
## After studying this chapter, you will be able to:

- Describe a competitive market and think about a price as an opportunity cost
- Explain the influences on demand
- Explain the influences on supply
- Explain how demand and supply determine prices and quantities bought and sold
- Use the demand and supply model to make predictions about changes in prices and quantities

# 3 DEMAND AND SUPPLY

**What makes the price of oil double and the price of gasoline almost double in** just one year? Will these prices keep on rising? Are the oil companies taking advantage of people? This chapter enables you to answer these and similar questions about prices—prices that rise, prices that fall, and prices that fluctuate.

You already know that economics is about the choices people make to cope with scarcity and how those choices respond to incentives. Prices act as incentives. You're going to see how people respond to prices and how prices get determined by demand and supply. The demand and supply model that you study in this chapter is the main tool of economics. It helps us to answer the big economic question: What, how, and for whom goods and services are produced?

At the end of the chapter, in *Reading Between the Lines*, we'll apply the model to the market for coffee and explain why its price increased sharply in 2010 and why it was expected to rise again.

## Markets and Prices

When you need a new pair of running shoes, want a bagel and a latte, plan to upgrade your cell phone, or need to fly home for Thanksgiving, you must find a place where people sell those items or offer those services. The place in which you find them is a *market.* You learned in Chapter 2 (p. 42) that a market is any arrangement that enables buyers and sellers to get information and to do business with each other.

A market has two sides: buyers and sellers. There are markets for *goods* such as apples and hiking boots, for *services* such as haircuts and tennis lessons, for *factors of production* such as computer programmers and earthmovers, and for other manufactured *inputs* such as memory chips and auto parts. There are also markets for money such as Japanese yen and for financial securities such as Yahoo! stock. Only our imagination limits what can be traded in markets.

Some markets are physical places where buyers and sellers meet and where an auctioneer or a broker helps to determine the prices. Examples of this type of market are the New York Stock Exchange and the wholesale fish, meat, and produce markets.

Some markets are groups of people spread around the world who never meet and know little about each other but are connected through the Internet or by telephone and fax. Examples are the e-commerce markets and the currency markets.

But most markets are unorganized collections of buyers and sellers. You do most of your trading in this type of market. An example is the market for basketball shoes. The buyers in this $3 billion-a-year market are the 45 million Americans who play basketball (or who want to make a fashion statement). The sellers are the tens of thousands of retail sports equipment and footwear stores. Each buyer can visit several different stores, and each seller knows that the buyer has a choice of stores.

Markets vary in the intensity of competition that buyers and sellers face. In this chapter, we're going to study a **competitive market**—a market that has many buyers and many sellers, so no single buyer or seller can influence the price.

Producers offer items for sale only if the price is high enough to cover their opportunity cost. And consumers respond to changing opportunity cost by seeking cheaper alternatives to expensive items.

We are going to study how people respond to *prices* and the forces that determine prices. But to pursue these tasks, we need to understand the relationship between a price and an opportunity cost.

In everyday life, the *price* of an object is the number of dollars that must be given up in exchange for it. Economists refer to this price as the **money price**.

The *opportunity cost* of an action is the highest-valued alternative forgone. If, when you buy a cup of coffee, the highest-valued thing you forgo is some gum, then the opportunity cost of the coffee is the *quantity* of gum forgone. We can calculate the quantity of gum forgone from the money prices of the coffee and the gum.

If the money price of coffee is $1 a cup and the money price of gum is 50¢ a pack, then the opportunity cost of one cup of coffee is two packs of gum. To calculate this opportunity cost, we divide the price of a cup of coffee by the price of a pack of gum and find the *ratio* of one price to the other. The ratio of one price to another is called a **relative price**, and a *relative price is an opportunity cost.*

We can express the relative price of coffee in terms of gum or any other good. The normal way of expressing a relative price is in terms of a "basket" of all goods and services. To calculate this relative price, we divide the money price of a good by the money price of a "basket" of all goods (called a *price index*). The resulting relative price tells us the opportunity cost of the good in terms of how much of the "basket" we must give up to buy it.

The demand and supply model that we are about to study determines *relative prices,* and the word "price" means *relative* price. When we predict that a price will fall, we do not mean that its *money* price will fall—although it might. We mean that its *relative* price will fall. That is, its price will fall *relative* to the average price of other goods and services.

### REVIEW QUIZ

1. What is the distinction between a money price and a relative price?
2. Explain why a relative price is an opportunity cost.
3. Think of examples of goods whose relative price has risen or fallen by a large amount.

You can work these questions in Study Plan 3.1 and get instant feedback. myeconlab

Let's begin our study of demand and supply, starting with demand.

## Demand

If you demand something, then you

1. Want it,
2. Can afford it, and
3. Plan to buy it.

*Wants* are the unlimited desires or wishes that people have for goods and services. How many times have you thought that you would like something "if only you could afford it" or "if it weren't so expensive"? Scarcity guarantees that many—perhaps most—of our wants will never be satisfied. Demand reflects a decision about which wants to satisfy.

The **quantity demanded** of a good or service is the amount that consumers plan to buy during a given time period at a particular price. The quantity demanded is not necessarily the same as the quantity actually bought. Sometimes the quantity demanded exceeds the amount of goods available, so the quantity bought is less than the quantity demanded.

The quantity demanded is measured as an amount per unit of time. For example, suppose that you buy one cup of coffee a day. The quantity of coffee that you demand can be expressed as 1 cup per day, 7 cups per week, or 365 cups per year.

Many factors influence buying plans, and one of them is the price. We look first at the relationship between the quantity demanded of a good and its price. To study this relationship, we keep all other influences on buying plans the same and we ask: How, other things remaining the same, does the quantity demanded of a good change as its price changes?

The law of demand provides the answer.

### The Law of Demand

The **law of demand** states

> Other things remaining the same, the higher the price of a good, the smaller is the quantity demanded; and the lower the price of a good, the greater is the quantity demanded.

Why does a higher price reduce the quantity demanded? For two reasons:

- Substitution effect
- Income effect

**Substitution Effect** When the price of a good rises, other things remaining the same, its *relative* price—its opportunity cost—rises. Although each good is unique, it has *substitutes*—other goods that can be used in its place. As the opportunity cost of a good rises, the incentive to economize on its use and switch to a substitute becomes stronger.

**Income Effect** When a price rises, other things remaining the same, the price rises *relative* to income. Faced with a higher price and an unchanged income, people cannot afford to buy all the things they previously bought. They must decrease the quantities demanded of at least some goods and services. Normally, the good whose price has increased will be one of the goods that people buy less of.

To see the substitution effect and the income effect at work, think about the effects of a change in the price of an energy bar. Several different goods are substitutes for an energy bar. For example, an energy drink could be consumed instead of an energy bar.

Suppose that an energy bar initially sells for $3 and then its price falls to $1.50. People now substitute energy bars for energy drinks—the substitution effect. And with a budget that now has some slack from the lower price of an energy bar, people buy even more energy bars—the income effect. The quantity of energy bars demanded increases for these two reasons.

Now suppose that an energy bar initially sells for $3 and then the price doubles to $6. People now buy fewer energy bars and more energy drinks—the substitution effect. And faced with a tighter budget, people buy even fewer energy bars—the income effect. The quantity of energy bars demanded decreases for these two reasons.

### Demand Curve and Demand Schedule

You are now about to study one of the two most used curves in economics: the demand curve. You are also going to encounter one of the most critical distinctions: the distinction between *demand* and *quantity demanded*.

The term **demand** refers to the entire relationship between the price of a good and the quantity demanded of that good. Demand is illustrated by the demand curve and the demand schedule. The term *quantity demanded* refers to a point on a demand curve—the quantity demanded at a particular price.

Figure 3.1 shows the demand curve for energy bars. A **demand curve** shows the relationship between the quantity demanded of a good and its price when all other influences on consumers' planned purchases remain the same.

The table in Fig. 3.1 is the demand schedule for energy bars. A *demand schedule* lists the quantities demanded at each price when all the other influences on consumers' planned purchases remain the same. For example, if the price of a bar is 50¢, the quantity demanded is 22 million a week. If the price is $2.50, the quantity demanded is 5 million a week. The other rows of the table show the quantities demanded at prices of $1.00, $1.50, and $2.00.

We graph the demand schedule as a demand curve with the quantity demanded on the *x*-axis and the price on the *y*-axis. The points on the demand curve labeled *A* through *E* correspond to the rows of the demand schedule. For example, point *A* on the graph shows a quantity demanded of 22 million energy bars a week at a price of 50¢ a bar.

**Willingness and Ability to Pay** Another way of looking at the demand curve is as a willingness-and-ability-to-pay curve. The willingness and ability to pay is a measure of *marginal benefit.*

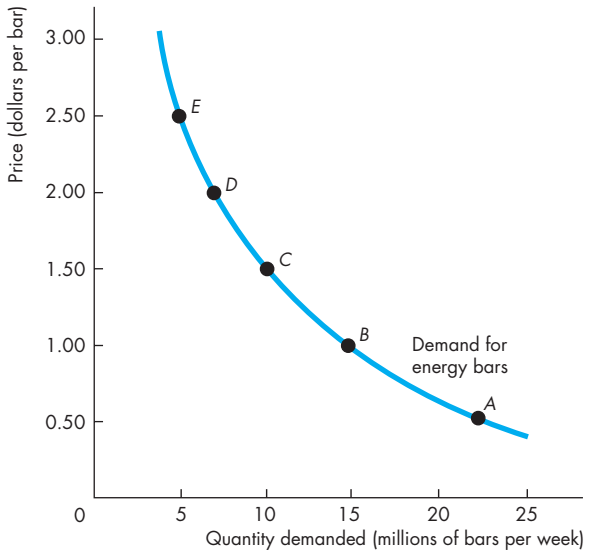
If a small quantity is available, the highest price that someone is willing and able to pay for one more unit is high. But as the quantity available increases, the marginal benefit of each additional unit falls and the highest price that someone is willing and able to pay also falls along the demand curve.

In Fig. 3.1, if only 5 million energy bars are available each week, the highest price that someone is willing to pay for the 5 millionth bar is $2.50. But if 22 million energy bars are available each week, someone is willing to pay 50¢ for the last bar bought.

## A Change in Demand

When any factor that influences buying plans changes, other than the price of the good, there is a **change in demand**. Figure 3.2 illustrates an increase in demand. When demand increases, the demand curve shifts rightward and the quantity demanded at each price is greater. For example, at $2.50 a bar, the quantity demanded on the original (blue) demand curve is 5 million energy bars a week. On the new (red) demand curve, at $2.50 a bar, the quantity demanded is 15 million bars a week. Look closely at the numbers in the table and check that the quantity demanded at each price is greater.

**FIGURE 3.1** The Demand Curve



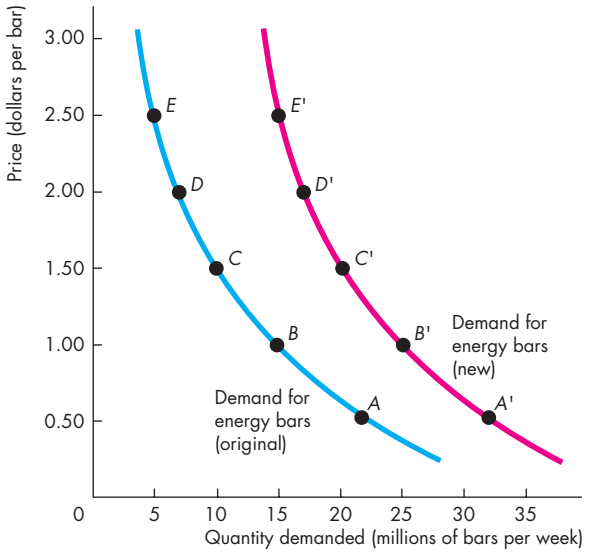

| | Price (dollars per bar) | Quantity demanded (millions of bars per week) |
|---|---|---|
| *A* | 0.50 | 22 |
| *B* | 1.00 | 15 |
| *C* | 1.50 | 10 |
| *D* | 2.00 | 7 |
| *E* | 2.50 | 5 |

The table shows a demand schedule for energy bars. At a price of 50¢ a bar, 22 million bars a week are demanded; at a price of $1.50 a bar, 10 million bars a week are demanded. The demand curve shows the relationship between quantity demanded and price, other things remaining the same. The demand curve slopes downward: As the price falls, the quantity demanded increases.

The demand curve can be read in two ways. For a given price, the demand curve tells us the quantity that people plan to buy. For example, at a price of $1.50 a bar, people plan to buy 10 million bars a week. For a given quantity, the demand curve tells us the maximum price that consumers are willing and able to pay for the last bar available. For example, the maximum price that consumers will pay for the 15 millionth bar is $1.00.

myeconlab animation

**FIGURE 3.2** An Increase in Demand




| | Original demand schedule<br>Original income | | | New demand schedule<br>New higher income | |
|---|---|---|---|---|---|
| | Price (dollars per bar) | Quantity demanded (millions of bars per week) | | Price (dollars per bar) | Quantity demanded (millions of bars per week) |
| *A* | 0.50 | 22 | *A'* | 0.50 | 32 |
| *B* | 1.00 | 15 | *B'* | 1.00 | 25 |
| *C* | 1.50 | 10 | *C'* | 1.50 | 20 |
| *D* | 2.00 | 7 | *D'* | 2.00 | 17 |
| *E* | 2.50 | 5 | *E'* | 2.50 | 15 |

A change in any influence on buying plans other than the price of the good itself results in a new demand schedule and a shift of the demand curve. A change in income changes the demand for energy bars. At a price of $1.50 a bar, 10 million bars a week are demanded at the original income (row *C* of the table) and 20 million bars a week are demanded at the new higher income (row *C'*). A rise in income increases the demand for energy bars. The demand curve shifts *rightward*, as shown by the shift arrow and the resulting red curve.

myeconlab animation

Six main factors bring changes in demand. They are changes in

- The prices of related goods
- Expected future prices
- Income
- Expected future income and credit
- Population
- Preferences

**Prices of Related Goods** The quantity of energy bars that consumers plan to buy depends in part on the prices of substitutes for energy bars. A **substitute** is a good that can be used in place of another good. For example, a bus ride is a substitute for a train ride; a hamburger is a substitute for a hot dog; and an energy drink is a substitute for an energy bar. If the price of a substitute for an energy bar rises, people buy less of the substitute and more energy bars. For example, if the price of an energy drink rises, people buy fewer energy drinks and more energy bars. The demand for energy bars increases.

The quantity of energy bars that people plan to buy also depends on the prices of complements with energy bars. A **complement** is a good that is used in conjunction with another good. Hamburgers and fries are complements, and so are energy bars and exercise. If the price of an hour at the gym falls, people buy more gym time *and more* energy bars.

**Expected Future Prices** If the expected future price of a good rises and if the good can be stored, the opportunity cost of obtaining the good for future use is lower today than it will be in the future when people expect the price to be higher. So people retime their purchases—they substitute over time. They buy more of the good now before its price is expected to rise (and less afterward), so the demand for the good today increases.

For example, suppose that a Florida frost damages the season's orange crop. You expect the price of orange juice to rise, so you fill your freezer with enough frozen juice to get you through the next six months. Your current demand for frozen orange juice has increased, and your future demand has decreased.

Similarly, if the expected future price of a good falls, the opportunity cost of buying the good today is high relative to what it is expected to be in the future. So again, people retime their purchases. They buy less of the good now before its price is expected

to fall, so the demand for the good decreases today and increases in the future.

Computer prices are constantly falling, and this fact poses a dilemma. Will you buy a new computer now, in time for the start of the school year, or will you wait until the price has fallen some more? Because people expect computer prices to keep falling, the current demand for computers is less (and the future demand is greater) than it otherwise would be.

**Income** Consumers' income influences demand. When income increases, consumers buy more of most goods; and when income decreases, consumers buy less of most goods. Although an increase in income leads to an increase in the demand for *most* goods, it does not lead to an increase in the demand for *all* goods. A **normal good** is one for which demand increases as income increases. An **inferior good** is one for which demand decreases as income increases. As incomes increase, the demand for air travel (a normal good) increases and the demand for long-distance bus trips (an inferior good) decreases.

**Expected Future Income and Credit** When expected future income increases or credit becomes easier to get, demand for the good might increase now. For example, a salesperson gets the news that she will receive a big bonus at the end of the year, so she goes into debt and buys a new car right now, rather than wait until she receives the bonus.

**Population** Demand also depends on the size and the age structure of the population. The larger the population, the greater is the demand for all goods and services; the smaller the population, the smaller is the demand for all goods and services.

For example, the demand for parking spaces or movies or just about anything that you can imagine is much greater in New York City (population 7.5 million) than it is in Boise, Idaho (population 150,000).

Also, the larger the proportion of the population in a given age group, the greater is the demand for the goods and services used by that age group.

For example, during the 1990s, a decrease in the college-age population decreased the demand for college places. During those same years, the number of Americans aged 85 years and over increased by more than 1 million. As a result, the demand for nursing home services increased.

**TABLE 3.1** The Demand for Energy Bars

**The Law of Demand**

*The quantity of energy bars demanded*

| *Decreases if:* | *Increases if:* |
|---|---|
| ■ The price of an energy bar rises | ■ The price of an energy bar falls |

**Changes in Demand**

*The demand for energy bars*

| *Decreases if:* | *Increases if:* |
|---|---|
| ■ The price of a substitute falls | ■ The price of a substitute rises |
| ■ The price of a complement rises | ■ The price of a complement falls |
| ■ The expected future price of an energy bar falls | ■ The expected future price of an energy bar rises |
| ■ Income falls* | ■ Income rises* |
| ■ Expected future income falls or credit becomes harder to get* | ■ Expected future income rises or credit becomes easier to get* |
| ■ The population decreases | ■ The population increases |

*An energy bar is a normal good.

**Preferences** Demand depends on preferences. *Preferences* determine the value that people place on each good and service. Preferences depend on such things as the weather, information, and fashion. For example, greater health and fitness awareness has shifted preferences in favor of energy bars, so the demand for energy bars has increased.

Table 3.1 summarizes the influences on demand and the direction of those influences.

## A Change in the Quantity Demanded Versus a Change in Demand

Changes in the influences on buying plans bring either a change in the quantity demanded or a change in demand. Equivalently, they bring either a movement along the demand curve or a shift of the demand curve. The distinction between a change in

the quantity demanded and a change in demand is the same as that between a movement along the demand curve and a shift of the demand curve.

A point on the demand curve shows the quantity demanded at a given price, so a movement along the demand curve shows a **change in the quantity demanded**. The entire demand curve shows demand, so a shift of the demand curve shows a *change in demand*. Figure 3.3 illustrates these distinctions.

**Movement Along the Demand Curve** If the price of the good changes but no other influence on buying plans changes, we illustrate the effect as a movement along the demand curve.

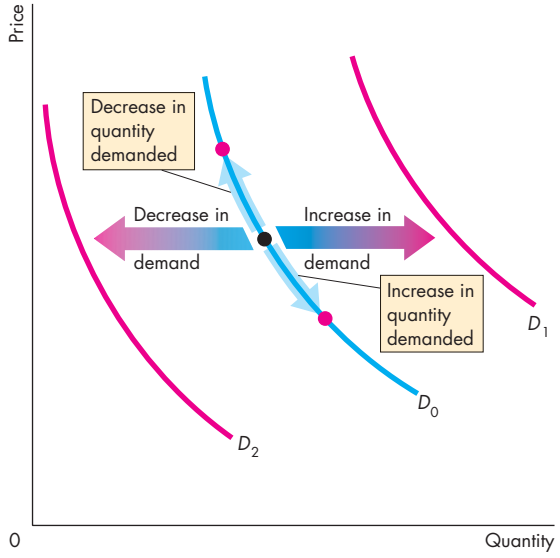
A fall in the price of a good increases the quantity demanded of it. In Fig. 3.3, we illustrate the effect of a fall in price as a movement down along the demand curve $D_0$.

A rise in the price of a good decreases the quantity demanded of it. In Fig. 3.3, we illustrate the effect of a rise in price as a movement up along the demand curve $D_0$.

**A Shift of the Demand Curve** If the price of a good remains constant but some other influence on buying plans changes, there is a change in demand for that good. We illustrate a change in demand as a shift of the demand curve. For example, if more people work out at the gym, consumers buy more energy bars regardless of the price of a bar. That is what a rightward shift of the demand curve shows—more energy bars are demanded at each price.

In Fig. 3.3, there is a *change in demand* and the demand curve shifts when any influence on buying plans changes, other than the price of the good. Demand *increases* and the demand curve *shifts rightward* (to the red demand curve $D_1$) if the price of a substitute rises, the price of a complement falls, the expected future price of the good rises, income increases (for a normal good), expected future income or credit increases, or the population increases. Demand *decreases* and the demand curve *shifts leftward* (to the red demand curve $D_2$) if the price of a substitute falls, the price of a complement rises, the expected future price of the good falls, income decreases (for a normal good), expected future income or credit decreases, or the population decreases. (For an inferior good, the effects of changes in income are in the opposite direction to those described above.)

**FIGURE 3.3** A Change in the Quantity Demanded Versus a Change in Demand




When the price of the good changes, there is a movement along the demand curve and *a change in the quantity demanded,* shown by the blue arrows on demand curve $D_0$. When any other influence on buying plans changes, there is a shift of the demand curve and a *change in demand*. An increase in demand shifts the demand curve rightward (from $D_0$ to $D_1$). A decrease in demand shifts the demand curve leftward (from $D_0$ to $D_2$).

myeconlab animation

## REVIEW QUIZ

1. Define the quantity demanded of a good or service.
2. What is the law of demand and how do we illustrate it?
3. What does the demand curve tell us about the price that consumers are willing to pay?
4. List all the influences on buying plans that change demand, and for each influence, say whether it increases or decreases demand.
5. Why does demand not change when the price of a good changes with no change in the other influences on buying plans?

You can work these questions in Study Plan 3.2 and get instant feedback. myeconlab

## Supply

If a firm supplies a good or service, the firm

1. Has the resources and technology to produce it,
2. Can profit from producing it, and
3. Plans to produce it and sell it.

A supply is more than just having the *resources* and the *technology* to produce something. *Resources and technology* are the constraints that limit what is possible.

Many useful things can be produced, but they are not produced unless it is profitable to do so. Supply reflects a decision about which technologically feasible items to produce.

The **quantity supplied** of a good or service is the amount that producers plan to sell during a given time period at a particular price. The quantity supplied is not necessarily the same amount as the quantity actually sold. Sometimes the quantity supplied is greater than the quantity demanded, so the quantity sold is less than the quantity supplied.

Like the quantity demanded, the quantity supplied is measured as an amount per unit of time. For example, suppose that GM produces 1,000 cars a day. The quantity of cars supplied by GM can be expressed as 1,000 a day, 7,000 a week, or 365,000 a year. Without the time dimension, we cannot tell whether a particular quantity is large or small.

Many factors influence selling plans, and again one of them is the price of the good. We look first at the relationship between the quantity supplied of a good and its price. Just as we did when we studied demand, to isolate the relationship between the quantity supplied of a good and its price, we keep all other influences on selling plans the same and ask: How does the quantity supplied of a good change as its price changes when other things remain the same?

The law of supply provides the answer.

### The Law of Supply

The **law of supply** states:

> Other things remaining the same, the higher the price of a good, the greater is the quantity supplied; and the lower the price of a good, the smaller is the quantity supplied.

Why does a higher price increase the quantity supplied? It is because *marginal cost increases.* As the quantity produced of any good increases, the marginal cost of producing the good increases. (See Chapter 2, p. 33 to review marginal cost.)

It is never worth producing a good if the price received for the good does not at least cover the marginal cost of producing it. When the price of a good rises, other things remaining the same, producers are willing to incur a higher marginal cost, so they increase production. The higher price brings forth an increase in the quantity supplied.

Let's now illustrate the law of supply with a supply curve and a supply schedule.

### Supply Curve and Supply Schedule

You are now going to study the second of the two most used curves in economics: the supply curve. You're also going to learn about the critical distinction between *supply* and *quantity supplied*.

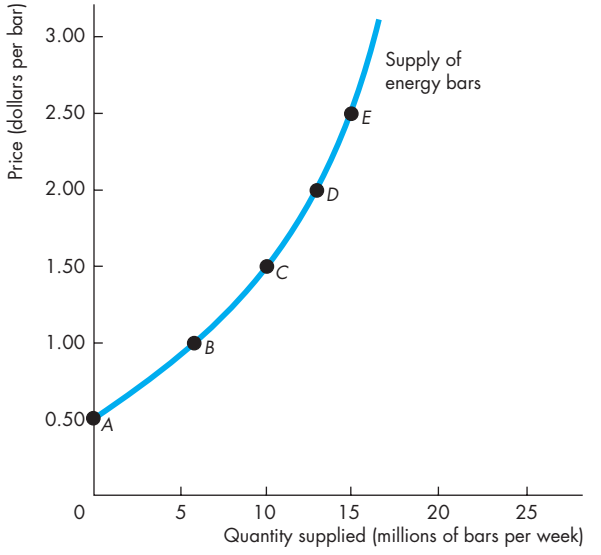
The term **supply** refers to the entire relationship between the price of a good and the quantity supplied of it. Supply is illustrated by the supply curve and the supply schedule. The term *quantity supplied* refers to a point on a supply curve—the quantity supplied at a particular price.

Figure 3.4 shows the supply curve of energy bars. A **supply curve** shows the relationship between the quantity supplied of a good and its price when all other influences on producers' planned sales remain the same. The supply curve is a graph of a supply schedule.

The table in Fig. 3.4 sets out the supply schedule for energy bars. A *supply schedule* lists the quantities supplied at each price when all the other influences on producers' planned sales remain the same. For example, if the price of an energy bar is 50¢, the quantity supplied is zero—in row *A* of the table. If the price of an energy bar is $1.00, the quantity supplied is 6 million energy bars a week—in row *B*. The other rows of the table show the quantities supplied at prices of $1.50, $2.00, and $2.50.

To make a supply curve, we graph the quantity supplied on the *x*-axis and the price on the *y*-axis. The points on the supply curve labeled *A* through *E* correspond to the rows of the supply schedule. For example, point *A* on the graph shows a quantity supplied of zero at a price of 50¢ an energy bar. Point *E* shows a quantity supplied of 15 million bars at $2.50 an energy bar.

**FIGURE 3.4** The Supply Curve




| | Price (dollars per bar) | Quantity supplied (millions of bars per week) |
|---|---|---|
| *A* | 0.50 | 0 |
| *B* | 1.00 | 6 |
| *C* | 1.50 | 10 |
| *D* | 2.00 | 13 |
| *E* | 2.50 | 15 |

The table shows the supply schedule of energy bars. For example, at a price of $1.00, 6 million bars a week are supplied; at a price of $2.50, 15 million bars a week are supplied. The supply curve shows the relationship between the quantity supplied and the price, other things remaining the same. The supply curve slopes upward: As the price of a good increases, the quantity supplied increases.

A supply curve can be read in two ways. For a given price, the supply curve tells us the quantity that producers plan to sell at that price. For example, at a price of $1.50 a bar, producers are planning to sell 10 million bars a week. For a given quantity, the supply curve tells us the minimum price at which producers are willing to sell one more bar. For example, if 15 million bars are produced each week, the lowest price at which a producer is willing to sell the 15 millionth bar is $2.50.

myeconlab animation

**Minimum Supply Price** The supply curve can be interpreted as a minimum-supply-price curve—a curve that shows the lowest price at which someone is willing to sell. This lowest price is the *marginal cost.*

If a small quantity is produced, the lowest price at which someone is willing to sell one more unit is low. But as the quantity produced increases, the marginal cost of each additional unit rises, so the lowest price at which someone is willing to sell an additional unit rises along the supply curve.

In Fig. 3.4, if 15 million bars are produced each week, the lowest price at which someone is willing to sell the 15 millionth bar is $2.50. But if 10 million bars are produced each week, someone is willing to accept $1.50 for the last bar produced.

## A Change in Supply

When any factor that influences selling plans other than the price of the good changes, there is a **change in supply**. Six main factors bring changes in supply. They are changes in

- The prices of factors of production
- The prices of related goods produced
- Expected future prices
- The number of suppliers
- Technology
- The state of nature

**Prices of Factors of Production** The prices of the factors of production used to produce a good influence its supply. To see this influence, think about the supply curve as a minimum-supply-price curve. If the price of a factor of production rises, the lowest price that a producer is willing to accept for that good rises, so supply decreases. For example, during 2008, as the price of jet fuel increased, the supply of air travel decreased. Similarly, a rise in the minimum wage decreases the supply of hamburgers.

**Prices of Related Goods Produced** The prices of related goods that firms produce influence supply. For example, if the price of energy gel rises, firms switch production from bars to gel. The supply of energy bars decreases. Energy bars and energy gel are *substitutes in production*—goods that can be produced by using the same resources. If the price of beef rises, the supply of cowhide increases. Beef and cowhide are *complements in production*—goods that must be produced together.

**Expected Future Prices** If the expected future price of a good rises, the return from selling the good in the future increases and is higher than it is today. So supply decreases today and increases in the future.

**The Number of Suppliers** The larger the number of firms that produce a good, the greater is the supply of the good. As new firms enter an industry, the supply in that industry increases. As firms leave an industry, the supply in that industry decreases.

**Technology** The term "technology" is used broadly to mean the way that factors of production are used to produce a good. A technology change occurs when a new method is discovered that lowers the cost of producing a good. For example, new methods used in the factories that produce computer chips have lowered the cost and increased the supply of chips.

**The State of Nature** The state of nature includes all the natural forces that influence production. It includes the state of the weather and, more broadly, the natural environment. Good weather can increase the supply of many agricultural products and bad weather can decrease their supply. Extreme natural events such as earthquakes, tornadoes, and hurricanes can also influence supply.

Figure 3.5 illustrates an increase in supply. When supply increases, the supply curve shifts rightward and the quantity supplied at each price is larger. For example, at $1.00 per bar, on the original (blue) supply curve, the quantity supplied is 6 million bars a week. On the new (red) supply curve, the quantity supplied is 15 million bars a week. Look closely at the numbers in the table in Fig. 3.5 and check that the quantity supplied is larger at each price.

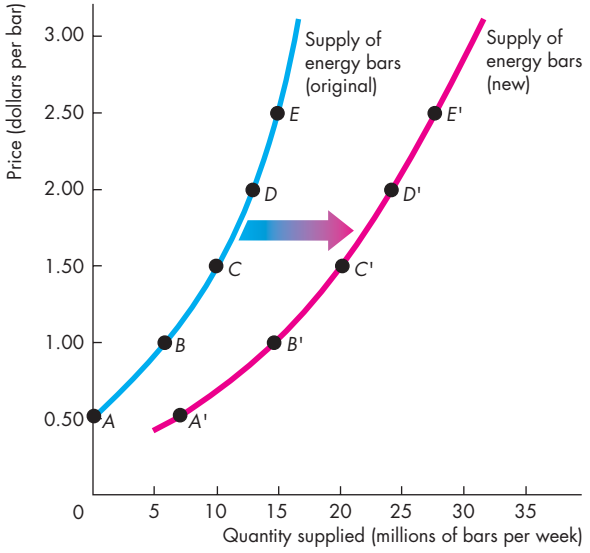
Table 3.2 summarizes the influences on supply and the directions of those influences.

## A Change in the Quantity Supplied Versus a Change in Supply

Changes in the influences on selling plans bring either a change in the quantity supplied or a change in supply. Equivalently, they bring either a movement along the supply curve or a shift of the supply curve.

A point on the supply curve shows the quantity supplied at a given price. A movement along the supply curve shows a **change in the quantity supplied**. The entire supply curve shows supply. A shift of the supply curve shows a *change in supply*.

**FIGURE 3.5** An Increase in Supply




| Original supply schedule Old technology | | | New supply schedule New technology | | |
|---|---|---|---|---|---|
| | Price (dollars per bar) | Quantity supplied (millions of bars per week) | | Price (dollars per bar) | Quantity supplied (millions of bars per week) |
| *A* | 0.50 | 0 | *A'* | 0.50 | 7 |
| *B* | 1.00 | 6 | *B'* | 1.00 | 15 |
| *C* | 1.50 | 10 | *C'* | 1.50 | 20 |
| *D* | 2.00 | 13 | *D'* | 2.00 | 25 |
| *E* | 2.50 | 15 | *E'* | 2.50 | 27 |

A change in any influence on selling plans other than the price of the good itself results in a new supply schedule and a shift of the supply curve. For example, a new, cost-saving technology for producing energy bars changes the supply of energy bars. At a price of $1.50 a bar, 10 million bars a week are supplied when producers use the old technology (row *C* of the table) and 20 million energy bars a week are supplied when producers use the new technology (row *C'*). An advance in technology *increases* the supply of energy bars. The supply curve shifts *rightward*, as shown by the shift arrow and the resulting red curve.

myeconlab animation

Figure 3.6 illustrates and summarizes these distinctions. If the price of the good changes and other things remain the same, there is a *change in the quantity supplied* of that good. If the price of the good falls, the quantity supplied decreases and there is a movement down along the supply curve $S_0$. If the price of the good rises, the quantity supplied increases and there is a movement up along the supply curve $S_0$. When any other influence on selling plans changes, the supply curve shifts and there is a *change in supply*. If supply increases, the supply curve shifts rightward to $S_1$. If supply decreases, the supply curve shifts leftward to $S_2$.

**TABLE 3.2** The Supply of Energy Bars

**The Law of Supply**

*The quantity of energy bars supplied*

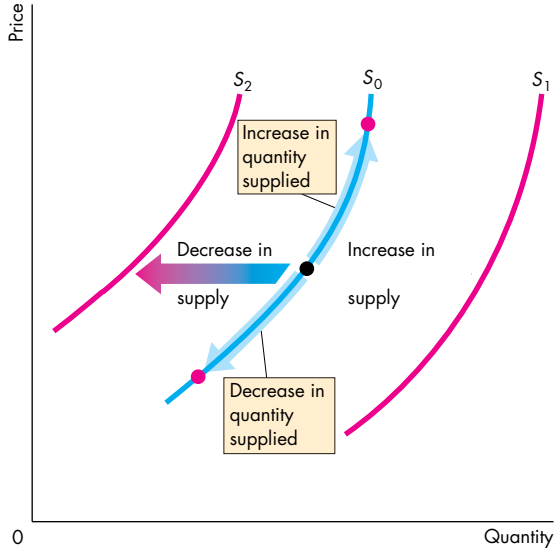
| *Decreases if:* | *Increases if:* |
|---|---|
| ■ The price of an energy bar falls | ■ The price of an energy bar rises |

**Changes in Supply**

*The supply of energy bars*

| *Decreases if:* | *Increases if:* |
|---|---|
| ■ The price of a factor of production used to produce energy bars rises | ■ The price of a factor of production used to produce energy bars falls |
| ■ The price of a substitute in production rises | ■ The price of a substitute in production falls |
| ■ The price of a complement in production falls | ■ The price of a complement in production rises |
| ■ The expected future price of an energy bar rises | ■ The expected future price of an energy bar falls |
| ■ The number of suppliers of bars decreases | ■ The number of suppliers of bars increases |
| ■ A technology change decreases energy bar production | ■ A technology change increases energy bar production |
| ■ A natural event decreases energy bar production | ■ A natural event increases energy bar production |

**FIGURE 3.6** A Change in the Quantity Supplied Versus a Change in Supply




When the price of the good changes, there is a movement along the supply curve and *a change in the quantity supplied,* shown by the blue arrows on supply curve $S_0$. When any other influence on selling plans changes, there is a shift of the supply curve and a *change in supply*. An increase in supply shifts the supply curve rightward (from $S_0$ *to* $S_1$), and a decrease in supply shifts the supply curve leftward (from $S_0$ *to* $S_2$).

myeconlab animation

## REVIEW QUIZ

1 Define the quantity supplied of a good or service.
2 What is the law of supply and how do we illustrate it?
3 What does the supply curve tell us about the producer's minimum supply price?
4 List all the influences on selling plans, and for each influence, say whether it changes supply.
5 What happens to the quantity of cell phones supplied and the supply of cell phones if the price of a cell phone falls?

You can work these questions in Study Plan 3.3 and get instant feedback. myeconlab

Now we're going to combine demand and supply and see how prices and quantities are determined.

## Market Equilibrium

We have seen that when the price of a good rises, the quantity demanded *decreases* and the quantity supplied *increases*. We are now going to see how the price adjusts to coordinate buying plans and selling plans and achieve an equilibrium in the market.

An *equilibrium* is a situation in which opposing forces balance each other. Equilibrium in a market occurs when the price balances buying plans and selling plans. The **equilibrium price** is the price at which the quantity demanded equals the quantity supplied. The **equilibrium quantity** is the quantity bought and sold at the equilibrium price. A market moves toward its equilibrium because

- Price regulates buying and selling plans.
- Price adjusts when plans don't match.

### Price as a Regulator

The price of a good regulates the quantities demanded and supplied. If the price is too high, the quantity supplied exceeds the quantity demanded. If the price is too low, the quantity demanded exceeds the quantity supplied. There is one price at which the quantity demanded equals the quantity supplied. Let's work out what that price is.

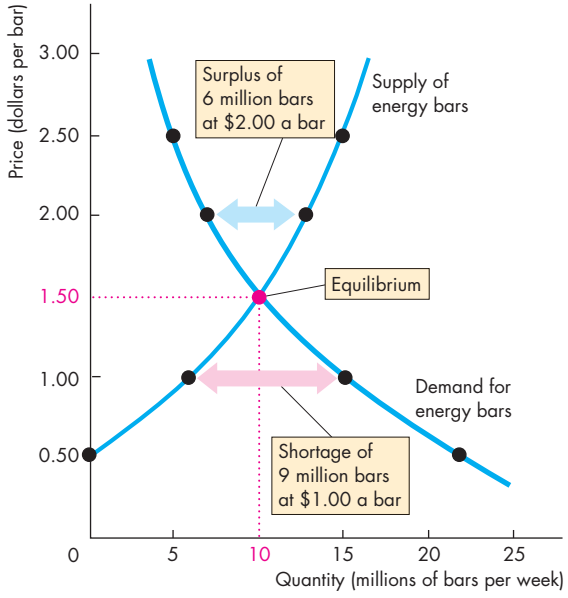
Figure 3.7 shows the market for energy bars. The table shows the demand schedule (from Fig. 3.1) and the supply schedule (from Fig. 3.4). If the price is 50¢ a bar, the quantity demanded is 22 million bars a week but no bars are supplied. There is a shortage of 22 million bars a week. The final column of the table shows this shortage. At a price of $1.00 a bar, there is still a shortage but only of 9 million bars a week.

If the price is $2.50 a bar, the quantity supplied is 15 million bars a week but the quantity demanded is only 5 million. There is a surplus of 10 million bars a week.

The one price at which there is neither a shortage nor a surplus is $1.50 a bar. At that price, the quantity demanded equals the quantity supplied: 10 million bars a week. The equilibrium price is $1.50 a bar, and the equilibrium quantity is 10 million bars a week.

Figure 3.7 shows that the demand curve and the supply curve intersect at the equilibrium price of $1.50 a bar. At each price *above* $1.50 a bar, there is a surplus of bars. For example, at $2.00 a bar, the surplus is 6

**FIGURE 3.7** Equilibrium




| Price (dollars per bar) | Quantity demanded | Quantity supplied | Shortage (–) or surplus (+) |
|---|---|---|---|
| | (millions of bars per week) | | |
| 0.50 | 22 | 0 | –22 |
| 1.00 | 15 | 6 | –9 |
| **1.50** | **10** | **10** | **0** |
| 2.00 | 7 | 13 | +6 |
| 2.50 | 5 | 15 | +10 |

The table lists the quantity demanded and the quantity supplied as well as the shortage or surplus of bars at each price. If the price is $1.00 a bar, 15 million bars a week are demanded and 6 million bars are supplied. There is a shortage of 9 million bars a week, and the price rises.

If the price is $2.00 a bar, 7 million bars a week are demanded and 13 million bars are supplied. There is a surplus of 6 million bars a week, and the price falls.

If the price is $1.50 a bar, 10 million bars a week are demanded and 10 million bars are supplied. There is neither a shortage nor a surplus, and the price does not change. The price at which the quantity demanded equals the quantity supplied is the equilibrium price, and 10 million bars a week is the equilibrium quantity.

myeconlab animation

million bars a week, as shown by the blue arrow. At each price *below* $1.50 a bar, there is a shortage of bars. For example, at $1.00 a bar, the shortage is 9 million bars a week, as shown by the red arrow.

## Price Adjustments

You've seen that if the price is below equilibrium, there is a shortage and that if the price is above equilibrium, there is a surplus. But can we count on the price to change and eliminate a shortage or a surplus? We can, because such price changes are beneficial to both buyers and sellers. Let's see why the price changes when there is a shortage or a surplus.

**A Shortage Forces the Price Up** Suppose the price of an energy bar is $1. Consumers plan to buy 15 million bars a week, and producers plan to sell 6 million bars a week. Consumers can't force producers to sell more than they plan, so the quantity that is actually offered for sale is 6 million bars a week. In this situation, powerful forces operate to increase the price and move it toward the equilibrium price. Some producers, noticing lines of unsatisfied consumers, raise the price. Some producers increase their output. As producers push the price up, the price rises toward its equilibrium. The rising price reduces the shortage because it decreases the quantity demanded and increases the quantity supplied. When the price has increased to the point at which there is no longer a shortage, the forces moving the price stop operating and the price comes to rest at its equilibrium.

**A Surplus Forces the Price Down** Suppose the price of a bar is $2. Producers plan to sell 13 million bars a week, and consumers plan to buy 7 million bars a week. Producers cannot force consumers to buy more than they plan, so the quantity that is actually bought is 7 million bars a week. In this situation, powerful forces operate to lower the price and move it toward the equilibrium price. Some producers, unable to sell the quantities of energy bars they planned to sell, cut their prices. In addition, some producers scale back production. As producers cut the price, the price falls toward its equilibrium. The falling price decreases the surplus because it increases the quantity demanded and decreases the quantity supplied. When the price has fallen to the point at which there is no longer a surplus, the forces moving the price stop operating and the price comes to rest at its equilibrium.

**The Best Deal Available for Buyers and Sellers** When the price is below equilibrium, it is forced upward. Why don't buyers resist the increase and refuse to buy at the higher price? The answer is because they value the good more highly than its current price and they can't satisfy their demand at the current price. In some markets—for example, the markets that operate on eBay—the buyers might even be the ones who force the price up by offering to pay a higher price.

When the price is above equilibrium, it is bid downward. Why don't sellers resist this decrease and refuse to sell at the lower price? The answer is because their minimum supply price is below the current price and they cannot sell all they would like to at the current price. Sellers willingly lower the price to gain market share.

At the price at which the quantity demanded and the quantity supplied are equal, neither buyers nor sellers can do business at a better price. Buyers pay the highest price they are willing to pay for the last unit bought, and sellers receive the lowest price at which they are willing to supply the last unit sold.

When people freely make offers to buy and sell and when demanders try to buy at the lowest possible price and suppliers try to sell at the highest possible price, the price at which trade takes place is the equilibrium price—the price at which the quantity demanded equals the quantity supplied. The price coordinates the plans of buyers and sellers, and no one has an incentive to change it.

## REVIEW QUIZ

1. What is the equilibrium price of a good or service?
2. Over what range of prices does a shortage arise? What happens to the price when there is a shortage?
3. Over what range of prices does a surplus arise? What happens to the price when there is a surplus?
4. Why is the price at which the quantity demanded equals the quantity supplied the equilibrium price?
5. Why is the equilibrium price the best deal available for both buyers and sellers?

You can work these questions in Study Plan 3.4 and get instant feedback. myeconlab

## Predicting Changes in Price and Quantity

The demand and supply model that we have just studied provides us with a powerful way of analyzing influences on prices and the quantities bought and sold. According to the model, a change in price stems from a change in demand, a change in supply, or a change in both demand and supply. Let's look first at the effects of a change in demand.

### An Increase in Demand

If more people join health clubs, the demand for energy bars increases. The table in Fig. 3.8 shows the original and new demand schedules for energy bars as well as the supply schedule of energy bars.

The increase in demand creates a shortage at the original price and to eliminate the shortage, the price must rise.

Figure 3.8 shows what happens. The figure shows the original demand for and supply of energy bars. The original equilibrium price is $1.50 an energy bar, and the equilibrium quantity is 10 million energy bars a week. When demand increases, the demand curve shifts rightward. The equilibrium price rises to $2.50 an energy bar, and the quantity supplied increases to 15 million energy bars a week, as highlighted in the figure. There is an *increase in the quantity supplied* but *no change in supply*—a movement along, but no shift of, the supply curve.

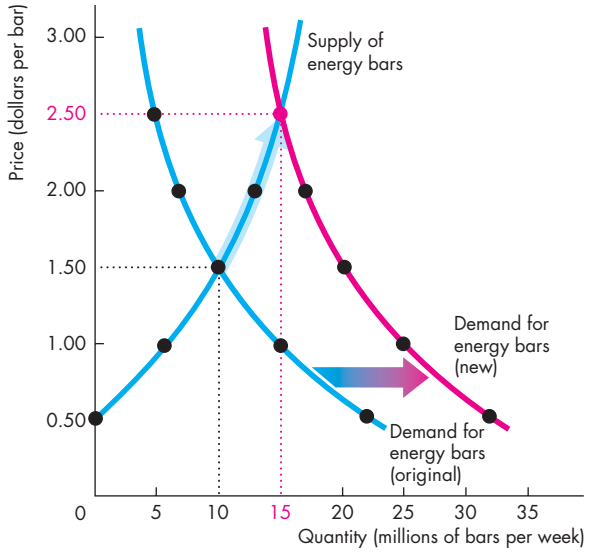
### A Decrease in Demand

We can reverse this change in demand. Start at a price of $2.50 a bar with 15 million energy bars a week being bought and sold, and then work out what happens if demand decreases to its original level. Such a decrease in demand might arise if people switch to energy gel (a substitute for energy bars). The decrease in demand shifts the demand curve leftward. The equilibrium price falls to $1.50 a bar, the quantity supplied decreases, and the equilibrium quantity decreases to 10 million bars a week.

We can now make our first two predictions:

1. When demand increases, the price rises and the quantity increases.
2. When demand decreases, the price falls and the quantity decreases.

**FIGURE 3.8** The Effects of a Change in Demand




| Price (dollars per bar) | Quantity demanded (millions of bars per week) | | Quantity supplied (millions of bars per week) |
|---|---|---|---|
| | Original | New | |
| 0.50 | 22 | 32 | 0 |
| 1.00 | 15 | 25 | 6 |
| **1.50** | **10** | 20 | **10** |
| 2.00 | 7 | 17 | 13 |
| **2.50** | 5 | **15** | **15** |

Initially, the demand for energy bars is the blue demand curve. The equilibrium price is $1.50 a bar, and the equilibrium quantity is 10 million bars a week. When more health-conscious people do more exercise, the demand for energy bars increases and the demand curve shifts rightward to become the red curve.

At $1.50 a bar, there is now a shortage of 10 million bars a week. The price of a bar rises to a new equilibrium of $2.50. As the price rises to $2.50, the quantity supplied increases—shown by the blue arrow on the supply curve—to the new equilibrium quantity of 15 million bars a week. Following an increase in demand, the quantity supplied increases but supply does not change—the supply curve does not shift.

myeconlab animation

## Economics in Action

### The Global Market for Crude Oil

The demand and supply model provides insights into all competitive markets. Here, we'll apply what you've learned about the effects of an increase in demand to the global market for crude oil.

Crude oil is like the life-blood of the global economy. It is used to fuel our cars, airplanes, trains, and buses, to generate electricity, and to produce a wide range of plastics. When the price of crude oil rises, the cost of transportation, power, and materials all increase.

In 2001, the price of a barrel of oil was $20 (using the value of money in 2010). In 2008, before the global financial crisis ended a long period of economic expansion, the price peaked at $127 a barrel.

While the price of oil was rising, the quantity of oil produced and consumed also increased. In 2001, the world produced 65 million barrels of oil a day. By 2008, that quantity was 72 million barrels.

Who or what has been raising the price of oil? Is it the action of greedy oil producers? Oil producers might be greedy, and some of them might be big enough to withhold supply and raise the price, but it wouldn't be in their self-interest to do so. The higher price would bring forth a greater quantity supplied from other producers and the profit of the producer limiting supply would fall.

Oil producers could try to cooperate and jointly withhold supply. The Organization of Petroleum Exporting Countries, OPEC, is such a group of producers. But OPEC doesn't control the *world* supply and its members' self-interest is to produce the quantities that give them the maximum attainable profit.

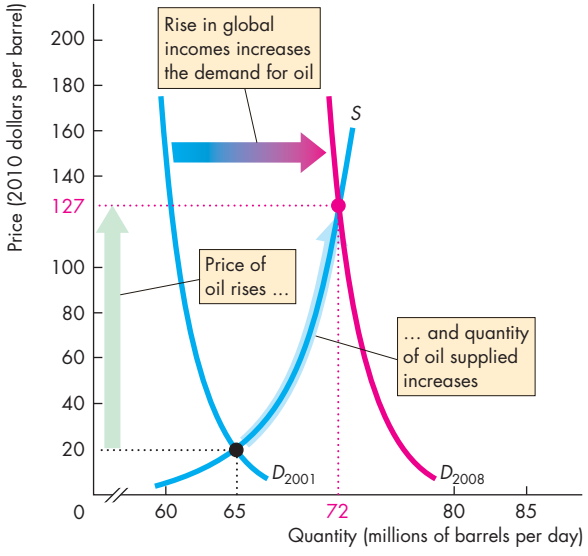
So even though the global oil market has some big players, they don't fix the price. Instead, the actions of thousands of buyers and sellers and the forces of demand and supply determine the price of oil.

So how have demand and supply changed?

Because both the price and the quantity have increased, the demand for oil must have increased. Supply might have changed too, but here we'll suppose that supply has remained the same.

The global demand for oil has increased for one major reason: World income has increased. The increase has been particularly large in the emerging economies of Brazil, China, and India. Increased world income has increased the demand for oil-using goods such as electricity, gasoline, and plastics, which in turn has increased the demand for oil.

The figure illustrates the effects of the increase in demand on the global oil market. The supply of oil remained constant along supply curve *S*. The demand for oil in 2001 was $D_{2001}$, so in 2001 the price was $20 a barrel and the quantity was 65 million barrels per day. The demand for oil increased and by 2008 it had reached $D_{2008}$. The price of oil increased to $127 a barrel and the quantity increased to 72 million barrels a day. The increase in the quantity is an *increase in the quantity supplied*, not an increase in supply.




**The Global Market for Crude Oil**

## An Increase in Supply

When Nestlé (the producer of PowerBar) and other energy bar producers switch to a new cost-saving technology, the supply of energy bars increases. Figure 3.9 shows the new supply schedule (the same one that was shown in Fig. 3.5). What are the new equilibrium price and quantity? The price falls to $1.00 a bar, and the quantity increases to 15 million bars a week. You can see why by looking at the quantities demanded and supplied at the old price of $1.50 a bar. The new quantity supplied at that price is 20 million bars a week, and there is a surplus. The price falls. Only when the price is $1.00 a bar does the quantity supplied equal the quantity demanded.

Figure 3.9 illustrates the effect of an increase in supply. It shows the demand curve for energy bars and the original and new supply curves. The initial equilibrium price is $1.50 a bar, and the equilibrium quantity is 10 million bars a week. When supply increases, the supply curve shifts rightward. The equilibrium price falls to $1.00 a bar, and the quantity demanded increases to 15 million bars a week, highlighted in the figure. There is an *increase in the quantity demanded* but *no change in demand*—a movement along, but no shift of, the demand curve.

## A Decrease in Supply

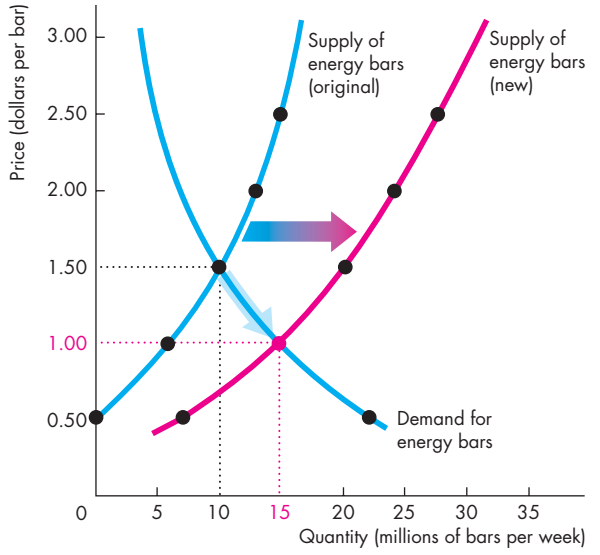
Start out at a price of $1.00 a bar with 15 million bars a week being bought and sold. Then suppose that the cost of labor or raw materials rises and the supply of energy bars decreases. The decrease in supply shifts the supply curve leftward. The equilibrium price rises to $1.50 a bar, the quantity demanded decreases, and the equilibrium quantity decreases to 10 million bars a week.

We can now make two more predictions:

1. When supply increases, the price falls and the quantity increases.
2. When supply decreases, the price rises and the quantity decreases.

You've now seen what happens to the price and the quantity when either demand or supply changes while the other one remains unchanged. In real markets, both demand and supply can change together. When this happens, to predict the changes in price and quantity, we must combine the effects that you've just seen. That is your final task in this chapter.

**FIGURE 3.9** The Effects of a Change in Supply




| Price (dollars per bar) | Quantity demanded (millions of bars per week) | Quantity supplied (millions of bars per week) | |
|---|---|---|---|
| | | Original | New |
| 0.50 | 22 | 0 | 7 |
| **1.00** | **15** | 6 | **15** |
| **1.50** | **10** | **10** | 20 |
| 2.00 | 7 | 13 | 25 |
| 2.50 | 5 | 15 | 27 |

Initially, the supply of energy bars is shown by the blue supply curve. The equilibrium price is $1.50 a bar, and the equilibrium quantity is 10 million bars a week. When the new cost-saving technology is adopted, the supply of energy bars increases and the supply curve shifts rightward to become the red curve.

At $1.50 a bar, there is now a surplus of 10 million bars a week. The price of an energy bar falls to a new equilibrium of $1.00 a bar. As the price falls to $1.00, the quantity demanded increases—shown by the blue arrow on the demand curve—to the new equilibrium quantity of 15 million bars a week. Following an increase in supply, the quantity demanded increases but demand does not change—the demand curve does not shift.

myeconlab animation

## Economics in Action

### The Market for Strawberries

California produces 85 percent of the nation's strawberries and its crop, which starts to increase in March, is in top flight by April. During the winter months of January and February, Florida is the main strawberry producer.

In a normal year, the supplies from these two regions don't overlap much. As California's production steps up in March and April, Florida's production falls off. The result is a steady supply of strawberries and not much seasonal fluctuation in the price of strawberries.

But 2010 wasn't a normal year. Florida had exceptionally cold weather, which damaged the strawberry fields, lowered crop yields, and delayed the harvests. The result was unusually high strawberry prices.

With higher than normal prices, Florida farmers planted strawberry varieties that mature later than their normal crop and planned to harvest this fruit during the spring. Their plan worked perfectly and good growing conditions delivered a bumper crop by late March.

On the other side of the nation, while Florida was freezing, Southern California was drowning under unusually heavy rains. This wet weather put the strawberries to sleep and delayed their growth. But when the rains stopped and the temperature began to rise, California joined Florida with a super abundance of fruit.

With an abundance of strawberries, the price tumbled. Strawberry farmers in both regions couldn't hire enough labor to pick the super-sized crop, so some fruit was left in the fields to rot.

The figure explains what was happening in the market for strawberries.

Demand, shown by the demand curve, *D*, didn't change. In January, the failed Florida crop kept supply low and the supply curve was $S_{January}$. The price was high at $3.80 per pound and production was 5.0 million pounds per day.

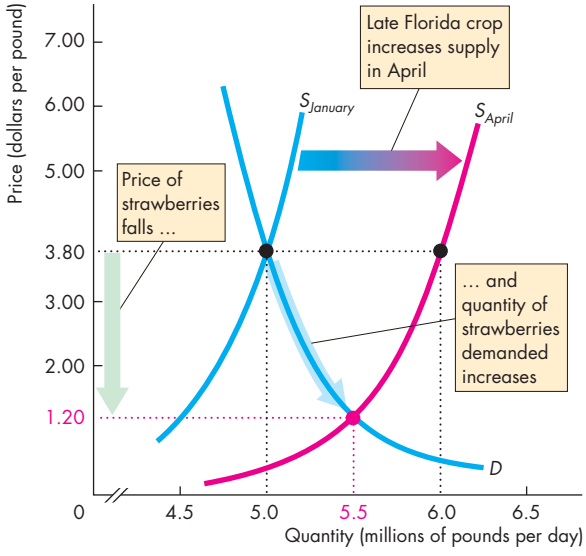
In April, the bumper crops in both regions increased supply to $S_{April}$. This increase in supply lowered the price to $1.20 per pound and increased the quantity demanded—a movement along the demand curve—to 5.5 million pounds per day.

You can also see in the figure why farmers left fruit in the field to rot. At the January price of $3.80 a pound, farmers would have been paying top wages to hire the workers needed to pick fruit at the rate of 6.0 million pounds per day. This is the quantity on supply curve $S_{April}$ at $3.80 a pound.

But with the fall in price to $1.20 a pound, growers were not able to earn a profit by picking more than 5.5 million pounds.

For some growers the price wasn't high enough to cover the cost of hiring labor, so they opened their fields to anyone who wanted to pick their own strawberries for free.

The events we've described here in the market for strawberries illustrate the effects of a change in supply with no change in demand.




**The Market for Strawberries**

## All the Possible Changes in Demand and Supply

Figure 3.10 brings together and summarizes the effects of all the possible changes in demand and supply. With what you've learned about the effects of a change in *either* demand or supply, you can predict what happens if *both* demand and supply change together. Let's begin by reviewing what you already know.

**Change in Demand with No Change in Supply** The first row of Fig. 3.10, parts (a), (b), and (c), summarizes the effects of a change in demand with no change in supply. In part (a), with no change in either demand or supply, neither the price nor the quantity changes. With an *increase* in demand and no change in supply in part (b), both the price and quantity increase. And with a *decrease* in demand and no change in supply in part (c), both the price and the quantity decrease.

**Change in Supply with No Change in Demand** The first column of Fig. 3.10, parts (a), (d), and (g), summarizes the effects of a change in supply with no change in demand. With an *increase* in supply and no change in demand in part (d), the price falls and quantity increases. And with a *decrease* in supply and no change in demand in part (g), the price rises and the quantity decreases.

**Increase in Both Demand and Supply** You've seen that an increase in demand raises the price and increases the quantity. And you've seen that an increase in supply lowers the price and increases the quantity. Fig. 3.10(e) combines these two changes. Because either an increase in demand or an increase in supply increases the quantity, the quantity also increases when both demand and supply increase. But the effect on the price is uncertain. An increase in demand raises the price and an increase in supply lowers the price, so we can't say whether the price will rise or fall when both demand and supply increase. We need to know the magnitudes of the changes in demand and supply to predict the effects on price. In the example in Fig. 3.10(e), the price does not change. But notice that if demand increases by slightly more than the amount shown in the figure, the price will rise. And if supply increases by slightly more than the amount shown in the figure, the price will fall.

**Decrease in Both Demand and Supply** Figure 3.10(i) shows the case in which demand and supply *both decrease*. For the same reasons as those we've just reviewed, when both demand and supply decrease, the quantity decreases, and again the direction of the price change is uncertain.

**Decrease in Demand and Increase in Supply** You've seen that a decrease in demand lowers the price and decreases the quantity. And you've seen that an increase in supply lowers the price and increases the quantity. Fig. 3.10(f) combines these two changes. Both the decrease in demand and the increase in supply lower the price, so the price falls. But a decrease in demand decreases the quantity and an increase in supply increases the quantity, so we can't predict the direction in which the quantity will change unless we know the magnitudes of the changes in demand and supply. In the example in Fig. 3.10(f), the quantity does not change. But notice that if demand decreases by slightly more than the amount shown in the figure, the quantity will decrease; if supply increases by slightly more than the amount shown in the figure, the quantity will increase.

**Increase in Demand and Decrease in Supply** Figure 3.10(h) shows the case in which demand increases and supply decreases. Now, the price rises, and again the direction of the quantity change is uncertain.

## REVIEW QUIZ

What is the effect on the price and quantity of MP3 players (such as the iPod) if

1. The price of a PC falls or the price of an MP3 download rises? (Draw the diagrams!)
2. More firms produce MP3 players or electronics workers' wages rise? (Draw the diagrams!)
3. Any two of the events in questions 1 and 2 occur together? (Draw the diagrams!)

You can work these questions in Study Plan 3.5 and get instant feedback. myeconlab

To complete your study of demand and supply, take a look at *Reading Between the Lines* on pp. 70–71, which explains why the price of coffee increased in 2010. Try to get into the habit of using the demand and supply model to understand the movements in prices in your everyday life.