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Demand and Supply Applications



4

CHAPTER OUTLINE

The Price System: Rationing and Allocating Resources

- Price Rationing
- Constraints on the Market and Alternative Rationing Mechanisms
- Prices and the Allocation of Resources
- Price Floors

Supply and Demand Analysis: An Oil Import Fee

Supply and Demand and Market Efficiency

- Consumer Surplus
- Producer Surplus
- Competitive Markets Maximize the Sum of Producer and Consumer Surplus
- Potential Causes of Deadweight Loss from Under- and Overproduction

Looking Ahead

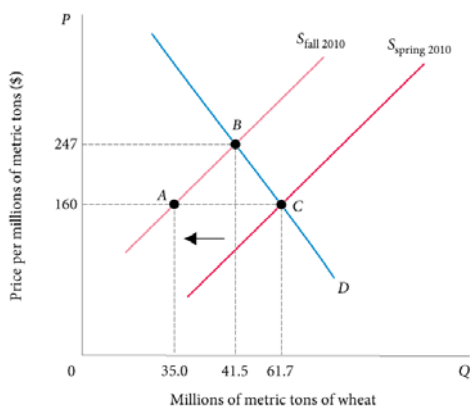
The Price System: Rationing and Allocating Resources

price rationing The process by which the market system allocates goods and services to consumers when quantity demanded exceeds quantity supplied.

Price Rationing

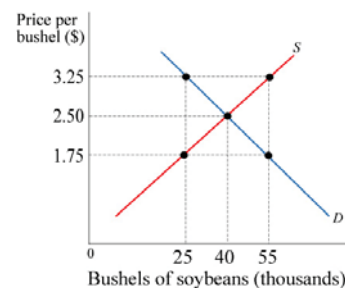
► **FIGURE 4.1** The Market for Wheat

Fires in Russia in the summer of 2010 caused a shift in the world's supply of wheat to the left, causing the price to increase from \$160 per millions of metric tons to \$247. The equilibrium moved from C to B.



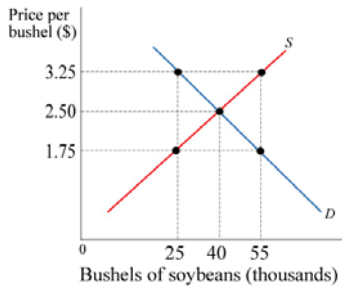
Refer to the graph below. At what price level is price rationing especially necessary?

- a. At \$3.25.
- b. At \$2.50.
- c. At \$1.75.
- d. None of the above. Price rationing is never desirable.



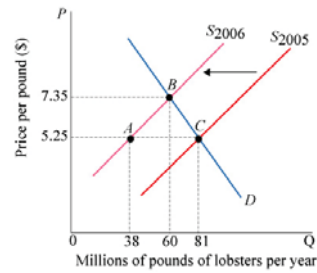
Refer to the graph below. At what price level is price rationing especially necessary?

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- b. At \$2.50.
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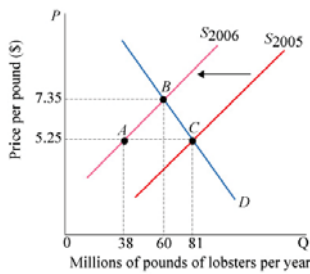
Refer to the figure. Start at point C. What is the impact of the shift in supply on the demand side of the market?

- a. After the shift in supply, there is a decrease in *quantity demanded*.
- b. After the shift in supply, there is a decrease in *demand*.
- c. After the shift in supply, there is an increase in *demand*.
- d. After the shift in supply, there is an increase in *quantity demanded*.



Refer to the figure. Start at point C. What is the impact of the shift in supply on the demand side of the market?

- a. **After the shift in supply, there is a decrease in quantity demanded.**
- b. After the shift in supply, there is a decrease in *demand*.
- c. After the shift in supply, there is an increase in *demand*.
- d. After the shift in supply, there is an increase in *quantity demanded*.

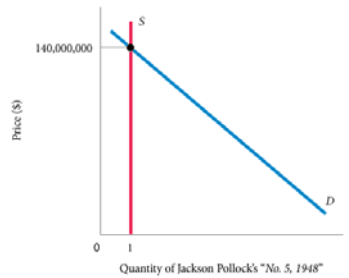


► FIGURE 4.2 Market for a Rare Painting

There is some price that will clear any market, even if supply is strictly limited.

In an auction for a unique painting, the price (bid) will rise to eliminate excess demand until there is only one bidder willing to purchase the single available painting.

Some estimate that the *Mona Lisa* would sell for \$600 million if auctioned.

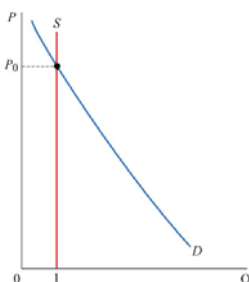


The adjustment of price is the rationing mechanism in free markets. Price rationing means that whenever there is a need to ration a good—that is, when a shortage exists—in a free market, the price of the good will rise until quantity supplied equals quantity demanded—that is, until the market clears.



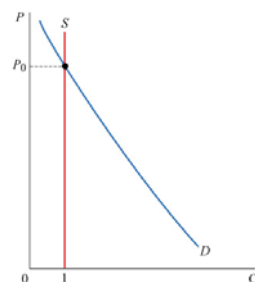
Refer to the figure below. The price of the good in question in this graph is primarily determined by:

- a. Demand.
- b. Supply.
- c. Consumer surplus.
- d. None of the above. The price is indeterminate.



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- b. Supply.
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Why Is My Hotel Room So Expensive? A Tale of Hurricane Sandy

Under normal circumstances, we would expect that most markets are more or less in equilibrium. To predict which prices rose post Hurricane Sandy, all we need to do is look at those businesses facing large shifts in either their demand or supply curves after the storm.

With many people forced out of their homes, hotel rooms became scarce. The hotel industry saw a large outward shift of the demand curve in its market. Unable to quickly increase output levels, higher prices and price gouging were now possible.

Complaints of price gouging were not only lodged against hotel businesses. You should be able to see how economics can help us predict what kinds of businesses are likely to be charged with the offense.

THINKING PRACTICALLY

- Why might we see a greater demand for festivals in poor countries than in rich ones? How might this be affected by choices available?

Oil, Gasoline, and OPEC

price ceiling A maximum price that sellers may charge for a good, usually set by government.

queuing Waiting in line as a means of distributing goods and services: a nonprice rationing mechanism.

favored customers Those who receive special treatment from dealers during situations of excess demand.

ration coupons Tickets or coupons that entitle individuals to purchase a certain amount of a given product per month.

black market A market in which illegal trading takes place at market-determined prices.

Constraints on the Market and Alternative Rationing Mechanisms

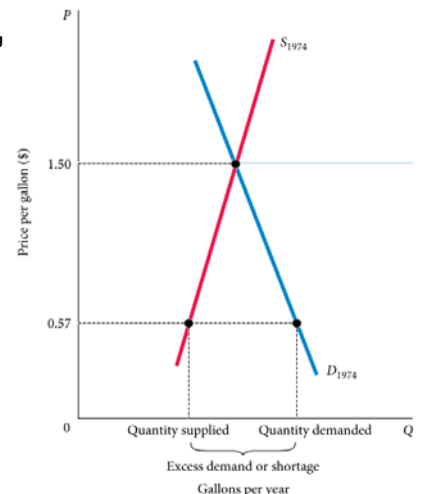
On occasion, both governments and private firms decide to use some mechanism other than the market system to ration an item for which there is excess demand at the current price. Policies designed to stop price rationing are justified in a number of ways, most often in the name of fairness.

Regardless of the rationale, two things are clear:

- Attempts to bypass price rationing in the market and to use alternative rationing devices are more difficult and more costly than they would seem at first glance.
- Very often such attempts distribute costs and benefits among households in unintended ways.

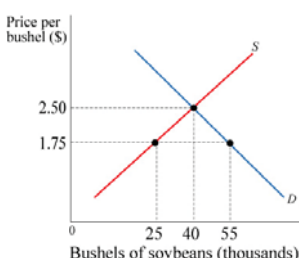
► FIGURE 4.3 Excess Demand (Shortage) Created by a Price Ceiling

In 1974, a ceiling price of \$0.57 cents per gallon of leaded regular gasoline was imposed. If the price had been set by the interaction of supply and demand instead, it would have increased to approximately \$1.50 per gallon. At \$0.57 per gallon, the quantity demanded exceeded the quantity supplied. Because the price system was not allowed to function, an alternative rationing system had to be found to distribute the available supply of gasoline.



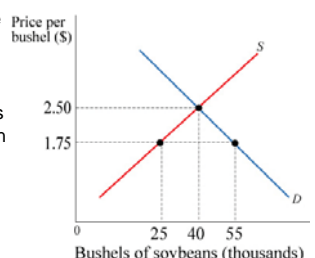
Refer to the figure. Assume that the price of \$1.75 is a government imposed price. Only one of the statements below is entirely correct. Which one?

- At a price of \$1.75, there is a surplus of soybeans, which is the result of an imposed price floor.
- At a price of \$1.75, there is a shortage of soybeans, which is the result of an imposed price floor of \$1.75.
- This graph shows a surplus of soybeans, which is the result of an imposed price ceiling of \$1.75.
- This graph shows a shortage of soybeans, which is the result of an imposed price ceiling of \$1.75.



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- This graph shows a surplus of soybeans, which is the result of an imposed price ceiling of \$1.75.
- This graph shows a shortage of soybeans, which is the result of an imposed price ceiling of \$1.75.**



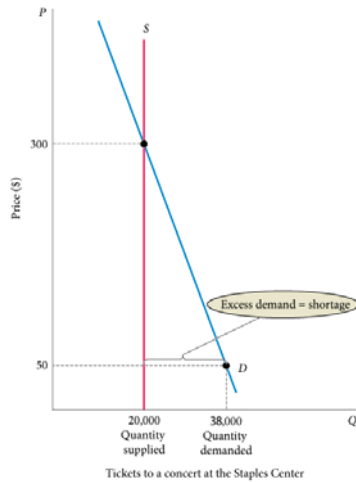
Rationing Mechanisms for Concert and Sports Tickets

► FIGURE 4.4 Supply of and Demand for a Concert at the Staples Center

At the face-value price of \$50, there is excess demand for seats to the concert.

At \$50 the quantity demanded is greater than the quantity supplied, which is fixed at 20,000 seats.

The diagram shows that the quantity demanded would equal the quantity supplied at a price of \$300 per ticket.



No matter how good the intentions of private organizations and governments, it is very difficult to prevent the price system from operating and to stop people's willingness to pay from asserting itself. Every time an alternative is tried, the price system seems to sneak in the back door. With favored customers and black markets, the final distribution may be even more unfair than what would result from simple price rationing.

Prices and the Allocation of Resources

Price changes resulting from shifts of demand in output markets cause profits to rise or fall. Profits attract capital; losses lead to disinvestment.

Higher wages attract labor and encourage workers to acquire skills.

At the core of the system, supply, demand, and prices in input and output markets determine the allocation of resources and the ultimate combinations of goods and services produced.

Price Floor

price floor A minimum price below which exchange is not permitted.

minimum wage A price floor set for the price of labor.

ECONOMICS IN PRACTICE

The Price Mechanism at Work for Shakespeare

Every summer, New York City puts on free performances of Shakespeare in the Park.

The true cost of a ticket is \$0 plus the opportunity cost of the time spent in line.

Students can produce tickets relatively cheaply by waiting in line. They can then turn around and sell those tickets to the high-wage Shakespeare lovers.



The rationale most often used by governments to intervene in the market system and try to determine its own rationing mechanism is:

- Efficiency and productivity.
- Fairness.
- Queuing.
- Elasticity.

THINKING PRACTICALLY

- Many museums offer free admission one day a week, on a weekday. We observe that museum goers are more likely to be senior citizens on that day than on a typical Saturday. Why?

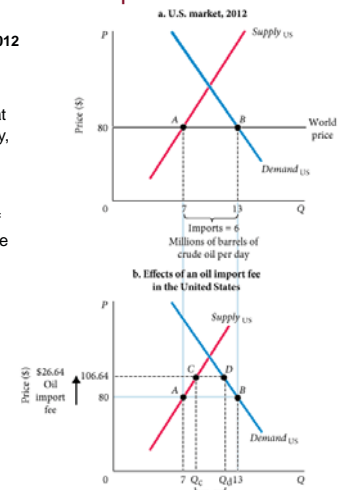
The rationale most often used by governments to intervene in the market system and try to determine its own rationing mechanism is:

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Supply and Demand Analysis: An Oil Import Fee

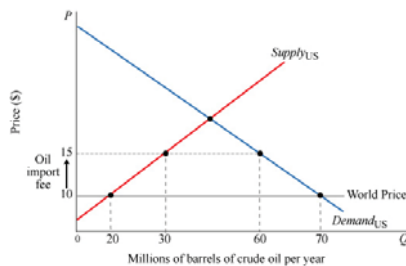
► **FIGURE 4.5** The U.S. Market for Crude Oil, 2012

In 2012 the world market price for crude oil was approximately \$80 per barrel. Domestic production in the United States that year averaged about 7 million barrels per day, while crude oil demand averaged just under 13 million barrels per day. The difference between production and consumption were made up of net imports of approximately 6 million barrels per day, as we see in panel (a). If the government imposed a tax in this market of 33.33%, or \$26.64, that would increase the world price to \$106.64. That higher price causes quantity demanded to fall below its original level of 13 million barrels, while the price increase causes domestic production to rise above the original level. As we see in panel (b), the effect is a reduction in import levels.



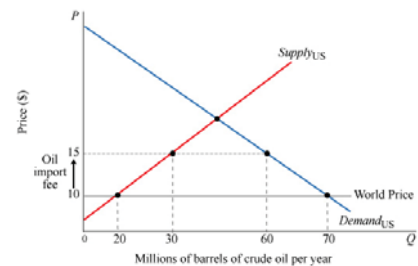
Refer to the figure below. Imposition of the oil import fee causes the quantity of imports to:

- Increase by 10 million barrels.
- Decrease by 10 million barrels.
- Decrease by 20 million barrels.
- Decrease by 30 million barrels.
- Decrease by 50 million barrels.



Refer to the figure below. Imposition of the oil import fee causes the quantity of imports to:

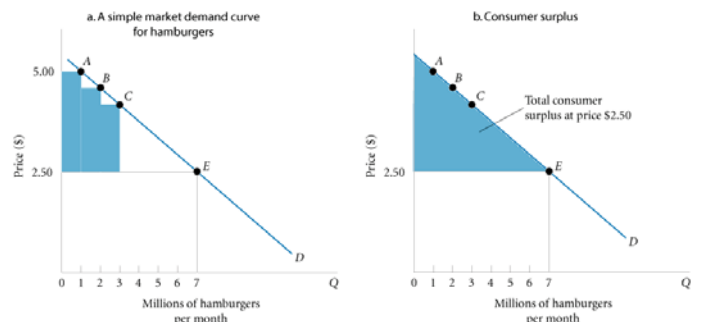
- Increase by 10 million barrels.
- Decrease by 10 million barrels.
- Decrease by 20 million barrels.**
- Decrease by 30 million barrels.
- Decrease by 50 million barrels.



Supply and Demand and Market Efficiency

Consumer Surplus

consumer surplus The difference between the maximum amount a person is willing to pay for a good and its current market price.

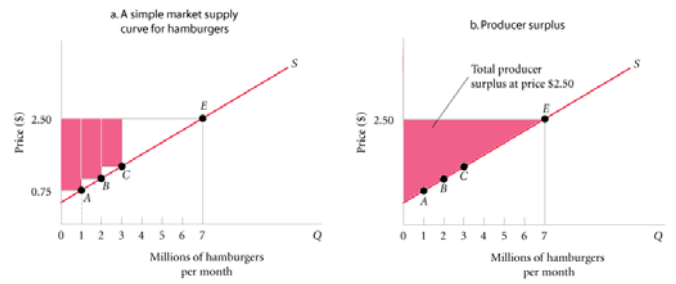


▲ **FIGURE 4.6** Market Demand and Consumer Surplus

As illustrated in panel (a), some consumers (see point A) are willing to pay as much as \$5.00 each for hamburgers. Since the market price is just \$2.50, they receive a consumer surplus of \$2.50 for each hamburger that they consume. Others (see point B) are willing to pay something less than \$5.00 and receive a slightly smaller surplus. Since the market price of hamburgers is just \$2.50, the area of the shaded triangle in panel (b) is equal to total consumer surplus.

Producer Surplus

producer surplus The difference between the current market price and the cost of production for the firm.



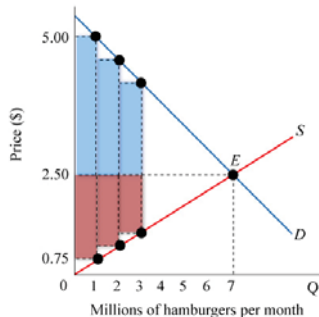
▲ **FIGURE 4.7** Market Supply and Producer Surplus

As illustrated in panel (a), some producers are willing to produce hamburgers for a price of \$0.75 each. Since they are paid \$2.50, they earn a producer surplus equal to \$1.75. Other producers are willing to supply hamburgers at prices less than \$2.50, and they also earn producer surplus. Since the market price of hamburgers is \$2.50, the area of the shaded triangle in panel (b) is equal to total producer surplus.



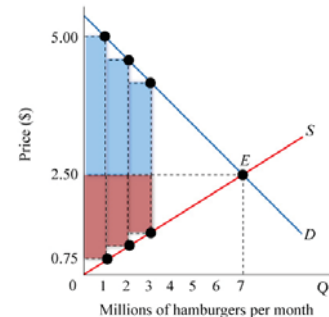
Refer to the figure below. How much are suppliers willing to receive in order to produce 1 million hamburgers?

- \$5.00 per hamburger.
- \$2.50 per hamburger.
- \$0.75 per hamburger.
- Anywhere between \$2.50 and \$5.00 per hamburger.

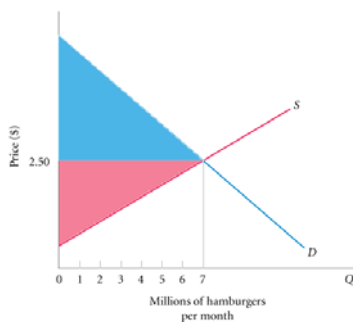


Refer to the figure below. How much are suppliers willing to receive in order to produce 1 million hamburgers?

- \$5.00 per hamburger.
- \$2.50 per hamburger.
- \$0.75 per hamburger.**
- Anywhere between \$2.50 and \$5.00 per hamburger.



Competitive Markets Maximize the Sum of Producer and Consumer Surplus



▲ **FIGURE 4.8** Total Producer and Consumer Surplus

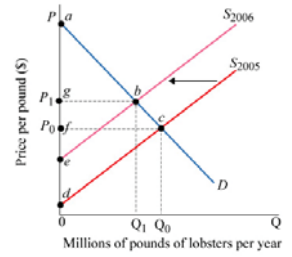
Total producer and consumer surplus is greatest where supply and demand curves intersect at equilibrium.

deadweight loss The total loss of producer and consumer surplus from underproduction or overproduction.

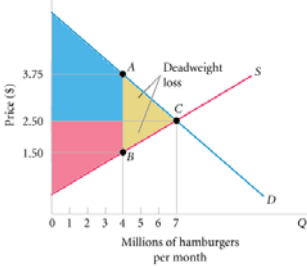


Refer to the figure. What is the impact of the shift in supply on consumer surplus?

- Consumer surplus decreases, from *acd* to *abe*.
- Consumer surplus decreases, from *acf* to *abg*.
- Consumer surplus increases, from *gbcf* to *abg*.
- Consumer surplus increases, from *cbcd* to *acd*.
- Consumer surplus does not change because supply is shifting, not demand.



a. Deadweight loss from underproduction



b. Deadweight loss from overproduction

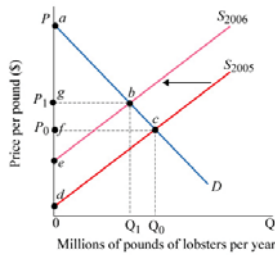


▲ FIGURE 4.9 Deadweight Loss

Panel (a) shows the consequences of producing 4 million hamburgers per month instead of 7 million hamburgers per month. Total producer and consumer surplus is reduced by the area of triangle ABC shaded in yellow. This is called the deadweight loss from underproduction. Panel (b) shows the consequences of producing 10 million hamburgers per month instead of 7 million hamburgers per month. As production increases from 7 million to 10 million hamburgers, the full cost of production rises above consumers' willingness to pay, resulting in a deadweight loss equal to the area of triangle ABC.

Refer to the figure. What is the impact of the shift in supply on consumer surplus?

- Consumer surplus decreases, from *acd* to *abe*.
- Consumer surplus decreases, from *acf* to *abg*.**
- Consumer surplus increases, from *gbcf* to *abg*.
- Consumer surplus increases, from *cbcd* to *acd*.
- Consumer surplus does not change because supply is shifting, not demand.



Potential Causes of Deadweight Loss from Under- and Overproduction

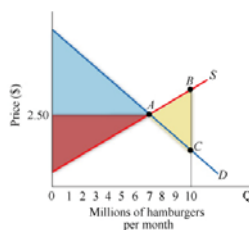
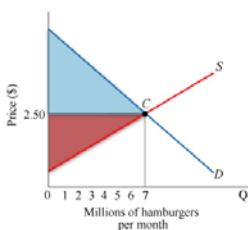
When supply and demand interact freely, competitive markets produce what people want at the least cost, that is, they are efficient.

There are a number of naturally occurring sources of market failure. Monopoly power gives firms the incentive to underproduce and overprice, taxes and subsidies may distort consumer choices, external costs such as pollution and congestion may lead to over- or underproduction of some goods, and artificial price floors and price ceilings may have the same effects.



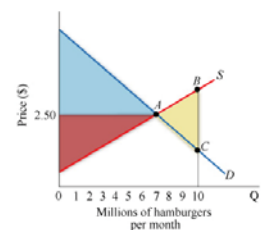
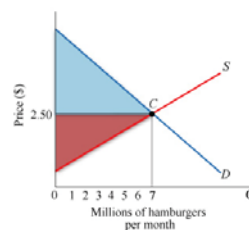
Refer to the figure below. The market on the left produces 7 million units, while the market on the right produces 10 million units. In which market is the total surplus generated from production and consumption the highest?

- In the market on the left.
- In the market on the right.
- In neither market. Both markets generate the same amount of surplus.
- In neither market. These markets don't generate any surpluses.



Refer to the figure below. The market on the left produces 7 million units, while the market on the right produces 10 million units. In which market is the total surplus generated from production and consumption the highest?

- In the market on the left.**
- In the market on the right.
- In neither market. Both markets generate the same amount of surplus.
- In neither market. These markets don't generate any surpluses.



Looking Ahead

We have now examined the basic forces of supply and demand and discussed the market/price system. These fundamental concepts will serve as building blocks for what comes next.

Whether you are studying microeconomics or macroeconomics, you will be studying the functions of markets and the behavior of market participants in more detail in the following chapters.

REVIEW TERMS AND CONCEPTS

black market

consumer surplus

deadweight loss

favored customers

minimum wage

price ceiling

price floor

price rationing

producer surplus

queuing

ration coupons