

Markets, Equilibrium, and Prices

6.1 Introduction

If you were to drive into Albion, Nebraska, from the south or west, the first thing you would see would be the swelling clouds of steam from the new ethanol plant on the edge of town. Ethanol, which in the United States is made primarily from corn, is a bio-fuel—a fuel made from recently living organisms or their by-products. Ethanol is in growing demand as a gasoline additive to help meet energy needs.

Ethanol, and the corn it is made from, is one of the main reasons that Albion, a farm town of 2,000 people in central Nebraska, is growing. On a hillside overlooking Albion, huge new homes are going up. In town, residents are renovating and expanding their houses. The town is getting a full-time dentist and now has a fine jewelry store and a gourmet coffee shop.

“There’s a buzz in Albion,” says Brad Beckwith, a corn and soybean farmer. He and farmers like him are reaping profits for the first time in decades. With the demand for corn increasing, grain prices are skyrocketing to historic levels. Beckwith and his wife are taking advantage of the boom while it lasts. They recently bought a new home, installed a hot tub, and purchased a big-screen television.

How does the rising demand for corn affect consumers? Think about all the foods you eat that are made from corn, such as corn flakes, corn muffins, and tortillas. Soda, candy, and hundreds of other processed foods contain high fructose corn syrup. And then there is popcorn. The corn used for popcorn is

The growing demand for corn to make ethanol, a gasoline additive, is affecting food prices.

Speaking of Economics

market equilibrium

The point at which the quantity of a product demanded by consumers in a market equals the quantity supplied by producers.

equilibrium price

The price at which the quantity of a product demanded by consumers equals the quantity supplied by producers.

equilibrium quantity

The quantity of a good or service demanded by consumers and supplied by producers when the market is in equilibrium.

price controls

Government-imposed limits on the prices that producers may charge in the market.

price floor

A minimum price set by the government to prevent prices from going too low. Minimum wage laws set a price floor for wages paid to workers.

price ceiling

A maximum price set by the government to prevent prices from going too high. Rent control laws set a price ceiling on the amount of rent a landlord can charge a tenant.

rationing

The controlled distribution of a limited supply of a good or service.

black market

An illegal market in which goods are traded at prices or in quantities higher than those set by law.



Is ethanol really the solution to our pollution problems, as some people hope? Research suggests that it may not be because the ethanol-making process itself creates so much pollution. Other potential biofuel alternatives include prairie grass and cattle manure.

different from that used in ethanol, and popcorn producers have to pay farmers more to plant it instead of corn for ethanol. Higher prices for corn mean increased prices for these foods at the grocery store.

Ranchers also pay more for corn, which they use to feed cattle, pigs, and chicken. The higher cost of feeding livestock is then passed on to consumers in the form of higher prices for beef, pork, and chicken.

There is no guarantee that corn prices will stay high, of course. Agricultural markets can be unstable, with swings in supply and demand that lead to rising and falling prices. Or as Beckwith puts it, "It's gone up so fast, what's to say it won't go down fast, too?" If ethanol does not prove to be as efficient a fuel as people hope, the demand for corn may slow.

There will always be factors affecting the prices of the products you buy. In this chapter, you will learn what these factors are. You will see how supply and demand interact to set prices and how changes in supply and demand can cause prices to change. This chapter will help you understand what "the price is right" really means.

6.2 What Happens When Demand Meets Supply?

If you have ever been to a farmers market or a flea market, you have probably seen people haggling over a price. You also surely noticed that it took an agreement between a buyer and a seller before a deal was made. If the buyer did not like the price, he or she might have walked away. If the seller had not wanted to accept the buyer's offer, no sale was made. You may think of such encounters as simple purchases. But to an economist, they represent the coming together of demand and supply.

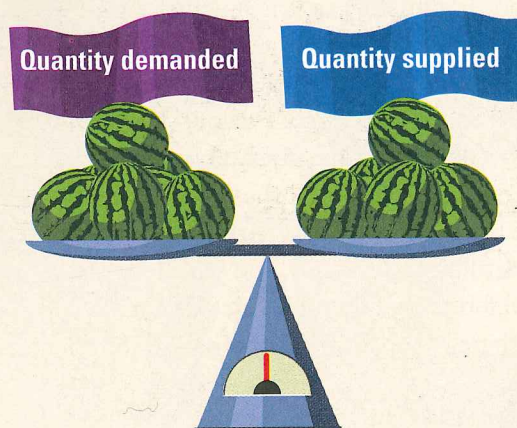
Market Equilibrium: The Point Where Buyers and Sellers Agree

In a market where consumers and producers are completely free to buy and sell goods and services, demand and supply work together to determine prices. This is true whether the market is a local farmers market or a global market. The very interaction of demand and supply drives prices to a point called **market equilibrium**. At this point of equilibrium, the quantity of a good or service that consumers are willing and able to buy equals the quantity that producers are willing and able to sell. The quantity demanded, in other words, equals the quantity supplied.

Key Concept

Market Equilibrium

Market equilibrium is reached when the price of a good or service adjusts to bring quantity demanded and quantity supplied into balance. Equilibrium is the result of the laws of supply and demand working together.



Market equilibrium can be compared to the point reached by a balance scale when each side holds an object of equal mass. The beam of the scale is level. It does not tip up or down. The opposing forces balance each other to create stability. Likewise, when a market is in equilibrium, demand and supply are balanced. Both consumers and producers are satisfied. Neither side has any reason to tip the scale.

Consider watermelons being sold at a weekly farmers market. Suppose that when the season opens, local farmers charge \$6.50 per seedless watermelon, hoping to sell 350 melons at this price. You and other customers try to bargain the price down, but the farmers won't budge. Most customers walk away, and the farmers sell only 50 melons.

The next week, the farmers bring 300 new melons and reduce the price to \$6.00 a melon. The price is still too high for you and many others. The farmers sell 100 melons and have 200 left over.

Two weeks later, the farmers bring 200 fresh melons to the market and reduce the price to \$5.00. All 200 melons get sold, and everyone who wanted to buy a melon got one. The farmers decide to keep the price at \$5.00 and bring 200 melons to market each week. At this price, the quantity of melons

demanded by buyers equals the quantity supplied by farmers. The melon market at this farmers market has reached equilibrium.

What if the farmers were to reduce the price even more? Let's assume they want to quickly sell 100 melons. They reduce the price to \$4.00 a melon. At this price, customers are eager to buy. They demand 300 melons, 200 more than the farmers have to sell. You don't get a watermelon because they are sold out.

The demand and supply schedule in Figure 6.2 shows the quantity of melons demanded and supplied at each price in the market. When these data are plotted on a graph, the resulting demand and supply curves intersect. This point of intersection is the point at which the market is in equilibrium. At the equilibrium point, the quantity of melons demanded equals the quantity supplied.

The price marked by the equilibrium point on a supply and demand graph is known as the **equilibrium price**. At this price, supply and demand are in balance. This price is also known as the **market-clearing price** because at this price, the market will be "cleared" of all surpluses and shortages. At the farmers market, for example, no customer who wants a melon will go home empty-handed when melons are sold at the

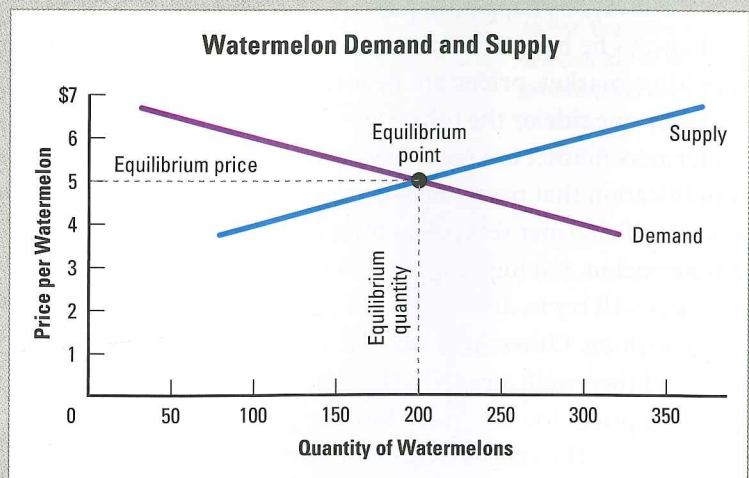
Figure 6.2

Reaching Market Equilibrium

A market reaches equilibrium when the quantity demanded by consumers equals the quantity supplied by producers. On the graph, equilibrium is found at the point where the demand and supply curves intersect.

- What is the equilibrium price at this point?
- What is the equilibrium quantity?

Price	Quantity Demanded	Quantity Supplied
\$4.00	300	100
4.50	250	150
5.00	200	200
5.50	150	250
6.00	100	300
6.50	50	350



A car purchase often involves intense bargaining over price between buyers and sellers. This car buyer and seller have reached agreement on a price that satisfies them both.



equilibrium price of \$5.00. Nor will any farmers go home with leftover melons.

The quantity marked by the equilibrium point on the same graph is called the **equilibrium quantity**. At this quantity, the amount of a good or service supplied by producers balances the quantity demanded by consumers. Both the graph and the schedule show that in this example, the equilibrium quantity is 200 melons.

Prices Move to Bring Markets into Balance

When supply matches demand, consumers and producers both come away satisfied. True, consumers would always be happier to pay less and producers would always be happier to charge more. But in a competitive market, prices are negotiated, not dictated by one side or the other.

A farmers market is a good place to witness the communication that passes between consumers and producers. If a farmer sets prices for a product, such as a watermelon, too high for most shoppers, some consumers will try to drive the price down with hard bargaining. Others will look the goods over in silence and then walk away. On the other hand, if a farmer sets prices too low, early-bird bargain hunters will flock to the stall, sweeping up every melon in sight. The farmer who knows how to read these

signals will respond by adjusting the price of melons up or down to match the current demand.

Such interaction between consumers and producers will eventually establish the equilibrium price for watermelons in that market. This equilibrium price—the price at which shoppers agree to buy all the melons the farmer agrees to sell—is the “right” price for both parties.

What goes on at a farmers market is a simplified version of the communication that takes place between all producers and consumers. In a larger market, this kind of negotiation happens more slowly and perhaps less personally than at a local farmers market. But the process is the same. Consumers and producers send each other numerous “trial and error” messages.

Consider, for example, a new product on the toy market—an electronic dog that can be trained to roll over. If the producer of this toy dog were to price it at \$100, and few consumers were to purchase it, consumers would be sending a message to the producer to reduce the price or be left with dogs on the shelf. On the other hand, if consumers were to form lines out the door to purchase the toy at that price, they would be sending a message to producers that the price may be too low.

The interaction between consumers and producers automatically pushes the market price of a good

or service toward the equilibrium price. **Market price** is the price a willing consumer pays to a willing producer for the sale of a good or service.

The process by which markets move to equilibrium is so predictable that economists sometimes refer to markets as being governed by the law of supply and demand. This is a shorthand way of saying that in a competitive free market, the law of supply and the law of demand will together push the price of a good or service to a level where the quantity demanded and the quantity supplied are equal.

Economist Alfred Marshall, who helped develop modern theories of supply and demand, famously compared supply and demand to the blades of a pair of scissors. It would be impossible to determine, he wrote, whether it is the top blade or the bottom blade that cuts through a piece of paper. The two blades operate in unison. In the same way, the laws of supply and demand operate together to arrive at equilibrium.

■ 6.3 What Happens When the Price Isn't "Right"?

Economists think of the equilibrium price as the "right" price because it is the price that producers and consumers can agree on. Sometimes, however,

producers set a market price that is above or below the equilibrium price. Economists refer to this state of affairs as **disequilibrium**. When disequilibrium occurs in a market, the quantity demanded is no longer equal to the quantity supplied. The result is either a shortage or a surplus.

When the Price Is Too Low, Shortages Result

Have you ever stood in a long line waiting for the latest video game release? Or have you gone to a theater to see a blockbuster movie only to find the tickets sold out?

Economists call situations like these—in which the quantity demanded at a specific price exceeds the quantity supplied—**excess demand**. Consumers experience excess demand as a shortage. A shortage occurs when there are too many consumers chasing too few goods. To economists, excess demand is a sign that the price of a good or service is set too low.

For example, suppose the owners of a juice bar concoct a new smoothie called Blueberry Blast. They price it at \$1.50. Soon the line of customers waiting to buy the \$1.50 smoothie is out the door, every day. The owners realize they have a problem—excess demand. The quantity demanded greatly exceeds the quantity they are willing and able to supply at this price. They may not be able to afford additional



When a price is set too high or too low, the result is disequilibrium. The quantity demanded and supplied are no longer in balance. For a juice bar owner, the challenge is to find the price at which the number of drinks supplied equals the number of drinks demanded by customers.

staff to accommodate all the customers, or to pay for all the smoothie supplies. The low price results in reduced profits for the owners.

The first graph in Figure 6.3 illustrates this problem. At \$1.50 per smoothie, customers will buy 5,000 drinks per month. The juice bar owners supply only 1,000 smoothies at this price. The result is a shortage for the many customers who want smoothies and are not able to buy them.

The juice bar owners could solve their excess demand problem by increasing the price of their smoothies until they have fewer long lines throughout the day. Doing this would bring them closer to the equilibrium price, at which the quantity demanded equals the quantity supplied.

When the Price Is Too High, Surpluses Result

Have you ever looked through a clearance rack for bargains on clothes? Or have you looked for laptops or cell phones on a Web site that sells overstocked electronic goods? These marked-down products have something in common. They were all initially offered for sale at prices above what consumers were willing to pay. The result was **excess supply**, a situation in which the quantity supplied at a specific price exceeds the quantity demanded. Producers experience excess supply as a surplus. A surplus occurs when there are too few consumers willing to pay what producers are asking for their goods.

Suppose that the juice bar owners, in trying to solve their excess demand problem, raise the price

Figure 6.3

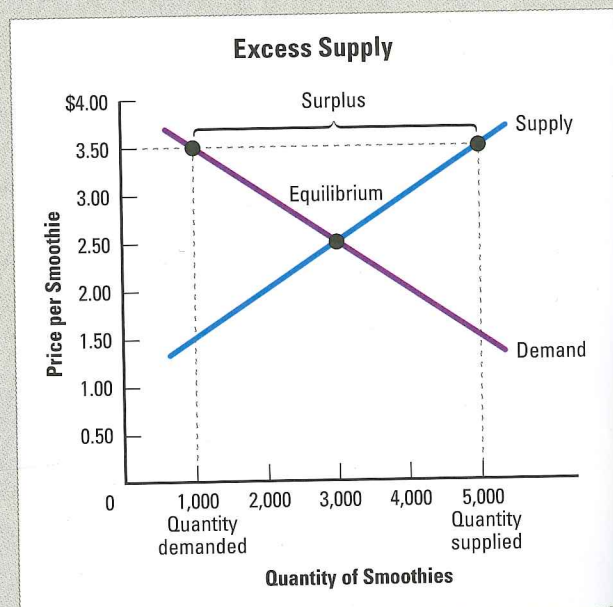
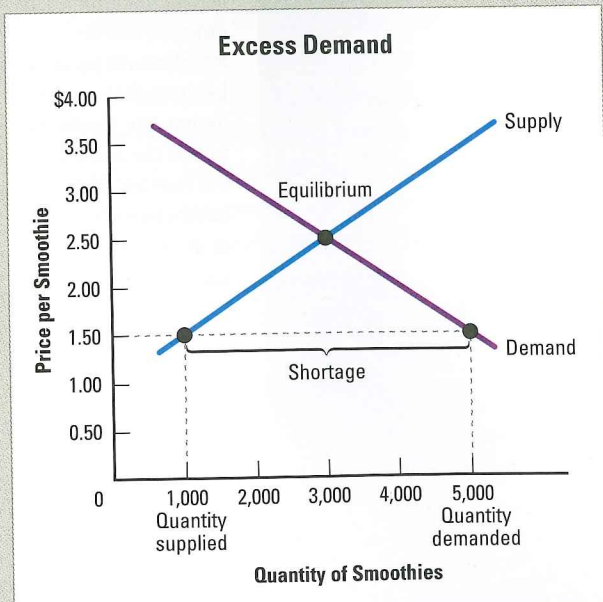
Graphing Excess Demand and Supply

These graphs show what happens when the price of smoothies is set either above or below the equilibrium price. The result is either excess demand or excess supply.

- What happens to supply when the price is set \$1.00 above equilibrium?
- What happens to demand when the price is set \$1.00 below equilibrium?

Smoothie Demand and Supply Schedule

Price	Quantity Demanded	Quantity Supplied	Outcome
\$1.50	5,000	1,000	shortage from excess demand
2.00	4,000	2,000	demand
2.50	3,000	3,000	equilibrium
3.00	2,000	4,000	surplus from excess supply
3.50	1,000	5,000	supply



of a Blueberry Blast to \$3.50 per drink. Business slows, and they soon discover that they are not selling enough drinks. The quantity demanded by customers is much less than the quantity the juice bar owners want to supply at this price. The excess supply results in a surplus of blueberry smoothie ingredients. Boxes of fresh blueberries go bad in the refrigerator and blenders stand idle on the counter.

The second graph in Figure 6.3 shows that at \$3.50 per smoothie, the juice bar owners are willing and able to produce 5,000 drinks. But customers buy only 1,000 smoothies, resulting in a surplus. If the owners choose to reduce the price, more customers would be willing and able to buy. The price would then move toward the equilibrium price, at which quantity demanded equals quantity supplied.

What price should the juice bar owners set for their Blueberry Blast? Figure 6.3 shows that the “right” price is \$2.50. At that price, the quantity of smoothies demanded—3,000—equals the quantity supplied.

The Time It Takes to Reach Equilibrium Varies

In a free market, surpluses and shortages are usually temporary. When a market is in disequilibrium, the actions of many producers and consumers serve to move the market price toward equilibrium. How long it takes to restore the equilibrium price varies from market to market.

Owners of a local juice bar might be able to change their blueberry smoothie prices every month until the price is “right.” In contrast, a national fast-food chain might take much longer to find the “right” price for every item on its menu. Menus, signs, and advertising would need to be changed for all the many restaurants. Whether prices change quickly or slowly, however, once they move toward equilibrium, shortages and surpluses start to disappear.

6.4 How Do Shifts in Demand or Supply Affect Markets?

In our hypothetical markets for watermelons and smoothies, equilibrium was restored by adjusting prices, thereby changing the quantity demanded and the quantity supplied in those markets. On a graph, a change in quantity demanded is shown as a movement from one point to another along the demand

curve. Similarly, a change in quantity supplied is shown as a movement from one point to another along the supply curve. When quantity demanded and quantity supplied move to the same point—the intersection of the curves—equilibrium is reached.

Suppose, though, that instead of changes in quantity demanded and quantity supplied, a market experiences a change in demand or supply. Such a change would shift the entire demand or supply curve to a new position on the graph. This shift, in turn, would have an effect on market equilibrium.

Three Questions to Ask About Demand and Supply Shifts

Anything that brings about a shift in the demand curve is a demand shifter. Loss of income, a spike in the population, a popular new fad—any of these events could shift demand by altering consumer spending patterns. Likewise, anything that shifts the supply curve is a supply shifter. Important supply



During the Beanie Baby craze of the 1990s, demand for these small stuffed animals soared. To maintain excitement about the toy, the maker of Beanie Babies kept prices low and limited supplies. The result was a frenzy of excess demand among collectors.

shifters include changes in the number of producers and changes in the cost of inputs.

When an event causes the demand or supply curve to shift, the point of equilibrium changes. To analyze such a change, economists ask three questions:

- Does the event affect demand, supply, or both?
- Does the event shift the demand or supply curve to the right or to the left?
- What are the new equilibrium price and quantity, and how have they changed as a result of the event?

Analyzing the Effect of a Change in Demand on Equilibrium Price

One of the most powerful factors that can influence market demand is changing consumer tastes. Consider, for example, what might happen if new medical research were to identify blueberries as a powerful “brain food.” How would this event affect the blueberry smoothie market? Think back to the three questions.

Does the event affect demand, supply, or both? The new research affects the demand for blueberry smoothies. After reading the published report, consumers buy more foods made with blueberries because they think eating blueberries will make them smarter. The research has little or no immediate impact on the supply of such products.

Does the event shift the demand or supply curve to the right or to the left? The event shifts the demand curve to the right. In Figure 6.4A, the demand for blueberry smoothies before the research was reported is represented by the initial demand curve, labeled D_1 . The demand after the report’s release is shown by the new curve, labeled D_2 . The D_2 curve is to the right of the D_1 curve. This shift to the right indicates an increase in demand.

What are the new equilibrium price and quantity, and how have they changed as a result of the event? Due to increased demand, the new equilibrium price—found at the intersection of the new demand curve and the supply curve—is \$3.00. The new equilibrium quantity is 4,000 smoothies. This is an increase over the initial equilibrium price of \$2.50 and equilibrium quantity of 3,000 smoothies.

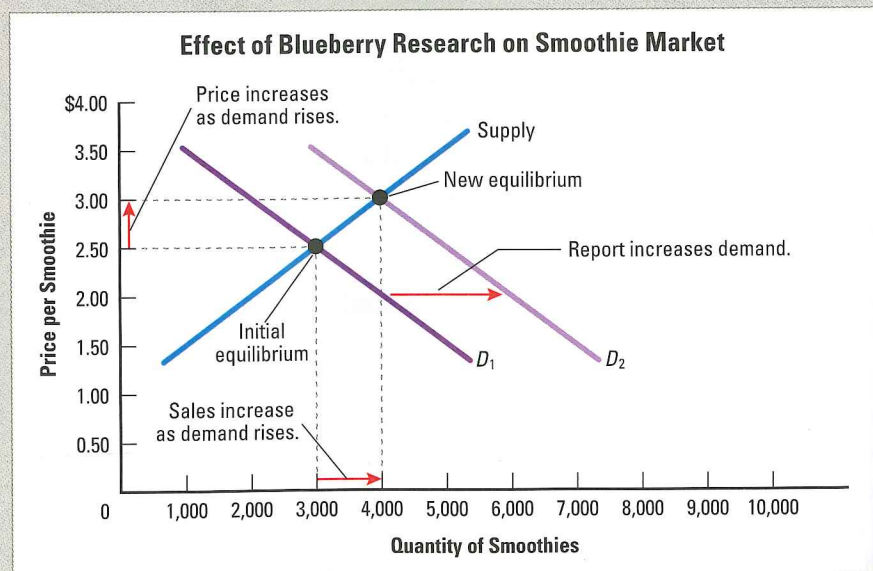
Notice that if the juice bar owners had kept the price of smoothies at \$2.50 after demand had increased, a shortage would have occurred. At \$2.50, consumers would have demanded 5,000 smoothies, but the producers would have been willing and able to supply only 3,000. By raising the price to \$3.00, the producers found the “right” price—the equilibrium price, at which the quantity demanded equals the quantity supplied.

Figure 6.4A

Graphing the Effects of a Shift in Demand

The graph shows how a shift in the demand for blueberry smoothies can affect market equilibrium. Here, the shift is caused by new research calling blueberries “brain food.”

- Find the initial equilibrium price and quantity.
- Note what happens to both the equilibrium price and the equilibrium quantity when the demand curve shifts to the right.
- What are the new equilibrium price and quantity?



Analyzing the Effect of a Change in Supply on Equilibrium Prices

Among the many variables that can shift market supply are extreme weather conditions, such as hurricanes, floods, and freezing temperatures. Consider how a prolonged summer drought in major blueberry-producing states might affect the market for blueberry smoothies. Suppose the blueberry harvest is half of the average amount. What impact would this have on the market?

Does the event affect demand, supply, or both?

The drought and subsequent bad harvest affect supply by driving up the cost of blueberries, one of the raw materials used in the production of blueberry smoothies. As a result of higher input costs, the juice bar owners supply fewer smoothies at every price. The drought has no impact on demand because the higher cost of blueberries does not change the number of smoothies people want to buy.

Does the event shift the demand or supply curve to the right or to the left? Because the number of smoothies produced has decreased at every price, the supply curve moves to the left. This is shown on the graph in Figure 6.4B. The new supply curve, labeled S_2 , is to the left of the initial supply curve, labeled S_1 .

What are the new equilibrium price and quantity, and how have they changed as a result of the event?

The new equilibrium price for blueberry smoothies is \$3.00. At this price, the new equilibrium quantity is 2,000 smoothies. Before the drought, the equilibrium price was \$2.50 and the equilibrium quantity was 3,000 smoothies. The drought has caused the equilibrium price to increase and the equilibrium quantity to decrease.

If producers had not raised the price of smoothies, a shortage would have occurred. At \$2.50, there would have been demand for 3,000 smoothies, but a supply of only 1,000. In other words, the price was no longer “right” at \$2.50. At \$3.00, the quantity of smoothies demanded and supplied became equal.

Analyzing the Effect of Changes in Both Demand and Supply

Finally, consider a scenario in which a combination of events causes changes in the demand and supply

of blueberry smoothies at the same time. The first event is the publication of a bestselling book that calls the blueberry “a miracle fruit” that promotes good health. The second event is the announcement by a supermarket chain that it is opening juice bars in most of its local stores. To determine the impact of these two events on the smoothie market, think again of the three questions.

Do the events affect demand, supply, or both? The events are likely to affect both demand and supply. The book, like the research report in the earlier scenario, motivates consumers to buy more blueberry smoothies, thus increasing the quantity demanded at all prices. The juice bars opening in supermarkets cause an increase in the number of producers, thus increasing the quantity of smoothies supplied at all prices.

Figure 6.4B

Graphing the Effects of a Shift in Supply

The graph shows how a shift in the supply of blueberry smoothies can affect market equilibrium. In this case, the shift is caused by a drought that damages the blueberry crop.

- Find the initial equilibrium price and quantity.
- Note what happens to both the equilibrium price and the equilibrium quantity when the supply curve shifts to the left.
- What are the new equilibrium price and quantity?

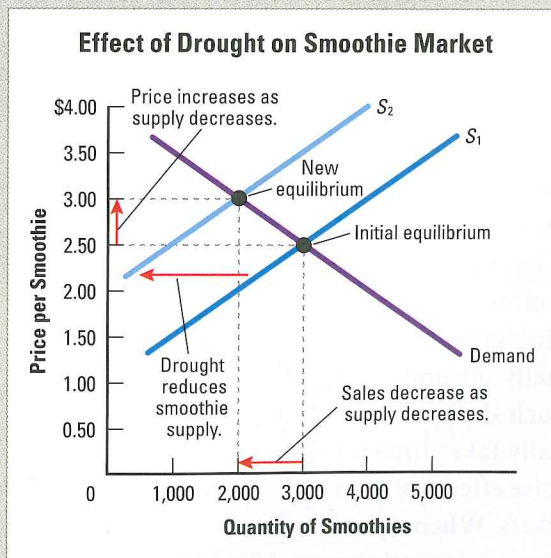
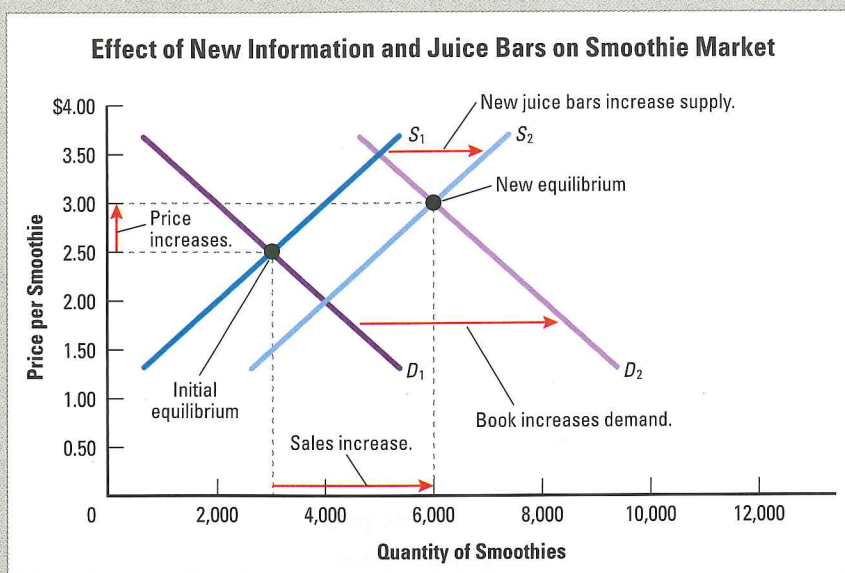


Figure 6.4C

Graphing the Effects of Shifts in Demand and Supply

The graph shows how a combined demand and supply shift can affect market equilibrium. In this case, the publication of a book on the health benefits of blueberries causes the shift in demand. The shift in supply is caused by the opening of new juice bars in supermarkets.

- What is the initial equilibrium price and quantity?
- Note what happens to the market equilibrium when both the demand and supply curves shift to the right.
- What is the new equilibrium price and quantity?



Do the events shift the demand or supply curve to the right or to the left? Because these events cause an increase in both quantity demanded and quantity supplied at all prices, both the demand curve and the supply curve shift to the right. This is shown on the graph in Figure 6.4C. The new demand and supply curves, labeled D_2 and S_2 , are to the right of the initial demand and supply curves, labeled D_1 and S_1 . This indicates an increase in both demand and supply.

What are the new equilibrium price and quantity, and how have they changed as a result of the event?

While both demand and supply have increased, demand for smoothies has increased even more than supply has. The graph in Figure 6.4C shows an increase of the equilibrium price from \$2.50 to \$3.00 and an increase of the equilibrium quantity from 3,000 to 6,000 smoothies. If the juice bar owners had not raised the price by 50¢, a shortage of 2,000 smoothies would have occurred.

In the real world, demand and supply are continually shifting in response to events. The impact of such shifts is not always immediately clear. It usually takes time for economists to discern the precise effects of demand and supply shifters on markets. When a product's demand and supply both increase, economists are safe in predicting that the

equilibrium quantity of that product will increase. But they can't tell with any certainty how the equilibrium price will change. In our simplified model of a market, the equilibrium price increased. In a real market, the equilibrium price could increase, decrease, or stay the same.

6.5 What Roles Do Prices Play in a Modern Mixed Economy?

Think about the last time you went shopping. What were you shopping for? Clothes? New athletic shoes? A birthday gift for a friend? Whatever it was, you probably found a lot to choose from. Athletic shoes, for example, come in dozens of styles and brand names. In the end, how did you decide what to buy? If you are like most consumers, price was an important component of your decision, perhaps even the deciding factor.

As consumers, most of us think of prices simply as indicators of what we have to pay to get what we want. Economists see prices differently. Looking at prices from the point of view of an economist, we find they perform a number of important roles in a modern mixed economy.

Prices Convey Information to Consumers and Producers

A primary role of price is to convey information. Both consumers and producers use this information to help make decisions. It may be an overstatement to call prices a “language,” but prices do send a signal. The high price of Manhattan real estate, for example, signals that this particular good is in short supply. The low price of rubber flip-flops sends the opposite signal. As economist Thomas Sowell puts it, “Prices are like messengers conveying news.”

To consumers, price signals the opportunity cost of a purchase. The opportunity cost of buying any product, remember, is the next best use for the money you spend. You may not think twice about buying something inexpensive, like a pack of shoelaces, because you give up little opportunity with the dollar you spend. On the other hand, before buying a pricey item like a flat-screen television, you would probably shop around, research brands, and seek out the lowest price. When the opportunity cost of buying is high, people tend to think carefully before parting with their money.

Prices convey information to producers as well. Prices tell producers what consumers want. Automobile manufacturers, for example, pay attention to which models and features sell at high prices and which need to be marked down in order to attract buyers. Prices are a way for automakers to gauge

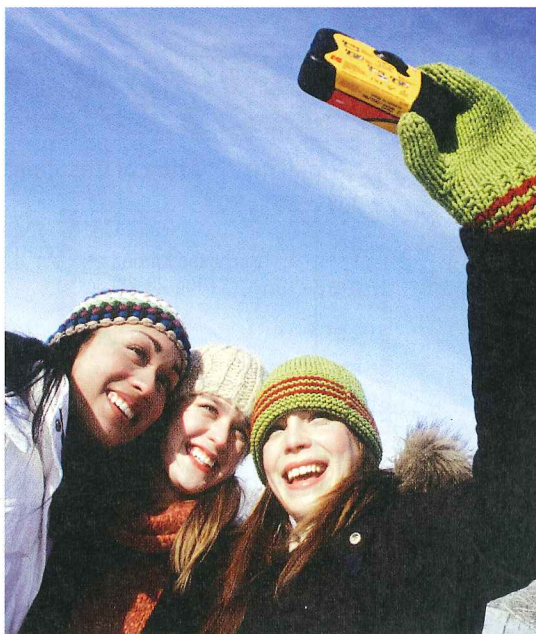
consumer preferences. Without monitoring prices, carmakers wouldn’t know which models to produce more of and which to cut back on.

Producers also use prices to appeal to the consumers they hope will buy their products. A firm that produces backpacks, for example, might offer a stylish model at a low price, targeted to preteens who want packs for school. The same firm might produce heavy-duty backpacks for serious adult hikers and offer them at higher prices. In each case, price sends a message about products and their intended markets.

Consumers, for their part, are used to interpreting these messages. They know that producers are trying to appeal to a wide range of tastes and budgets. Consumers use price to sort through the resulting variety of goods in the marketplace. Faced with a vast selection of running shoes ranging in price from around \$19 to over \$200, for example, most consumers will narrow their searches to a limited price range. The choice of how much to spend may, in part, be based on what a person can afford. But it also reflects the consumer’s expectation of what will be available at that price.

Prices Create Incentives to Work and Produce

As the incentives-matter principle reminds us, people respond to incentives. In a market-based economy, prices function as an incentive because they represent potential for profit. Rising prices in



The two cameras shown here are priced very differently. The low price of the disposable camera on the right signals consumers that it is to be used for casual snapshots. The high price of the camera on the left signals that it is equipped for professional-level photography.

a market motivate existing firms to produce more, and they encourage new firms to enter the market. Falling prices, in turn, serve as incentives for firms to cut back on production or even to leave a market to look for better opportunities elsewhere.

When home prices increase, for example, the change signals construction firms, architects, builders, and tradespeople that there are profits to be made in the housing market. Existing firms build more houses, and new firms get into the act. When prices in the same housing market decrease, the reverse happens. Construction firms build fewer houses. Architects, builders, and tradespeople look for other markets for their talents, such as house renovations and commercial construction.

Just as changing prices motivate producers, prices in the form of wages and salaries motivate workers. The opportunity to earn a higher “price” can inspire people to enter the workforce or seek higher-paying jobs. On the other hand, low wages can act as disincentives for people to seek work.

Prices Allow Markets to Respond to Changing Conditions

Prices allow markets to adjust quickly when major events such as wars and natural disasters interfere

with the production or movement of goods, wreaking havoc on supply. Figure 6.5 shows what happened to gas prices in late summer 2005, when the U.S. Gulf Coast was slammed by two powerful hurricanes. The first, Hurricane Katrina, shut down most crude oil production in the Gulf of Mexico and damaged oil refineries from Texas to Florida. Immediately afterward, a government official described the uncertainty facing the oil industry.

They don't know how many platforms are down, how many refineries are down, and how long it'll take to get the power back on. It depends on how much damage, particularly hidden damage . . . some of the undersea pipeline damage can be hard to detect.

—Michael Burdette, USA TODAY, Aug. 29, 2005

Four weeks later, just as the industry was starting to recover, Hurricane Rita struck, causing additional disruptions to the oil supply. The two hurricanes brought a halt to almost 30 percent of the U.S. oil-refinery capacity.

For the next few weeks, gas prices fluctuated, sometimes wildly, as oil companies struggled to bring the quantity of gas demanded in line with

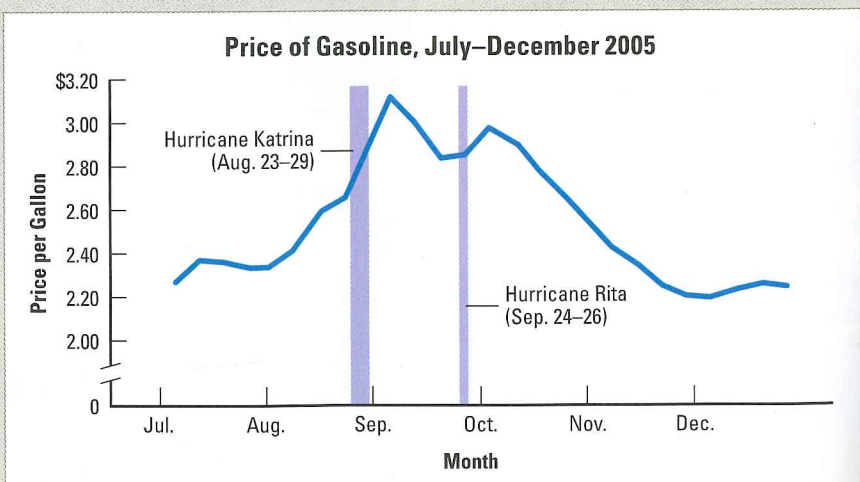
Figure 6.5

The Impact of Hurricanes Katrina and Rita on Gas Prices

In August 2005, Hurricane Katrina slammed into the Gulf Coast, destroying offshore oil rigs and damaging oil refineries. The next month, Hurricane Rita struck. Combined, the hurricanes disrupted almost 30 percent of the U.S. oil refinery capacity. The line graph shows how gas prices fluctuated as the market adjusted to these changing conditions.



Source: Energy Information Administration.



Key Concept

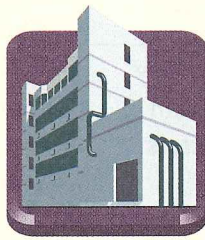
Prices

Prices act as messengers in our economy. They convey information that consumers, producers, and workers need to make the most efficient use of their scarce resources.



For consumers, prices

- convey information about products.
- signal the opportunity cost of a purchase.
- allocate products in short supply to those who value them most.



For producers, prices

- signal what consumers want most in a product.
- are used to target different markets.
- indicate when to increase or decrease production.



For workers, prices

- create incentives to enter the labor force.
- signal the level of demand for their skills and work experience.
- inspire search for higher-paying jobs.

what refiners were able to supply. One newspaper reported, “Confused drivers in Georgia saw prices that had climbed as high as \$5 a gallon suddenly drop back to \$3 in the span of 24 hours.” Fluctuating prices frustrated consumers, but they allowed the market to adjust to the disruption in supply caused by the hurricanes.

By early November 2005, the industry had largely recovered, with only 5 percent of oil-refining capacity still disabled. The retail price of gasoline that month averaged \$2.30 per gallon. A month later, the average price had dropped to \$2.23 per gallon, lower than it had been before Hurricane Katrina. This new, low equilibrium price reflected the fact that in addition to the increase in supply as U.S. facilities went back on line, refiners throughout the world had rushed fuel to the United States in the months after the hurricanes. As the supply of gasoline increased, prices at the pump went down.

By throwing the gasoline market into disequilibrium, Hurricanes Katrina and Rita illustrated the key role that prices play in correcting both shortages and surpluses. Prices give markets the flexibility they need to reach equilibrium even under changing conditions.

Prices Allocate Scarce Resources Efficiently

Perhaps the most important role of price in a market-based economy is to guide resources to

their most efficient uses. Consider, for example, the market for dairy products, such as yogurt, ice cream, and cheese. The firms whose dairy products are in greatest demand will buy the most milk in order to make products to meet that demand. Guided by prices that communicate what consumers want, dairy producers automatically allocate milk—a scarce resource used to make many different products—to its most valued use.

Or consider the earlier example of car manufacturers who use prices to decide which models to produce and in what quantities. These production decisions are, at bottom, decisions about how best to use limited resources. As Thomas Sowell explains,

Without really knowing why consumers like one set of features rather than another, producers automatically produce more of what earns a profit and less of what is losing money. That amounts to producing what the consumers want and stopping the production of what they don't want. Although the producers are only looking out for themselves and their companies' bottom line, nevertheless from the standpoint of the economy as a whole the society is using its scarce resources more efficiently because decisions are guided by prices.

—Thomas Sowell, *Basic Economics*, 2007

■ 6.6 How Does Government Intervention Affect Markets?

On the whole, when prices are allowed to freely rise and fall to their equilibrium levels, they do an effective job of allocating scarce resources to their best uses. On occasion, however, governments intervene in the market in an attempt to influence prices. They do this by placing limits on how high or low certain prices may be. These limits are called **price controls**.

Why Governments Intervene in Markets

The temptation to impose price controls is, as the economist Henry Hazlitt reminds us, nothing new.

The record of price controls goes as far back as human history. They were imposed by the Pharaohs of ancient Egypt. They were decreed by Hammurabi, king of Babylon, in the eighteenth century B.C. They were tried in ancient Athens.

—Henry Hazlitt, *The Wisdom of Henry Hazlitt*, 1993

In modern economies, governments usually impose price controls when they are persuaded that supply and demand will result in prices that are unfairly high for consumers or unfairly low for producers. For example, in the 1970s the U.S. government imposed price controls on gasoline in response to reduced shipments of foreign oil due to crises in the Middle East. This action was taken to protect consumers from price swings. The government has also imposed price controls during wars in attempts to ensure that goods are distributed fairly during periods of shortage.

Governments can control prices in two ways: by setting price floors or price ceilings. Both methods affect supply and demand.

Price Floors Lead to Excess Supply

When a government wants to keep prices from going too low, it sets a price floor. A **price floor** is a minimum price consumers are required to pay for a good or service. A price at or above a price floor is legal, while a price below the price floor is illegal.

Price floors are meant to push prices up, ensuring that producers receive a benefit for providing a good or service. Pressure to impose price floors

usually arises when producers feel the market isn't providing them with adequate income. Suppose, for example, that the equilibrium price of wheat were to fall so low that wheat farmers were struggling to survive. The government could intervene to establish a price floor for wheat.

The minimum wage is another type of price floor. The **minimum wage** is a government-imposed legal floor on the hourly wage rate, which is the price the market pays for labor. The rationale for the minimum wage is that in some low-skill job markets, where workers outnumber jobs, supply and demand would drive the equilibrium wage so low that many workers would be earning too little to live decently.

While price floors may benefit some people, the larger effect of a price floor is excess supply. To see why, consider the impact of an increase in the minimum wage on both workers and employers. As the minimum wage rises, more people apply for minimum wage jobs. The result is an increase in the supply of low-skill job seekers. At the same time, employers reduce the number of minimum wage workers they hire in an effort to keep their wage costs from rising. The result is a decrease in demand for low-skill workers.

Figure 6.6A illustrates the effect of this combined increase in supply and decrease in demand. At the equilibrium wage rate of \$5.00 per hour, the quantity of workers demanded—3 million—equals the quantity supplied. At the minimum wage of \$6.00 per hour, however, 4 million workers are supplied—that is, willing and able to work—but only 2 million workers are demanded—that is, hired. This leaves a surplus of 2 million unemployed people.

A price floor above the equilibrium price of wheat would have the same effect. Farmers would produce more wheat to sell, but buyers would buy less, resulting in a surplus of wheat.

Price Ceilings Lead to Excess Demand

When a government wants to keep prices from going too high, it sets a price ceiling. A **price ceiling** is a maximum price consumers may be required to pay for a good or service. A price at or below a price ceiling is legal. A price above the ceiling is not legal.

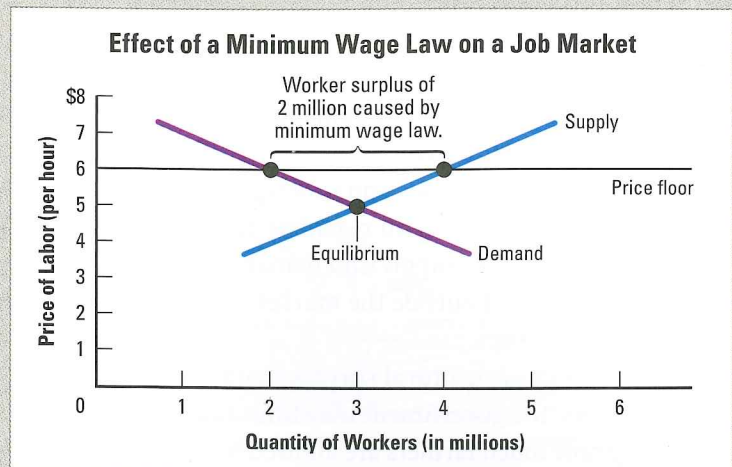
Governments impose price ceilings to enable consumers to buy essential goods or services they wouldn't be able to afford at the equilibrium price. Price ceilings are usually established in response to

Figure 6.6A

Analyzing the Impact of a Price Floor

A price floor is a minimum price set by the government on a good or service. Minimum wage is an example of a price floor. The graph shows how setting minimum wage above the equilibrium wage affects the job market.

- How does the price floor in the graph affect the quantity of workers supplied? The quantity demanded?
- Is the result a shortage or a surplus of workers?



a crisis, such as war, natural disaster, or widespread crop failure. Such supply-shifting events can lead to price increases that may cause a financial burden for a great many people while enriching a select few.

The best-known form of price ceilings in the United States today is rent control. **Rent control** regulations make it illegal to charge more than a specified monthly amount for rental housing. In New York City, rent control was introduced during World War II to protect poor families. Over time, the regulations were eased somewhat. But a half-century later, some 2.5 million New Yorkers were still living in more than a million rent-regulated apartments.

Figure 6.6B illustrates the effect of rent control on the rental housing market in a typical city. As you might have guessed, imposing a rent ceiling that is below the equilibrium rent leads to excess demand. The artificially low rents attract young people eager to leave home and live independently or retirees hoping to reduce their expenses—in short, anyone who likes a bargain—into the rental market.

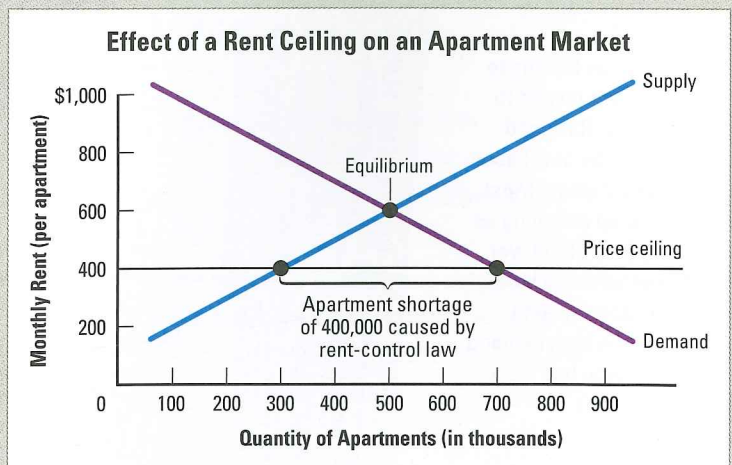
At the same time, the supply of apartments in the market decreases as landlords who are unwilling to rent at such low prices seek other ways to use their properties. Some, for example, might decide to convert their apartments to condominiums to sell.

Figure 6.6B

Analyzing the Impact of a Price Ceiling

A price ceiling is a maximum price set by the government on a good or service. Rent control laws are an example of price ceilings. The graph shows how establishing a rent ceiling below the equilibrium rent affects the apartment market.

- How does the price ceiling in the graph affect the quantity of apartments demanded? The quantity supplied?
- Is the result a shortage or a surplus of apartments?



Moreover, fewer potential landlords enter the rental market because of the difficulty of making a profit under rent control laws. The result is excess demand and a shortage of apartments.

Dealing with Excess Supply and Demand: Rationing and Black Markets

Price controls lead to surpluses and shortages because they prevent markets from reaching a market-clearing price. The excess supply and demand that arise must be addressed outside the market. This happens in various ways.

In the case of an agricultural surplus that results from price floors, the government may limit supply by restricting how much farmers are allowed to grow. Or the government may buy the crop surplus at the price floor to store for later use or to give to a developing country as foreign aid. Such aid often has the effect of undercutting farmers in countries that cannot compete with cheap American surplus grain.

When shortages occur, the government may impose rationing. **Rationing** is the controlled distribution of a limited supply of a good or service. For example, during the 1973 oil crisis, price ceilings on gasoline led to a severe gas shortage. The government instituted a rationing system based on license plate numbers to cope with the shortage. During World War II, the government rationed tires, gasoline, sugar, and other goods that were in short supply because they were being used for the war effort.

Rationing can be a costly means of allocating scarce goods. A giant bureaucracy, the Office of

Price Administration (OPA), had to be set up during World War II to enforce the rationing regulations. Thousands of rationing boards were created, operated by 60,000 employees and 200,000 volunteers.

Shortages can also give rise to black markets. A **black market** is an illegal market in which goods are traded at prices or in quantities higher than those set by law. There was a thriving black market during World War II for meat, sugar, and gasoline, among other products. Some people bought and sold meat through bootleg suppliers. People also made counterfeit ration coupons. In one month alone in 1944, the OPA counted 3 million counterfeit coupons.

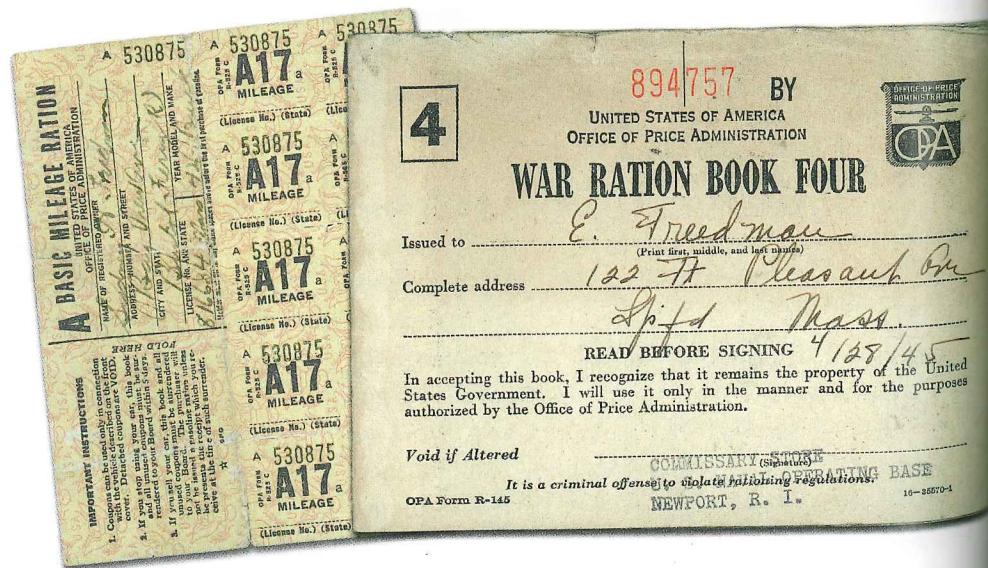
Why Ending Price Controls Is Difficult

At this point you might be wondering why, if price controls are so harmful to markets, the government doesn't just get rid of them. The answer to this question has more to do with politics than economics.

The political pressure on elected officials to intervene in the market when prices rise and fall rapidly can be intense. And although price controls are inefficient, many people believe that they further the goal of economic equity in such situations.

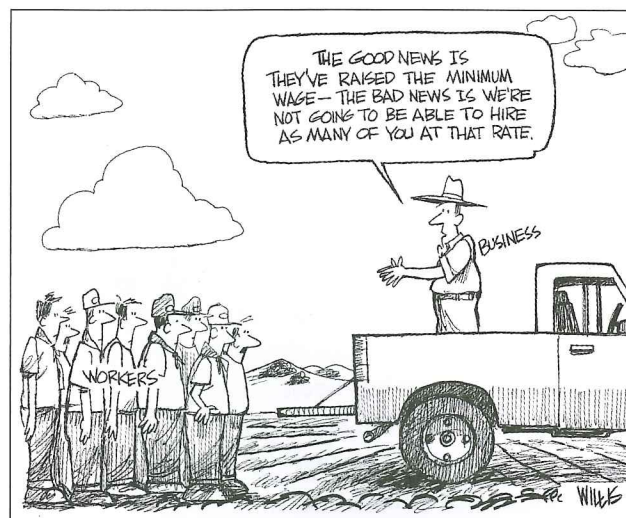
Moreover, some people—farmers, people who live in rent-controlled apartments, workers who earn minimum wage—clearly benefit from price controls. Labor unions also support minimum wage laws because such laws are believed to push all wages upward. The combined voices—and votes—of those who support price controls are enough to make most politicians reluctant to repeal them.

Rationing became a way of life for Americans during World War II. Ration books filled with stamps like those shown here were issued to each household. Rationed items could not be purchased without those stamps. Most people accepted rationing as a necessary part of the war effort. Nonetheless, a black market soon sprang up to provide goods in high demand to customers who had more cash than coupons.



Most economists, as you would expect, take a dim view of price controls. When a government tries to set prices, economists warn, it is likely to set them too high or too low. The inevitable result will be shortages or surpluses. Markets, on the other hand, when left alone, will naturally gravitate to the “right” price.

This takes us back to the question we started with, *How do you know when the price is “right”?* The simple answer is that the price is right when the market reaches equilibrium. The process of reaching equilibrium, however, is anything but simple. It involves the individual decisions of countless producers and millions of consumers just like you. In the next chapter, you will learn more about how markets work and what happens when they work less perfectly than the model of supply and demand suggests they should.



The minimum wage is a price floor set by the government on the hourly wage rate for labor. The minimum wage is intended to benefit low-wage workers, but critics claim it may not always do so.

Summary

In a free market, demand and supply automatically move prices to equilibrium, the point at which quantity demanded equals quantity supplied.

What happens when demand meets supply? Demand and supply interact to drive prices for goods and services to the equilibrium level. On a graph, this equilibrium point is found at the intersection of the demand and supply curves. The equilibrium price, also known as the market-clearing price, may be thought of as the “right” price.

What happens when the price isn’t “right”? Disequilibrium occurs when prices are set above or below the equilibrium price. When prices are too low, excess demand leads to shortages. When prices are too high, excess supply leads to surpluses.

How do shifts in supply or demand affect markets? Many kinds of events can cause demand and supply curves to shift to the right or left. Markets adjust to such changed conditions by seeking a new equilibrium point.

What role do prices play in a modern mixed economy? Prices convey information to consumers and producers as to what to buy and produce. Prices motivate workers and firms to enter markets, and they help markets respond to changing conditions. They guide resources to their most efficient uses.

How does government intervention affect markets? Governments sometimes implement price controls when prices are considered unfairly high for consumers or unfairly low for producers. Price floors, such as minimum wage laws, prevent prices from going too low, but lead to excess supply. Price ceilings, such as rent control laws, prevent prices from going too high, but lead to shortages.