CHAPTER 14
EXTERNALITIES, MARKET FAILURE, AND PUBLIC CHOICE

Chapter in a Nutshell

So far, this book has described consumption and production of goods where all of the costs and benefits are borne directly by those who do the consuming and producing. However, many types of consumption and production activities spill over to affect third parties. These unintended spillover effects are called economic externalities by economists. Externalities may be negative or positive for third parties. For example, a negative externality might be having an Eminem fan in the dorm room next to yours coming home late at night and playing throbbing hip hop music when you have an economics exam at 8:00 a.m. the next day. An example of a positive externality is your dorm neighbors playing the same music when you are in a mood to have fun (assuming you like hip hop), not sleep. If you like hip hop and your rowdy neighbors play it regularly, then you can be a free rider, enjoying the benefits of hearing the music without paying for them.

Negative externalities impose costs on third parties for which they aren’t compensated. Positive externalities are benefits that third parties enjoy without having to pay. In either case, the market has failed. Because no one pays for the costs resulting from negative externalities, too much of these types of activities occurs in a market. On the other hand, because people who create positive externalities aren’t paid for the benefits they create for others, the market will generate too few of these activities.

Government can correct these market failures. A variety of approaches can be used to address the problem of negative externalities. For example, the government can impose a pollution compensation tax on an activity that creates negative externalities in order to bring the private cost in line with the social cost of the activity. Creating new property forms is another alternative. Here, instead of government directly regulating an activity to make sure that resources are allocated efficiently, resources may be privatized so that individuals will have an incentive to exercise property rights to the resources efficiently. Or, the government may impose obligatory controls regarding certain activities. For example, most municipalities don’t allow leaves to be burned or dogs to roam freely.

In cases of positive externalities, the role for government is to encourage more of an activity to be undertaken. Government can do this by subsidizing the activity from tax revenues or by simply providing the activity itself, as in the case of public goods such as national defense, lighthouses, clean air, and clean water. However, government failure can occur if government fails to buy the quantity of public goods that generates maximum efficiency. Government failure can arise because, even with an honest effort, political representatives are unable to accurately measure our preferences regarding the purchase of public goods. Another potential problem is that government’s choices of public goods may reflect the preferences of special-interest lobbies rather than the public’s interest. Economists who hold this view of public choice believe that the production and allocation of public goods are dictated primarily by the need for government officials to keep their jobs.

After studying this chapter, you should be able to:

- Explain the difference between negative and positive externalities.
- Discuss why poorly defined property rights cause externalities.
- Use graphs to show how market failure can be corrected for both types of externalities.
- Compare and contrast the different approaches for correcting negative externalities.
Define and give examples of public goods.

Distinguish between a pure public good and a near-public good.

Describe the opposing views of public choice.

**Concept Check** — See how you do on these multiple-choice questions.

Externalities exist due to market failure. What is the source of market failure that causes externalities?

1. The reason that so many economic activities create externalities is that
   a. free riders exist
   b. third parties become involved in decision making
   c. special-interest groups lobby for them
   d. property rights are poorly defined
   e. government failure prevents them from being halted

To answer the following question, think about position of the social cost curve relative to the private cost (supply) curve.

2. If the social cost of supplying a good or service is higher than the private cost, then
   a. the production of the good or service should be subsidized
   b. the price of the good or service is too low
   c. the price of the good or service is too high
   d. obligatory controls are the only way to correct the situation
   e. the good or service is a public good

The public choice view holds that self-interest guides a large part of political behavior. Would catering to the needs of special-interest lobbies be in the self-interest of government officials who aim to keep their jobs?

3. The public choice view of the provision of public goods holds that
   a. government officials always try their utmost to act in the public’s best interest
   b. government failure occurs only rarely
   c. the public chooses government officials in elections and is ultimately responsible for the provision of public goods
   d. special-interest lobbies play an important role in determining the level of provision of various public goods
   e. voting is the best way to determine the level of provision of public goods

Be able to distinguish between a private good and a public good. There are also near-public goods.

4. A public good is a good whose benefits are
   a. diminished as it is consumed and whose benefits cannot be withheld from anyone
   b. not diminished as it is consumed and whose benefits cannot be withheld from anyone
   c. not diminished as it is consumed and whose benefits can be withheld from anyone
   d. concentrated among a select few
   e. enjoyed by everyone in society
Why do special interest lobbies exist?

5. A special-interest lobby attempts to
   a. make certain that just the right amounts of public goods are provided
   b. persuade government to act on its behalf
   c. eliminate negative externalities
   d. eliminate positive externalities
   e. promote efficiency in government to avoid government failure

Am I on the Right Track?

Your answers to the questions above should be d, b, d, b, and b. There are some strong similarities between
the material in the last chapter and this one. In both cases, the market outcome is shown to be undesirable
because it fails to create an efficient allocation of society’s resources. In both cases, appropriate government
action can help to correct the problems with the market outcome. This chapter shows the role that government
can play in correcting negative externalities and providing public goods. Economic principles help guide the
development of policies to combat market failure.

Key Terms Quiz — Match the terms on the left with the definitions in the column on the right.

1. third parties
2. market failure
3. externalities
4. public goods
5. free rider
6. public choice
7. property rights
8. government failure
9. social cost
10. special-interest lobby
11. asymmetric information
12. moral hazard

   a. unintended costs or benefits imposed on third parties
   b. situation where one side of the market (buyer or seller) has more
      information than the other side (buyer or seller)
   c. view that the allocation of public goods is determined by the
      need for government officials to keep their jobs
   d. the cost to society of producing a good including both the private
      costs and the externalities costs
   e. people upon whom the externalities are imposed
   f. situation where individuals in a market (buyers or sellers) react to
      market signals by altering their behavior in ways that undermine
      the benefits others derive from the market
   g. benefits from these goods aren’t diminished by consumption and
      cannot be withheld from anyone
   h. a group organized to influence government concerning the
      costs and benefits of particular public goods
   i. the failure of the market to achieve an optimal allocation of the
      economy’s resources
   j. someone who consumes a good or service without paying for it
   k. the failure of government to buy the quantity of public goods
      that generates maximum efficiency
   l. the right to own a good or service and to enjoy the benefits that
      the use of the good or service provides

Graphing Tutorial

A new graph that shows the effect of negative externalities on a market is presented in this chapter. Actually,
this graph is a variant of the demand and supply diagram with which you are now familiar. To show the effect
of a negative externality on a market in a graph, let’s consider the market for steel. Suppose that the production
of steel involves dumping waste water in a river upstream from a fishery specializing in trout. Clearly, this is a
negative externality for the fishery that depends on clean water. The private cost of supplying a ton of steel is
less than the social cost of supplying a ton of steel. Suppose that the pollution cost associated with producing
steel is a constant $5 per ton. How would the private cost of producing steel be affected if the pollution cost were included? The private cost would be shifted upward vertically by $5. Adding the pollution cost of producing steel to the private cost generates the social cost curve of producing steel. This scenario is represented by the graph below.

Before the cost of pollution is included in the supply of steel, the supply curve reflects the marginal cost of producing steel to the steel producers only. Thus, the supply reflects only the private costs of producing steel. However, the cost of pollution is a constant $5 per ton. Therefore, the social cost of producing steel is shifted up from the supply (private cost) curve by a vertical distance of $5.

How can we correct this problem? This can be done with a pollution compensation tax equal to $5 per ton of steel. Before the tax, 80 tons of steel would be produced and sold for $10 per ton. The tax forces producers and consumers of steel to consider the full social cost of their actions. The price per ton rises to $12 and the quantity consumed falls to 60 tons. With less steel being produced, less pollution is created. Furthermore, revenue is generated from the tax equal to $5/ton x 60 tons = $300, and this revenue can be used to fund more extensive clean-up efforts.

**Graphing Pitfalls**

Make certain that when you represent the effect of a negative externality on a market, you shift the supply curve (the private cost) upward and to the left to generate the social cost curve. Remember, the idea is that the private cost curve doesn’t reflect all of the costs to society of a particular activity. The social cost curve must lie above the private cost curve because the cost to society for any level of production is higher than the private cost. You can’t show the effect of a negative externality with a graph like the one drawn on the following page.
In a graph that shows the effect of a negative externality on a market, the social cost curve has to lie above the supply (private cost) curve!

**True-False Questions** — If a statement is false, explain why.

1. Third-party effects can be either harmful or beneficial to those who experience them. (T/F)

2. Without government intervention, negative externalities are borne directly by the producer of a good or service, so they diminish profit. (T/F)

3. Ideally, a pollution compensation tax will exactly match the cost of a negative externality. (T/F)

4. Third-parties who reap benefits without paying are called free riders. (T/F)

5. If property rights are poorly defined, then market failure results. (T/F)

6. The social cost of an activity is equal to the private cost plus the cost of the negative externality. (T/F)

7. A free market can still be efficient when negative or positive externalities are present. (T/F)

8. If steel production causes a negative externality, then the market generates a price for steel that is too low. (T/F)
9. If the market price is below marginal cost, then too many resources are devoted to the activity. (T/F)

10. The Coase theorem applies in cases where many parties are involved in a property rights dispute. (T/F)

11. By taxing polluters an amount per unit of the good produced equal to the cost of the negative externality, the quantity of pollution generated is reduced. (T/F)

12. Typically, if the government chooses to tax polluters, pollution levels fall to zero. (T/F)

13. A public good is not diminished by consumption and cannot be withheld from consumption. (T/F)

14. If people choose not to pay for a public good, they can be excluded from consuming it. (T/F)

15. A special-interest lobby will consider only the broader interests of society in its lobbying efforts. (T/F)

**Multiple-Choice Questions**

1. If the social cost of producing chickens is greater than the private cost, then we can be sure that
   a. a positive externality exists
   b. chicken is healthful and more should be produced
   c. a negative externality exists
   d. the price of chicken is too low
   e. chicken productions should be subsidized

2. Pollution is an example of market failure because
   a. the equilibrium price is higher than the efficient price
   b. the equilibrium price is less than the efficient price
   c. property rights are poorly distributed
   d. the market does not produce enough of the good
   e. those who suffer from pollution are compensated outside the market

3. In order for someone to be a free rider, an activity must be undertaken that
   a. arranges for ride-sharing at rush hour
   b. creates benefits for people who can't be forced to pay for them
   c. beautifies a neighborhood
   d. improves national defense
   e. identifies the beneficiaries and forces them to pay

4. All of the following are goods for which property rights are hard to identify except
   a. a river running along a field of corn
   b. the atmosphere over a field of corn
   c. crows that eat the corn on the field
   d. the ozone layer
   e. a field of corn
5. When there are negative externalities, the price should be adjusted so that it is equal to
   a. social cost
   b. private cost
   c. the amount of the externality
   d. zero
   e. the number of free riders

6. All of the following are ways to cope with negative externalities except
   a. public choice
   b. obligatory controls
   c. pollution taxes
   d. creating new property forms
   e. private negotiations according to the Coase theorem

7. The social cost curve lies above the supply (private cost) curve for the producer in cases of
   a. positive externalities
   b. negative externalities
   c. public goods
   d. near-public goods
   e. public choice

8. An example of the government creating a new property form in order to deal with the problem of a negative externality would be
   a. the establishment of the EPA
   b. taxing air and water pollution
   c. requiring catalytic convertors on automobiles
   d. administration of the national parks through the Department of the Interior
   e. auctioning rights to pollute to electric utility companies

9. Which of the following approaches would likely fail to control pollution that is noxious, yet not life-threatening, but affects millions of people (for example, acid rain)?
   a. private negotiations according to the concepts expressed in the Coase Theorem
   b. obligatory pollution controls
   c. pollution taxes
   d. trading pollution rights in an imaginary bubble
   e. making polluters liable for the monetary value of the damages they cause

10. A clear advantage to using obligatory control directives to deal with negative externalities is that they
    a. reduce the need for bureaucrats
    b. reduce pollution to zero
    c. are relatively simple
    d. are costless to monitor and enforce
    e. are fair to polluters

11. If a per unit tax is imposed on a producer of a good with a negative externality, then the tax shifts the producer's
    a. marginal cost curve to the right
    b. marginal cost curve to the left
    c. total fixed cost to the left
    d. total fixed cost to the right
    e. price downward
12. The private market will not provide enough of a pure public good because of
   a. negative externalities
   b. obligatory controls over production methods
   c. public choice not to produce the good
   d. special interest lobbies
   e. the free rider problem

13. Which of the following is an example of a near-public good?
   a. a lighthouse
   b. a congested freeway during the morning rush hour
   c. a polio vaccination program sponsored by the government
   d. national defense
   e. public education

14. Government failure occurs when
   a. social cost lies to the left of private cost
   b. the good it purchases has a greater negative externality than a positive one
   c. the quantity of public goods it purchases is less than the socially optimal quantity
   d. it pays a higher price for a public good than it would pay on the private market
   e. obligatory controls are imposed

15. Public choice holds that
   a. public officials serve the community's interest
   b. government failure cannot occur
   c. society does not consume enough public goods
   d. we should presume self-interested behavior on the part of public officials
   e. given the number of parties running for public office, the people's choice is limited

16. Voting fails to generate the efficient quantity of a public good because
   a. lobbying groups use bribes to change people's votes
   b. public goods are not depleted by consumption
   c. public goods cannot be withheld from consumption
   d. voting doesn't accurately reflect the magnitude of benefits from public goods
   e. markets are always the best way to achieve efficiency

17. Consumption of a pure public good
   a. depletes the supply of the good for others
   b. increases the supply of the good
   c. denies the opportunity to consume the good to others
   d. excludes others from consuming the good somewhat
   e. neither depletes the good nor excludes others from consuming it

18. All of the following are examples of obligatory controls except
   a. the “No Smoking” signs posted in public buildings
   b. automobile emissions testing requirements
   c. restrictions on the transportation of hazardous wastes
   d. trading in pollution rights between electrical utility companies
   e. the requirement that cars all use unleaded fuel
19. A government-sponsored cash subsidy to people who plant trees will have the effect of
   a. decreasing the supply of privately-grown trees
   b. result in government failure
   c. increasing the demand for trees
   d. increasing the supply of trees
   e. lowering the price of trees

20. Suppose that farmers decide individually whether or not to get their own cattle vaccinated against anthrax. Which of the following results?
   a. There is market failure because the equilibrium quantity of vaccine is too low.
   b. There is market failure because the equilibrium price of vaccine is too low.
   c. There is market failure because both the equilibrium price and quantity of vaccine are too high.
   d. There is no market failure because the market will tend toward equilibrium.
   e. There is no market failure, although both the equilibrium price and quantity of vaccine are too high.

The following questions relate to the applied, global, and theoretical perspectives in the text.

21. Typically, the property right to an unobstructed or picturesque view has not been protected in United States courts unless
   a. the individual claiming such a property right is a celebrity
   b. property owners who must clear trees and shrubs that obstruct a view are compensated
   c. the property right is passed on through a covenant or easement
   d. removing obstructions to the view creates a financial hardship for the property owner
   e. the case originates in California

22. Sulfur dioxide and nitrogen oxides are compounds that cause acid rain when they are released into the atmosphere. Acid rain in Canada is
   a. a negative externality that is caused mainly by releases of these compounds in the United States
   b. caused entirely by releases of these compounds in Canada
   c. less of a problem because lime in the soil there neutralizes the acid
   d. decreasing because firms in the United States voluntarily reduced emissions of these compounds
   e. decreasing because of stringent antipollution laws in Canada

23. The Coase theorem suggests that private negotiation will lead to the correction of market failure when
   a. only a few people are involved
   b. property rights are clearly recognized
   c. negotiation costs are low
   d. people are willing to cooperate
   e. a, b, and c must hold true

24. A situation where the seller has information regarding the hazards of a product, yet continues to sell it without informing consumers (e.g., cigarette producers), is described as ___________________, whereas, a situation where a homeowner doesn’t bother to replace the battery in a smoke detector because she holds a generous insurance policy is called ___________________.
   a. asymmetric information; moral hazard
   b. asymmetric hazard; moral information
   c. information hazard; moral asymmetry
   d. moral hazard; asymmetric information
   e. unfair; careless
25. The pursuit of self-interest in a “commons” where everyone has access to a valuable resource will cause
   a. the common good of society to be realized
   b. careful conservation of the resource
   c. overuse of the resource
   d. individuals to make sure they bear the full costs of their actions
   e. a reduction in pollution levels

**Fill in the Blanks**

1. Costs and benefits that affect unsuspecting third parties are called _____________ and _____________ externalities, respectively.

2. If property rights were ______________________, externalities would not exist.

3. Correcting for negative externalities means forcing producers to face the ________________ of their actions.

4. In the case of a pure public good, consumption does not ________________, the good and consumption of the good cannot be ________________.

5. Groups that are organized to persuade government to take actions that serve their interests are called ________________.

**Discussion Questions**

1. Why do economists use the word *external* to describe third-party effects that are harmful or beneficial?

2. Increasingly, groundwater pollution is being recognized as a serious problem in many regions. How does the difficulty associated with assigning property rights to groundwater contribute to the problem of groundwater pollution?

3. Compare and contrast the advantages and disadvantages of the three approaches that government can take to cope with the problem of external costs.

4. What's the difference between a pure public good and a near-public good?
5. What are the competing views on public choice held by economists?

Problems

1. a. Suppose that a steel firm is a monopoly and has the demand, marginal revenue, and marginal cost functions shown in the graph below. What price and output combination will the monopoly select? Explain your choice.

![Graph showing demand, marginal revenue, and marginal cost curves for steel production.]

b. Suppose the production of steel generates water pollution in a nearby river that costs a constant $10 per ton of steel produced. What is the size of the negative externality? If the monopolist included the cost of the negative externality in its marginal costs, how would the marginal cost curve shift? Draw in the social cost curve that includes the cost of the negative externality in the monopoly’s marginal costs.

c. If a tax equal to the negative externality is imposed on each unit of steel produced, what price will the monopolist charge and how much steel will be produced? Will this policy improve the quality of water in the river? How?

2. The town of Edisto Beach, South Carolina, has a horrible mosquito problem from May through October each year. The table below shows the community’s demand and supply schedules for spraying for mosquitoes.

<table>
<thead>
<tr>
<th>Price ($/spraying)</th>
<th>Quantity Demanded</th>
<th>Quantity Supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>70</td>
<td>4</td>
<td>12</td>
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<tr>
<td>60</td>
<td>6</td>
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<td>4</td>
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<tr>
<td>20</td>
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<td>2</td>
</tr>
</tbody>
</table>
Suppose the town derives a positive externality of $20 for every spraying for mosquitoes. What is the extent of market failure in this situation? What price and quantity does the market generate? What price and quantity are consistent with an efficient level of spraying? How can the efficient level of spraying be realized? Illustrate your answer using the axes provided below.

Everyday Applications

Tomorrow, as you go through the day, make a list of all the negative and positive externalities that you experience. Externalities are everywhere in modern life. Consider the negative and positive externalities that you create on any given day. What if you were taxed for the negative externalities you create and compensated for the benefits you create generating positive externalities? Would you have a net gain or a net loss?

Economics Online

The Property and Environment Research Center (PERC) is an environmental organization unlike many others because it focuses on market approaches to solving environmental problems. Economic principles are the basic tools for analysis used by researchers at PERC. The Coase theorem that is discussed in your text figures prominently in much of PERC’s analysis. For a closer look at the work done by PERC, visit their Web site (http://www.perc.org/).
Answers to Questions

Key Terms Quiz

a. 3  f. 12  k. 8
b. 11  g. 4  l. 7
c. 6  h. 10
d. 9  i. 2

e. 1  j. 5

True-False Questions

1. True
2. False. External costs are external to the producer of a good or service so they don’t diminish profit.
3. True
4. True
5. True
6. True
7. False. If negative and positive externalities exist, then the market has failed to create a socially optimum allocation of resources.
8. True
9. True
10. False. The Coase theorem applies when the number of parties involved in a dispute is small.
11. True
12. False. If the tax is set equal to the marginal externality cost, then pollution is reduced to its socially optimum level.
13. True
14. False. In cases of public goods, the good cannot be withheld from consumption.
15. False. A special-interest lobby considers the particular interests of its members in its lobbying efforts.

Multiple-Choice Questions

1. c  6. a  11. b  16. d  21. c
2. b  7. b  12. e  17. e  22. a
3. b  8. e  13. b  18. d  23. e
4. e  9. a  14. c  19. c  24. a
5. a  10. c  15. d  20. a  25. c

Fill in the Blanks

1. negative; positive
2. clearly defined
3. social costs
4. diminish; withheld
5. special-interest lobbies

Discussion Questions

1. The word external suggests that the third-party effect was external to the decision maker's thinking about whether to undertake an activity. The costs or benefits are external to the person creating them, so they are
not taken into consideration when the action that creates them is undertaken.

2. Assigning property rights to groundwater is difficult. Simply deciding how much water is in an aquifer is a problem. One also has to consider the rate at which an aquifer recharges through rainfall. To assign property rights, one would have to develop a system to measure withdrawals of water and to prevent pollution from occurring. Also, a system whereby exchanges of water rights to the groundwater could be accomplished would be necessary so that a market price for the groundwater be established. Once property rights to groundwater are clearly defined, the users will realize the true value of the water and will have greater incentive to protect the water from pollution.

3. Obligatory control directives are simple and direct. However, there is no guarantee that the socially optimal level of the externality will result. Creating a new property form is a good approach if property rights can be defined easily. But this may be problematic. Taxing the activity that generates the externality is a workable approach if the marginal externality cost can be measured accurately.

4. A pure public good is not diminished by consumption and cannot be withheld from consumption. The benefits from a pure public good are completely external. The benefits from a near-public good are not completely external. The benefits may be diminished somewhat with consumption, and/or it may be possible to withhold them from others to some extent.

5. Some economists hold that public officials make public choices with the public interest in mind. However, other economists view public choices as skewed by the lobbying efforts of special interests. If this second view of public choice is correct, then government will rarely purchase the socially optimum quantity of public goods. Therefore, government failure is almost always a problem.

Problems

1. a. The monopolist will produce 300 tons of steel and charge $40 per ton for it. The output level of 300 tons corresponds to the point where MR = MC, and the price of $40 per ton is the price read from the demand curve at that output level.

b. The size of the negative externality is $10(300) = $3,000. Because of the negative externality, the social cost curve is shifted up by $10 vertically from the monopolist’s marginal cost curve, as shown in the graph on the following page.

c. The tax will make the marginal cost of steel equal to the marginal social cost. Now, the monopolist will choose an output level where MR = MSC, or an output level equal to approximately 260 tons of steel. The price read from the demand curve at this output level is approximately $43 per ton. Steel output is lower, so the external cost of pollution becomes $10(260) = $2,600. The tax generates enough revenue to cover the damage from the negative externality.
2. The extent of the market failure in this case is that the town will not spray often enough for mosquitoes because the market does not take into account the $20 per spraying positive externality. Taking the positive externality into account shifts the demand curve upward by $20 at every quantity, as shown on the graph below. Instead of purchasing 8 sprayings at a cost of $50 per spraying, the community will purchase the efficient level of 10 sprayings at a cost of $60 per spraying. The sprayings will be purchased through subsidization. For example, the buyers will pay the price read from the demand curve labeled Demand’, and then get a $20 rebate drawn from general revenues to support the spraying program.
Homework Questions

True-False Questions — If a statement is false, explain why.

1. Negative externalities are costs imposed on third parties while positive externalities are benefits enjoyed by third parties. (T/F)

2. In a graph of demand and supply, the effect of including the cost of a negative externality is to shift the supply curve up and to the left. (T/F)

3. The Coase Theorem emphasizes the need for government to intervene in order to solve problems created by externalities. (T/F)

4. The free rider problem applies to consumption of private goods but not public goods. (T/F)

5. According to the public choice view, the interest of the public is central to the decision-making process that government officials undertake when determining the amounts of public goods to supply. (T/F)

Multiple Choice Questions

1. A negative externality, such as the discharge of waste water into a river, means that
   a. the social cost curve is below the supply (private cost) curve
   b. too little of the activity that generates the waste water is occurring
   c. the social cost curve is above the supply (private cost) curve
   d. government should subsidize the activity causing the negative externality
   e. government regulations on pollution should be more stringent

2. Private negotiations along the lines suggested by the Coase Theorem are best suited to resolve conflicts that affect
   a. a large number of widely dispersed households
   b. only a small number of individuals
   c. only those who create positive externalities
   d. only those who create negative externalities
   e. the provision of near-public goods but not pure public goods

3. One drawback to the use of pollution compensation taxes is that
   a. it is not easy to arrive at the exact size of tax to be imposed
   b. taxing polluters is inherently unfair
   c. the tax is easy to avoid
   d. new technologies will be developed to cut down on pollution
   e. pollution levels will increase in spite of the tax
4. A public good differs from a private good in that it
   a. fails to satisfy individual needs
   b. creates benefits that are not exclusive
   c. creates benefits that are consumed only by government
   d. creates restricted benefits
   e. is more costly because it is produced by government

5. Suppose that consumption of a good results in some depletion and some exclusion, like driving on a
   crowded freeway. In such cases, the good is described as
   a. nonrenewable
   b. a pure public good
   c. a near public good
   d. a private good
   e. one that creates negative externalities

**Discussion Questions/Problems**

1. Use a graph to show how a pollution tax could work. Explain the advantages and disadvantages associated
   with such a tax.

2. Would limiting the size of government be an effective way to control government failure? Explain.