Housing Markets and Rent Ceilings

The response of the housing market to shocks depends on whether the market is regulated. Suppose that the supply decreases, perhaps because of an earthquake. In an unregulated market:

- In the short run, the equilibrium rent rises and there is no shortage. This outcome is demonstrated in Figure 6.1, which shows what happened in San Francisco after the 1906 earthquake. Supply decreased and demand did not change. Rents rose from $16 to $20 and the equilibrium quantity of apartments decreased to 74,000 units.
- The higher rent encourages building activity, so as time passes, supply increases and the short-run supply curve shifts rightward.
- In the long run, the rent and quantity of apartments rented return to their original levels.

The government might regulate a market. A price ceiling is a regulation that makes it illegal to charge a price higher than a specified amount. A price ceiling imposed in a housing market is called a rent ceiling. A rent ceiling prohibits charging rent that exceeds the ceiling amount. Rent ceilings alter the market’s behavior to a supply shock:

- Figure 6.1 shows that with a rent ceiling of $16, after the decrease in supply, the rent stays at $16 and a shortage of 56,000 units (100,000 demanded minus 44,000 supplied) emerges.

The existence of a shortage leads to:

- search activity — time spent looking for someone with whom to do business.
- black markets — an illegal market in which the price exceeds the legally imposed price ceiling.

Rent ceilings create inefficiency and a deadweight loss. Figure 6.2 (on the next page) illustrates the deadweight loss created by a rent ceiling. In the absence of a rent ceiling, in the figure the equilibrium rent would be $300 per month and the quantity of apartments would be 3,000. With a rent ceiling of $200 per month, the quantity of apartments decreases to 2,000, a shortage exists, and a deadweight loss — the gray triangle — is created.
**The Labor Market and the Minimum Wage**

In an unregulated labor market, in the short run a decrease in the demand for a type of labor lowers the wage rate for that type of labor. The lower wage rate influences workers to leave this labor market, which decreases the supply of this type of labor, which offsets the initial fall in the wage rate and further decreases employment in this labor market decreases.

A **price floor** is a regulation that makes it illegal to buy or sell at a price lower than the specified level. A **minimum wage law** is a price floor that makes hiring workers for less than the specified wage rate illegal.

- In a regulated labor market, when the demand for labor decreases minimum wage laws create lower employment and create unemployment.
- Most economists believe that minimum wage laws contribute to high unemployment among low-skilled young workers.
- Minimum wage laws create economic inefficiency. They result in unemployment and excessive job search.

**Taxes**

A sales tax decreases the supply of the taxed good, so the supply curve shifts leftward. The vertical distance between the supply curve with the tax and without it equals the amount of the tax. The equilibrium price, including the tax, rises and the equilibrium quantity decreases, as illustrated in Figure 6.3. After the tax of $2 per taco (which equals the length of the double-headed pink arrow) is imposed, the quantity of tacos decreases from 3 million to 2 million and the price paid by buyers rises from $3 to $4 per taco. Sellers receive the price, $4, minus the tax, $2, so suppliers keep $2 per taco. After a tax is imposed, buyers pay more for the product and sellers keep less.

The division of the tax depends on the elasticities of demand and supply. The more inelastic the demand, the more demanders pay of the tax.

- Perfectly inelastic demand — buyers pay all the tax.
- Perfectly elastic demand — sellers pay all the tax. The more inelastic the supply, the more sellers pay of the tax.
- Perfectly inelastic supply — sellers pay all the tax.
- Perfectly elastic supply — buyers pay all the tax.

Usually products with inelastic demands are taxed because the tax does not reduce the quantity purchased by as much as taxing goods with elastic demands. So taxing a good with an inelastic demand results in more tax revenue and a smaller deadweight loss than taxing a good with an elastic demand.

- In general, imposing a tax on a product creates a deadweight loss, as illustrated in Figure 6.3. (If the demand or supply is perfectly inelastic, imposing the tax creates no deadweight loss.)
**Markets for Illegal Goods**

The purchase and sale of some goods is illegal. Penalties can be levied on sellers and/or buyers.

Compared to the situation if the product was legal, if sellers are penalized:
- ♦ The cost of selling the product rises, so the supply curve shifts leftward.
- ♦ These penalties boost the price and decrease the quantity.

Compared to the situation if the product was legal, if buyers are penalized:
- ♦ The perceived benefits from the product fall, so the demand curve shifts leftward.
- ♦ These penalties lead to a fall in the price and a decrease in the quantity.

If buyers and sellers are each penalized:
- ♦ Both the demand and supply curves shift leftward.
- ♦ The quantity definitely decreases. The price rises if the decrease in supply is larger and falls if the decrease in demand is larger.

A policy of decriminalizing and then taxing the product might be able to achieve the same consumption levels as prohibition. But:
- ♦ The required tax rate might be high, leading to substantial tax evasion.
- ♦ Legalization might send the wrong signal to potential consumers.

**Stabilizing Farm Revenues**

The demand for farm products is inelastic, so variations in the harvest results in wide price and revenue swings. In an unregulated market, a poor harvest leads to a large increase in price and raises total farm revenue; a bumper crop results in a large fall in price and lowers total farm revenue. Speculative markets and farm price stabilization policies can change these results.
- ♦ Farm prices can be stabilized through speculation by inventory holders, who buy at low prices (thereby boosting the price) to sell at high prices (thereby lowering the price). Inventory holding reduces price fluctuations but it does not stabilize farm revenues.
- ♦ Farm stabilization agencies of the government also limit price fluctuations by setting production limits (quotas), setting price floors, and buying any resulting surplus.

**Helpful Hints**

1. **The Effect of an Earthquake on the Demand for Housing:** An earthquake destroys apartments and thereby decreases the supply of housing. People are made homeless; why doesn’t this effect then increase the demand for housing? To see why, suppose that before the earthquake there are 100,000 apartments rented at $400 a month. Thus the quantity of apartments demanded at a rent of $400 a month is 100,000 and all 100,000 families demanding an apartment have one. Suppose an earthquake destroys 60,000 apartments so that 60,000 families are homeless. At the rent of $400 a month, there are still 100,000 apartments demanded but now of the 100,000 families demanding an apartment, only 40,000 have one; 60,000 are homeless. The key point is that the demand has not changed. At the rent of $400 a month, the same number of apartments are demanded before and after the earthquake.

2. **The Harm from Rent Ceilings:** Whenever some influence disturbs an equilibrium in an unregulated (free) market, the differing desires of buyers and sellers are brought back into balance by price movements. If prices are controlled by government regulation, however, the price mechanism no longer can serve this purpose. In the case of price ceilings, increased search activity will emerge. By creating increased search, price ceilings waste society’s scarce resources. For instance, with rent controls, would-be apartment dwellers, fruitlessly driving around the city searching for an apartment, accomplish nothing from a social perspective. The time and energy that these people dissipate in futile search activity creates nothing socially useful.

In addition, price ceilings deliver the wrong signals to suppliers. In a free market, a shortage of apartments means rents are driven higher. Higher rents give apartment owners the incentive to increase the number of apartments they rent, which helps overcome the initial shortage. With rent controls, rents do not rise. Hence apartment owners have no incentive to increase the number of apartments they rent.

3. **Intuitive Explanation of Who Pays a Tax:** Consider the intuition of how the demand elasticity affects the division of the tax. Suppliers always want
to pass all of the tax along to buyers in the form of a higher price. But if the demand for the product is very elastic, consumers can find good substitutes for the product being taxed. So, if sellers tried to stick demanders with a large part of the tax, buyers would substitute other products, and suppliers would find themselves unable to sell anything. In this case, suppliers absorb a large portion of the tax. However, if the demand for the good is inelastic, consumers cannot readily find anything to take the product’s place. In this situation, consumers pay a large part of the tax.

Similar reasoning applies to the elasticity of supply. If supply is very elastic, suppliers can find other products to produce and so buyers wind up paying most of the tax. However, if the supply is inelastic, producers cannot easily switch to producing another product. Buyers do not have to pay much in this case because suppliers can’t find anything else to produce.

Questions

**True/False and Explain**

**Housing Markets and Rent Ceilings**
1. In an unregulated housing market, higher rents increase the quantity of housing supplied.
2. With a rent ceiling set below the equilibrium rent, there is no way to allocate apartments among potential renters.
3. Suppose that price controls are holding the price of gasoline below its equilibrium level. When controls are abolished and the price rises, the amount of gasoline purchased by consumers will decrease.
4. A rent ceiling below the equilibrium rent increases economic efficiency and decreases the deadweight loss because more people can afford apartments.

**The Labor Market and the Minimum Wage**
5. In an unregulated labor market, a decrease in the demand for low-skilled labor leads to a fall in the wage rate for low-skilled workers.
6. If the minimum wage is above the equilibrium wage, raising the minimum wage decreases the number of workers employed.

7. Most economists believe that raising the minimum wage has no effect on unemployment.

**Taxes**

8. Levying a tax on a product shifts its supply curve so that the supply curve with the tax lies below the supply curve without the tax.
9. Buyers always pay a larger amount of a sales tax than do sellers.
10. If the demand for Exxon gasoline is perfectly elastic, imposing a tax on Exxon gasoline raise its price.
11. The more elastic the demand for a product, the larger is the amount of a sales tax paid by consumers.

**Markets for Illegal Goods**

12. Imposing penalties on sellers of an illegal product raises the price of the illegal product.
13. Imposing penalties on both buyers and sellers of an illegal product always raises the price of the illegal product.

**Stabilizing Farm Revenue**

14. If demand for a farm product is inelastic, in the absence of inventories or government programs, a crop failure decreases farmers’ total revenue.
15. If the current price is higher than an inventory holder’s expected future price, the inventory holder sells goods from his or her inventory.
16. Farm stabilization agencies generally create large shortages of farm products.

**Multiple Choice**

**Housing Markets and Rent Ceilings**
1. The short-run supply curve for rental housing is positively sloped because
   a. the supply of housing is fixed in the short run but not the long run.
   b. the current stock of buildings will be used more intensively as rents rise.
   c. the cost of constructing new buildings rises as the number of buildings increases.
   d. new buildings will be constructed as rents rise.
2. In an unregulated market, which of the following will NOT happen as result of the sudden destruction of a large proportion of the stock of housing?
   a. Higher rents
   b. A persisting shortage of rental housing
   c. More basement apartments offered for rent
   d. More families sharing living quarters

3. If the government sets a price ceiling on pizza that is below the equilibrium price of a pizza, then
   a. there is a shortage of pizza.
   b. there is a surplus of pizza.
   c. existing firms will expand their production to meet the increased quantity demanded.
   d. new firms will enter the market to meet the increase in the quantity demanded.

For the next five questions, use Table 6.1, which shows the supply and demand schedules for apples.

**Table 6.1**

<table>
<thead>
<tr>
<th>Price (dollars per pound)</th>
<th>Quantity demanded (tons per year)</th>
<th>Quantity supplied (tons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.10</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>1.00</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>0.90</td>
<td>32</td>
<td>26</td>
</tr>
<tr>
<td>0.80</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>0.70</td>
<td>40</td>
<td>22</td>
</tr>
</tbody>
</table>

4. What is the equilibrium price of an apple?
   a. $1.10 per pound
   b. $1.00 per pound
   c. $0.80 per pound
   d. $0.60 per pound

5. What is the equilibrium quantity of apples?
   a. 24 tons
   b. 28 tons
   c. 32 tons
   d. 36 tons

6. The government imposes a price ceiling of 80¢ per pound. At this price, how many apples are supplied?
   a. 24 tons
   b. 28 tons
   c. 32 tons
   d. 36 tons

7. At the ceiling price of 80¢ per pound, how many apples are consumed?
   a. 24 tons
   b. 28 tons
   c. 32 tons
   d. 36 tons

8. At the ceiling price of 80¢ per pound of apples, what is the shortage of apples?
   a. 0 tons
   b. 12 tons
   c. 24 tons
   d. 36 tons

9. In Figure 6.4, with the supply curve of housing $S_1$ and with a rent ceiling of $300 a month, there is
   a. a surplus of $100 a month.
   b. a shortage of 5,000 apartments a month.
   c. a shortage of 2,000 apartments a month.
   d. neither a shortage nor surplus of apartments.

10. In Figure 6.4 a disaster strikes so that the supply curve shifts to $S_2$. If the rent ceiling remains at $300, there is a
    a. surplus of $200 a month.
    b. shortage of 5,000 apartments a month.
    c. shortage of 4,000 apartments a month.
    d. shortage of 1,000 apartments a month.
11. Which of the following is an example of a black market?
   a. A market where legal transactions take place at prices lower than a government imposed price ceiling.
   b. A market where illegal transactions take place at prices higher than a government imposed price ceiling.
   c. A legal market where buyers and sellers search for each other.
   d. An illegal market in which the lights are not turned on.

The Labor Market and the Minimum Wage

12. In a labor market without a minimum wage, the demand for labor decreases. As a result, the wage rate ____ and as time passes ____.
   a. falls; the demand for labor increases
   b. rises; the supply of labor increases
   c. falls; the supply of labor decreases
   d. falls; neither the supply of nor demand for labor changes

**FIGURE 6.5**

**Multiple Choice Questions 13 and 14**

13. In Figure 6.5 if the minimum wage was set at $3 per hour, what would be the level of unemployment in millions of hours?
   a. 50.
   b. 40.
   c. 20.
   d. 0.

14. In Figure 6.5 if the minimum wage was set at $9 per hour, what would be the level of unemployment?
   a. 50 million hours
   b. 40 million hours
   c. 20 million hours
   d. 0 hours

15. Suppose the government imposes a minimum wage above the equilibrium wage rate for low-skilled workers. When will more workers be employed?
   a. When the minimum wage is in effect.
   b. When the minimum wage is NOT in effect.
   c. Employment is the same regardless of the presence or absence of this minimum wage.
   d. The question cannot be answered without knowledge of the actual amounts of the minimum wage and equilibrium wage rate.

**Taxes**

**FIGURE 6.6**

**Multiple Choice Questions 16, 17, 18**

16. In Figure 6.6 what is the amount of the tax on CDs?
   a. $14 per CD
   b. $13 per CD
   c. $2 per CD
   d. $1 per CD

17. In Figure 6.6, how much of the tax is paid by buyers?
   a. $14 per CD
   b. $13 per CD
   c. $2 per CD
   d. $1 per CD
18. In Figure 6.6, how much of the tax is paid by suppliers?
   a. $14 per CD  
   b. $13 per CD  
   c. $2 per CD  
   d. $1 per CD

19. The division of a tax falls heaviest on consumers when
   a. demand is perfectly elastic.  
   b. demand is inelastic but not perfectly inelastic.  
   c. demand is perfectly inelastic.  
   d. supply is perfectly inelastic.

20. Suppose that the government wants to discourage the use of cigarettes. If it imposes a tax on cigarettes, the equilibrium quantity decreases the most when the elasticity of demand equals
   a. 2.00.  
   b. 1.00.  
   c. 0.50.  
   d. 0.

21. The more elastic the supply, the
   a. more likely the government is to tax the product.  
   b. more likely the government is to impose a price ceiling.  
   c. smaller the amount of any tax imposed on the product paid by the suppliers.  
   d. more elastic is the demand.

Markets for Illegal Goods

22. By imposing sanctions on buyers of an illegal good, the government shifts the good’s
   a. demand curve rightward.  
   b. demand curve leftward.  
   c. supply curve leftward.  
   d. supply curve rightward.

23. If sanctions are imposed on sellers but not users of an illegal good, the
   a. price falls and the quantity decreases.  
   b. price rises and the quantity increases.  
   c. price rises and the quantity decreases.  
   d. price falls and the quantity increases.

24. If the government wants to discourage consumption of a good, it can
   a. impose penalties on buyers of the good.  
   b. impose penalties on sellers of the good.  
   c. tax the product.  
   d. do all of the above because all the policies serve to decrease consumption of the good.

Stabilizing Farm Revenues

25. Which of the following combinations would yield the greatest price fluctuation?
   a. Large shifts in the supply curve and inelastic demand  
   b. Large shifts in the supply curve and elastic demand  
   c. Large shifts in the supply curve and perfectly elastic demand  
   d. Small shifts in the supply curve and elastic demand

26. Inventory holders buy when the current price is
   a. higher than the future expected price.  
   b. equal to the future expected price.  
   c. lower than the future expected price.  
   d. None of the above because the future expected price has nothing to do with when speculators buy.

27. Speculative markets in inventories
   a. always raise the price paid by consumers of the product.  
   b. always lower the price received by suppliers of the product.  
   c. can help limit fluctuations in the price of the product.  
   d. Both answers (a) and (b) are correct.

28. You notice that a bumper crop of soy beans has no effect on the price of soy beans and that the incomes of farmers who grow soy beans increase. This set of observations can be the result of
   a. a perfectly inelastic demand for soy beans.  
   b. an inelastic but not necessarily perfectly inelastic demand for soy beans.  
   c. speculators holding inventories of soy beans.  
   d. the supply curve of soy beans being downward sloping.
29. The European Union countries have been accumulating butter mountains and wine lakes. These surpluses are the result of
   a. price floors for agricultural products that are below equilibrium market prices.
   b. price floors for agricultural products that are above equilibrium market prices.
   c. price ceilings for agricultural products that are below equilibrium market prices.
   d. price ceilings for agricultural products that are above equilibrium market prices.

30. Which of the following creates a deadweight loss?
   a. A housing market with a rent ceiling below the equilibrium rent
   b. A labor market with a minimum wage above the equilibrium wage
   c. A farm market in which the government has imposed quotas
   d. All of the above create a deadweight loss

**Short Answer Problems**

1. Suppose that there is a significant decrease in the supply of timber. Explain how an unregulated market adjusts. What induces consumers to decrease their consumption of timber?

**Table 6.2**

**Short Answer Questions 2, 3**

<table>
<thead>
<tr>
<th>Price (dollars per gallon)</th>
<th>Quantity demanded (millions of gallons per year)</th>
<th>Quantity supplied (millions of gallons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.40</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>1.30</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>1.20</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>1.10</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>1.00</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>0.90</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

2. Table 6.2 presents the supply and demand schedules for gasoline.
   a. With no government intervention in the market, what is the equilibrium price of gasoline? The equilibrium quantity?
   b. If there is a deadweight loss, what does it equal?

3. Suppose that the supply schedule of gasoline in Table 6.2 suddenly decreases, perhaps because of events in the Middle East. In particular, suppose that at every possible price of gasoline, the quantity supplied is now 8 million gallons less per year.
   a. If the government did not impose any price controls, what is the new equilibrium price of gasoline? The new equilibrium quantity? How is the gasoline allocated now among potential consumers?
   b. Suppose that the government imposed a price ceiling of 90¢. Now what is the quantity demanded? The quantity supplied?
   c. With a price ceiling of 90¢ in place, how much gasoline do consumers buy? What is the amount of the shortage? How is gasoline allocated among potential consumers?
   d. When are demanders able to consume more gasoline? When the price is controlled at 90¢ a gallon, or when the price is left free to reach its equilibrium? Explain.

4. Suppose that policymakers decide that the price of a pizza is too high and that not enough people can afford to buy pizza. As a result, they impose a price ceiling on pizza that is below the current equilibrium price. When are consumers able to buy more pizza: before the price ceiling or after? Use a demand and supply diagram to support your answer.

5. Table 6.3 presents the demand and supply schedules for bushels of corn.
   a. Plot the demand and supply curves in Figure 6.7.
   b. What is the equilibrium price of a bushel of corn? The equilibrium quantity?
   c. Suppose the government imposes a price ceiling of $3.90 per bushel of corn. On your diagram, show the quantities demanded and supplied and identify any shortage or surplus. Illustrate the deadweight loss.
6. Use the demand and supply schedules in Table 6.3. Suppose that the government decides to impose a tax of 30¢ per bushel of corn.
   a. Plot the demand and supply curves in Figure 6.8 (on the next page) and show how the tax affects the supply curve.
   b. After the tax is imposed, what is the equilibrium price of corn? The equilibrium quantity?
   c. What does the deadweight loss equal?

7. The government makes one more attempt to alter the equilibrium in the corn market, given by the demand and supply schedules in Table 6.3. The government decides to impose a price floor of $4.10. It does so by promising farmers that it will buy the amount of corn necessary to keep the price pegged at no less than $4.10 a bushel.
   a. In Figure 6.9 plot the demand and supply schedules and the price floor.
   b. With the price floor in place, what is the amount of corn consumed by private demanders? How much corn do farmers grow?
   c. How much corn does the government buy? How much does keeping the price at $4.10 a bushel cost the government?

8. After graduating, you land a plush job advising the president on economic matters. One day the president asks you for your suggestions about products to tax.
   a. The president asks you to produce a list of items to be taxed that will yield substantial tax revenue to the government and for which consumers pay a large amount of the tax. Without trying to name specific products, what is the general characteristic of the demand for the products that you will suggest be taxed? Why?
   b. After you discuss this first list with the president, the president realizes that this year is an election year. As a result, the president changes your assignment a bit. Now the president asks you for a list of products that will still yield a lot of revenue for the government, but whose tax will fall more heavily on producers. Again without trying to name specific products, what is

### Table 6.3
**Short Answer Problems 5, 6, 7**

<table>
<thead>
<tr>
<th>Price (dollars per bushel)</th>
<th>Quantity demanded (millions of bushels per year)</th>
<th>Quantity supplied (millions of bushels per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.20</td>
<td>30</td>
<td>42</td>
</tr>
<tr>
<td>4.10</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>4.00</td>
<td>38</td>
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<td>42</td>
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<tr>
<td>3.80</td>
<td>46</td>
<td>34</td>
</tr>
<tr>
<td>3.70</td>
<td>50</td>
<td>32</td>
</tr>
</tbody>
</table>

### Figure 6.7
**Short Answer Problem 5**

![Figure 6.7](image)

### Figure 6.8
**Short Answer Problem 6**

![Figure 6.8](image)
9. You are in charge of combating illegal drug use in the United States. You must decide between imprisoning users or imprisoning sellers of drugs.
   a. If you decide to imprison users, what effect do you expect this policy to have on the price and quantity of illegal drugs?
   b. If you decide to imprison sellers, what effect do you think this policy will have on the price and quantity of illegal drugs?
   c. Without knowing which policy is being followed, can changes in the price of illegal drugs alone determine the success of a policy designed to reduce the consumption of illegal drugs?

10. Suppose that demand for a good is subject to unpredictable fluctuations so that sometimes the demand increases and other times the demand decreases. Explain how inventory holders reduce the price variability of the good.

You're the Teacher

1. “I don’t get this stuff about how suppliers and demanders split the sales tax. Every time I go to the store, I pay all the sales tax. I have never seen a store that offered to split the tax with me. So, how can our text say that suppliers usually have to pay part of a tax? I’m lost; can you help me out?” Your classmate is befuddled. Point your friend in the right direction.
Answers

True/False Answers

Housing Markets and Rent Ceilings
1. T The supply curve has a positive slope: As the rent rises, the quantity supplied of apartments increases.
2. F Lines and payments on the black market are devices that help allocate apartments among potential renters.
3. F With the price control, there was a shortage of gasoline; when the price rises, suppliers produce more gasoline and demanders are able to buy more.
4. F A rent ceiling below the equilibrium rent creates inefficiency and a deadweight loss.

The Labor Market and the Minimum Wage
5. T The fall in the wage rate signals workers to substitute other endeavors or other labor markets where the demand for their effort has not decreased.
6. T By raising the wage that firms must pay, firms respond by decreasing the quantity of workers they demand, that is, decreasing the number of workers they will hire.
7. F Most economists believe that a rise in the minimum wage increases unemployment.

Taxes
8. F The supply curve shifts so that the new supply curve lies above the initial supply curve and the vertical distance between the two curves is the amount of the tax.
9. F The amount paid by buyers depends on the relative elasticities of demand and supply.
10. F If the demand for a product is perfectly elastic, a tax has no effect on its price.
11. F The more elastic the demand, the larger the amount of the tax paid by suppliers.

Markets for Illegal Goods
12. T The penalties increase the cost of supplying the good, thereby decreasing the supply and causing a rise in the price.
13. F The price rises if the penalties are more severe on sellers and falls if they are more severe on buyers.

Stabilizing Farm Revenues
14. F The crop failure raises the price of the crop and, because the demand for it is inelastic, boosts farmers’ total revenue.
15. T The inventory holder will sell to take advantage of the temporarily higher price.
16. F Stabilization programs almost always result in large surpluses, not shortages.

Multiple Choice Answers

Housing Markets and Rent Ceilings
1. b As rents rise, building owners are motivated to make more space available for use as apartments.
2. b Any incipient shortage is eliminated by the higher rents that result.
3. a When a price ceiling is below the equilibrium price, the quantity demanded exceeds the quantity supplied and a shortage results.
4. b At this price, the quantity supplied of apples equals the quantity demanded.
5. b When apples are $1 per pound, 28 tons of apples are demanded and supplied.
6. a At a price of 80¢ a pound, the supply schedule shows that producers supply 24 tons per year.
7. a Although consumers demand 36 tons of apples, only 24 tons are produced, so only 24 tons can be consumed.
8. b The shortage equals the quantity of apples demanded, 36 tons, minus the quantity of apples supplied, 24 tons.
9. c The shortage equals the quantity demanded at the ceiling price (5,000) minus the quantity supplied at that price (3,000).
10. c The shortage increases because the quantity demanded remains at 5,000 while the quantity supplied falls to 1,000.
11. b Black markets are illegal markets wherein people conduct transactions at prices forbidden by the government.

The Labor Market and the Minimum Wage
12. c In the short run, the decrease in demand lowers the wage rate. Then, as time passes, the lower wage rate creates an incentive for workers to move to other markets, and so the supply of labor decreases.
13. **d** A minimum wage of $3 falls below the equilibrium wage, so no unemployment is created.

14. **c** If the minimum wage is raised to $9, the quantity of labor supplied, 50 million hours, exceeds the quantity demanded, 30 million hours, by 20 million hours.

15. **b** The fact that the minimum wage rate exceeds the equilibrium wage rate means that firms will decrease the quantity of employment that they demand, thereby decreasing employment.

**Taxes**

16. **c** The supply curve with the tax lies above the supply without the tax by a distance equal to the amount of the tax. The vertical distance in Figure 6.6 is $2, so this amount is the tax.

17. **d** The total price paid by consumers climbs from $12 to $13, so demanders pay $1 of the tax.

18. **d** The receipts per CD fall from $12 to $11, so suppliers pay $1 of the tax.

19. **c** When demand is perfectly inelastic, the price of the product rises by the entire amount of the tax so consumers pay the entire tax.

20. **a** The greater the elasticity of demand, the more the tax decreases the equilibrium quantity consumed.

21. **c** The more elastic the supply, the greater the amount of a tax paid by consumers.

**Markets for Illegal Goods**

22. **b** The sanctions decrease the benefits buyers receive from the good, thereby decreasing demand for the product.

23. **c** The sanctions shift the supply curve leftward, thereby raising the price and decreasing the quantity.

24. **d** All of the policies decrease the quantity so all could be used to discourage consumption of a good.

**Stabilizing Farm Revenues**

25. **a** This set of factors describes the situation in many agricultural markets, so in the absence of regulation, agricultural prices would be subject to large fluctuations.

26. **c** By purchasing when the price is currently low, inventory holders expect to profit by selling when the price rises in the future.

27. **c** Inventory holders buy when the current price otherwise would be low, thereby raising the price, and sell when the current price otherwise would be high, thereby lowering the price.

28. **c** Speculators buy a large part of the crop, so the price does not fall and their purchases boost the incomes of soy bean farmers.

29. **b** The floor price being above the equilibrium price gives producers the incentive to increase their production of butter and wine. Meanwhile, demanders have the incentive to decrease their consumption, so the European Union nations must buy the resulting surplus.

30. **d** Rent ceilings, minimum wages, and quotas all create deadweight losses.

**Answers to Short Answer Problems**

1. If the timber market is in equilibrium initially and there is a significant decrease in supply, an excess quantity will be demanded at the existing price. As a result, the price of timber rises, which causes movements along the new supply and the demand curve. The rising price results in a price-induced increase in the quantity supplied and a price-induced decrease in the quantity demanded. The price continues to rise until the excess quantity demanded is eliminated. The price hike causes consumers to decrease their desired consumption of timber and substitute other products, such as brick or plaster. Note how price adjustments coordinate people’s decisions in this unregulated market.

2. a. The equilibrium price of gasoline is $1.00 a gallon because that price equates the quantity supplied to the quantity demanded. The equilibrium quantity is 16 million gallons a year.

   b. There is no deadweight loss in this unregulated market.

   c. If the government imposes a price ceiling of 90¢ a gallon, the demand schedule shows that consumers demand 18 million gallons of gasoline a year. At the ceiling price, the supply schedule indicates that producers supply 14 million gallons of gasoline a year.

   d. With the price ceiling, only 14 million gallons of gasoline are available. Thus even though consumers would be willing to purchase 18 million gallons, all they can actually buy is 14 million gallons. The shortage equals the amount con-
consumers are willing to buy (18 million gallons) minus the amount actually available (14 million gallons), or 4 million gallons.

e. The easiest way to calculate the deadweight loss uses Figure 6.10, which shows the deadweight loss triangle. The height of the triangle is $0.20 per gallon (= $1.10 – $0.90) and the base of the triangle is 2 million gallons (= 16 million gallons – 14 million gallons). Using the formula for the area of a triangle, the deadweight loss therefore equals \( \frac{1}{2} \cdot \text{height} \cdot \text{base} \), or $200,000.

3. a. Table 6.4 makes answering this question easier. It shows the new supply schedule after the decrease in supply. Note that the demand schedule is unchanged. The new equilibrium price is $1.20 a gallon, and the new equilibrium quantity is 12 million gallons a year. The gasoline is allocated among consumers by price. Faced with the higher price, consumers will decrease the quantity they demand. Essentially, those consumers willing and able to pay the higher price buy gasoline and consumers either unwilling or unable to pay the higher price do not.

b. If the government imposes a price ceiling of 90¢ a gallon, the demand schedule shows that the quantity demanded is 18 million gallons. The quantity supplied at the ceiling price is 6 million gallons.

c. With the price ceiling, consumers are able to purchase only the amount of gasoline actually made available. That is, consumers can buy only 6 million gallons of gasoline, and there is a shortage of 12 million gallons (18 million gallons – 6 million gallons). Because the price cannot allocate gasoline among consumers, other mechanisms come into play. Long lines will exist at gasoline stations, so people willing and able to wait in the lines will buy gasoline. Black markets, where bribes and other side payments are made to suppliers by consumers, will spring up. Thus consumers willing and able to participate in black markets will buy gasoline.

d. When the price is left free to reach its equilibrium, consumers can buy and use 12 million gallons of gasoline. With the price ceiling, consumers can buy only 6 million gallons of gasoline. Hence, as a group, consumers are able to consume more gasoline when the market is left unregulated.

4. Figure 6.11 (on the next page) illustrates the pizza market before and after the price ceiling has been imposed. Before a price ceiling of, say, $11 is imposed, the equilibrium price is $12 a pizza and the quantity produced and consumed is 3 million per month. With the price ceiling of $11 a pizza, suppliers are willing to produce only 2 million pizzas a month. Consumers would like to buy more pizza, 4 million a month, but they cannot buy what is not produced. Thus only 2 million pizzas rather than 3 million are consumed after the price ceiling. So even though the price ceiling might have been imposed to give more consumers the ability to afford to buy pizza, in aggregate more pizza is consumed without the price ceiling than with it.
5. a. Figure 6.12 presents graphs of the demand and supply schedules.
b. The equilibrium price of corn is $4.00 a bushel, where the demand and supply curves cross. The equilibrium quantity is 38 million bushels per year.
c. Figure 6.12 shows that, with a price ceiling of $3.90, the quantity demanded is 42 million bushels of corn and the quantity supplied is 36 million bushels of corn. Thus the shortage is 6 million bushels of corn. The deadweight loss is the area of the gray triangle.

6. a. Figure 6.13 illustrates the demand curve and the supply curves (with and without the tax). The tax shifts the supply curve so that it lies above the old supply curve by the amount of the tax, or 30¢ a bushel.
b. As Figure 6.13 shows, the equilibrium price after the tax is imposed is $4.10 a bushel because the demand curve and the supply plus tax curve cross at this price. The equilibrium quantity is 34 million bushels.
c. The deadweight loss equals the area of the gray triangle in Figure 6.13. The height of the triangle is $.30 per bushel ($4.10 bushel – $3.80 bushel) and the base of the triangle is the decrease in production, 4 million bushels (38 million bushels – 34 million). Thus using the formula for the area of a triangle give $(1/2)(.30)(4\text{ million bushels})$ or $600,000$. 

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**FIGURE 6.11**
Short Answer Problem 4

**FIGURE 6.12**
Short Answer Problem 5

**FIGURE 6.13**
Short Answer Problem 6
7. a. Figure 6.14 shows the market with the price floor of $4.10 a bushel.

b. With the price floor in place, private demanders buy only 34 million bushels of corn, but farmers supply 40 million bushels.

c. Without any government action, a price of $4.10 a bushel creates a surplus of 6 million bushels of corn. To keep the price at $4.10 a bushel, the government must buy this surplus. Hence the government spends (4.10/bushel) (6 million bushels), or $24,600,000.

8. a. You want to find products for which the demand is relatively inelastic. Taxing products with inelastic demands has two effects. First, the decrease in the equilibrium quantity is less than it would be if a good with an elastic demand were taxed; and, second, the amount of the tax paid by consumers is higher for goods with inelastic demands. Because the president wants the taxes to fall most heavily on consumers, the second effect directly achieves the president’s second goal. In addition, the president also wants to generate substantial tax revenues. Because the equilibrium quantity is not decreased much, more of this product will be bought and sold. Thus with more transactions, the government will collect more tax. So the first effect means that the government will collect significant tax revenues — the president’s first goal.

b. You will recommend that the government tax products with relatively inelastic supplies. First a relatively inelastic supply means that a tax does not reduce the equilibrium quantity by much. As a result, the government will collect more tax revenues than if it taxed products with elastic supplies. Second, the amount of the tax paid by suppliers increases as the supply becomes less elastic. So by taxing products with inelastic supplies, the producers will pay a larger part of the tax.

9. a. Imposing sanctions on consumers shifts the demand curve for illegal drugs leftward. That lowers the price and decreases the quantity of illegal drugs consumed.

b. If sellers are penalized, the supply curve shifts leftward. In this case, the price of illegal drugs rises and the quantity consumed decreases.

c. The answers to parts (a) and (b) illustrate that the price of illegal drugs alone cannot be used to judge the success of a policy against drugs. For instance, if the price rises when sanctions are imposed against sellers, such as imprisoning sellers, the policy is effective. However, if the price rises when sanctions are imposed against users, the policy is failing because even with the sanctions demand is increasing enough so that consumption is rising. Hence to use price changes as a signal of the success or failure of a policy also requires knowledge of what type of policy is being pursued.

10. Inventory holders buy the product to exploit any potential profit opportunities. In particular, they aim to sell the good from their inventories if the current price is higher than the expected future price and they strive to buy the good to be added to their inventories if the current price is below the expected future price. The first profit opportunity — selling when the current price is higher than the expected future price — reduces the current price. The second profit opportunity — buying when the current price is lower than the expected future price — raises the current price. Selling, if the price is higher than, or buying, if the price is lower than the expected future price, means that the price will not deviate much from the expected future price. Thus speculative markets in inventories reduce price fluctuations and make the price less variable.


You're the Teacher

1. “You’re getting a bit confused. It’s easiest to explain this concept with a concrete example: I’m hungry so let’s think about pizza. Suppose that the government did not tax pizza and that the equilibrium price was $11 per pizza. Okay, now suppose that the government slaps a $2 per pizza tax on pizza. What our textbook has shown me is that this tax will raise the price, say, to $11.50 per pizza. In other words, the price — including the tax — will be $11.50 per pizza. That also means that the price without the tax falls to $9.50 per pizza. So when we call the people at the pizza shop on the phone, they tell us that the price is $9.50 plus $2 tax, or $11.50. So, it looks like we’re getting stuck with the entire $2 tax. But we’re not. Actually, after the tax is imposed, we pay only $0.50 more because the price we pay rises only from $11.00 to $11.50. The pizza makers wind up paying $1.50 of this tax: Before the tax they got to keep $11.00 per pizza, but after the tax they get to keep only $9.50 per pizza. The moral here is that appearances can be deceiving. Another moral is that you need to study your economics more!”
Chapter Quiz

1. In the short run, a shock that increases the supply results in a ____ equilibrium quantity and a ____ market price.
   a. smaller; lower  
   b. smaller; higher  
   c. larger; lower  
   d. larger; higher

2. Effective rent controls
   a. increase search activity.  
   b. increase the long-run housing supply.  
   c. have no effect on the quantity of apartments rented.  
   d. increase the vacancy rate of apartments.

3. How does an earthquake affect the housing market?
   a. It shifts the supply curve leftward and does not shift the demand curve.  
   b. It shifts the demand curve leftward and does not shift the supply curve.  
   c. It shifts both the supply and demand curves leftward.  
   d. It shifts the supply curve leftward and the demand curve rightward.

4. A price floor set below the equilibrium price
   a. decreases only the quantity demanded.  
   b. decreases only the quantity supplied.  
   c. decreases both the quantity supplied and the quantity demanded.  
   d. has no effect.

5. The minimum wage boosts firms’ incentive to
   a. hire more workers.  
   b. increase output.  
   c. use labor-saving technology.  
   d. hire teens.

6. In the market for skilled-labor, a rightward shift of the demand curve directly
   a. raises the equilibrium wage rate.  
   b. lowers the equilibrium wage rate.  
   c. increases the supply of high-skilled labor.  
   d. decreases the supply of high-skilled labor.

7. In the market for low-skilled labor, labor saving technology directly shifts the
   a. labor supply curve rightward.  
   b. labor supply curve leftward.  
   c. labor demand curve rightward.  
   d. labor demand curve leftward.

8. The supply and demand for a good are neither perfectly elastic nor perfectly inelastic. Hence imposing a tax on the good harms
   a. only buyers.  
   b. only sellers.  
   c. both buyers and sellers.  
   d. neither buyers nor sellers.

9. If the government declares that selling certain drugs is illegal, then the
   a. demand curve shifts rightward.  
   b. demand curve shifts leftward.  
   c. supply curve shifts rightward.  
   d. supply curve shifts leftward.

10. If inventory holders are present, a bumper farm crop will ____ the price of the product and ____ the total revenue collected by farmers.
    a. lower; decrease  
    b. lower; not change  
    c. not change; increase  
    d. not change; decrease

The answers for this Chapter Quiz are on page 367