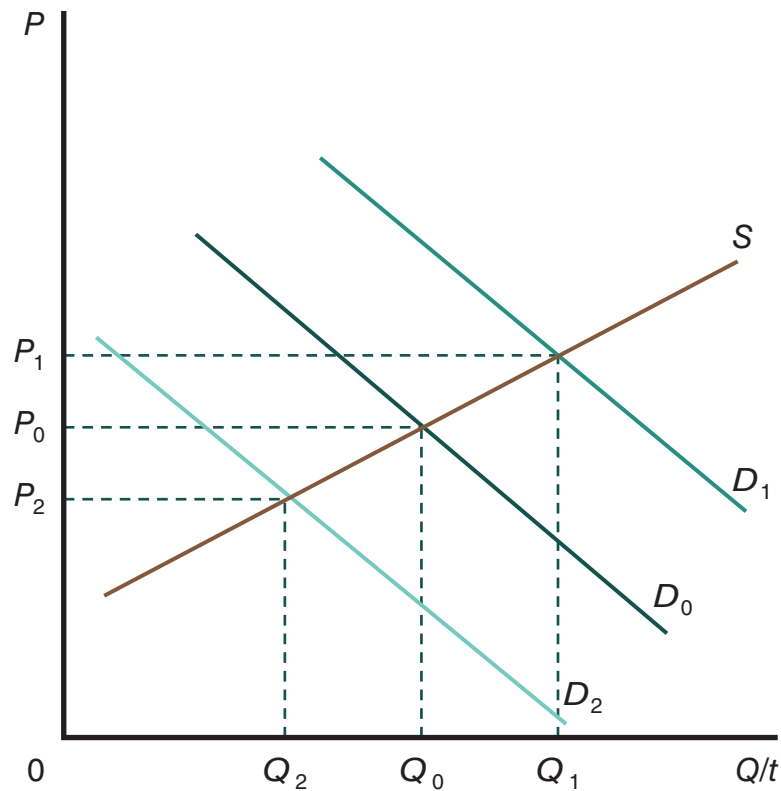
The law of demand and the law of supply support a very powerful theory of how markets work to set and change prices. That theory is based on two propositions. The first is that quantity demanded is negatively related to price. The second is that quantity supplied is positively related to price. When these two propositions are combined, they imply several things:

- When the quantity demanded exceeds the quantity supplied ($Q_d > Q_s$), price will rise.
- When the quantity demanded is less than the quantity supplied ($Q_d < Q_s$), price will fall.
- When the quantity demanded equals the quantity supplied, ($Q_d = Q_s$), price is at equilibrium.

This theory, combined with the possible shifts in *ceteris paribus* conditions, produces all of the basic elements of a model of how prices (and quantities) are determined in a market system.

Changes in Demand and Supply

When changes occur in any of the *ceteris paribus* conditions that affect demand, the model can be used to trace the effect on market equilibrium. Assume first that there is an increase in demand, that is, an outward, rightward shift of the entire curve. This increase in demand could be a result of a change in any of the *ceteris paribus* conditions. It could result from an increase in income (for a normal good), a change in tastes in favor of the good, an increase in the price of a substitute or a decrease in the price of a complement, an increase in the size of the consuming group, or a change in expectations. The increase in demand is shown when the demand curve shifts to the right from D_0 to D_1 in Figure 3.8. The equilibrium price rises from P_0 to P_1 , and the price increase causes quantity supplied to increase to from Q_0 to Q_1 . Consumers demand a larger quantity of the good at every price than before the shift of the curve.

Figure 3.8: Changes in demand

An increase in demand from D_0 to D_1 causes the equilibrium price to rise from P_0 to P_1 and the quantity supplied to increase from Q_0 to Q_1 . A decrease in demand from D_0 to D_2 causes the equilibrium price to fall from P_0 to P_2 and the quantity supplied to fall from Q_0 to Q_2 .

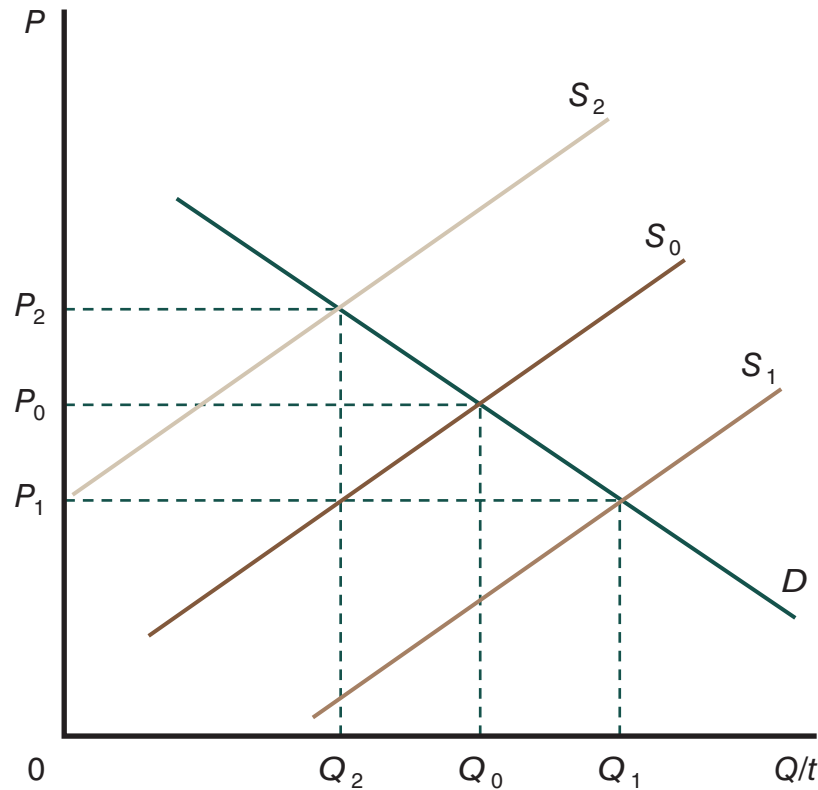
Now consider a decrease in demand. A decrease in demand means that consumers will demand less of a good at every price. This decrease could result from a fall in income, a change in tastes away from the good, a decrease in the price of a substitute or an increase in the price of a complement, a decrease in the size of the consuming group, or a change in expectations. The decrease in demand is shown as inward, leftward shift in the demand curve from D_0 to D_2 in Figure 3.8. The decrease in demand causes the equilibrium price to fall from P_0 to P_2 , and quantity supplied responds by falling from Q_0 to Q_2 .

Changes in any condition that affects supply will shift the supply curve. An increase in supply could result from an advance in technology, a decrease in the price of a resource, an increase in the number of suppliers, or a change in expectations. The increase in supply appears on a graph as a rightward shift of the supply curve, from S_0 to S_1 in Figure 3.9. This increase in supply would cause the equilibrium price to fall from P_0 to P_1 , leading to an increase in the quantity demanded from Q_0 to Q_1 .

A decrease in supply could result from an increase in the price of a resource, a decrease in the number of suppliers, or a change in expectations. A decrease in supply is shown as a leftward shift of the supply curve, from S_0 to S_2 in Figure 3.9. This decrease in supply

causes the equilibrium price to rise from P_0 to P_2 and the quantity demanded to decrease from Q_0 to Q_2 .

Figure 3.9: Changes in supply



An increase in supply from S_0 to S_1 causes the equilibrium price to fall from P_0 to P_1 and the quantity demanded to increase from Q_0 to Q_1 . A decrease in supply from S_0 to S_2 causes the equilibrium price to rise from P_0 to P_2 and the quantity demanded to fall from Q_0 to Q_2 .

The supply and demand model is very useful in analyzing a variety of economic problems and issues. As you apply this model, keep in mind the difference between changes in demand and supply (that is, shifts in the positions of the curves) and changes in the quantity demanded and quantity supplied (that is, movements along the curves). The importance of this difference will become very clear as you attempt to untangle situations that involve several changes in ceteris paribus conditions.

Are Prices Fair?

The analysis of supply and demand presented in this chapter has been positive rather than normative. No mention has been made of what constitutes a fair or just price. Nor has there been any comment as to whether certain minimal levels of consumption of certain goods are necessary for a fair society. Supply and demand theory predicts how an increase in demand for a good will affect price and quantity. A higher price may mean

that some people can no longer afford the item, regardless of how necessary or “basic” the item may appear to be. The supply and demand model offers no moral evaluation of what prices should be.

In the real world, people often pay different prices for the same good. In the supply and demand model, the equilibrium price is a single, unique price that is paid by all buyers and received by all sellers. There may be different prices for different buyers and sellers because of **transactions costs**. Transactions costs are costs associated with gathering information about markets (prices and quantities supplied) for consuming or producing. Organizing, negotiating, and searching take time and involve opportunity costs. Firms are organized to reduce transactions costs on the producing side. For consumers, the existence of transactions costs means that different people may pay different prices for the same good or service.

A familiar example of such price differences is that gas stations next to freeways charge higher prices for gasoline than do stations farther away from freeways. Why? Transactions costs. Most users of a freeway are unfamiliar with the area and are in a hurry. They perceive the cost of searching for a lower price to be higher than the potential saving produced by such searching. Think about what gas prices might be in a retirement community. Do you think there would be lower and more uniform gas prices in and around a retirement community because the opportunity cost of the customers’ time is lower? If you live near a retirement community, you might want to check on the prices charged for gasoline in nearby areas.

Check Point: Changes in Demand and Supply

When the market is out of equilibrium, the price will change.

- When the quantity demanded exceeds the quantity supplied, price will rise.
- When the quantity demanded is less than the quantity supplied, price will fall.
- When the quantity demanded equals the quantity supplied, price is stable at equilibrium.

Changes in demand cause the demand curve to shift.

- An increase in demand shifts the demand curve to the right.
- A decrease in demand shifts the demand curve to the left.

Changes in supply cause the supply curve to shift.

- An increase in supply shifts the supply curve to the right.
- A decrease in supply shifts the supply curve to the left.

3.5 Evaluating the Market Process

In Chapter 2, you saw that each and every economy must address three basic questions: what, how, and for whom? Supply and demand—the market process—provide important signals to inform, direct, and motivate economic agents in answering these questions.

Functions of Prices

Prices play a central role in a market system in allocating scarce resources and answering the basic economic questions. The primary functions of prices are to inform, direct, and motivate consumers and firms.

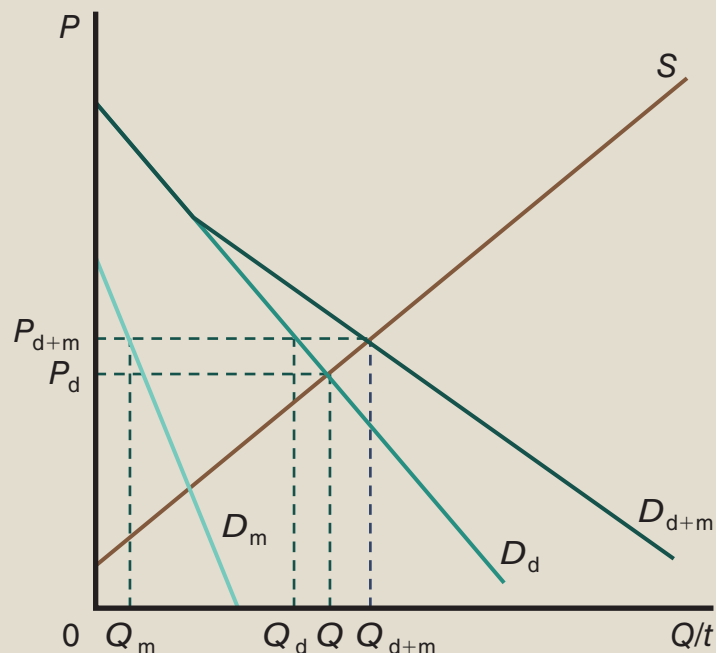
Policy Focus: The Simple Supply and Demand Analysis of NAFTA

There is a lot of political debate about international trade. Let us revisit the discussion of the North American Free Trade Agreement (NAFTA) from the Policy Focus box in Chapter 2. NAFTA, signed into law in 1993, was designed to make trade between Canada, the United States, and Mexico much freer. Twenty years later, NAFTA is still a hotly debated issue. We can now use the supply and demand model to analyze this policy debate.

A change in the number of suppliers and the number of buyers can shift the supply and demand curves, respectively. With NAFTA, these shifts can result from additional buyers and sellers in Canada and Mexico. Since there already was a free trade agreement between the United States and Canada prior to 1993, we will focus on Mexico.

In an open economy, the market demand curve faced by producers is the sum of the domestic demand for the product and the foreign demand for the product. Consider the market demand for U.S. corn, which is exported to Mexico. If there were no Mexican demand, the market price would settle at P_d in Figure 3.10 and corn producers would sell Q tons of corn. When Mexican demand, D_m , is added, the price rises to P_{d+m} and the amount sold rises to Q_{d+m} . The price of corn and the amount of corn sold have both increased. U.S. consumers are paying a higher price because they now pay P_{d+m} . Since the domestic demand curve has not shifted and the price has increased, the quantity of corn demanded by U.S. consumers will fall. In this example, domestic consumption falls to Q_d .

Figure 3.10: Mexican demand for corn



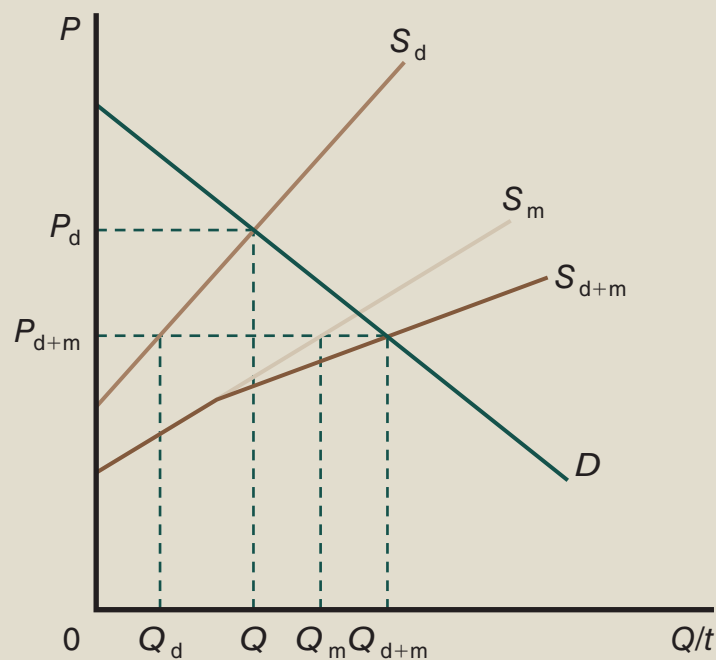
(continued)

Policy Focus: The Simple Supply and Demand Analysis of NAFTA (*continued*)

It appears that domestic corn producers have gained at the expense of domestic corn consumers. After all, consumers now pay a higher price for less corn. This conclusion is correct, but it ignores the other side of the equation. Mexican consumers can only buy the corn if they sell something that earns the currency necessary to pay for the corn. The domestic supply of the product that Mexicans sell to pay for the corn will have an effect in other markets.

Figure 3.11 shows the U.S. market for textiles. Without a Mexican supply, the domestic price and quantity would be P_d and Q_d . Adding the Mexican supply, S_m , changes the equilibrium. There is a decline in price to P_{d+m} and an increase in quantity demanded to Q_{d+m} . In this case, the domestic consumption of textiles increases by the difference between Q_{d+m} and Q_d . U.S. consumers can purchase more textiles at a lower price.

Figure 3.11: Mexican supply for textiles



There is an important lesson in this example of supply and demand in an open economy. According to the supply and demand model, NAFTA would result in higher prices and less consumption of exported items, and lower prices and more consumption of imported items. So there are winners and losers as a result of NAFTA. In this example, corn farmers and textile consumers in the United States are gainers, while textile producers and corn consumers in the United States are losers. In Mexico the situation on gainers and losers is reversed. But as demonstrated in Chapter 2, the principle of comparative advantage shows that the net effect of trade is an expansion of choices and an increase in total consumption for consumers in the domestic market. You can use this model to predict who will speak for NAFTA, and who against it, in the policy debate.

Informing

Market prices condense a great deal of complex information into a simple form. This condensed information is useful to consumers and producers in making decisions. An increase in demand causes a market price to rise. The supplier of a product does not have to know what caused demand to change. All suppliers need to know is that the price has increased. They will respond by increasing the quantity supplied. Likewise, consumers do not need to understand anything about the production process or the associated costs. All they need to know is the market price. If the price rises, consumers decrease the quantity demanded. The market price, then, provides all participants in the market with up-to-the-minute information on the relative scarcity of goods.

Directing

Market participants act on price information. If suppliers are bringing too much of a good to market, its price will fall. The decisions of consumers and producers will move the market to a new equilibrium. Market prices will signal for an increase in the production of those products of which consumers are demanding more. Firms will produce these goods by bringing resources together in a way directed by the market prices of those resources. All of this takes place without any individual or group telling consumers and entrepreneurs how or why to act. All of the necessary information is found in market prices.

Motivating

The *for whom* question is also a reminder that price is a powerful motivator. Supply and demand establish a reward structure for owners and users of productive resources. Households and firms will seek to produce those goods or develop those skills that are highly desired by others, in order to earn rewards in the form of higher incomes. All of this happens without any government agency or central planning bureau telling people what to do. No one has to tell a supermarket owner when to be open or where to build a store, or tell a bright young person to invest in education. People pursue certain activities because they perceive those activities to be in their own self-interest.

The Efficiency of the Market

According to Adam Smith, the invisible hand informs, directs, and motivates the self-interest of market participants. Suppliers are motivated to guide resources into the production of the goods most wanted by consumers and to produce those goods with the most efficient methods and resource combinations possible. In the words of Nobel laureate George L. Stigler, “an economic actor on average knows better the environment in which he is acting and the probable consequences of his actions than an outsider, no matter how clever the outsider may be” (1982, p. 16).

Freedom

Finally, an important result of a market system is that individuals enjoy a great deal of freedom to pursue their own self-interest. In a market system, the production and distribution of goods and services take place on a basis of voluntary cooperation in the pursuit

of individual self-interest. Nobel laureate Milton Friedman, a champion of the market system, described this advantage in these terms:

So long as effective freedom of exchange is maintained, the central feature of the market organization of economic activity is that it prevents one person from interfering with another in respect to most of his activities. The consumer is protected from coercion by the seller because of the presence of other sellers with whom he can deal. The seller is protected from coercion by the consumer because of other consumers to whom he can sell. The employee is protected from coercion by the employer because of other employers for whom he can work, and so on. And the market does this impersonally and without centralized authority. (Friedman, 1981, pp. 14–15)

Shortcomings of Markets and Nonmarket Allocations

Although the market is a highly efficient way to allocate resources, it does have some drawbacks, as we observed in Chapter 2. Some of those drawbacks include failure to provide public goods or to correct negative externalities, stabilization problems, and inequality in the distribution of income. Markets also perform poorly when there is a lack of competition. The quotation from Friedman does not apply when monopolies interfere with freedom of choice. Often the failings of the market lead to government intervention, resulting in a mixed economy rather than a pure market economy.

Critics of the market system range from those who would replace it with complete central direction to those with a more middle-of-the-road approach. The latter see a variety of ways of dividing responsibilities between markets and government. If prices are not allowed to direct resources in certain situations, some other mechanism must be developed for their allocation. Government directives, waiting in line, and appeals to good behavior are possible allocative mechanisms. The benefits of government intervention must be weighed against the very strong advantages of markets in terms of efficiency and flexibility.

Check Point: Price as a Signal to Market Participants

Prices are vital in allocating scarce resources and answering the basic economic questions. They

- inform by condensing complex information into a simple form,
- direct by signaling for a change in the production of those products of which consumers are demanding more or less, and
- motivate consumers and firms to pursue certain activities out of self-interest.

Summary

Consider again. . . You should now have a pretty good understanding of the different interactions in the market for Madison Square Garden concert tickets. Ticket promoters likely knew at the start that the market was not going to be in equilibrium at a price per ticket ranging from \$50 to \$100. One should wonder why they did not price the tickets higher. Perhaps they were trying to make tickets affordable for typical

fans' budgets. But if they understood the concepts of supply and demand, they should have known that underpricing the tickets would not result in cheaper tickets for fans.

When the market price is too low, a secondary market develops. The prices in this secondary market will reach the true equilibrium price according to the forces of supply and demand. Generally, the biggest fans will be willing to pay higher prices to see the concert. Lesser fans, or those with a smaller budget for such a luxury, will skip the show.

What happens to the difference in value between the initial ticket price and the equilibrium price in the secondary market? Who gains and who loses from underpricing tickets? Fans who score the tickets at the initial price win. Scalpers who are able to sell the tickets in the secondary market at higher prices win. Who loses? Anyone who misses the show, if you ask a fan!

Key Points

1. The quantity demanded is the amount of a good or service consumers are willing and able to buy at a specific price during a certain time period. Demand is the relationship between the quantities demanded of a good or service at various prices over a certain time period. Demand depends on the current price of the good or service as well as on nonprice determinants. These other influences on demand include the size of the group demanding the good, the tastes of the consuming group, the incomes of that group, the prices of related goods and services, and the expectations concerning the future.
 - The law of demand states that the quantity demanded of a good or service is negatively related to its price, *ceteris paribus*. Changes in the price of a good affect the quantity demanded of that good. That is, a price change leads to a movement along the demand curve.
 - Changes in the *ceteris paribus* conditions cause demand to either increase or decrease. That is, there is a shift in the position of the entire demand curve. When income increases, the demand for a normal good will increase and the demand for an inferior good will decrease. Two goods are complements when a price increase in one will cause a decrease in demand for the other. Two goods are substitutes if an increase in the price of one causes an increase in demand for the other.
2. The quantity supplied is the amount of a good or service sellers are willing and able to sell at a specific price during a certain time period. Supply is the relationship between the quantities supplied of a good or service at various prices over a certain time period.
 - Supply depends on the price of the good or service as well as on nonprice determinants. These include the prices of resources, the level of technology, the number of suppliers, and expectations.
 - The law of supply states that the quantity supplied of a good or service is usually a positive function of its price, *ceteris paribus*. Changes in a good's price affect the quantity supplied of that good.
3. Changes in prices of resources that affect supply cause supply to either increase or decrease. When prices of resources increase, there will be a decrease in supply.

- An advance in technology or increase in the number of suppliers will usually cause supply to increase.
4. The market-clearing (equilibrium) price is the price at which the amount consumers wish to purchase is equal to the amount suppliers wish to sell. When supply or demand shifts, the market is in disequilibrium until natural forces determine a new equilibrium price and quantity.
 5. The comparison of two equilibrium positions is called comparative statics. The supply and demand model has two endogenous variables—price and quantity—that are determined within the model. The exogenous variables are determined outside the model but influence what goes on in the model by shifting supply and demand. These variables include prices of related goods, tastes, income, expectations, and technology. The supply and demand model, like most economic models, uses marginal analysis. It focuses on decisions about the next unit purchased or sold rather than on aggregate or all-or-nothing decisions.
 6. Prices play an important role in informing, directing, and motivating consumers and producers. If left alone, markets maximize individual freedom by allowing individuals to pursue their own self-interest.

Key Terms

comparative statics A technique of comparing two equilibrium positions to determine the changing relationships between variables.

complementary goods Goods that are jointly consumed. The consumption of one enhances the consumption of the other.

decrease in demand A shift in the demand curve indicating that at every price, consumers demand a smaller amount than before.

decrease in supply A shift in the supply curve indicating that at every price, a smaller quantity will be offered for sale than before.

demand The relationship between the quantities demanded of a good or service at various prices over a certain time period.

demand curve A graph representing a demand schedule.

demand schedule The various quantities demanded at various prices during a specified period of time.

endogenous variables Variables that are explained or determined within a model.

exogenous variables Variables that are determined outside a model and affect endogenous variables.

expectations Feelings that individuals have about future conditions.

increase in demand A shift in the demand curve indicating that at every price, a larger quantity will be offered for sale than before.

increase in supply A shift in the supply curve indicating that at every price, a larger quantity will be offered for sale than before.

inferior good A good for which demand decreases as income increases.

law of demand States that the quantity demanded of a good or service in a given time period is negatively related to its price, *ceteris paribus*.

law of supply The quantity supplied of a good or service is usually a positive function of price, *ceteris paribus*.

marginal analysis A technique for analyzing problems by examining the results of small changes.

market-clearing price The equilibrium price, which clears the market because there are no frustrated consumers or suppliers.

market demand curve A curve on a graph that shows what quantities will be demanded by all consumers in a certain market at various prices. The market demand curve is the sum of all of the individual demand curves.

market equilibrium A point at which quantity demanded by consumers is equal to quantity supplied by producers. The price at which this occurs is the equilibrium price, or market-clearing price.

market supply curve The sum of all of the individual supply curves. A market supply curve shows what quantities will be supplied by all firms at various prices during a specific time period.

normal good A good for which demand increases as income increases.

primary effect The dominant or immediate effect of a change in an economic variable.

quantity demanded The amount of a good or service consumers are willing and able to buy at a specific price during a certain time period.

quantity supplied The amount of a good or service sellers are willing and able to sell at a specific price during a certain time period.

secondary effects Effects indirectly related to the immediate effect, often smaller and felt after some time.

substitute goods Goods that can be interchanged. The consumption of one replaces the consumption of the other.

supply The quantity of a good offered for sale at various prices during a certain time period.

supply curve A graph representing a supply schedule and showing the quantities supplied at various prices in a certain time period.

supply schedule A table that shows quantities offered for sale at various prices over a particular time period.

transactions costs Costs associated with gathering information about markets (prices and quantities supplied) for consuming or producing.

Critical Thinking and Discussion Questions

1. How can expectations about economic conditions affect supply?
2. Does the fact that some people appear to buy more of some goods as their prices go up, such as mink coats and diamonds, negate the law of demand?
3. How can belief in a future change in the availability of gasoline affect the demand for automobiles?
4. A market-clearing price is the price at which the amount sold equals the amount purchased. Is this correct?
5. List all of the conditions that can decrease demand or supply.
6. List all of the conditions that can increase demand or supply.
7. Why is it so important to distinguish changes in demand and changes in supply from changes in quantity demanded and changes in quantity supplied?

8. If both the supply and demand curves shift to the right, what happens to price and quantity? What happens if both the supply and demand curves shift to the left?
9. Develop a simple theory to explain (predict) student grades in this course. Identify at least two exogenous variables and one endogenous variable.
10. Pat, a professional student, failed an economics course and decided to sell flowers on a street corner to make ends meet. A second flower seller established a business directly across the street from Pat. Pat, unconcerned, came up with the following hypothesis: "When supply increases, demand will increase. Therefore, I will be just as well off as I was before the second flower seller arrived." Did Pat deserve to fail economics? Why or why not?
11. Why do some people shop at convenience stores, knowing they will pay higher prices, even when a supermarket with lower prices is open on the same block?
12. Explain whether each of the following will shift the supply curve or the demand curve for milk and in which direction:
 - a. The birth rate rises. (There are more babies.)
 - b. There is a drought, creating a shortage of feed for dairy herds.
 - c. Scientists find that drinking too much milk increases the risk of heart disease.
 - d. Scientists find that drinking more milk reduces the chances of developing osteoporosis.
13. Draw a supply curve for tablet computers that slopes upward and a demand curve for tablet computers that slopes downward. They intersect at an equilibrium price of \$2,000 and an equilibrium quantity of 6,000 units per month. Now experiment with each of the following:
 - a. A breakthrough in the technology of making tablet hardware substantially lowers the cost of production. Which curve shifts, and which way? (Draw it on your diagram.) Find the new equilibrium price and quantity. Did they increase or decrease?
 - b. Suppose high schools nationwide decide to purchase tablet computers for students to use in their classes. Does this affect supply or demand? Which curve shifts, and in which direction? What is the effect on price and quantity?
 - c. A foreign firm enters the market, adding a new source of supply. How does this change affect the price, quantity, and market supply curve? What is the impact on domestic firms?
14. The following table lists market information you gathered about landing slots at the Hartsfield–Jackson Atlanta International Airport. Suppose you are asked to make a recommendation to the airport manager about pricing the slots to reduce crowding and delays. What will you recommend?

Market for landing slots from 8:00 A.M. to 9:00 A.M.		
Price	Quantity supplied	Quantity demanded
0	12	50
250	12	40
500	12	20
1,000	12	15
1,500	12	8
2,000	12	2

15. In 2011, Microsoft launched the new Xbox 360, one of the hot gift items that year, which is used to play games. Only Xbox games can be played on this system, and they cannot be played on other systems (like the two primary competitors, Sony's PlayStation 3 and Nintendo's Wii). How would a shortage of Xbox 360 systems affect the demand for Xbox games? Should governmental policy allow such an arrangement?

