

# chapter 3

## Supply and Demand

### Chapter Objectives

Students will learn in this chapter:

- That the market for a good can be described with two curves: a demand curve and a supply curve.
- That a competitive market is made up of many buyers and sellers and no buyer or seller can control the price.
- What the demand curve is and what causes it to shift.
- What the supply curve is and what causes it to shift.
- How the supply and demand curves determine a market's equilibrium price and quantity.
- How the equilibrium price and quantity of a market are affected by shifts of the demand and supply curve.

### Chapter Outline

**Opening Example:** The market for coffee is used to introduce supply and demand. Starbucks in 2006 is used to explain how events outside anyone's control can affect the market price and quantity for coffee. Starbucks and coffee prices are used to explain supply and demand in broad terms.

#### I. Supply and Demand: A Model of a Competitive Market

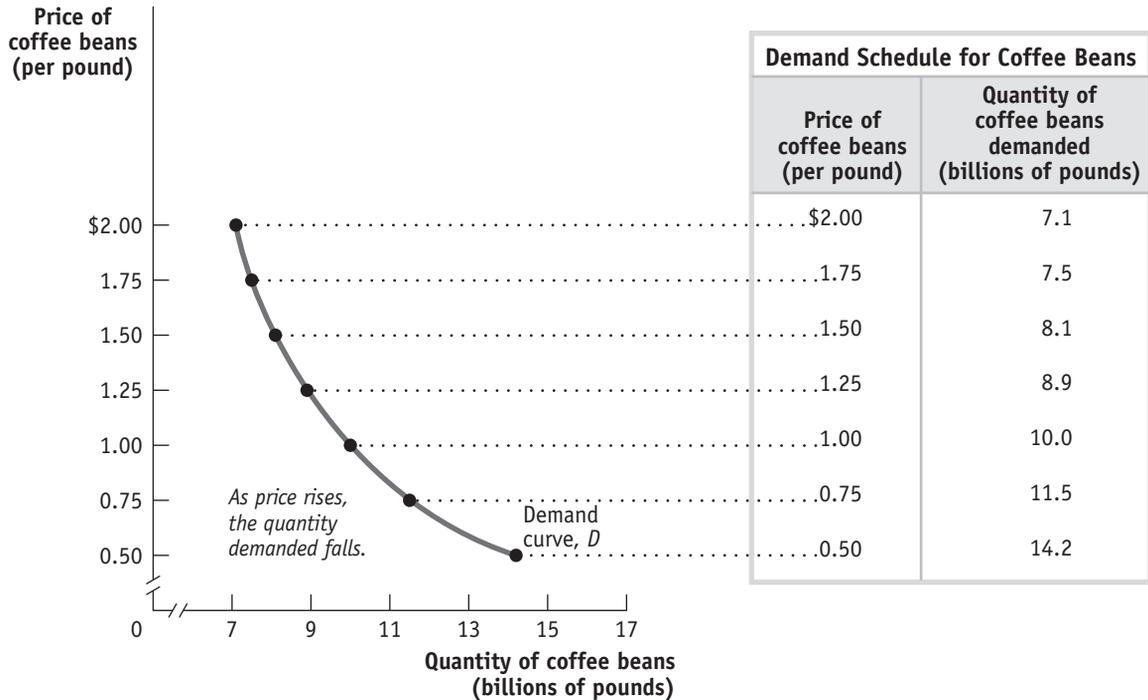
- A. *Definition:* A **competitive market** is one in which there are many buyers and sellers of a good.
- B. *Definition:* The **supply and demand model** is a model of how a competitive market works.

#### II. The Demand Curve and the Demand Schedule

- A. *Definition:* A **demand schedule** shows how much of a good consumers are willing and able to buy at different prices.
- B. *Definition:* A **demand curve** is a graphical representation of the demand schedule. It shows how much of a good or service consumers want to buy at a given price.
- C. The demand schedule and demand curve are illustrated in text Figure 3-1, shown on the next page.
- D. *Definition:* The **quantity demanded** is the actual amount consumers are willing to buy at some specific price.

E. *Definition:* The **law of demand** says that a higher price of a good, other things equal, leads people to demand a smaller quantity of the good.

**The Demand Schedule and the Demand Curve**



1. The law of demand implies that the demand curve will be downward sloping: the higher the price of a good, the less of it consumers want.

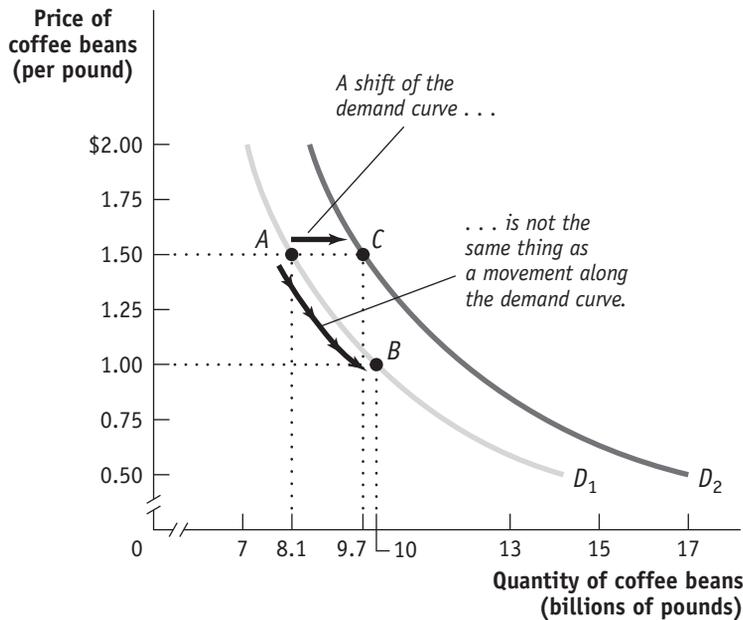
F. *Definition:* A **shift of the demand curve** is a change in the quantity demanded at any given price, represented by the change of the original demand curve to a new position, denoted by a new demand curve.

1. If consumers want more of the good at any given price, the curve shifts to the right. If consumers want to buy less of a good at any given price, the curve shifts to the left.

G. *Definition:* A **movement along the demand curve** is a change in the quantity demanded of a good that is the result of a change in that good's price.

H. The difference between a shift of the demand curve and movement along the demand curve is illustrated in text Figure 3-3, shown on the next page.

### Movement Along the Demand Curve Versus Shift of the Demand Curve



#### I. Factors that shift the demand curve

##### 1. Changes in the prices of related goods

- a. *Definition:* Two goods are **substitutes** if a fall in the price of one of the goods makes consumers less willing to buy the other good.
- b. *Definition:* Two goods are **complements** if a fall in the price of one good makes people more willing to buy the other good.

##### 2. Changes in income

- a. *Definition:* When a rise in income increases the demand for a good—the normal case—we say that the good is a **normal good**.
- b. *Definition:* When a rise in income decreases the demand for a good, the good is an **inferior good**.

##### 3. Changes in tastes

##### 4. Changes in expectations

##### 5. Changes in the number of consumers

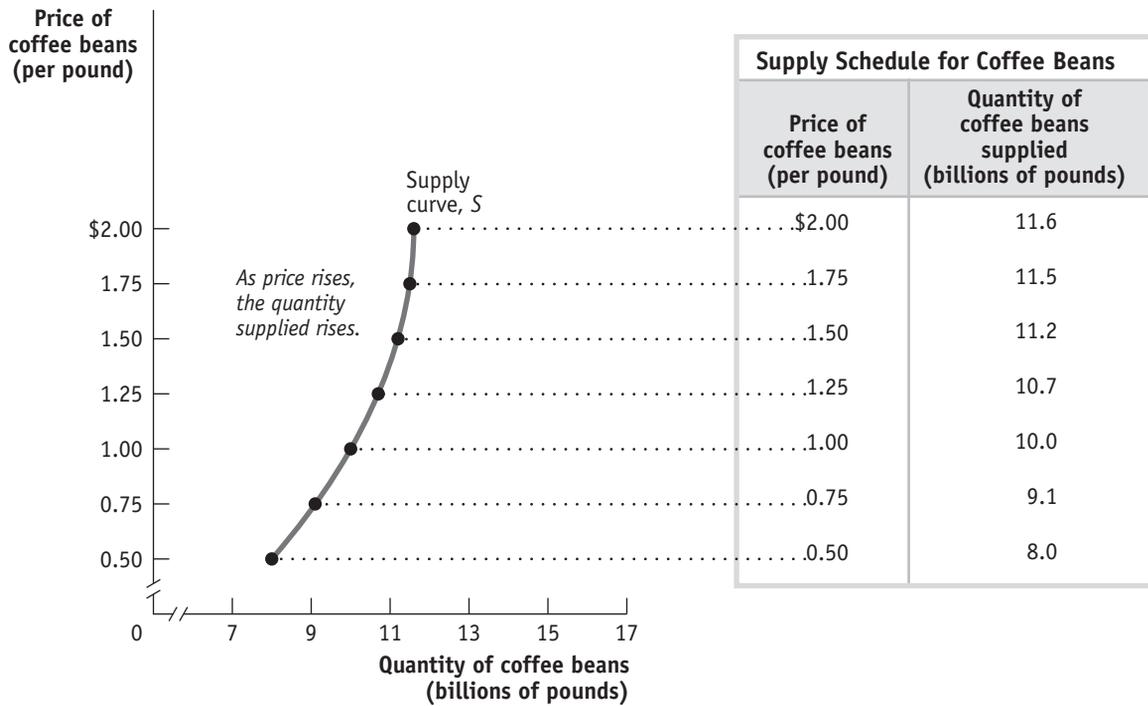
#### J. The individual versus the market demand curve.

1. *Definition:* An **individual demand curve** illustrates the relationship between quantity demanded and price for an individual consumer.

### III. The Supply Curve

- A. *Definition:* The **quantity supplied** is the actual amount of a good or service sellers are willing to sell at some specific price.
- B. *Definition:* The **supply schedule** shows how much of a good or a service producers are willing to sell at some specific price.
- C. The supply schedule and supply curve are illustrated in text Figure 3-6, shown on the next page.

The Supply Schedule and the Supply Curve



D. *Definition:* A **supply curve** shows graphically how much of a good or service sellers are willing to sell at any given price.

1. The supply curve is upward sloping because, all else equal, as the price of a good rises, people are willing to sell a greater quantity of a good.

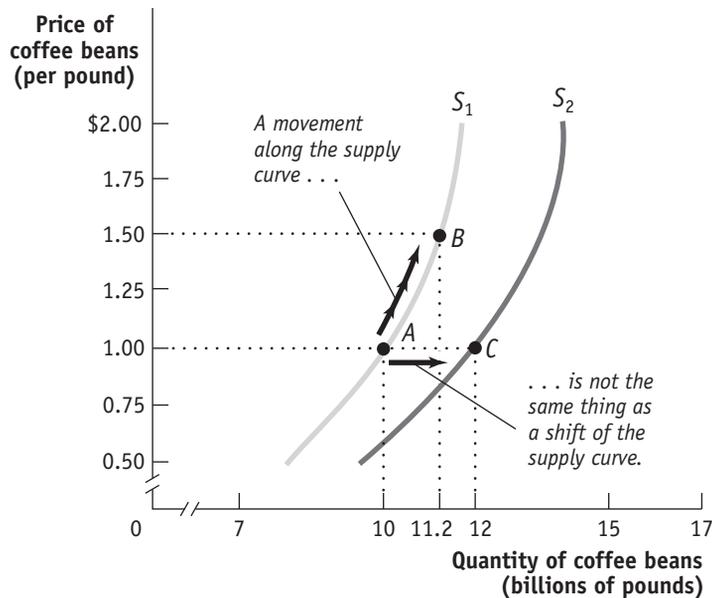
E. *Definition:* A **shift of the supply curve** is a change in the quantity supplied of a good at any given price. It is represented by the change of the original supply curve to a new position, denoted by a new supply curve.

1. If supply increases, the curve shifts to the right; if the supply decreases the supply curve shifts to the left.

F. *Definition:* A **movement along the supply curve** is a change in the quantity supplied of a good that is the result of a change in that good's price.

G. The difference between a shift in the supply curve and movement along the curve is illustrated in text Figure 3-8, shown on the next page.

### Movement Along the Supply Curve Versus Shift of the Supply Curve



#### H. Factors that shift the supply curve

1. Changes in input prices
  - a. *Definition:* An **input** is a good that is used to produce another good.
2. Changes in the price of related goods or services
3. Changes in technology
4. Changes in expectations
5. Changes in the number of producers

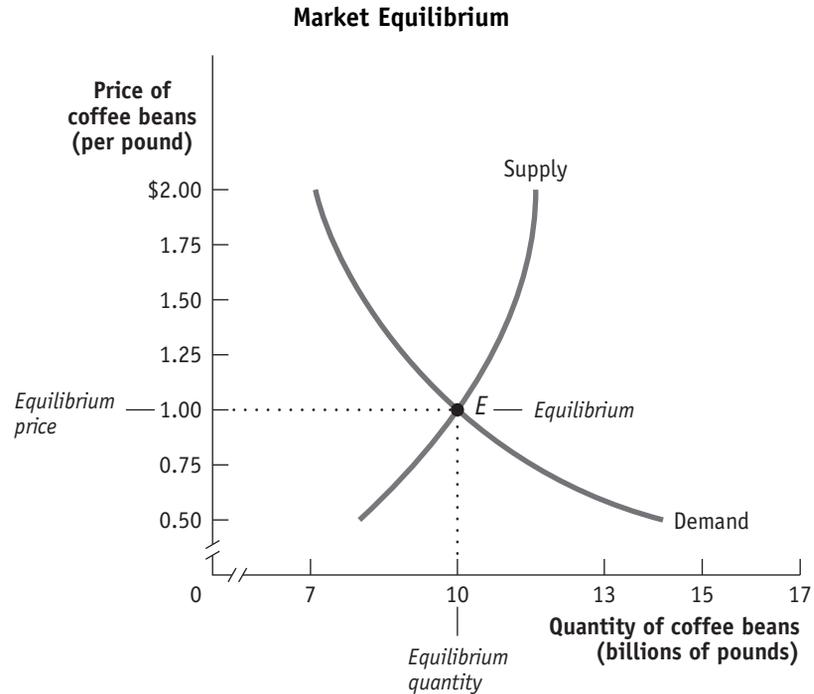
#### I. The individual versus the market supply curve

1. *Definition:* An **individual supply curve** illustrates the relationship between quantity supplied and price for an individual producer.

## IV. Supply, Demand, and Equilibrium

A. *Definition:* A competitive market is in equilibrium when price has moved to a level at which the quantity demanded of a good equals the quantity supplied of that good. The price at which this takes place is the **equilibrium price**, also referred to as the **market-clearing price**. The quantity of the good bought and sold at that price is the equilibrium quantity. Market equilibrium is illustrated in text Figure 3-11, shown on the next page.

1. Why do all sales and purchases in a market take place at the same price? In any market where buyers and sellers are around for some time they will observe which price works best for them. If a seller is trying to charge above the equilibrium price, buyers will shop elsewhere.
2. Why does the market price fall if it is above the equilibrium price? The quantity supplied in the market is greater than the quantity demanded. Excess supply causes the market price to fall.
  - a. *Definition:* There is a **surplus** of a good when the quantity supplied exceeds the quantity demanded. Surpluses occur when the price is above the equilibrium level.



3. Why does the market price rise if it is below the equilibrium price? The quantity supplied is less than the quantity demanded and there will be excess demand, causing the price to rise.
  - a. *Definition:* There is a **shortage** of a good when the quantity demanded exceeds the quantity supplied. Shortages occur when the price is below its equilibrium level.

## V. Changes in Supply and Demand

### A. What happens when the demand curve shifts

1. An increase in demand (the demand curve shifts right) leads to a rise in both the equilibrium price and the equilibrium quantity.
2. A decrease in demand (the demand curve shifts left) leads to a fall in both the equilibrium price and equilibrium quantity.

### B. What happens when the supply curve shifts

1. An increase in supply (the supply curve shifts right) leads to a fall in the equilibrium price and a rise in the equilibrium quantity.
2. A decrease in supply (the supply curve shifts left) leads to a rise in the equilibrium price and a fall in the equilibrium quantity.

### C. Simultaneous shifts in supply and demand

1. The results for equilibrium quantity and equilibrium price depend on the direction of the shifts in supply and demand, and by how much these curves shift.

## Teaching Tips

### Supply and Demand: A Model of a Competitive Market

#### *Creating Student Interest*

Ask students if they can think of anyone who would like to be able to predict when the price of something was going to go up or down. Buyers, sellers and speculators can benefit from this information (buy low, sell high!). Ask them if they can think of anyone who would like to be able to predict when quantities sold will increase or decrease. Sellers especially need to plan for these changes (for example, hiring more workers or laying them off). Explain that they are about to learn a model that will help them to predict the effect of changes in the economy on prices and quantities. The information can be very valuable (making money in the stock market, for instance). In fact, it is at the core of what many people do for a living—predicting changes in markets.

#### *Presenting the Material*

It can be difficult for students to adjust to using economic models. Be sure that students understand that the goal is not to memorize definitions but to learn how to use the supply-and-demand model. It may be helpful to give them a sample question to show them at the start what they should be able to do after studying the chapter. For example, “How will an increase in the price of gasoline affect the price and quantity of SUVs sold?” Ask the students to speculate about the possible effects. As you build the pieces of the model, periodically remind students about this ultimate goal: to be able to use the supply and demand model.

## The Demand Curve

#### *Creating Student Interest*

Pair up students and ask: What did you buy recently, and why? Then ask a few pairs to report. List on the board the various factors that influenced their decisions. These will range from “it was convenient” to “I wanted it.” Often, students will say they “needed” to buy something. However, if you ask them if they had a substitute, they will understand that they preferred the item. From the list on the board, it is clear that price is just one of many factors that can influence demand. Indicate that we will focus on price first and how it influences the amount consumers want to buy.

Ask students to think of products that have rising sales. What factors influence the demand for these products? HD TVs, hybrid cars, and cellular phones with added capabilities (beyond the capability to make a phone call!) are some recent examples.

#### *Presenting the Material*

Do a quick survey of three students in the class and their demand for gallons of gasoline per week. Ask them how many gallons they will buy at various prices (assume a particular octane level). A hypothetical example may look like the following.

Price	Quantity (gallons) demanded per week	Quantity (gallons) demanded per week	Quantity (gallons) demanded per week	Total market demand Schedule
	Jim	Ricardo	Leticia	
\$2.40	5	10	10	25
\$2.20	8	12	10	30
\$2.00	10	15	10	35
\$1.80	14	18	10	42
\$1.60	16	20	10	46
\$1.40	18	20	10	48

Follow up on the survey by drawing the demand curve given the three responses.

## The Supply Curve

### *Creating Student Interest*

Ask students if any of them have recently sold an item. Have any of them ever sold an item on eBay? What other methods did they use? How long did it take them to sell the item and do they think they got the highest price they could? Have students assume the role of sellers and consider how price acts as an incentive to sell.

### *Presenting the Material*

Ask students to write down how many hours they are willing to tutor economics students at the following hourly wage rates: \$16.00, \$12.00, \$10.00, \$8.00, \$6.00. Then ask three students to report their responses. Add up the hours at each wage, and derive the upward-sloping supply curve. Note: A few students may choose to work fewer hours as the wage rises, but generally the overall response produces an upward sloping supply curve.

## Supply, Demand, and Equilibrium

### *Creating Student Interest*

Remind students of the discussion of equilibrium in an earlier chapter. Ask them what it means to say that someone was walking along and lost their equilibrium (it's their balance—they fell down—and achieved a new equilibrium on the ground!). Emphasize that equilibrium is a general concept and that they will see it in different specific models throughout economics. In general, it means balance, and that there is no tendency for change without an outside force.

### *Presenting the Material*

Draw a graph showing supply and demand (together at last on the same graph!). Alfred Marshall described supply and demand as scissor blades. Neither can accomplish as much on its own as the two can accomplish together! When both curves are on the same graph, their intersection will determine equilibrium price and quantity. Show students how to find the equilibrium price and quantity on the graph. Ask students how to describe this point on the graph. (“Where supply and demand intersect” would be a cor-

rect answer.) Ask students what is equal at the equilibrium point. Make the point that it is quantity demanded that equals quantity supplied (that is, supply does not equal demand). Remind students of the distinction made earlier between demand/quantity demanded and supply/quantity supplied. Quantity demanded/supplied refers to the points on the curve (which are equal at equilibrium). *Demand* and *supply* refer to the entire curves, which are not equal (they are only equal at the one point). Use this to reinforce the distinctions made earlier.

Remind students that at equilibrium there is balance and there is no tendency for change. At our equilibrium here, there is balance between the forces of supply and of demand and there is no tendency for *price* to change. Students will eventually come to know that where two lines intersect on a graph in economics often has significance. However, it is important that students understand why the intersection is the equilibrium in this model. Perhaps the best way to show why the intersection is equilibrium is to show students what happens when the price is not at equilibrium (it is above or below equilibrium).

Select a price above equilibrium. Ask students what consumers think about a high price. Show the quantity demanded on the graph. Ask them what producers think about the higher price. Show the quantity supplied. Determine the surplus on the graph and ask students what producers will do when surpluses start building up in the warehouse (they will lower price—that is, have a sale). Prices will tend to fall when they are above equilibrium. Ask them how long they will continue lowering price (until the surplus is gone)—that’s at equilibrium! Follow the same process to show the shortage when price is below equilibrium. Ask how producers decide who gets to buy when there is a shortage (whoever pays more). Thus, price will have a tendency to rise when it is below equilibrium, until the shortage is gone—at equilibrium. Only at equilibrium is there no tendency for price to change. There is balance between quantity supplied and quantity demanded.

Give a specific numerical example of an equilibrium price in the razor market.

Price	Quantity demanded	Quantity supplied	
\$5.00	120,000	200,000	Surplus $QS > QD$
\$4.00	160,000	160,000	*Equilibrium $QD = QS$
\$3.00	180,000	120,000	Shortage $QD > QS$
\$2.00	220,000	100,000	Shortage $QD > QS$

## Changes in Supply and Demand

### *Creating Student Interest*

Ask students to identify some products with prices that have changed recently. Ask them to speculate on what demand or supply factors might have been responsible for the change in the equilibrium price.

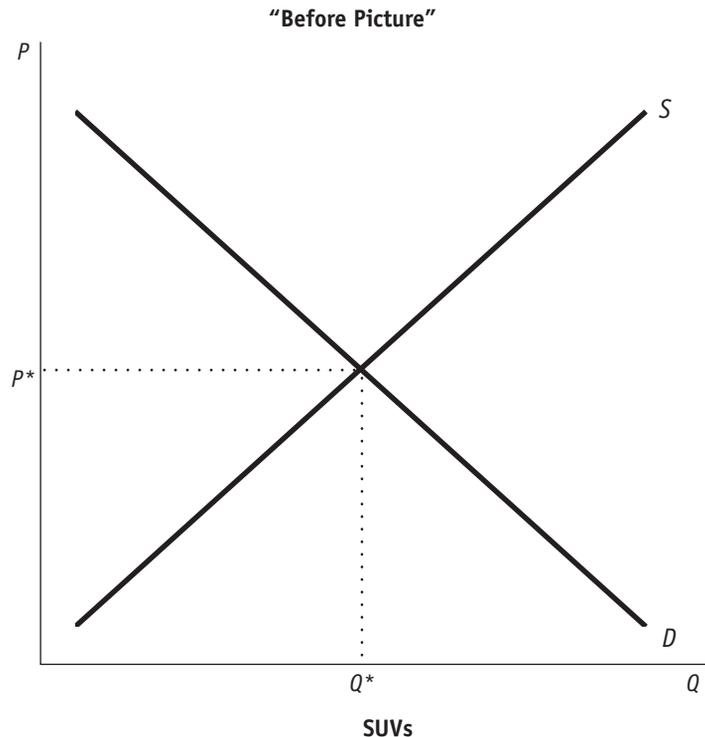
### *Presenting the Material*

Use a simplifying chart to make the distinction between a shift in demand and a change in quantity demanded: Put price on the left and all the other factors that can cause a shift in demand to change on the right. Indicate that if price is causing the change in the quantity demanded it is represented by a movement along the demand curve. On the right, factors that change demand, such as a change in tastes or income, cause a shift in the demand curve.

Give the example of Gillette when it came out with the Mach 3 razor. The company reconfigured the production line so that the production of razors doubled per hour. Changing technology represents a determinant of supply and causes the supply curve to shift to the right.

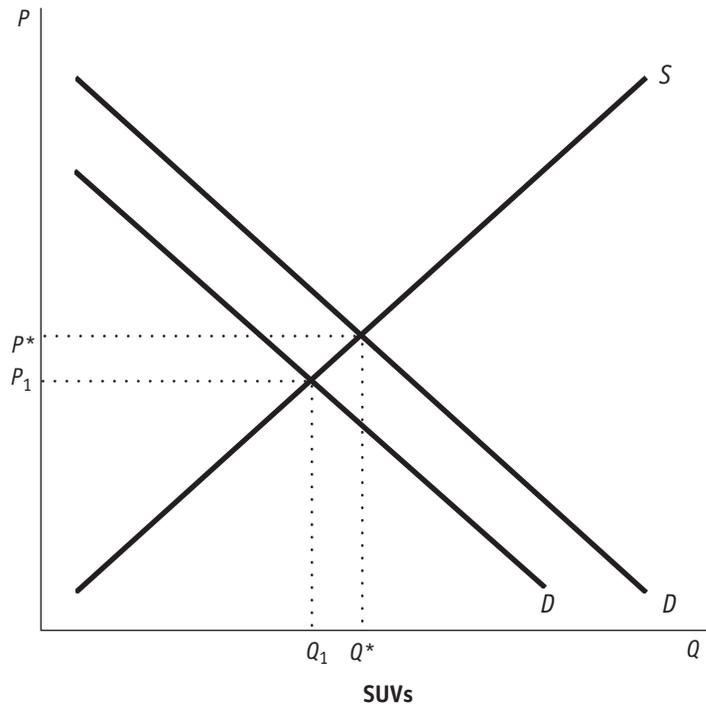
Price of razors	Quantity before the new technology	Quantity after the new technology
\$5.00	100,000	200,000
\$4.00	80,000	160,000
\$3.00	60,000	120,000
\$2.00	40,000	80,000

Students need to practice using economic models. It can help them to start off thinking about a three-step process for using the model to answer questions. When they are faced with analyzing the effect of a change in a market on equilibrium price and/or quantity, they need to know how to draw a supply-and-demand graph. Point out that very often “A” assignments and exams have little supply and demand graphs drawn in the margins! Explain to students that the goal is to be able to answer a question along these lines: What happens to the price and quantity for SUVs when the price of gasoline increases? To answer such questions, students need first to learn to draw a “starting point” graph. Have them think of this as a “before picture.” The before picture is always the same and does not have numbers on it—we are looking only for directional changes (that is, does price/quantity increase or decrease?). For a complete graph, the axes must be labeled, the curves must be labeled and the equilibrium P and Q must be shown on the axes. It is also useful to get students in the habit of labeling the market they are drawing, since questions sometimes involve multiple markets (for instance, SUVs and gasoline) and it is easy to draw the wrong market graph.



Once they have the before picture, students can work through the question by asking themselves three questions. (1) Which side of the market is affected? Here they need to know and

understand (not memorize!) the determinants of demand and supply and be able to recognize them in an example. Point out that any single change will shift only one of the curves (students sometimes overanalyze and want to shift both curves—usually due to confusing a change in supply/demand with the change in quantity supplied/ quantity demanded that results at the new equilibrium). In this case, gasoline and SUVs are complements in consumption, so it is the demand of the market that will change. (2) Does it increase or decrease? When the price of gasoline increases, people buy less gasoline (it's the law—of demand). If they buy less gasoline, the demand for gas-consuming SUVs will decrease. (3) Which way does the curve move? Increases are to the right and decreases are to the left. Remind students that to the right on the horizontal axis, numbers are larger and to the left they are smaller. Now draw the change—label the new curve and the equilibrium.



Explain to students that they should use the graph to reveal the answer to them rather than trying to get the graph to show the answer they think it should. They should come to rely on the model rather than their intuition. This approach needs to be augmented in the case of a problem with more than one change.

## Common Student Pitfalls

- Demand versus quantity demanded.** Students often confuse a change in quantity demanded (a movement to a new point on the same demand curve) with a change in demand (the whole demand curve shifts). The difficulty can be caused by either semantics or a misunderstanding of the model. Be sure to explain both the difference in terminology and the difference that applies to the model. *Quantity* refers to a point and *demand* refers to the whole curve. Emphasize that *quantity demanded* refers to the point on the curve and a change in quantity demanded is caused by a change in price (point out that price is the variable on the vertical axis). For each demand curve, price can change but everything else is held constant. A change in any of the things held constant (the determinants of demand: price of related goods, income, tastes, expectations, the number of consumers) will cause the whole curve to shift. This means that, at each and every price, quantity is different.

- **Supply versus quantity supplied.** The same confusion can happen with differentiating quantity supplied and supply. This creates an opportunity to go over the issue again using supply, and the reinforcement can help students get the point nailed down. Students often confuse a change in quantity supplied (a movement to a new point on the same supply curve) with a change in supply (the whole supply curve shifts). The difficulty can be caused by either semantics or a misunderstanding of the model. Make sure that you explain both the difference in terminology and the difference that applies to the model. *Quantity* refers to a point and *supply* refers to the whole curve. Emphasize that *quantity supplied* refers to the point on the curve and a change in quantity supplied is caused by a change in price (point out that price is the variable on the vertical axis). For each supply curve, price can change but everything else is held constant. If any of the things held constant changes (the determinants of supply: input prices, the price of related goods, technology, expectations, the number of producers) the whole curve will shift. This means that, at each and every price, quantity is different.
- **Equilibrium.** Students will often “learn” that equilibrium is where the two lines cross. Reinforce the general concept of equilibrium before discussing the equilibrium in the supply and demand model. Help them to understand that a market continuously informs buyers and sellers where the equilibrium price is so that both adjust their bid and ask prices. This price “clears” the market in that all unsold products must be reduced in price to sell. In a specific real estate market, the market may be moving toward an equilibrium price, as stubborn sellers are forced to lower their prices if they wish to sell now.
- **Bought and sold.** When we start to discuss the equilibrium price and quantity, students will often ask if it is the price or quantity bought or sold. Emphasize that at equilibrium, quantity demanded equals quantity supplied and the price paid equals the price received, so it is both. But also note that in the real world, there can be a difference between the price sellers receive and the price buyers pay (for example when there is an intermediary in the market who “takes a cut.” However, at this point, we sacrifice realism in the interest of simplicity and let the equilibrium price and quantity be the same for buyers and sellers.
- **Which curve is it anyway?** Any change in price of a good is likely to have been caused by a change in supply or demand. But students can be confused about which curve it was. It can help them to consider which way quantity changed to be a clue. If price and quantity change in the same direction (say, they both increase) this suggests a shift in demand. If they move in different directions, it suggests a shift in supply. Illustrate these ideas by drawing supply and demand graphs or by having students draw them.

## Case Studies in the Text

### Economics in Action

*Beating the Traffic*—This EIA uses an auto trip to the center city as a “good” to explain how cities attempt to address traffic congestion. Examples include decreasing the price of substitutes (subsidizing mass transit), increasing the price of complements (increasing the costs for parking and taxes), and considers a “congestion charge.”

Ask students the following questions:

1. How can a city reduce the demand for traffic by lowering the price of a substitute? (Cities reduce the price of subway and bus rides.)
2. How can a city reduce the demand for traffic by raising the price of a complementary good? (Cities raise the price to park in a garage.)

3. As a result, show graphically what happens to the demand for the highway. (The demand curve for traffic shifts to the left.)

*Only Creatures Small and Pampered*—This EIA uses supply and demand to explain why the quantity of large animal (farm) vets has decreased while the quantity of small animal (pet) vets has increased. The number of pets, the income of pet owners, and competition are used to explain the changes.

Ask students the following questions:

1. What has happened to the number of pet veterinarians over the past two decades and why? (It has increased because the service has become more lucrative as the number of pet owners and their incomes have increased.)
2. How has the number of pet vets affected the supply of farm veterinarians? (The number of farm vets has decreased, since pet vets and farm vets are services related in production—vets can specialize in one field or the other.)
3. Use a graph to show the effect of the changes over the past two decades on the market for pet vet services and the market for farm vet services. (Demand increases in the pet vet services market—increasing quantity supplied—supply decreases in the farm vet services market).

*The Price of Admission*—This EIA looks at the markets for concert tickets and explains why different markets have different equilibrium prices for the tickets. Tastes and opportunity costs help to explain the differences.

Ask students the following questions:

1. Why are there different prices for concert tickets depending on where you buy them? (Tastes and opportunity costs.)
2. Do the internet concert ticket markets appear to be competitive? How do you know? (Yes, prices tend to move to an equilibrium.)

*The Great Tortilla Crisis*—This EIA uses the market for tortillas in Mexico to illustrate how the market for corn in the United States affects the price of food in Mexico. Changes in the demand for ethanol fuel (which is made from corn) has affected U.S. corn prices and that has, in turn, affected the price of corn tortillas in Mexico.

Ask students the following questions:

1. What changes are affecting the U.S. corn market and why? Graph the changes. (The demand for corn is increasing due to changes in the demand for ethanol.)
2. How do the changes in the U.S. corn market affect the tortilla market in Mexico? Explain. (The increased price of corn—an input into tortillas—decreases the supply of tortillas.)
3. Graph the effect of the changes from above on the Mexican tortilla market. (The supply shifts to the left.)

## For Inquiring Minds

*Tribulations on the Runway*—This FIM uses the market for fashion models as an example of how supply and demand affect the market price (wage).

## Global Comparison

*Pay More, Pump Less*—The law of demand is illustrated using differences in gasoline taxes between countries. As gas prices increase in a country (in part, due to taxes), gasoline consumption decreases.

## Activities

### Drawing a Demand Curve (30–45 minutes)

Organize students into groups of 5 or 6 students. Each team will survey the quantity demanded for a specific product. Assign each team only one product to survey. Some possibilities:

- A private parking space on campus
- A new Dell laptop computer
- A three-ring notebook
- Note-taking service per hour
- Units for college courses at your campus
- A flat-panel high-definition TV

1. Teams brainstorm five possible prices for their product, from high to low.
2. Teams agree on how all members will conduct the survey. For example, they can ask: “If the price is \_\_\_\_, how many will you buy?” or, “If the price is \_\_\_\_\_, will you buy it?” (A “yes” is counted as 1, and a “no” is counted as 0.)
3. Each team member interviews two students in the class regarding their demand for the team’s product.
4. Students return to the team and add the quantity demanded at each price for all team member surveys.
5. Teams draw the demand curve for their product and post it on the board.

### Shifts and Movements Along the Demand Curve (5 minutes)

Give examples that are in the same general market to illustrate the difference between a shift and a movement along the demand curve, as shown below.

Example	Movement along the demand curve	A shift in the demand curve
1. Mammoth Mountain hikes the price for ski tickets and sales plummet.	X	
2. Lack of snow keeps the skiers away.		X
3. An increase in the excise tax on cigarettes causes younger smokers to quit.	X	
4. Cutting cigarette ads from TV causes cigarette smoking among teens to fall.		X
5. Nike sales fall as Skecher shoes gain popularity.		X
6. Teens have had it with the high price of Nike Air Jordans.	X	
7. Mortgage rates are at an all time low, and new home loan applications soar.	X	
8. A booming economy spurs home sales.		X

**Generating a Market Supply Schedule (5–10 minutes)**

Ask students about their willingness to sell their labor time at the wages listed below. Put the wages on the board, and ask students to write down how many hours they are willing to work per week at each wage. Choose three students to report.

Wage per hour	Student 1	Student 2	Student 3	Market Supply
\$20.00	40	25	20	85
\$15.00	30	20	15	65
\$10.00	25	15	10	50
\$8.00	20	10	8	38
\$6.00	10	5	5	20

Add the three responses, and plot the supply curve for labor time on the board. Even if a few students choose to work less hours per week when the wage rises, most students will want to work more hours. (The substitution effect generally dominates the income effect of a higher wage.)

**Movement Along the Supply Curve versus Shifts in the Supply Curve**

The examples below can be passed out to students or discussed in class.

Example	Movement along the supply curve	A shift in the supply curve
1. As home prices rise, more people put out a For Sale sign.	X	
2. Personal bankruptcies rise with the recession, forcing homeowners to sell.		X
3. College grads avoid teaching jobs as starting salaries fall.	X	
4. Worsening working conditions in urban schools chase away prospective teachers.		X
5. As the price of airline tickets rise, airlines add more flights.	X	
6. The price of jet fuel drops and airlines expand the number of flights.		X

**Class Simulation: Buying and Selling Turquoise (30 minutes)**

- Divide the class in half and assign one side to be buyers of turquoise and the other, sellers of turquoise.
- Prepare a set of playing cards as indicated below.
  - Buyer cards read “Do not pay more than \$250” (for example)
  - The quantities are: \$225 (3) \$250 (3) \$275 (3) \$300 (3) \$325 (2) \$350 (2) \$375 (2) \$400 (2)
  - Seller cards read, “Do not sell for less than \$275” (for example)
  - Print up an equal amount of buyer cards and seller cards.

Ask a student to help you pass out the cards to the buyers and sellers in the class. Students draw one card from the stack.

- Tell buyers to buy the turquoise as cheaply as possible, and sellers to sell as high as they can. If students do not make a trade during the session, they take the entire amount on the card as a loss.
- Students have 3–4 minutes to make a deal. Buyers try to get the cheapest price they can, and sellers try to get a high price. When two students agree on a compromise price, they shake hands and come to the board; a recorder keeps track of the trades.
- Students also keep track of their trades in each round. (If buyers make a deal below the amount on their card, they count that as a profit.)
- Run the simulation for at least three rounds, rotating buyers and sellers. At the end of the game the chart will appear as shown belowe.

Price	Round 1	Round 2	Round 3	QD, QS
\$400		x		1, 64
\$375	xx			3, 63
\$350	xx	x	X	7, 61
\$325	xxx	xxx	Xx	15, 57
\$300	xxxx	xxxx	Xx	25, 48
\$275	xxxxxx	xxxxxx	Xxx	39, 38
\$250	xxxxx	xxxxxx	Xxxx	54, 24
\$225	xxxx	xx	Xxx	63, 9

From the data on the board, you derive the demand schedule from the completed trades by counting the trades from top to bottom cumulatively.

The demand schedule of the above example will be:

\$400 = 1

\$375 = 3 (The buyer who paid \$400 would also be willing to buy at \$375 if he or she had the opportunity. The trades are totaled cumulatively as you move down to lower prices.)

\$350 = 7

\$325 = 15

\$300 = 25

\$275 = 39

\$250 = 54

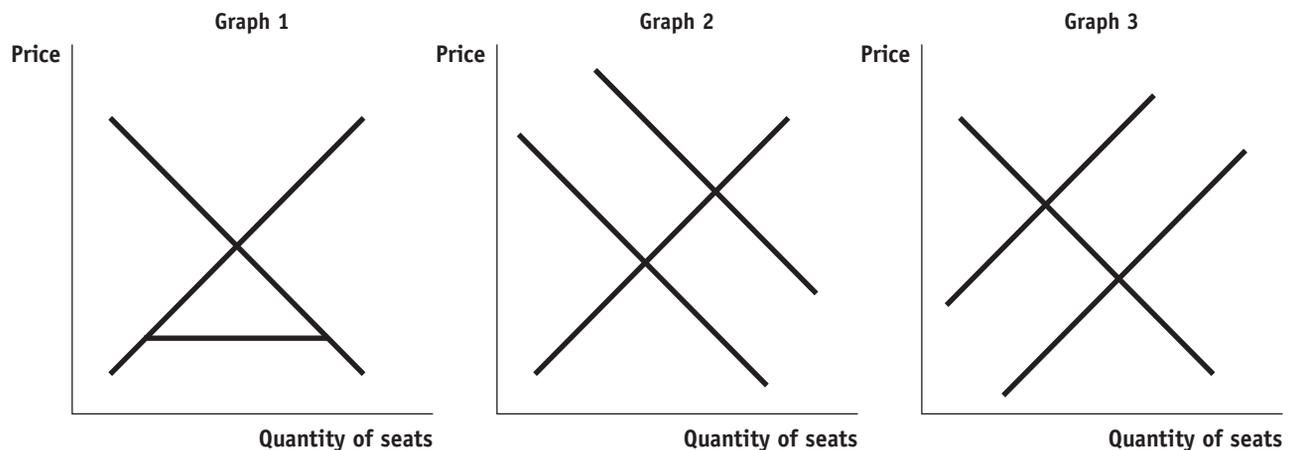
\$225 = 63

1. Given the data, what was the equilibrium price? Students can see where most trades took place. They can also plot the demand and supply curves and determine the equilibrium price more precisely.
2. Ask: Why if the game is played for more rounds do the trades start to cluster around the equilibrium price? Clearly, the market acts as a feedback mechanism, informing market participants of what trades are more likely to take place.
3. Ask what would happen to the equilibrium price if the price on the buyer cards (in effect, an increase in income) were to double? The equilibrium price will rise.

### A Ticket Shortage (10–15 minutes)

Pair students and give them the following scenario: You are responsible for a concert on campus and have sold out all the tickets at \$20 apiece. Unfortunately, there are 100 students outside the concert who still want to get in and are angry and frustrated.

1. Is \$20 the equilibrium price? (No, we know that this price is below the equilibrium price because it causes a shortage.)
2. How do you remedy the ticket shortage? (Raise the price for future concerts, expand the capacity of the arena.)
3. Put the three graphs on the next page on the board. Ask students to label each graph and identify what kind of solution it represents for the ticket shortage.
4. Which solution would fans prefer? (Fans would like a free voucher for a future concert.) Concert organizers? (They would like a higher price for future concerts.)



Graph 1 indicates that the cause of the shortage was a price set below the equilibrium price. To remedy this problem for future concerts, the ticket price must be equal to the equilibrium price. Graph 2 shows a shift in the demand curves for the concert. Students must speculate on possible ways in which the demand for the concert can be reduced. One solution that students often come up with is to give angry concert fans a voucher for a future concert. In graph 3, there is a shift in the supply curve for the concert. Students brainstorm how the supply of seats could be expanded, such as renting additional chairs for the concert.

### Applying Analysis to a News Article: Supply and Demand (20–30 minutes)

Ask students to bring in an article from a newspaper, magazine, or relevant online source that is about a specific market and indicates a change in price of the product. For smaller classes, you can bring in several copies of the *Wall Street Journal* and pass these around to teams of students. Ask them to:

1. Identify the relevant market.
2. Describe the nature of the change in the market: shift in demand or shift in supply.
3. Describe the direction of the shift.
4. Describe what induced the shift.
5. Indicate the effect of the shift on the equilibrium market price. Indicate when you can predict the change in the equilibrium quantity, and indicate when you cannot.

**Additional Examples: Changes in the Equilibrium Price** (5–10 minutes)

Pair students and give them the following examples to analyze.

Example	Demand shifts right or left?	Supply shifts right or left?	Equilibrium price up or down?	Equilibrium quantity up or down?
1. Demand for colorful prom night attire boosts sales of fuchsia cummerbunds.	Right		Up	Up
2. The expiration of drug patents increases the number of generic drugs available to consumers.		Right	Down	Up
3. Panic reigns on Wall Street as millions of stockholders sell simultaneously.		Right	Down	Up
4. GM and Ford overestimate demand and produce too many cars in the midst of a slowdown in the economy.	Left	Right	Down	Indeterminate
5. The entry of hundreds of nail salons in southern California drags down price and profits.		Right	Down	Up
6. Airline pilots negotiate a dramatic salary increase, and airlines are forced to raise ticket prices.		Left	Up	Down
7. Mexico opens a deep-water port in Ensenada and shippers shun the LA port. (The market is shipments through the LA port.)	Left		Down	Down
8. Luxury home sales fall as the stock market sputters and wealth falls.	Left		Down	Down
9. Competition in the fast-food industry increases the number of restaurants.		Right	Down	Up
10. Parking fees for the New York Yankees skyrocket and ticket sales fall. (The market is for baseball tickets.)	Left		Down	Down

## Web Resources

The following websites provide useful examples for teaching supply and demand.

Internet Center for Management and Business administration, Inc. <http://www.netmba.com/econ/micro/supply-demand/>.

“The Economics of Valentine’s Day” lesson plan, available at The University of St. Louis’ Economics America website: <http://www.umsl.edu/~econed/lesson2.htm>.

