



Chapter

6

GOVERNMENT ACTIONS IN MARKETS

Answers to the Review Quizzes

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1. What is a rent ceiling and what are its effects if it is set above the equilibrium rent?
A rent ceiling is a specific example of a price ceiling. A rent ceiling is a government imposed regulation that makes it illegal to charge a rent higher than a specified level. If a rent ceiling is set above the equilibrium rent, it has no effect because it does not make the equilibrium rent illegal.
2. What are the effects of a rent ceiling that is set below the equilibrium rent?
If the rent ceiling is set *below* the equilibrium rent, the quantity of housing units demanded by renters exceeds the quantity supplied by landlords. Since landlords are not forced to supply more units than the supply curve would indicate for the rent ceiling price, the quantity of housing units actually rented equals the quantity supplied, rather than the quantity demanded. This causes a shortage in the rental housing market.
3. How are scarce housing resources allocated when a rent ceiling is in place?
With an effective rent ceiling, some means for allocation of housing units (other than by price) becomes necessary. Some housing is allocated by first-come, first-serve. Other housing is allocated by discrimination. Black markets also develop, where housing units are allocated at a rent higher than the regulated rent.
4. Why does a rent ceiling create an inefficient and unfair outcome in the housing market?
A rent ceiling creates inefficiency because at the quantity of apartments that are rented, the marginal social benefit exceeds the marginal social cost. Rent ceilings are unfair under the "fair rules" approach because rent ceilings prevent voluntary transactions. Rent ceilings are unfair under the "fair results" approach because there is no assurance that apartments go to those

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1. What is a minimum wage and what are its effects if it is set above the equilibrium wage?

A *minimum wage* is a price floor applied to the labor market. A minimum wage is a government imposed regulation that makes it illegal to charge (or pay) a wage rate lower than a specified level. If the minimum wage is set above the equilibrium wage, it creates a surplus of labor—unemployment—and decreases workers' and firms' surplus.

2. What are the effects of a minimum wage set below the equilibrium wage?

If the minimum wage is set *below* the equilibrium wage, then the law has no impact on the labor market equilibrium wage and quantity.

3. Explain how scarce jobs are allocated when a minimum wage is in place.

If a minimum wage is set *above* the equilibrium wage, the ability of the competitive market to allocate resources is thwarted and other means must be used. Sometimes the method used is first-come, first-served so that those who are first in line to apply for openings are given the jobs. Other times discrimination is used so that those from favored groups are allocated the jobs.

4. Explain why a minimum wage creates an inefficient allocation of labor resources.

A competitive labor market allowed to reach its equilibrium creates an efficient allocation of resources. At the equilibrium, the amount of employment is such that the marginal social cost of labor to workers equals the marginal social benefit from labor to firms. A minimum wage set above the equilibrium wage rate creates a surplus of labor—the quantity of labor supplied exceeds the quantity of labor demanded. The minimum wage reduces employment so that it is less than the efficient amount.

5. Explain why a minimum wage is unfair.

Workers who receive wage hikes and retain their jobs gain from the minimum wage but workers who lose their jobs and workers who must extensively search for a job lose. Those who keep (or find) jobs are not necessarily the least well off, so the minimum wage fails the fair results approach to fairness. And the minimum wage also fails the fair rules approach to fairness because the minimum wage blocks voluntary transactions that otherwise would occur.

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1. How does the elasticity of demand influence the incidence of a

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demand, the smaller the quantity bought so the smaller the tax revenue; and the larger the deadweight loss.

2. How does the elasticity of supply influence the incidence of a tax, the quantity bought, the tax revenue, and the deadweight loss?

The more elastic the supply for a given demand the larger the increase in the price paid by the buyers and the smaller the decrease in the price received by the sellers, which means that the incidence on buyers is larger. Additionally, the more elastic the supply, the smaller the quantity bought so the smaller the tax revenue and the larger the deadweight loss.
3. Why is a tax inefficient?

The imposition of a tax on a market causes a wedge to be driven between the price received by the seller and the price paid by the buyer. This causes the marginal social benefit from the last unit sold to be higher than its marginal social cost, and the market will under-produce the good or service being taxed. If more of the good or service were produced, the marginal social benefit gained would be greater than the marginal social cost incurred, and the net benefit to society would increase.
4. When would a tax be efficient?

A tax is efficient, that is, creates no deadweight loss, when demand is perfectly inelastic or supply is perfectly inelastic. In both these cases a tax does not change the quantity produced and so creates no deadweight loss.
5. What are the two principles of fairness that are applied to tax systems?

The two principles of fairness are the benefits principle and the ability-to-pay principle. The benefits principle asserts that people should pay taxes equal to the benefits they receive from the government provided services. The ability-to-pay principle asserts that people should pay taxes according to how easily they can bear the burden of the tax.

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1. Summarize the effects of a production quota on the market price and the quantity produced.

A production quota set below the equilibrium quantity raises the price and decreases the quantity.
2. Explain why a production quota is inefficient.

A production quota is inefficient because it decreases production. As a result the marginal social benefit of the last unit produced



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3. Explain why a voluntary production quota is difficult to operate.
A voluntary quota is difficult to operate because a production quota results in a massive incentive to "cheat" on the production quota by increasing production. A production quota decreases the quantity produced. By decreasing the quantity produced, a production quota raises the price and reduces the marginal social cost of the last unit produced. Because the price exceeds the marginal social cost, producers have an incentive to increase their production (beyond the quota amount) to boost their profit.
4. Summarize the effects of a subsidy on the market price and the quantity produced.
A subsidy increases the price received by sellers, shifts the supply curve rightward, and places a wedge between the marginal social benefit and marginal social cost of producing the good. The subsidy creates a deadweight loss, a higher equilibrium quantity sold, over-production, and a lower price paid by the consumers. The subsidy increases farm revenues to all farmers.
5. Explain why a subsidy is inefficient.
A subsidy creates inefficiency because a subsidy leads to a lower price and increased production. Marginal social benefit equals the price and so the lower price signals that the marginal social benefit falls. And the increased production means that the marginal social cost of production rises. So at the level of production with a subsidy, the marginal social benefit is less than the marginal social cost and inefficiency is created.

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1. How does the imposition of a penalty for selling an illegal drug influence demand, supply, price, and the quantity of the drug consumed?
If the penalty is levied on the *seller*, the penalty is added to the *minimum price required* for supplying the good or service. The demand curve remains unchanged but the supply curve shifts leftward, so that the vertical distance between the initial supply curve and the supply curve with the penalty equals the dollar value of the penalty. In this case, the equilibrium price of the good rises and the equilibrium quantity decreases.
2. How does the imposition of a penalty for possessing an illegal drug influence demand, supply, price, and the quantity of the drug consumed?
If the penalty is levied on the *buyer*, the penalty is subtracted from the *maximum willingness to pay* for the good. The supply curve remains unchanged and the demand curve shifts leftward, so that the



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3. How does the imposition of a penalty for selling or possessing an illegal drug influence demand, supply, price, and the quantity of the drug consumed?

If *buyers and sellers* face penalties, both the demand and supply curves shift leftward. If the shift of the supply curve is larger, the equilibrium price rises and quantity decreases; if the shift of the demand curve is larger, the price falls and quantity decreases; if the shifts are the same magnitude, the price is unchanged and the quantity decreases.

4. Is there any case for legalizing drugs?

To reduce the consumption of drugs, they can be legalized and taxed. Legalizing and then taxing drugs has the benefit of raising funds for the government that could be used to help educate people about the danger of consuming drugs. However, if very high taxes are necessary to reduce the consumption of illegal drugs to the level of use when they were banned, this will cause buyers and sellers to engage in unreported trade in the black market and avoid the tax through tax evasion.

The logo for Cartagena99 features the text 'Cartagena99' in a stylized, teal-colored font. The '99' is significantly larger and more prominent than the rest of the text. The logo is set against a background of overlapping light blue and orange shapes that resemble a stylized map or abstract graphic.

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Answers to the Study Plan Problems and Applications

Use Figure 6.1, which shows the market for rental housing in Townsville, to work Problems 1 and 2.

1. a. What are the equilibrium rent and equilibrium quantity of rental housing?

The equilibrium rent is \$450 a month and the equilibrium quantity is 20,000 housing units.

- b. If a rent ceiling is set at \$600 a month, what is the quantity of housing rented and what is the shortage of housing?

The quantity of housing rented is equal to 20,000 units. If the rent ceiling is set at \$600 per month, it is above the equilibrium rent and so is ineffective. The rent stays at \$450 per month and the quantity rented remains at 20,000 housing units. There is no shortage of housing units. Because the rent ceiling is ineffective, the market remains at its equilibrium so there is no shortage of housing units.

2. If a rent ceiling is set at \$300 a month, what is the quantity of housing rented, the shortage of housing, and the maximum price that someone is willing to pay for the last unit of housing available?

The quantity rented is 10,000 housing units. The quantity of housing rented is equal to the quantity supplied at the rent ceiling. The shortage of housing is 20,000 housing units. At the rent ceiling, the quantity of housing demanded is 30,000, but the quantity supplied is 10,000, so there is a shortage of 20,000 housing units. The maximum price that someone is willing to pay for the 10,000th unit available is \$600 a month. The demand curve tells us the maximum price that someone is willing to pay for the 10,000th unit.

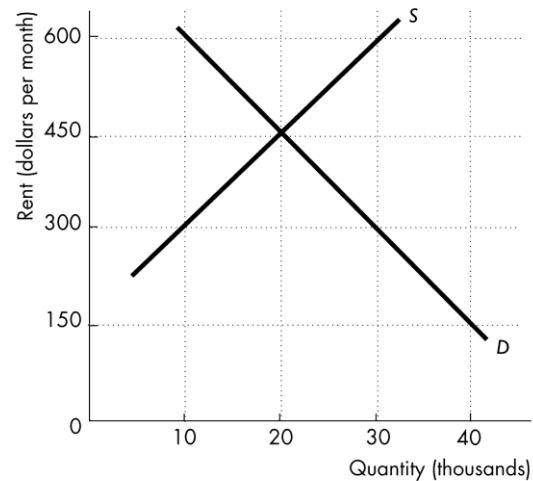
Use the following news clip to work Problems 3 to 6.

Capping Gasoline Prices

As gasoline prices rise, many people are calling for price caps, but price caps generate a distorted reflection of reality, which leads buyers and suppliers to act in ways inconsistent with the price cap. By masking reality, price caps only make matters worse.

Source: *Pittsburgh Tribune-Review*, September 12, 2005

FIGURE 6.1
Problems 1 and 2



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Suppose that a price ceiling is set below the equilibrium price of gasoline.

3. How does the price cap influence the quantity of gasoline supplied and the quantity demanded?

If the price ceiling is set below the equilibrium price, the quantity of gasoline supplied decreases and the quantity of gasoline demand increases.

4. How does the price cap influence

- a. The quantity of gasoline sold and the shortage or surplus of gasoline?

With the increase in the quantity demanded and the decrease in quantity supplied, a shortage of gasoline is created. The quantity of gasoline sold decreases from the equilibrium quantity before the price ceiling to equal the quantity supplied at the capped price.

- b. The maximum price that someone is willing to pay for the last gallon of gasoline available on a black market?

The maximum price someone is willing to pay for the last gallon of gasoline available is determined by the demand curve. The demand curve is upward sloping, so when the quantity of gasoline available decreases, the maximum price that someone is willing to pay for the last gallon available increases.

5. Draw a graph to illustrate the effects of a price ceiling set below the equilibrium price in the market for gasoline.

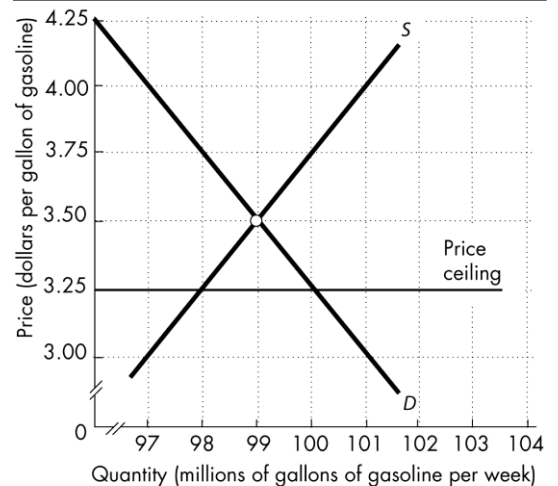
Figure 6.2 shows the effect of a price ceiling set below the equilibrium price in the market for gasoline. At the ceiling price there is a shortage because the quantity of gasoline demanded, 100 million gallons per week in the figure, exceeds the quantity of gasoline supplied, 98 million gallons per week.

6. Explain the various ways in which a price ceiling on gasoline that is set below the equilibrium price would make buyers and sellers of gasoline better off or worse off. What would happen to total surplus and deadweight loss in this market?

A price ceiling set below the equilibrium price benefits some consumers and harms others. Consumers who are able to buy gasoline at the price ceiling without

FIGURE 6.2

Problem 5



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off. All producers of gasoline are made worse off. The total surplus decreases and a deadweight loss is created.

Use the following data to work Problems 7 to 9.

The table gives the demand and supply schedules of teenage labor.

Wage rate (dollars per hour)	Quantity demanded (hours per month)	Quantity supplied
4	3,000	1,000
5	2,500	1,500
6	2,000	2,000
7	1,500	2,500
8	1,000	3,000

7. Calculate the equilibrium wage rate, the number of hours worked, and the quantity of unemployment.

The equilibrium wage rate is \$6 an hour and 2,000 hours a month are worked.

Unemployment is zero. Everyone who wants to work for \$6 an hour is employed.

8. If a minimum wage for teenagers is set at \$5 an hour, how many hours do they work and how many hours of teenage labor are unemployed?

They work 2,000 hours a month. A minimum wage rate is the lowest wage rate that a teenager can be paid for an hour of work. Because the equilibrium wage rate exceeds the minimum wage rate, the minimum wage is ineffective. The wage rate will be \$6 an hour and employment is 2,000 hours. There is no unemployment. The wage rate rises to the equilibrium wage, the wage rate at which the quantity of labor demanded equals the quantity of labor supplied. So there is no unemployment.

9. If a minimum wage for teenagers is set at \$7 an hour,

- a. How many hours do teenagers work and how many hours are unemployed?

At \$7 an hour, 1,500 hours a month are employed and 1,000 hours a month are unemployed. The quantity of labor employed equals the quantity demanded at \$7 an hour. Unemployment is equal to the quantity of labor supplied at \$7 an hour minus the quantity of labor demanded at \$7 an hour. The quantity supplied is 2,500 hours a month and the quantity demanded is 1,500 hours a month, so 1,000 hours a month are unemployed.

- b. Demand for teenage labor increases by 500 hours a month. What is the wage rate paid to teenagers and how many hours of teenage labor are unemployed?

The wage rate is \$7 an hour, and unemployment is 500 hours a month.

At the minimum wage of \$7 an hour, the quantity demanded is 2,000 hours a month and the quantity supplied is 2,500 hours a month so 500 hours a month are unemployed.

Use the following data to work Problems 10 to 12.



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workers in the region, India is trying to win better conditions for their citizens.

Source: *International Herald Tribune*, March 27, 2008

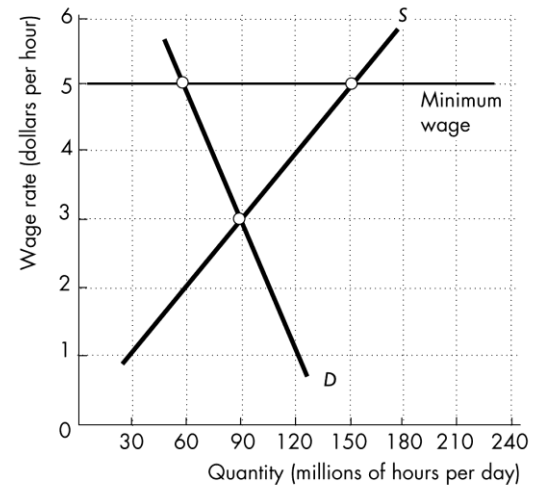
Suppose that the Gulf countries paid a minimum wage above the equilibrium wage to Indian workers.

10. How would the market for labor be affected in the Gulf countries? Draw a supply and demand graph to illustrate your answer.

Figure 6.3 shows the outcome in the Gulf countries' labor markets. In the figure, without a minimum wage the equilibrium wage rate is \$3 per hour and 90 million hours of labor are employed. The minimum wage decreases the quantity of labor demanded, in the figure to 60 million hours of labor, and increases the quantity of labor supplied, in the figure to 150 million hours of labor. As a result, unemployment increases to 90 million hours in the figure.

FIGURE 6.3

Problem 10



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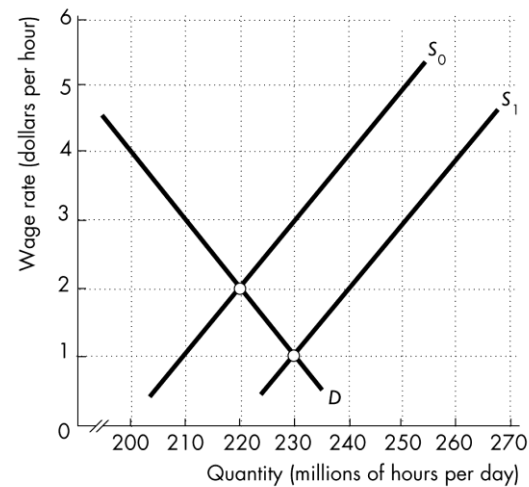
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11. How would the market for labor be affected in India? Draw a supply and demand graph to illustrate your answer. [Be careful: the minimum wage is in the Gulf countries, not in India.]

The effect on the labor market in India is ambiguous. On the one hand workers in India who learn about the higher wage rates in the Persian Gulf countries might leave India to work at these jobs. In this case, labor supply in India decreases and the labor supply curve in India shifts leftward. On the other hand Indian workers in the Gulf countries who are unemployed might return to India to gain employment. In this case, labor supply in India increases and the labor supply curve in India shifts rightward. Presuming the second effect dominates, Figure 6.4 shows that the increase in the supply of labor lowers the wage rate and increases employment in India. (If the first effect dominated, in India the wage rate would rise and employment would increase.)

FIGURE 6.4
Problem 11



12. Would migrant Indian workers be better off or worse off or unaffected by this minimum wage?

Some migrant Indian workers are better off—those who retain their higher paying job or find a higher paying job without much search activity. Other migrant Indian workers are worse off—those who are fired when the wage rate rises, those who cannot find a job, and those who find a job but only after incurring much costly search activity.

13. The table gives the demand and supply schedules for chocolate brownies.

Price (cents per brownie)	Quantity demanded (millions per day)	Quantity supplied (millions per day)
50	5	3
60	4	4
70	3	5
80	2	6
90	1	7

- a. If brownies are not taxed, what is the price of a brownie and how many are bought?

With no tax on brownies, the price is 60 cents a brownie and 4 million a day are bought.

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sellers, excluding the tax, is 50 cents a brownie. Consumers and sellers each pay 10 cents of the tax on a brownie.

- c. If buyers are taxed 20¢ a brownie, what is the price? How many are bought? Who pays the tax?

The price received by sellers, excluding the tax, is 50 cents a brownie, and 3 million brownies a day are consumed. The price paid by buyers, including the tax, is 70 cents a brownie. Consumers and sellers each pay 10 cents of the tax.

14. **Will Cuts on China's Luxury Goods Tax Prevent Chinese from Buying Abroad?**

Last year Chinese tourists bought almost two-thirds of luxury goods sold in Europe. If you look at China's luxury goods tax, it is easy to see why shopping overseas is so popular. According to the Chinese Ministry of Commerce, prices for luxury goods in China are 45% higher than in Hong Kong, 51% higher than the United States, and 72% higher than France.

Source: PRLog, March 21, 2012

- a. Explain why it is "easy to see why shopping overseas is so popular" with wealthy Chinese shoppers.

Shopping overseas is popular with wealthy Chinese because they pay a much lower price for luxury items abroad rather than buying them in China. The law of demand implies that wealthy Chinese citizens will purchase more of the luxury items abroad because the price is lower abroad.

- b. Who pays most of the Chinese luxury tax: sellers or buyers? Explain your answer.

The demand for buying luxury goods in China has a good substitute, buying luxury goods abroad. This substitute makes the demand for buying luxury goods in China more elastic, and thereby means that Chinese sellers will pay most of the Chinese tax.

- c. Explain how a cut in China's luxury tax rate will change the quantity of luxury goods purchased in China.

A cut in China's luxury tax will lower the price of luxury goods in China and thereby increase the quantity of luxury goods purchased in China.

15. **How to Take a Gas Holiday**

High fuel prices will probably keep Americans closer to home this summer, despite the gas-tax "holiday" that would shave 18¢ off every gallon.

Time, May 19, 2008

Would the price of gasoline that consumers pay fall by 18¢ a gallon? How would consumer surplus change? Explain your answers.

The price that consumers pay would not fall by the entire 18 cents.

This result is simply the "flip" side of the result that if an 18

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Use the following data to work Problems 16 and 17.

The demand and supply schedules for rice are in the table.

Price (dollars per box)	Quantity demanded (boxes per week)	Quantity supplied (boxes per week)
1.20	3,000	1,500
1.30	2,750	2,000
1.40	2,500	2,500
1.50	2,250	3,000
1.60	2,000	3,500

16. Calculate the price, the marginal cost of rice, and the quantity produced if the government sets a production quota of 2,000 boxes a week.

With a production quota of 2,000 boxes a week, the price is \$1.60 a box, the marginal cost \$1.30 a box, and the quantity produced is 2,000 boxes a week. The production quota decreases the quantity supplied to 2,000 boxes a week. The marginal cost of producing 2,000 boxes of rice is given by the supply schedule and is \$1.30 a box.

17. Calculate the price, the marginal cost of rice, and the quantity produced if the government introduces a subsidy of \$0.30 a box.

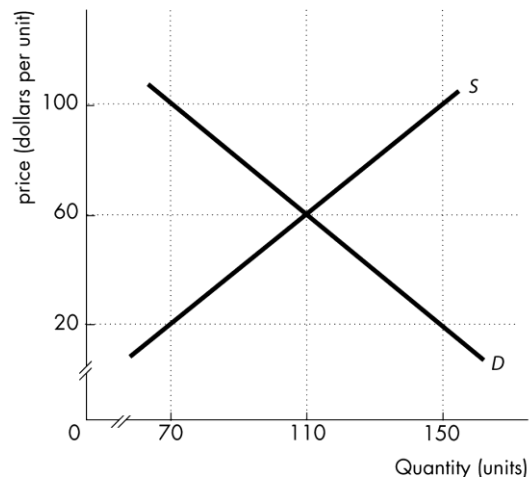
With a subsidy of \$0.30 a box for rice, the price is \$1.20 a box, the marginal cost \$1.50 a box, and the quantity produced is 3,000 boxes a week. The subsidy of \$0.30 lowers the price at which each quantity in the table is supplied. For example, rice farmers will supply 3,000 boxes a week if the price is \$1.50 minus \$0.30, which is \$1.20. With a subsidy, the market equilibrium occurs at a price of \$1.20 a box. At this price, the quantity demanded is 3,000 boxes and the quantity supplied is 3,000 boxes. The marginal cost of producing rice is given by the supply schedule and is \$1.50 a box.

18. Figure 6.5 illustrates the market for a banned substance. Calculate the market price and the quantity consumed if a penalty of \$20 a unit is imposed on

- a. Sellers only.

With a penalty of \$20 a unit on sellers, the price is \$70 a unit and the quantity consumed is 100 units. The \$20 penalty on sellers decreases the supply. The supply curve shifts leftward so that the vertical distance between the initial supply curve and the new supply curve is \$20. In Figure 6.6, the supply curve shifts to S_1 and the demand curve remains D . With this new supply curve, the

FIGURE 6.5
Problem 18



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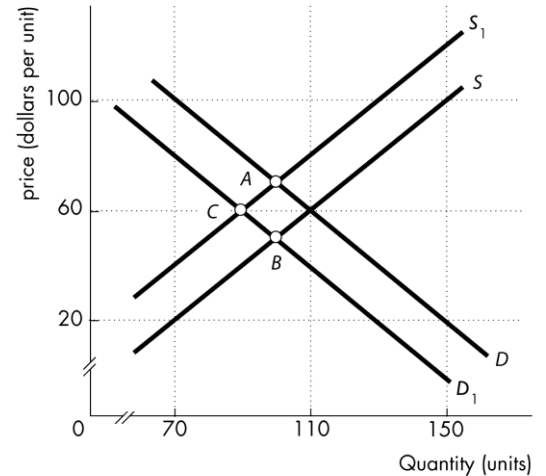
b. Buyers only.

With a penalty of \$20 a unit on buyers, the price is \$50 a unit and the quantity consumed is 100 units. The \$20 penalty on buyers decreases the demand. The demand curve shifts leftward so that the vertical distance between the initial demand curve and the new demand curve is \$20. In Figure 6.6, the demand curve shifts to D_1 and the supply curve remains S . With this new demand curve, the equilibrium is at point B in Figure 6.6, with an equilibrium price of \$50 a unit and an equilibrium quantity of 100 units.

c. Both sellers and buyers.

With a penalty of \$20 a unit on sellers and on buyers, the price is \$60 a unit and the quantity consumed is 90 units. The \$20 penalty on sellers decreases the supply. The supply curve shifts leftward so that the vertical distance between the initial supply curve and the new supply curve is \$20. The \$20 penalty on buyers decreases the demand. The demand curve shifts leftward so that the vertical distance between the initial demand curve and the new demand curve is \$20. In Figure 6.6, the supply curve shifts to S_1 and the demand curve shifts to D_1 . With these new supply and demands curves, the equilibrium is at point C in Figure 6.6, with an equilibrium price of \$60 a unit and an equilibrium quantity of 90 units.

FIGURE 6.6
Problem 18



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Answers to Additional Problems and Applications

Use this news clip to work Problems 19 and 20.

Despite Protests, Rent Board Sets 7.25% Increase

New York's Rent Guidelines Board voted for a rent increases of up to 7.25 percent over the next two years on rent-stabilized apartments. A survey reported that last year costs for the owners of rent-stabilized buildings rose by 7.8 percent. In addition there is growing concern about the ability of the middle class to afford to live in New York City.

Source: *The New York Times*, June 28, 2006

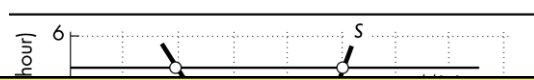
19. a. If rents for rent-stabilized apartments do not increase, how do you think the market for rental units in New York City will develop?
- If the rents do not increase, there will be a persistent shortage of apartments. The quality of the available apartments decreases even more over time as owners do not have an incentive to keep up the maintenance.
- b. Are rent ceilings in New York City helpful to the middle class? Why or why not?
- The rent ceilings are helpful to middle-class New Yorkers who already have a rent controlled apartment because they pay lower rents than otherwise. Rent ceilings definitely are not helpful to middle-class New Yorkers who are looking for an apartment.
20. a. Explain the effect of the increase in the rent ceiling on the quantity of rent-stabilized apartments.
- The increase in the rent ceiling increases the quantity of apartments supplied.
- b. Why is rent stabilization a source of conflict between renters and owners of apartments?
- Current renters of apartments are made better off by rent ceilings because these regulations keep rents at lower levels than their equilibrium. Apartment owners are made worse off by rent ceilings for the exact same reason: These regulations keep rents at lower levels than their equilibrium. So renters lobby to retain rent stabilization regulations and apartment owners lobby to remove them.

Use the following news clip to work Problems 21 and 22.

Malaysia Passes Its First Minimum Wage Law

About 3.2 million low-income workers across Malaysia are expected to benefit from the country's first minimum wage, which the government says will transform Malaysia into a high-income nation. Employer groups argue that paying the minimum wage, which is not based on productivity or

FIGURE 6.7
Problem 21



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21. On a graph of the market for low-skilled labor, show the effect of the minimum wage on the quantity of labor employed.
Figure 6.7 shows the effect in the labor market. Before the hike in the minimum wage, the equilibrium wage rate was 3 ringgits per hour and equilibrium employment was 3.4 million workers. After the imposition of the minimum wage, assumed to 5.5 ringgits an hour, employment falls to 3.2 million and unemployment equals 0.3 million workers (the difference between 3.5 million workers, the quantity of labor supplied at a wage rate of 5.5 ringgits an hour, and quantity of labor demanded at the same wage rate.)
22. Explain the effects of the minimum wage on the workers' surplus, the firms' surplus, and the efficiency of the market for low-skilled workers.
Taking account of the cost of job search, workers' surplus decreases. Firms' surplus also decreases because they must pay a higher wage rate. The labor market becomes less efficient and a deadweight loss is created.
23. Use the news clip in Problem 21.
- a. If the Malaysian government cut the tax on business profits, would it offset the effect of the minimum wage on employment? Explain.
The tax cut on small businesses would offset some of the harm imposed on small businesses but it would not offset much of the decrease in employment. The higher wage rate leads firms to decrease the quantity of labor they demand. If a tax cut increases firms' profitability and they respond by increasing their production, then the demand for labor increases. This increase would offset some of the initial fall in employment. But the offset likely would be small because the cut in taxes will be shared between the businesses and the consumers.
- b. Would a cut in the Social Security tax that small businesses pay offset the effect of the higher minimum wage on employment? Explain.
A cut in the Social Security Tax imposed on small businesses could offset the effect the minimum wage hike had on decreasing employment. If Social Security Taxes are cut, firms' demand for labor would increase which would result in an increase in employment. Of course the size of the offset would depend on the size of the cut in the Social Security Tax and the elasticity of demand for labor and the elasticity supply of labor. Because the supply of labor is probably quite inelastic, most of the benefit of the cut in Social Security tax would be received by workers, which also makes the potential offset small.



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24. The demand and supply schedules for tulips are in the table.

- a. If tulips are not taxed, what is the price and how many bunches are bought?

The price is \$14 per bunch and 80 bunches are purchased.

- b. If tulips are taxed \$6 a bunch, what are the price and quantity bought? Who pays the tax?

If tulips are taxed \$6 a bunch, consumers pay \$18 per bunch, suppliers receive \$12 per bunch, and 60 bunches per week are bought. Of the \$6 tax, consumers pay \$4 in the form of a higher price paid and suppliers pay \$2 in the form of a lower price received.

Price (dollars per bunch)	Quantity demanded (bunches per week)	Quantity supplied
10	100	40
12	90	60
14	80	80
16	70	100
18	60	120

25. **Cigarette Taxes, Black Markets, and Crime: Lessons from New York's 50-Year Losing Battle**

New York City has the highest cigarette taxes in the country. During the four months following the recent tax hike, sales of taxed cigarettes in the city fell by more than 50 percent as consumers turned to the city's bustling black market. The thriving illegal market for cigarettes has diverted billions of dollars from legitimate businesses and governments to criminals.

Source: *Cato Institute*, February 6, 2003

- a. How has the market for cigarettes in New York City responded to the high cigarette taxes?

Consumers (and some suppliers!) have turned to the black market. In the black market taxes are not collected so the price to consumers is significantly lower. So the tax decreases the quantity demanded in the legal market and increases demand in the black market.

- b. How does the emergence of a black market impact the elasticity of demand in a legal market?

The black market is a close substitute for the legal market, so the emergence of the black market increased the price elasticity of demand in the legal market.

- c. Why might an increase in the tax rate actually cause a decrease in the tax revenue?

If the demand is elastic, then the decrease in the equilibrium quantity from the tax is large enough so that the government collects less tax revenue. More specifically, if the magnitude of the percentage decrease in the quantity exceeds the percentage increase in the tax rate, then the tax revenue collected by the government decreases.

Use the following to work problems 26 to 28.



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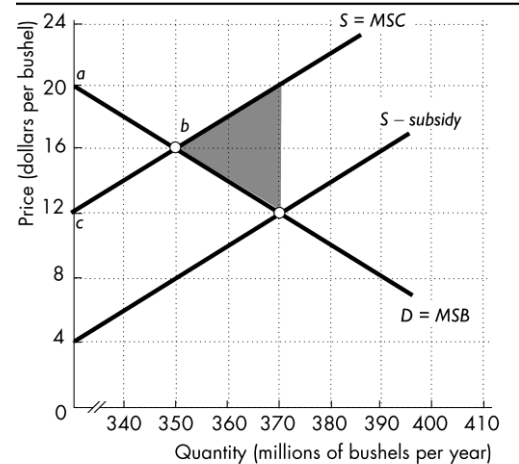
formula. The market has done what Congress couldn't do and that is "slash farm subsidies."

Source: *The Wall Street Journal*, July 25, 2011

26. a. Why are U.S. soybean farmers subsidized?
The federal government subsidizes soybean farmers because of extensive farm lobbying. The subsidies help farmers avoid low prices and low incomes.
- b. Explain how a subsidy paid to soybean farmers affects the price of soybean and the marginal cost of producing it.
A subsidy increases the supply of soybeans. The increase in supply lowers the price of soybeans and increases the quantity produced. With the increase in the quantity produced the marginal cost of growing soybeans rises.
27. Show in a graph how a subsidy paid to soybean farmers affects the consumer surplus and the producer surplus from soybean. Does the subsidy make the soybean market more efficient or less efficient? Explain.

In Figure 6.8, with no subsidy, the equilibrium price is \$16 per bushel and 350 million bushels are produced. The total surplus is the triangular area *abc*. The upper half of the triangle is the consumer surplus and the lower half is the producer surplus. With the subsidy the price falls to \$12 per bushel and the equilibrium quantity rises to 370 million bushels. There is a deadweight loss, equal to the area of the grey triangle. The total surplus with the subsidy is the initial total surplus minus the total deadweight loss (in Figure 6.8, the two areas are the same size, so the total surplus—the sum of the consumer surplus plus the producer surplus—is \$0.) With the subsidy, the expanded level of production means that marginal social cost exceeds marginal social benefit so the subsidy makes the market less efficient.

FIGURE 6.8
Problem 27



28. In the market for corn with a price support, explain why the corn price has risen and ended up being too high to "trigger payouts."
The price supports are paid ("triggered") only when the equilibrium price of corn falls below the support price. In this case, the government will buy corn and make payments to raise the price to the support price. In the market for corn, demand has increased by more

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29. The table gives the demand and supply schedules for an illegal drug.

Price (dollars per unit)	Quantity demanded (units per day)	Quantity supplied
50	500	300
60	400	400
70	300	500
80	200	600
90	100	700

a. If there are no penalties on buying or selling the drug, what is the price and how many units are consumed?

The price is \$60 per unit and 400 units are consumed.

b. If the penalty on sellers is

\$20 a unit, what are the price and quantity consumed?

The price is \$70 per unit and 300 units are consumed.

c. If the penalty on buyers is \$20 a unit, what are the price and quantity consumed?

The price \$50 per unit and 300 units are consumed.

Economics in the News

30. After you have studied *Reading Between the Lines* on pp. 144–145, answer the following questions.

a. Suppose the New York minimum wage rate had been raised to \$7.25 an hour in 2007 and the demand for and supply of labor were as shown in Fig. 1 on p. 145. Describe the situation in the Buffalo-Niagara region labor market.

The minimum wage equals the equilibrium wage rate. With this situation, the equilibrium wage rate remains \$7.25 and the equilibrium quantity of employment remains 117,000 workers.

b. How does Assembly Speaker Sheldon Silver want to change the New York minimum wage law?

Mr. Silver wants to raise the minimum wage from \$7.25 an hour to \$8.50 an hour in 2013. Afterwards, Mr. Silver wants to adjust the minimum wage so that it rises in line with inflation.

c. How would Mr. Silver's proposal change the minimum wage in 2013 and 2014 and how would you expect the labor market to be influenced by the changes you've described?

In 2013, Mr. Silver's proposal would set the minimum wage above the equilibrium wage rate. The quantity of labor demanded would decrease and the quantity of labor supplied would increase. Employment would decrease and unemployment would increase. In 2014, the minimum wage would rise in line with the inflation rate. The minimum wage would continue to exceed the equilibrium wage rate, so the situation in the labor in 2014 market would be similar to that in 2013:

Employment is less than equilibrium employment and unemployment results.



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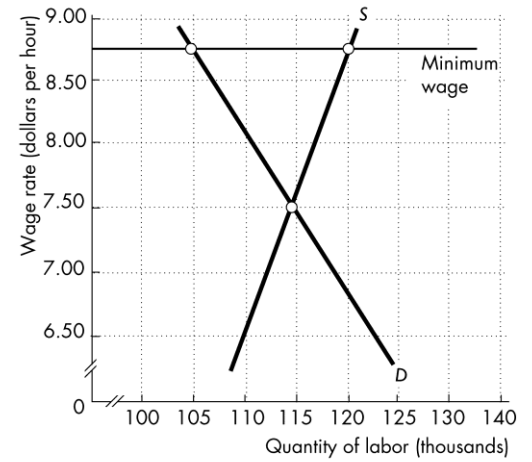
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- d. Draw a graph of the Buffalo-Niagara region labor market in 2014 to illustrate your answer to part (c).

Figure 6.9 shows the labor market in 2014. The equilibrium wage rate is \$7.50 and the minimum wage is \$8.75. Because the minimum wage exceeds the equilibrium wage rate, the wage rate in the market equals the minimum wage, \$8.75. At this wage rate, the quantity of labor employed is 105,000. There number of workers unemployed equals 15,000 (the quantity of labor supplied is 120,000 workers and the number employed is 105,000).

FIGURE 6.9

Problem 30



31. **Hollywood: Organized Crime Hits the Movies**

The Mexican army seized 1,180 disc burners and 3.14 million copies of movies and TV shows from 23 warehouses in a move to fight piracy that costs Hollywood about \$590 million a year.

Source: Bloomberg *Businessweek*, April 7, 2011

Assume that the marginal cost of producing a DVD (legal or illegal) is a constant \$3 and that legal DVDs bear an additional marginal cost of \$5 each in royalty payments to film studios.

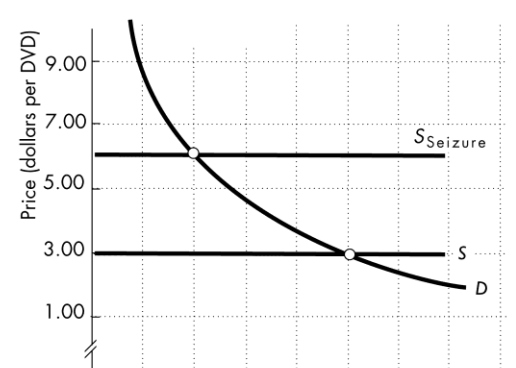
- a. Draw a graph of the market for counterfeit DVDs, assuming that there are no effective penalties on either buyers or sellers for breaking the law.

Figure 6.10 shows the market for illegal DVDs. With no penalties the supply curve is S and the demand curve is D . In the figure, the equilibrium price is \$3.00 per DVD and the equilibrium quantity is 5 million DVDs.

- b. How do the events reported in the news clip change the market

FIGURE 6.10

Problem 31



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Figure 6.10, the supply curve shifts from S to S_{Seizure} . The price rises, in the market to \$6 per disc, and the quantity decreases, to 2 million discs.

- c. With no penalty on buyers, if a penalty for breaking the law is imposed on sellers at more than \$5 a disc, how does the market work and what is the equilibrium price?

The marginal cost of producing illegal discs increases from \$3.00 per disc to \$3.00 per disc + penalty. The supply curve shifts upward by the amount of the penalty so it becomes a horizontal line at a price higher than \$8. For instance, if a \$6 penalty was imposed, the supply curve would shift upward by \$6 from the initial supply curve S . With the demand and supply curves in Figure 6.10, the new equilibrium price for an illegal DVD paid by buyers becomes \$9, the equilibrium price received by sellers becomes \$3, and the equilibrium quantity becomes 9 million.

- d. With no penalty on sellers, if a penalty for breaking the law is imposed on buyers at more than \$5 a disc, how does the market work and what is the equilibrium price?

With a penalty imposed on buyers of more than \$5.00 per disc, the demand curve for illegal discs shifts downward by the amount of the penalty, that is, shifts downward by more than \$5.00. If the penalty imposed is, say, \$6, the demand curve shifts downward by \$6. With the demand and supply curves in Figure 6.10, the new equilibrium price for an illegal DVD paid by buyers becomes \$9, the equilibrium price received by sellers becomes \$3, and the equilibrium quantity becomes 9 million.

- e. What is the marginal benefit of an illegal DVD in the situations described in parts (c) and (d)?

The marginal benefit of an illegal DVD is determined by the demand curve. In both parts (c) and (d), in Figure 6.10 the marginal benefit of a DVD with 1 million DVDs being transacted is \$9.00.

- f. In light of your answer to part (e), why does law enforcement usually focus on sellers rather than buyers?

Law enforcement typically focuses on sellers because there are fewer sellers and their locations are easier to find.

32. Drivers Feel the Pinch as Diesel Hits \$4 a Gallon

"The high price of gasoline is hurting our economy," said Mark Kirsch, a trucker, who organized a rally in Washington. "It's hurting middleclass people."

Source: *The Washington Post*, April 29, 2008

Explain to truck drivers why a cap on the price of gasoline would hurt middle-class people more than the high price of gasoline hurts.

The high price of gasoline harms middle-class people because they

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people will be unable to buy gasoline and virtually all middle-class people will need to spend extensive time driving to search for gasoline to buy, thereby wasting time and gasoline. Both of these harm middle-class consumers and they have no choice—some are simply unable to find gasoline to buy and all of them must search for gasoline.

33. On December 31, 1776, Rhode Island established wage controls to limit wages to 70¢ a day for carpenters and 42¢ a day for tailors.
- a. Are these wage controls a price ceiling or a price floor? Why might they have been introduced?
- The wage controls are price ceilings. They might have been introduced because the wages being paid to carpenters and tailors were considered "too high," possibly because of an increase in demand for their services or possibly because all prices and wages were rising and these wages were rising the fastest.
- b. If these wage controls are effective, would you expect to see a surplus or a shortage of carpenters and tailors?
- If the wage controls are effective, there would be a shortage of carpenters and tailors.

The logo for Cartagena99 features the text "Cartagena99" in a stylized, teal-colored font. The "99" is significantly larger and more prominent than the word "Cartagena". The text is set against a light blue background with a white, star-like shape behind it. Below the text is a horizontal orange and yellow gradient bar.

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