Section 1 Combining Supply and Demand

Preview

Objectives

After studying this section you will be able to:

1. **Explain** how supply and demand create balance in the marketplace.
2. **Compare** a market in equilibrium with a market in disequilibrium.
3. **Identify** how the government sometimes intervenes in markets to control prices.
4. **Analyze** the effects of price ceilings and price floors.

Section Focus

In an uncontrolled market, the price of a good and quantity sold will settle at a point where the quantity supplied equals the quantity demanded. The government can set a maximum or minimum price, but that can lead to an imbalance between supply and demand.

Key Terms

equilibrium
disequilibrium
excess demand
excess supply
price ceiling
price floor
rent control
minimum wage

The market system makes certain that consumers can buy the products they want, that sellers make enough profit to stay in business, and that sellers respond to changing needs and tastes of consumers. Other economic systems have been tried—most notably, central planning—and have been judged by most observers to be less successful than the market system.

In this section we will combine our tools for studying demand and supply to learn how markets operate and how markets can turn competing interests into a positive outcome for both sides. In the process we will discover that free markets usually produce some of their best outcomes when they are left alone, without government intervention.

Balancing the Market

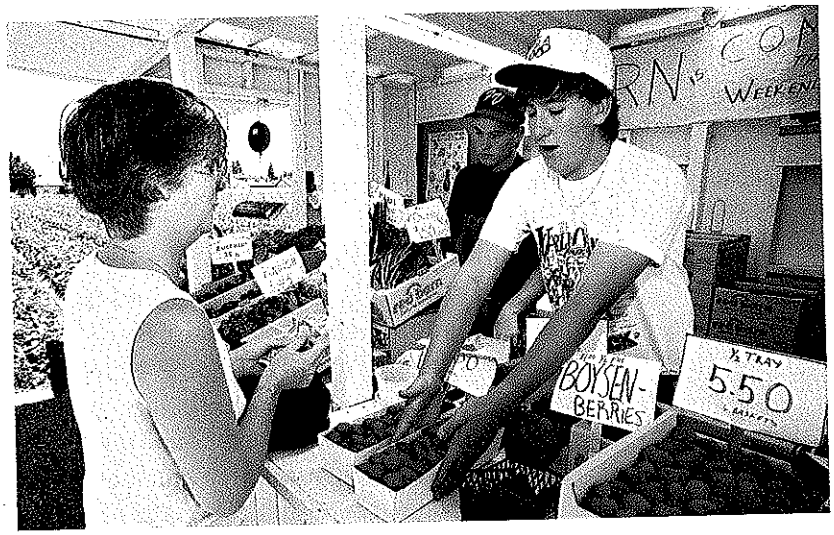
Just as buyers and sellers come together in a market, the study of demand and supply will come together in this section. We begin by looking at the supply and demand schedules. As you will recall, a demand schedule shows how much consumers are willing to buy at various prices. A supply schedule shows how much sellers are willing to sell at various prices. Comparing these schedules should allow us to find common ground for the two sides of the market.

The combined supply and demand schedule in Figure 6.1 combines the market demand and supply schedules for pizza slices that you saw in Chapters 4 and 5. For each price, this schedule lists both the number of slices that consumers are willing to buy and the number of slices that pizzerias are willing to supply.

equilibrium *the point at which quantity demanded and quantity supplied are equal*

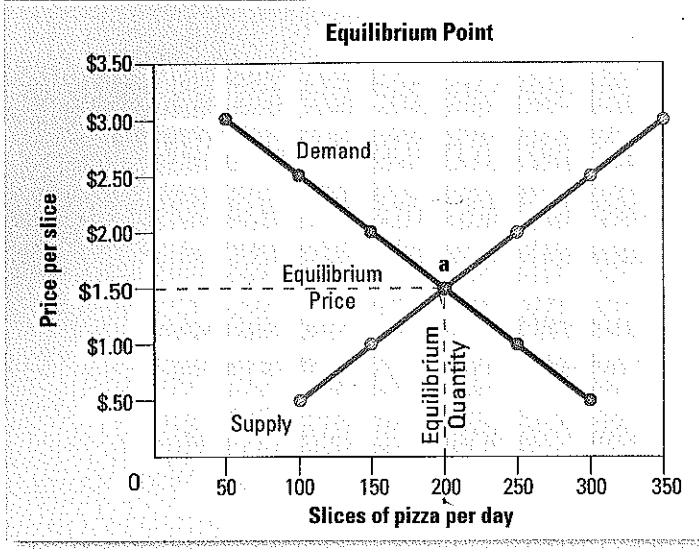
Defining Equilibrium

The point where demand and supply come together at the same number of slices is called the **equilibrium.** Equilibrium is the point of balance between price and quantity. At equilibrium, the market for a good is stable.



▼ In the market equilibrium, prices adjust to make the quantity supplied equal to the quantity demanded.

Figure 6.1 Finding Equilibrium



Combined Supply and Demand Schedule

Price of a slice of pizza	Quantity demanded	Quantity supplied	Result
$ .50	300	100	Shortage from excess demand
$1.00	250	150	
$1.50	200	200	Equilibrium
$2.00	150	250	Surplus from excess supply
$2.50	100	300	
$3.00	50	350	

BUILDING KEY CONCEPTS

Market equilibrium will be found at the price at which the quantity demanded is equal to the quantity supplied. Markets and Prices **How many slices are sold at $2.50 a slice? How many slices are sold at equilibrium?**

To find the equilibrium price and equilibrium quantity, simply look for the price at which the quantity supplied equals the quantity demanded. Do you see that in Figure 6.1 this occurs at a price of $1.50 per slice? At that price, and only at that price, the quantity demanded and the quantity supplied are equal, at 200 slices per day. This is the market equilibrium.

In the market for pizza, as in any market, quantities supplied and demanded will be equal at only one price and one quantity. At this equilibrium price, buyers will purchase exactly as much of the product as firms are willing to sell. Buyers who are willing to purchase the goods at the equilibrium price will find ample supplies on store shelves. Firms that are willing to sell at the equilibrium price will find enough buyers for their goods.

Graphing Equilibrium

We can also illustrate equilibrium with a supply and demand graph. In Figure 6.1, we have plotted on the same graph the market supply curve and the market demand curve for slices of pizza. The equilibrium price and quantity can be found where quantity supplied equals quantity demanded, or the point where the supply curve crosses the demand curve. On the graph, this is point a.

Disequilibrium

If the market price or quantity supplied is anywhere but at the equilibrium, the market is in a state that economists call **disequilibrium.** Disequilibrium occurs when quantity supplied is not equal to quantity demanded in a market. In the above example, disequilibrium will occur with any price other than $1.50 per slice or any quantity other than 200 slices. Disequilibrium can produce one of two outcomes, excess demand or excess supply.

Excess Demand

The problem of **excess demand** occurs when quantity demanded is more than quantity supplied. When the actual price in a market is below the equilibrium price, you have excess demand, because a low price encourages buyers and discourages sellers.

For example, in Figure 6.1, a price of $1.00 per slice of pizza will lead to a quantity demanded of 250 slices per day and a quantity supplied of only 150 slices

disequilibrium *describes any price or quantity not at equilibrium; when quantity supplied is not equal to quantity demanded in a market*

excess demand *when quantity demanded is more than quantity supplied*

per day. At this price, there is excess demand of 100 slices per day.

When customers want to buy 100 more slices of pizza than restaurants are prepared to sell, these customers will have to wait in long lines for their pizza, and some will have to do without. In Figure 6.2, below, we have illustrated the excess demand at $1.00 per slice by drawing a dotted line across the graph at that price. As you can see, at $1.00 a slice, the quantity demanded is 250 slices, and the quantity supplied is 150 slices.

If you were running the pizzeria, and you noticed long lines of customers waiting to buy your pizza at $1.00 per slice, what would you do? Assuming that you like to earn profits, you would probably raise the price. As you increased the price of pizza, you would be willing to work harder and bake more, because you would know you could earn more money for each slice you sell.

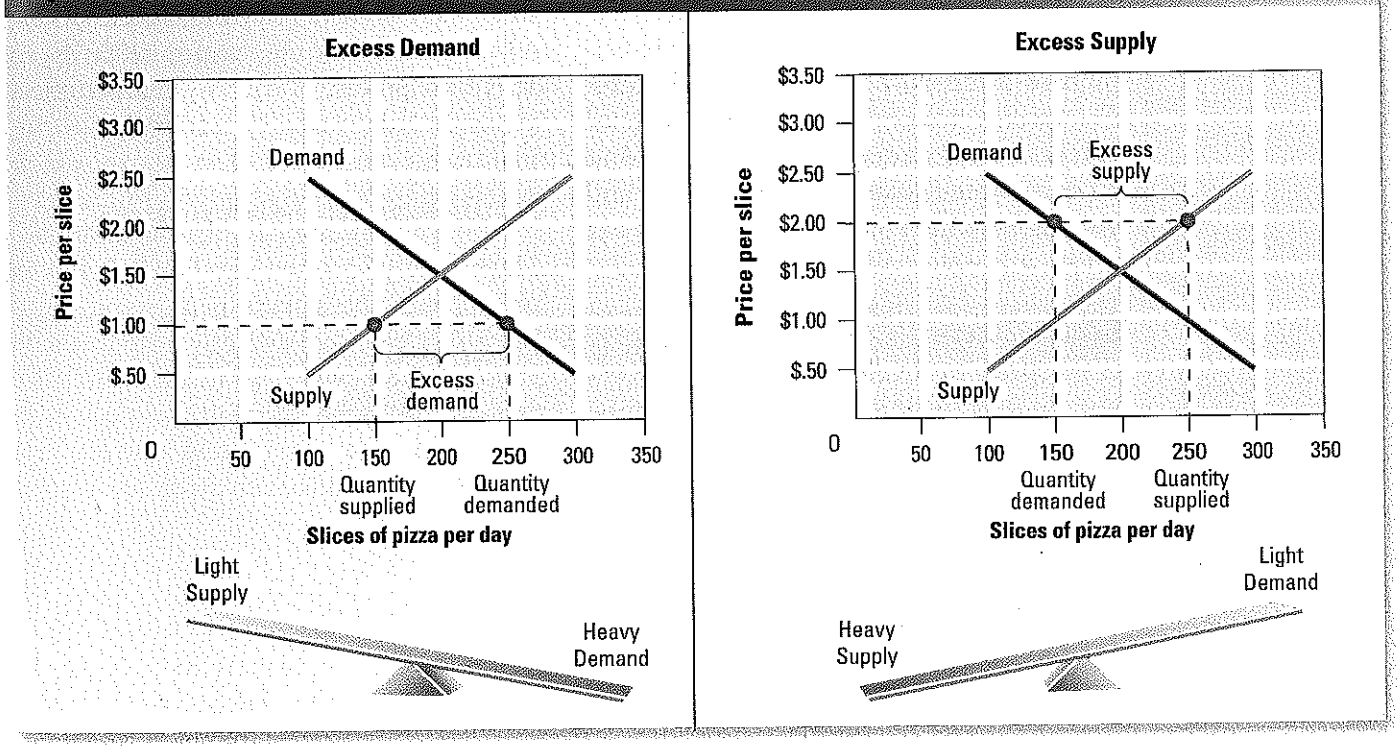
Of course, as the price rises, customers will buy less pizza, since it is becoming relatively more expensive. When the price reaches $1.50 per slice, you will find that you are earning more profits and can keep up with demand, but the lines are much shorter. Some days you may throw out a few leftover slices, and other days you have to throw an extra pizza or two in the oven to keep up with customers, but on the whole, you are meeting the needs of your customers. In other words, the market is now at equilibrium.

As long as there is excess demand, and the quantity demanded exceeds the quantity supplied, suppliers will keep raising the price. When the price has risen enough to close the gap, suppliers will have found the

FAST FACT

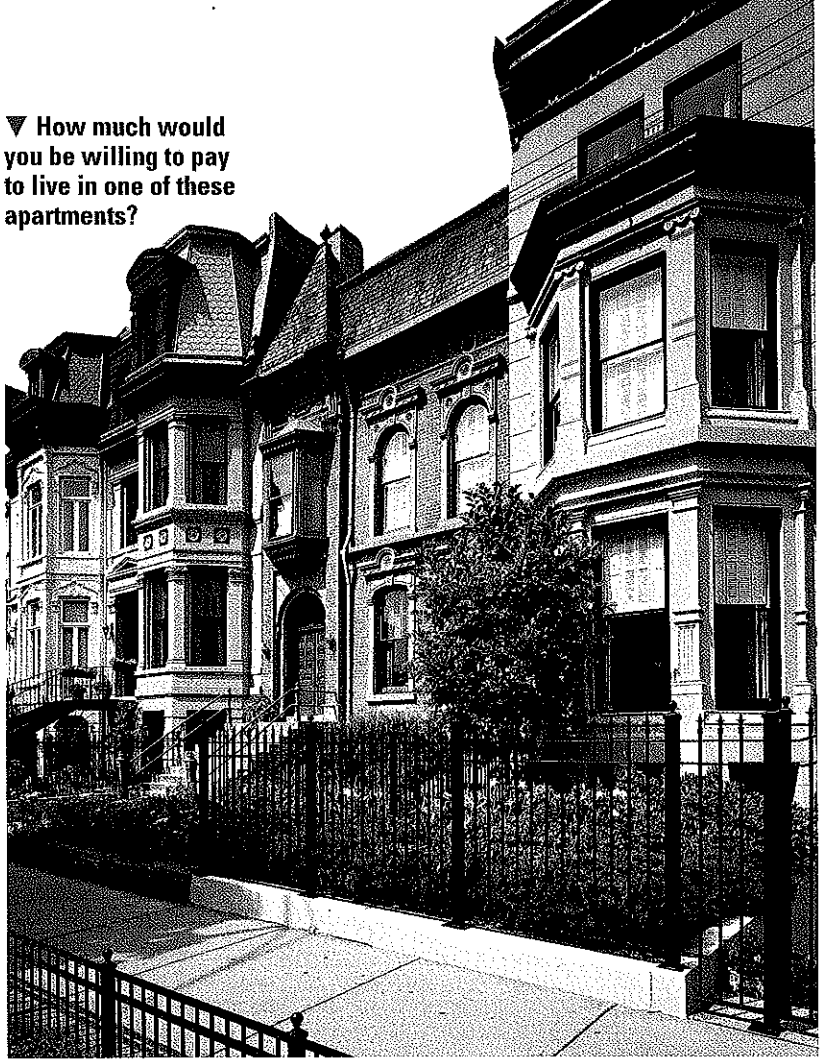
Excess supply was a major problem for the tourism industry in the last months of 1999. Hotels, restaurants, and cruise lines assumed that people would be willing to pay a very high price to celebrate the start of the year 2000, and doubled or tripled their usual rates for special "millennium" travel packages. Unfortunately, many people decided not to travel around January 1, 2000, and many who did travel refused to pay thousands of dollars for dinner or one night in a hotel. High prices and the large number of choices led to a problem of excess supply.

Figure 6.2 Excess Demand and Excess Supply



Excess demand and excess supply both lead to a market with fewer sales than at equilibrium.

Supply and Demand **Why are sales lower at $1.00 a slice than at $2.00 a slice?**



▼ **How much would you be willing to pay to live in one of these apartments?**

highest price that the market will bear. They will continue to sell at that price until one of the factors described in Chapter 4 or 5 changes the demand or supply curve and creates new pressures to raise or lower prices, and eventually, a new equilibrium.

Excess Supply

If the price is too high, then the market will face a problem of excess supply. **Excess supply** occurs when quantity supplied exceeds quantity demanded. For example, at a price of $2.00 per slice of pizza, the quantity supplied of 250 slices per day is much greater than the quantity demanded of 150 slices per day. This means that pizzeria owners will be making 100 more slices of pizza each day than they can sell at that price. The relatively high price encourages pizzeria owners to work hard and bake lots of pizza, but it discourages customers from buying pizza, since it is relatively more expensive than other menu items. Some customers will buy one slice instead of two, while others will eat elsewhere. The problem is shown graphically in Figure 6.2. At the end of the day, it is likely that 100 slices will have to be thrown out.

After a short time, pizzeria owners will get tired of throwing out unsold pizza at closing time and will cut their prices. As the price falls, the quantity demanded will rise, and more customers will buy more pizza. At the same time, pizzeria owners will prepare fewer pizzas. As the price of pizza falls, the quantity demanded rises and the quantity supplied falls. This process will continue until the price reaches $1.50 per slice. At that price, the amount of pizza that pizzeria owners are willing to sell is exactly equal to the amount that their customers are willing to buy.

Whenever the market is in disequilibrium and prices are flexible, market forces will push the market toward the equilibrium. Sellers do not like to waste their resources on excess supply, particularly when the goods cannot be stored for long, like pizza. And when there is excess demand, profit-seeking sellers realize that they can raise prices to earn more profits. In this way, market prices move toward the equilibrium level.

Government Intervention

Markets tend toward equilibrium, but in some cases the government steps in to control prices. The government can impose a **price ceiling**, or a maximum price that can be legally charged for a good. In other cases, the government can create a **price floor**, or a minimum price for a good or service.

Price Ceilings

A price ceiling is a maximum price, set by law, that sellers can charge for a good or service. The government places price ceilings on some goods that are considered "essential" and might become too expensive for some consumers. For example, some local governments, notably New York City, have

excess supply *when quantity supplied is more than quantity demanded*

price ceiling *a maximum price that can be legally charged for a good or service*

price floor *a minimum price for a good or service*

experimented with ceilings on apartment rents, called **rent control**. Rent control was introduced to prevent inflation during a housing crisis in the early 1940s and continued after World War II. More recently, other cities imposed rent control, often motivated by a desire to help poor households by cutting their housing costs and permitting them to live in neighborhoods they could otherwise not afford. As we'll see, rent control reduces the quantity and quality of housing, so it helps some households but harms others, including many poor households. If the ceiling is established below the equilibrium price, the result will look like graph A in Figure 6.3 below.

In this market, the supply and demand curves for two-bedroom apartments meet at the equilibrium shown at point c in graph B. At this point, rents are $900 a month. Consumers will demand 30,000 apartments and suppliers will offer 30,000 apartments for rent.

Suppose that the city government passes a law that limits the rent on two-bedroom apartments to $600 per month. At that price, the quantity of apartments demanded is 40,000 (point b), and the quantity supplied is 20,000 (point a). At such a low price, apartments seem inexpensive, and many people will try to rent apartments instead of living with their families or investing in their own houses.

However, some landlords will have difficulty earning profits or breaking even at these low rents. Fewer new apartment buildings will be built, and older ones might be converted into offices, stores, or condominiums.

As you can see in graph A of Figure 6.3, the result is excess demand of 20,000 apartments. The price ceiling increases the quantity demanded but decreases the quantity supplied. Since rents are not allowed to rise, this excess demand will last as long as the price ceiling holds.

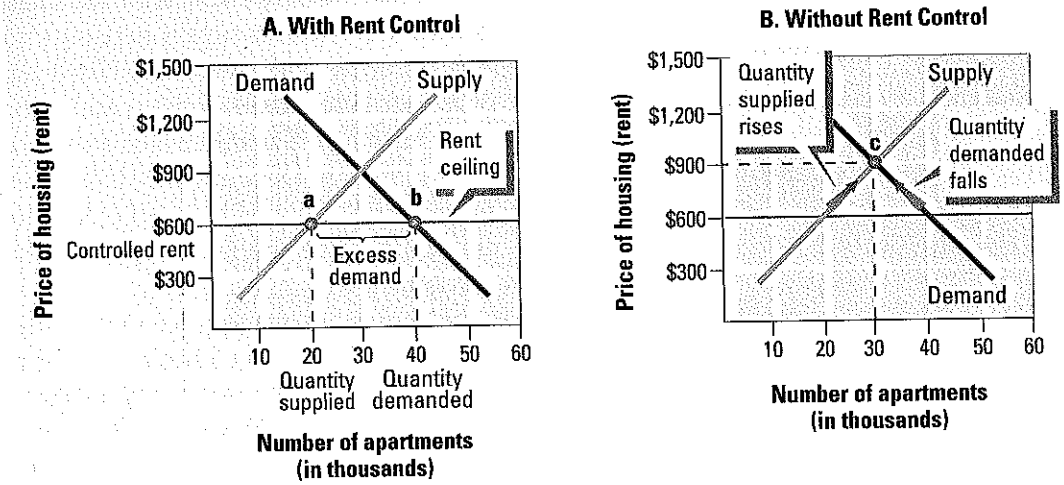
rent control *a price ceiling placed on rent*

The Cost of Price Ceilings

When the price cannot rise to the equilibrium level, the market must determine which 20,000 of the 40,000 households will get an apartment, and which 20,000 will do without. Although governments usually pass rent control laws to help renters with the greatest need, few of these renters benefit from rent control. Methods besides prices, including long waiting lists, discrimination by landlords, and even bribery, are used to allocate the scarce supply of apartments among the many people who want them. Luck becomes an important factor, and sometimes the only way to get a rent-controlled apartment is to inherit it from a parent or grandparent.

New York City revised its laws in the 1990s to exclude the wealthiest renters

Figure 6.3 **The Effects of Rent Control**



BUILDING KEY CONCEPTS

Rent control helps some people, but it also creates a housing market with fewer, less-desirable homes.

Supply and Demand

At what price does the market for apartments reach equilibrium without rent control?

minimum wage *a minimum price that an employer can pay a worker for an hour of labor.*

from rent control protection after newspapers discovered that some very wealthy people rented spacious apartments at prices much less than market value.

Additionally, since the rent controls limit landlords' profits, landlords may try to increase their income by cutting costs. Why should a landlord give a building a fresh coat of paint and a new garden if he or she can't earn the money back through higher rent? Besides, if there's a waiting list to get an apartment, the landlord has no incentive to work hard and attract renters. As a result, many rent-controlled apartment buildings become run-down, and renters may have to wait months to have routine problems fixed.

Ending Rent Control

If rents were allowed to rise to the market equilibrium level, which is $900 per month, the quantity of apartments in the market would actually rise to 30,000 apartments. The market would be in equilibrium, and people who could afford $900 a month would have an easier time finding vacant apartments. Instead of spending time and money searching for apartments, and then having to accept an apartment in a poorly maintained building, many renters would be able to find a wider selection of apartments. Landlords would also have a greater incentive to properly maintain their buildings and invest in new construction.

On the other hand, people lucky enough to live in a rent-controlled apartment may no longer be able to afford to stay there once rent control is ended and the landlord can legally raise the rent. As soon as the neighborhood improves, these renters may be priced out of their own apartments, to be replaced by people willing to pay the equilibrium price. Remember that ending rent control increases the number of apartments on the market by 10,000.

Certainly, the end of rent control benefits some people and hurts others. Economists agree that the benefits of ending rent control exceed the costs, and suggest that there are better ways to help poor households find affordable housing.

Price Floors

A price floor is a minimum price, set by the government, that must be paid for a good or service. Price floors are often imposed when government wants sellers to receive some minimum reward for their efforts.

The Minimum Wage

One well-known price floor is the **minimum wage,** which sets a minimum price that an employer can pay a worker for an hour of labor. The federal government sets a base level for the minimum wage, and states can set their own minimum wages even higher. A full-time worker being paid the federal minimum wage will earn less than the federal government says is necessary to support a couple with one child. However, it does provide some lower limit for workers' earnings. The important question, as you will read in *Debating Current Issues* on pages 180–181, is whether the benefits to minimum wage workers outweigh the loss of some jobs.

If the minimum wage is set above the market equilibrium wage rate, the result is a decrease in employment, as demonstrated in Figure 6.4. This figure illustrates the supply curve of labor, which shows the number of worker-hours offered at various

▼ The minimum wage has a strong impact on teens in the work force.

wage rates, and a demand curve for labor, which shows the number of workers employers will hire at various wages.

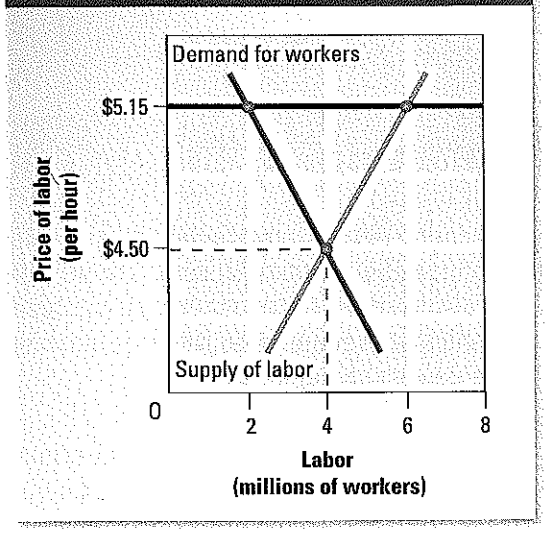
If the market equilibrium wage for low-skilled labor is $4.50 per hour, and the minimum wage is set at $5.15, the result is an excess supply of labor. There are now 4 million more people looking for work than employers are willing to hire. (Remember that in this example, the worker is the supplier because he or she supplies labor that is bought by an employer.) Firms will employ 2 million fewer workers than they would at the equilibrium wage rate because the price floor on labor keeps the wage rate artificially high. If the minimum wage is below the equilibrium rate, it will have no effect because employers would have to pay at least the equilibrium rate anyway to find workers in a free market.

Price Supports in Agriculture

Price floors are used for many farm products around the world. Until 1996, the United States set minimum prices for several commodities, although these price floors were not legal limits. Instead, whenever the price fell below the price floor, the government created demand by buying excess crops.

Although Congress abolished price supports in 1996, several states in the Northeast have formed the Northeast Dairy Compact to guarantee a minimum price for milk produced on farms in these states.

Figure 6.4 **Effects of Minimum Wage**



BUILDING KEY CONCEPTS

A minimum wage law can set the price of labor above the equilibrium price, leading to a labor surplus. Supply and Demand **According to this graph, how big is the surplus of workers when the minimum wage is $5.15 per hour?**

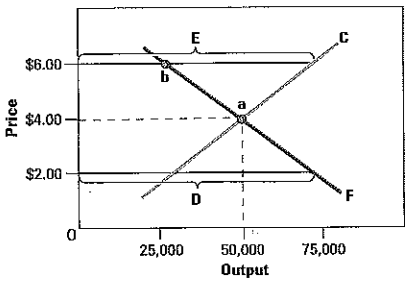
Section 1 Assessment

Key Terms and Main Ideas

1. What is unique about an **equilibrium** price?
2. What situation can lead to **excess demand?**
3. How is a **price floor** different from a **price ceiling?**
4. How does **rent control** work?

Applying Economic Concepts

5. *Using the Databank* Turn to the graph of median weekly earnings on page 536 in the Databank. Suppose that the federal government has raised the minimum wage to $500 per week. **(a)** Which category of jobs would be least affected by the change? **(b)** Which two categories would be most affected by the new minimum wage? **(c)** What are the likely consequences for workers in these two fields?
6. *Critical Thinking* What are the benefits and drawbacks of a price ceiling?
7. *Math Practice* The graph below shows supply and demand curves in the notebook market. Use what you have learned in this section to identify the following elements of the graph: price floor, supply curve, equilibrium point, disequilibrium point, demand curve, price ceiling.



Take It to the NET Rent control is one example presented in this section of ways in which the government acts to control prices. Investigate some recent rent control issues. Use the links provided at the following Web site for help in completing this activity. **www.phschool.com**

Section 2

Changes in Market Equilibrium

Preview

Objectives

After studying this section you will be able to:

1. **Identify** the determinants that create changes in price.
2. **Explain** how a market reacts to a fall in supply by moving to a new equilibrium.
3. **Explain** how a market reacts to shifts in demand by moving to a new equilibrium.

Section Focus

When a supply or demand curve shifts, a new equilibrium occurs. The market price and quantity sold move toward the new equilibrium.

Key Terms

surplus
shortage
search costs

Economists say that a market will tend toward equilibrium, which means that the price and quantity will gradually move toward their equilibrium levels. Why does this happen? Remember that excess demand will lead firms to raise prices. Higher prices induce the quantity supplied to rise and the quantity demanded to fall until the two values are equal.

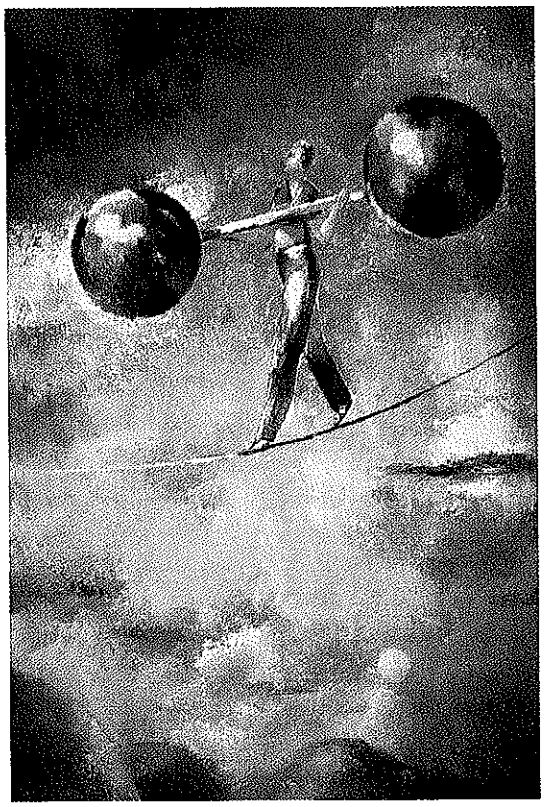
On the other hand, excess supply will force firms to cut prices. Falling prices will cause quantity demanded to rise and quantity supplied to fall until, once again, they are equal. Through these relationships, the market price and quantity sold of a good will move toward their equilibrium values.

Remember from Chapters 4 and 5 that all of the changes in demand and supply described above are changes along a demand or supply curve. Assuming that a market starts at equilibrium, there are two factors that can push it into disequilibrium: a shift in the entire demand curve and a shift in the entire supply curve.

Changes in Price

In Chapter 5, you read about the different factors that shift a supply curve to the left or to the right. These factors include advances in technology, new government taxes and subsidies, and changes in the prices of the raw materials and labor used to produce the good.

Since market equilibrium occurs at the intersection of a demand curve and a supply curve, a shift of the entire supply curve will change the equilibrium price and quantity. A shift in the supply curve to the left or the right creates a new equilibrium. Since markets tend toward equilibrium, a change in supply will set market forces into motion that lead the market to this new equilibrium price and quantity sold.



◀ **A functioning market will carefully balance supply and demand.**

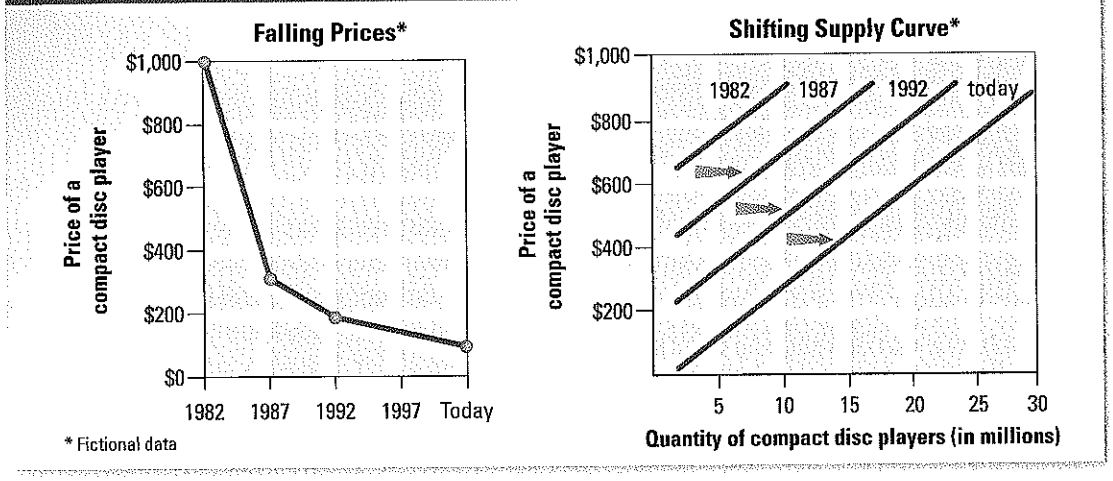
BUILDING KEY CONCEPTS

As CD players become cheaper to produce, the supply increases at all but the lowest prices.

Supply and Demand

Why do the 1982 and 1987 supply curves begin so high up on the graph?

Figure 6.5 **Falling Prices and the Supply Curve**



Understanding a Shift in Supply

When compact disc players were first introduced in the early 1980s, a basic, single-disc machine cost around $1,000. The early compact disc players were much more expensive and less sophisticated than the compact disc players people use today. Gradually, as firms developed better technology for producing compact disc players, their prices fell. In 1987, a consumer could purchase a fancy single-disc player for $300; just five years later, in 1992, a similar player could be purchased for about $200. Today, consumers can buy a compact disc player for around $100.

Not only have the prices of compact disc players fallen, but the machines on sale today have many more features and options than the original $1,000 machine. Technology has lowered the cost of manufacturing compact disc players and has also reduced the costs of some of the inputs, like computer chips. These advances in production have allowed manufacturers to produce compact disc players at lower costs. Producers have passed on these lower costs to consumers in the form of lower market prices.

We can use the tools developed in Chapter 5 to graph the effect of these changes on the CD market's supply curve. Figure 6.5 shows how the supply curve shifted outward, or to the right, as manufacturers offered more and more CD players at lower prices. In the early 1980s, no compact disc players were offered for $300. They were simply too expensive to develop and manufacture. Today, manufacturers can offer millions of CD players at this price.

Finding a New Equilibrium

Picture the point in time when compact disc players were evolving from an expensive luxury good to a mid-priced good. A new generation of computer chips has just reduced the cost of production. These lower costs have shifted the supply curve to the right where at each price, producers are willing to supply a larger quantity.

This shift, shown in Figure 6.6 using fictional quantities, has thrown the market into disequilibrium. At the old equilibrium price, suppliers are now willing to offer 4,000,000 compact disc players, up from 2,000,000.

In Figure 6.6, the increase in quantity supplied at the old equilibrium price is shown as the change from point a to point b. However, the quantity demanded at this price has not changed, and consumers will only buy 2,000,000 compact disc players. At this market price, unsold compact disc players will begin to pile up in the warehouse. When quantity supplied exceeds quantity demanded at a given price, economists call this a **surplus.** The surplus compact disc players are

surplus *situation in which quantity supplied is greater than quantity demanded; also known as excess supply*

excess supply, so something will have to change to bring the market to equilibrium.

As you read in Section 1, suppliers will respond to excess supply by reducing prices. As the price falls from $600 to $400, more consumers decide to buy compact disc players, and the quantity demanded rises. The combined movement of falling prices and increasing quantity demanded can be seen in Figure 6.6 as a change from point a to point c. Notice that this change is a movement along the demand curve, not a shift of the entire demand curve.

Eventually, the price falls to a point where quantity supplied and quantity demanded are equal, and excess supply is no longer a problem. This new equilibrium point, shown at point c in Figure 6.6, marks a lower equilibrium price and a higher equilibrium quantity sold than before the supply curve shifted. This is how equilibrium changes when supply increases, and the entire supply curve shifts to the right.

Changing Equilibrium

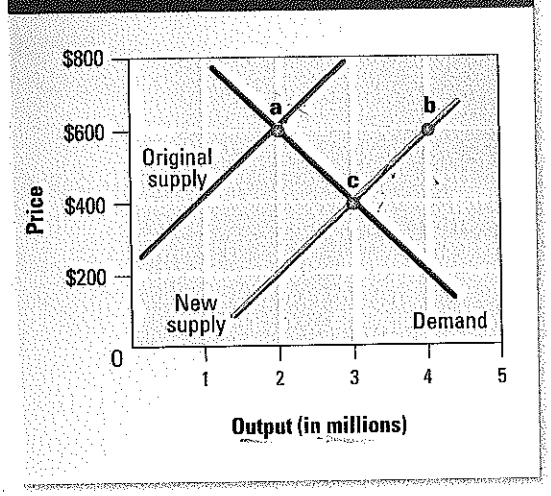
As the price of compact disc players fell due to better technology, more and more people bought them. The equilibrium in this market, then, started moving gradually downward and to the right. This is where the quantities demanded and supplied are higher, and the prices are lower.

The supply curve for compact disc players has been moving to the right ever since the first $1,000 compact disc players were sold. The curve continues to shift today as new technology continues to drive down the production cost and market price of the most basic machines.

Equilibrium is usually not an unchanging, single point on a graph. The equilibrium in the compact disc player market has always been in motion. The market equilibrium follows the intersection of the demand curve and the supply curve as that point moves downward along the demand curve.

Equilibrium is a "moving target" that changes as market conditions change. Manufacturers and retail sellers of compact disc players are constantly searching for a new equilibrium as technology and methods of production change. Consumers recognize this "searching" by the frequent price changes, sales, and rebates on compact disc players. Each of these tactics is designed to keep the machines moving out of stores as fast as new machines come in.

Figure 6.6 A Change in Supply



BUILDING KEY CONCEPTS

When supply increases, prices fall, and quantity demanded increases to reach a new equilibrium.

Supply and Demand How would you compare the location of the new equilibrium to that of the old equilibrium?

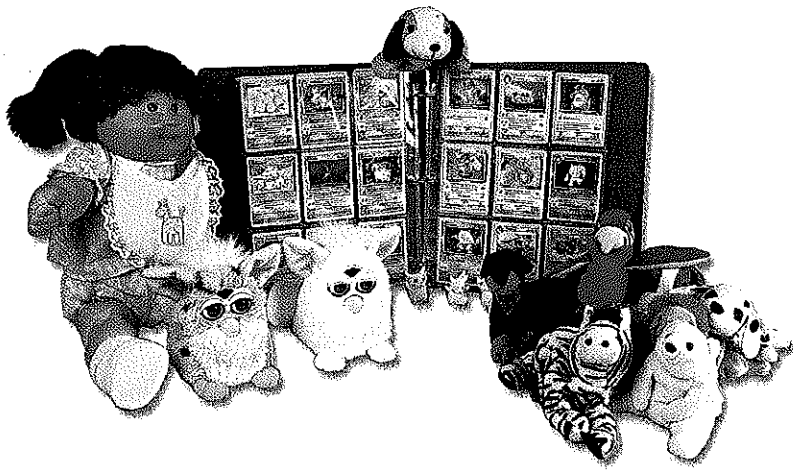
A Fall in Supply

Just as new technology or lower costs can shift the supply curve to the right, so other factors that reduce supply can shift the supply curve to the left. Consider the market for cars. If the price of steel rises, automobile manufacturers will produce fewer cars at all price levels, and the supply curve will shift to the left. If auto workers strike for higher wages, and the company must pay more for labor to build the same number of cars, supply will decrease. If the government imposes a new tax on car manufacturers, supply will decrease. In all of these cases, the supply curve will move to the left, because the quantity supplied is lower at all price levels.

THE WALL STREET JOURNAL. CLASSROOM EDITION

In the News Supply is increasing and costs are decreasing in the personal computer industry, as described in this excerpt from an article in The Wall Street Journal Classroom Edition:

"As for PCs, Mr. Halla figures his factories will be able to cram 20 million transistors on a chip by the middle of this year, enough to create a PC-on-a-chip that is about as powerful as the sub-$1,000 machines that are taking the market by storm. . . . Mr. Halla talks of a day when PCs will be so cheap that they are built into watches and dashboards, increasing annual shipments to 700 million units from 70 million."



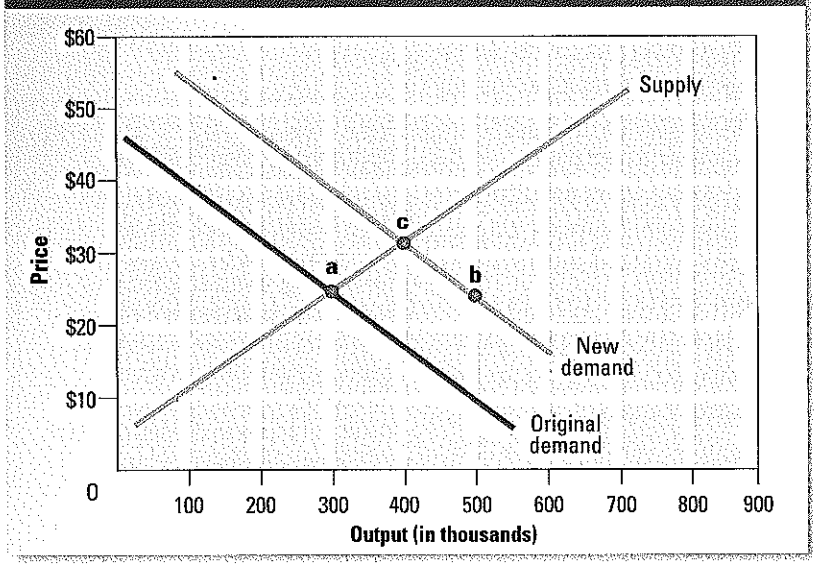
▲ **Almost every fall, a trendy toy emerges as one that every child "must have." Demand for these toys increases.**

shortage *situation in which quantity demanded is greater than quantity supplied; also known as excess demand*

search costs *the financial and opportunity costs consumers pay when searching for a good or service*

When the supply curve shifts to the left, the equilibrium price and quantity sold will change as well. This process is the exact opposite of the change that results from an increase in supply. As the supply curve shifts to the left, suppliers raise their prices and the quantity demanded falls. The new equilibrium point will be at a spot along the demand curve above and to the left of the original equilibrium point. The market price is higher than before, and the quantity sold is lower.

Figure 6.7 A Change in Demand



BUILDING KEY CONCEPTS

When demand shifts, price and quantity supplied change to create a new equilibrium.

Prices and Markets **What happens to prices when the demand curve shifts to the right?**

Shifts in Demand

Almost every year, around November, a new doll or toy emerges as a nationwide fad. People across the country race to stores at opening time and stand in long lines to buy that year's version of Tickle Me Elmo or Pokémon.

As you read in Chapter 4, these fads reflect the impact of consumer tastes and advertising on consumer behavior. Fads like these, in which demand rises quickly, are real-life examples of a rapid, rightward shift in a market demand curve. Figure 6.7 shows how a rapid, unexpected increase in market demand will affect the equilibrium in a market for a hypothetical, trendy toy.

The Problem of Excess Demand

In Figure 6.7, the fad causes a sudden increase in market demand, and the demand curve shifts to the right. This shift leads to excess demand at the original price of $24 (point b). Before the fad began, quantity demanded and quantity supplied were equal at 300,000 dolls, shown at point a. On the graph, excess demand appears as a gap between the quantity supplied of 300,000 dolls and the new quantity demanded of 500,000 at $24, shown at point b. This is an increase of 200,000 in the quantity demanded. Economists would also describe this as a **shortage** of 200,000 dolls.

In the stores that carry the dolls, excess demand appears as bare shelves and long lines. Excess demand also appears in the form of **search costs**—the financial and opportunity costs consumers pay in searching for a good or service. Driving to different stores and calling different towns to find an available doll are both examples of search costs.

In the meantime, the available dolls must be rationed, or distributed, in some other manner. In this case, long lines, limits on the quantities each customer may buy, and

"first come, first serve" policies are used to distribute the dolls among customers.

Return to Equilibrium

As time passes, firms will react to the signs of excess demand and raise their prices. In fact, customers may actually push prices up on their own if there is "bidding" in the market, as there is for real estate, antiques, fine art, and hard-to-find items.

If a parent cannot find the doll he wants at the store, he might offer the store keeper an extra $5 to guarantee him a doll from the next shipment. Through these methods, the market price will rise until the quantity supplied equals the quantity demanded at 300,000 dolls. All of these dolls are sold at the new equilibrium price of $30, shown at point c in Figure 6.7.

When demand increases, both the equilibrium price and the equilibrium quantity also increase. The demand curve has shifted, and the equilibrium point has moved, setting in motion market forces that push the price and quantity toward their new equilibrium values.

A Fall in Demand

When a fad passes its peak, demand can fall as quickly as it rose. Excess demand turns into excess supply for the once-popular toy as parents look for a new, more trendy gift for their children. Overflowing store shelves and silent cash registers, the symptoms of excess supply, replace long lines and bidding wars.

When demand falls, the demand curve shifts to the left. Suppliers respond by cutting prices on their inventory. Price and quantity sold slide down along the supply curve to a new equilibrium point at point a in Figure 6.7. The end of the fad restores the original price and quantity supplied.

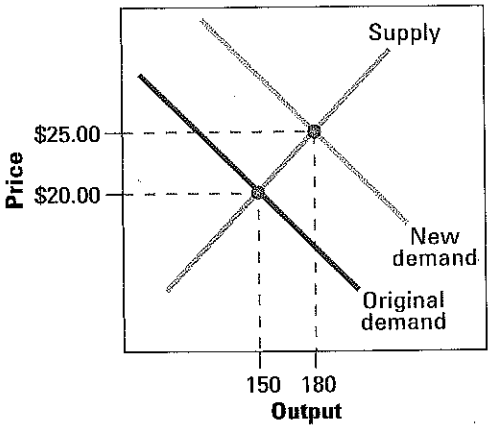
Section 2 Assessment

Key Terms and Main Ideas

1. What conditions lead to a **surplus?**
2. What is an example of a **search cost?**

Applying Economic Concepts

3. ***Decision Making*** Explain how the equilibrium price and quantity sold of eggs will change in the following cases. Remember that they need not move in the same direction. **(a)** An outbreak of food poisoning is traced to eggs. **(b)** Scientists breed a new chicken that lays twice as many eggs each week. **(c)** A popular talk show host convinces her viewers to eat an egg a day.
4. ***Critical Thinking*** What will happen to suppliers in a market if there is a surplus of the good they sell, but no supplier can afford to lower prices?
5. ***Math Practice*** The graph at the right shows the effects of a demand shift on a particular market. **(a)** Has demand increased or decreased? Explain. **(b)** What are the original equilibrium price and quantity sold? **(c)** What are the new equilibrium price and quantity sold? **(d)** A new tax raises the cost of production. How does the supply curve react? **(e)** Give a market price and quantity sold that might be a new equilibrium point after this cost increase.



Take It to the NET Search costs are continually dropping as computers and the Internet make searching easier and easier. Choose an item you or a classmate plans to purchase within the next month and find the best price using the Internet. Use the links provided at the following Web site for help in completing this activity. **www.phschool.com**

Section 3 The Role of Prices

Preview

Objectives

After studying this section you will be able to:

1. **Analyze** the role of prices in a free market.
2. **List** the advantages of a price-based system.
3. **Explain** how a price-based system leads to a wider choice of goods and more efficient allocation of resources.
4. **Describe** the relationship between prices and the profit incentive.

Section Focus

Goods and services can be divided up among buyers and sellers by a central plan or a price-based market system. Prices allow an efficient, flexible exchange of goods.

Key Terms

supply shock
rationing
black market
spillover costs

In Section 1, you read how supply and demand interact to determine the equilibrium price and quantity sold in a market. You also read about how those prices change over time. Prices are a key element of equilibrium. Price changes can move markets toward equilibrium and solve problems of excess supply and excess demand. In this section we will discuss the importance of prices and the role they play.

In a free market, prices are a tool for distributing goods and resources throughout the economy. Prices are nearly always the most efficient way to allocate, or distribute, resources. The alternative method for distributing goods and resources, namely a centrally planned economy, is not nearly as efficient as a market system based on prices.

Prices in the Free Market

Prices serve a vital role in a free market economy. Prices help move land, labor, and capital into the hands of producers, and finished goods into the hands of buyers. The following example shows the benefits of a system based on free market prices.

Kevin decides to buy a sweater for his sister for her birthday next month. He goes to a nearby shopping center and compares the prices of several different sweaters. Kevin finds that a department store offers cotton cable-knit sweaters for $30 to $50 and soft cashmere sweaters for $110. He visits other stores and finds that he can spend as little as $20 for an acrylic sweater or as much as $350 for a designer cashmere sweater. Kevin considers his sister's tastes and his own income and buys his sister one of the less expensive cotton sweaters.

Later, Kevin uses his computer to browse catalogs of mail-order stores. He's surprised to find a sweater very similar to the one he bought, but it's on sale for $5 less, shipping

▼ **Sweaters sell for different prices, depending on quality, style, and type of yarn.**

included. Kevin decides to buy the sweater on-line with his credit card and return the sweater he bought at the mall.

Kevin's story, familiar to anyone who has shopped for a gift, demonstrates the importance of prices to the free market system. The simple process of buying a gift for a friend or relative would be much more complicated and inefficient without the price system.

The Advantages of Prices

Prices provide a language for buyers and sellers. Could you conceive of a marketplace without prices? Without prices as a standard measure of value, a seller would have to barter for goods by bidding shoes or apples to purchase a sweater. A sweater might be worth two pairs of shoes to one customer, but another customer might be willing to trade three pairs of shoes for the same sweater. The supplier would have no consistent and accurate way to measure demand for a product.

Price as an Incentive

Buyers and sellers alike look at prices to find information on a good's demand and supply. The law of supply and the law of demand describe how people and firms respond to a change in prices. In these cases, prices are a signal that tell a consumer or producer how to adjust. Prices communicate to both buyers and sellers whether goods are in short supply or readily available.

In the example of the popular doll discussed in Section 2, the increased demand for the doll told suppliers that people wanted more dolls, and soon! However, the signal that producers respond to is not simply the demand, but the high price consumers are willing to pay for the doll, well above the usual retail price. This higher price tells firms that people want more dolls, but also that the firms can earn more profit by producing more dolls, because they are in demand. Therefore, rising prices in a market will cause existing firms to produce more goods and will attract new firms to enter a market.

Prices as Signals

Think of prices as a traffic light. A relatively high price is a green light that tells producers that a specific good is in demand and that they should use their resources to produce more. New suppliers will also join the market. A low price, however, is a red light to producers that a good is being overproduced. In this case, low prices tell a supplier that he or she might earn higher profits by using existing resources to produce a different product.

For consumers, a low price is a green light to buy more of a good. A low price indicates that the good carries a low opportunity cost for the consumer, and offers a good buying opportunity. By the same token, a high price is a red light to stop and think carefully before buying.

Flexibility

Another important aspect of prices is that they are flexible. When a supply shift or a demand shift changes the equilibrium in a market, price and quantity supplied need to change to solve problems of too much or too little demand. In many markets, prices are much more flexible than output levels.


ECONOMY

U.S. Cuts Crop Forecasts Amid Drought

ECONOMY

North Carolina Hurricane Damages Rise

Losses Are Expected to Hit At Least $6 Billion Total: New Storm Is Awaited

Floyd Fallout

Harvest's Prospects Wilt in Heat Wave, Drought in East

▼ **Drought, floods, or frost can kill crops and cause a supply shock.**

Prices can be easily increased to solve a problem of excess demand, and they can be just as easily decreased to eliminate a problem of excess supply.

For example, a **supply shock** is a sudden shortage of a good, such as gasoline or wheat. A supply shock creates a problem of excess demand because suppliers can no longer meet the needs of consumers. The immediate problem is how to divide up the available supply among consumers.

What are the options? Increasing supply can be a time-consuming and difficult process. For example, wheat takes time to plant, grow, and harvest. **Rationing,** or dividing up goods and services using criteria other than price, is expensive and can take a long time to organize. Rationing is the basis of central planning, which you read about in Chapter 2.

Raising prices is the quickest way to resolve excess demand. A quick rise in prices will reduce quantity demanded to the same level as quantity supplied and avoid the problem of distribution. The people who have enough money and value the good most highly will pay the most for the good. These consumers will be the only consumers still in the market at the higher price, and the market will settle at a new equilibrium.

Price System Is "Free"

Unlike central planning, a distribution system based on prices costs nothing to administer. Central planning requires central planners who collect information on production and decide how resources are to be distributed. In the former Soviet Union, the government employed thousands of bureaucrats in an enormous agency called GOSPLAN to organize the economy. During World War II, the United States government set up the Office of Price Administration to prevent inflation and coordinate rationing of important goods.

On the other hand, free market pricing distributes goods through millions of decisions made daily by consumers and suppliers. Kevin, from the beginning of the section, looks at the prices of sweaters and decides which one to buy for his sister and which supplier to buy it from. A farmer reads the reports from the commodity exchanges and decides whether to grow corn instead of soybeans next year. Everyone is familiar with how prices work and knows how to use them. In short, prices help goods flow through the economy without a central plan.

A Wide Choice of Goods

One of the benefits of a market-based economy is the diversity of goods and services consumers can buy. Price gives suppliers a way to allow consumers to choose among similar products. Kevin could buy his sister an acrylic sweater for $20, a cotton sweater for $40, or a cashmere sweater for much more. Based on his income and his sister's tastes, Kevin decided on a cotton sweater at the lower end of the price range. The prices provided an easy way for Kevin to narrow his choices to a certain price range. Prices also allow producers to target the audience they want with the products that will sell best to that audience.

In a command economy, however, one organization decides what goods are produced and how much stores will charge for these goods. To limit their costs,

supply shock *a sudden shortage of a good*

rationing *a system of allocating scarce goods and services using criteria other than price*

▼ During the World War II era, civilians could only buy a certain amount of meat and other goods each month. People needed both cash and ration points to buy.

▲ **North Korea's Communist government has built identical apartment blocks for its citizens, who do not get to choose where to live.**

central planners restrict production to a few varieties of each product. As a result, consumers in the former Communist states of Eastern Europe and the Soviet Union had far fewer choices of goods than consumers in Western Europe and the United States. You may ask why Communist governments used a command economic system. The answer is, in part, that they hoped to distribute wealth evenly throughout their society. As a result, the government of the Soviet Union built whole neighborhoods of identical apartment blocks and supermarkets with names such as "Supermarket No. 3."

Rationing and Shortages

Although goods in the Soviet Union were inexpensive, consumers could not always find them. When they did, they often had to wait hours for eggs or soap, years for apartments or telephones. The United States experienced similar problems, although far less severe, when the government instituted temporary price controls during World War II.

Although rationing in the United States was only a short-term hardship, like rationing in the Soviet Union it was expensive and left many consumers unhappy. The needs of the U.S. armed forces for food, metal, and rubber during World War II created tremendous shortages at home, and the government controlled the distribution of food and consumer goods. Choices were limited, and consumers felt, rightly or wrongly, that some people fared better than others. However, rationing was chosen because a price-based system might have put food and housing out of the reach of some Americans, and the government wanted to guarantee every civilian a minimum standard of living in wartime.

The Black Market

Despite the ration system, the federal government was unable to control the supply of all goods passing through the economy. A butcher could sell a steak without asking for ration points, or a landlord might be willing to rent an apartment at the rate fixed by the government only if the renter threw in a cash "bonus" or an extra two months' rent as a "deposit."

When people conduct business without regard for government controls on price or quantity, they are said to do business on the **black market**. Black markets allow consumers to pay more so they can buy a good when rationing makes it otherwise unavailable. Although black markets are a nearly inevitable consequence of rationing, such trade is illegal and strongly discouraged by governments.

black market *a market in which goods are sold illegally*

Efficient Resource Allocation

All of the advantages of a free market allow prices to allocate resources efficiently. Efficient resource allocation means that economic resources—land, labor, and capital—will be used for their most valuable purposes. A market system, with its freely changing prices, ensures that resources go to the uses that consumers value most highly. A price-based system also ensures that resource use will adjust to the changing demands of consumers.

These changes take place without any central control, because the people who own resources—landowners, workers who sell their labor, and people who provide capital to firms—seek the largest possible returns. How do people earn the largest returns? By selling their resources to the highest bidder. The highest bidder will be that firm that produces goods that are in the highest demand. Therefore, the resources will flow to the uses that are most highly valued by consumers. This flow is the most efficient way to use our society's scarce resources.

Global Connections

Rationing and Prices Cuba has two different systems for distributing goods. Some goods are rationed, while many others are sold in stores at different prices. The difference between the two systems is that the price-based system uses not Cuba's currency, the peso, but the United States dollar. Many Cubans earn dollars by working in tourism or as gifts from family members outside the country. Cubans with dollars can buy a variety of food and clothing at stores and restaurants that only accept dollars. Cubans who are paid in pesos must get their food through the state's rationing system. Prices are very low, but food is rationed, and the government provides each person with a limited amount of grain, coffee, salt, and other basic foods.

Prices and the Profit Incentive

Suppose that scientists predicted extremely hot weather for the coming summer. In most parts of the country, consumers would buy up air conditioners and fans, to prepare for the heat. Power companies would buy reserves of oil and natural gas to supply these appliances with enough power. Since demand would exceed supply, consumers would bid up the price of fans, and power plants would bid up the price of fuel. Suppliers would recognize the possibility for profit in the higher prices charged for these goods, and they would produce more fans and air conditioners. Oil and natural gas fields would hire workers to pump more fuel for power plants. Eventually, more fans, air conditioners, and fuel would move into the market. The potential heat wave would have created a need for certain goods, and the rise in prices would have given producers an incentive to meet this need.

As we previously noted, efficient resource allocation occurs naturally in a market system as long as the system works reasonably well. Landowners tend to use their scarce property in the most profitable manner. Workers usually move toward high-paying jobs, and capital will be invested in the firms that pay the highest returns.

The Wealth of Nations

Adam Smith made this point in his famous book *The Wealth of Nations*, published in 1776. Smith explained that it was not because of charity that the baker and the butcher provided people with their food. Rather, they provide people with bread and meat because prices are such that they

▼ The People's Republic of China is moving away from a command economy and rationing to a more market-based economy.

▲ **The price of water affects how efficiently it is used. When water is provided to farmers at a higher price, they have an incentive to irrigate more efficiently.**

will profit from doing so. In other words, businesses prosper by finding out what people want, and then providing it. This has proved to be a more efficient system than any other that has been tried in the modern era.

Market Problems

There are some exceptions to the general idea that markets lead to an efficient allocation of resources. The first problem, imperfect competition, can affect prices, and higher prices can affect consumer decisions. If only a few firms are selling a product, there might not be enough competition among sellers to lower the market price down to the cost of production. When only one producer sells a good, this producer will usually charge a higher price than we would see in a market with several competitive businesses. In the following chapter, you will read more about how markets behave under conditions of imperfect competition.

A second problem can involve **spillover costs,** also known as externalities, that include costs of production, such as air and water pollution, that "spill over" onto people who have no control over how much of a good is produced. Since producers do not have to pay spillover costs, their total costs seem artificially low, and they will produce more than the equilibrium quantity of the good. The extra costs will be paid by consumers.

Imperfect information is a third problem that can prevent a market from operating smoothly. If buyers and sellers do not have enough information to make informed choices about a product, they may not make the choice that is best for them.

spillover costs *costs of production that affect people who have no control over how much of a good is produced*

Section 3 Assessment

Key Terms and Main Ideas

1. How does a **supply shock** affect equilibrium price and quantity?
2. How is **rationing** different from a price-based market system?

Applying Economic Concepts

3. *Decision Making* List three reasons why a price-based system works more efficiently than central planning.
4. *Critical Thinking* Give two examples of situations in which prices gave you an incentive to purchase or not purchase a good or service.
5. *Try This* Distribute $50 in play money to each student in your class. Then, ask students to bid for items from the following basket of goods and services: 10 pairs of movie tickets, 20 fine restaurant dinners, 40 bagels, 5 pairs of running shoes, and 30 hours of dog walking. **(a)** What prices were bid for these goods? **(b)** Why do you think some goods received higher bids than others? **(c)** What do you think would happen to the bids if the number of items for sale doubled?
6. *Critical Thinking* What do you think Adam Smith would think of rationing? Explain.

Take It to the NET

The gasoline crisis of the 1970s is one of the most memorable supply shocks in recent history. Why did it happen? How did it affect people's lives? Are we using resources more efficiently now? Prepare an outline to answer these questions. Use the links provided at the following Web site for help in completing this activity. **www.phschool.com**