

Why Markets Fail !!

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Competitive markets fail for four basic reasons: *market power*, *incomplete information*, *externalities*, and *public goods*. We will discuss each in turn.

Market Power

Suppose, for example, that the producer of food in our Edgeworth box diagram has monopoly power. It therefore chooses the output quantity at which marginal revenue (rather than price) is equal to marginal cost and sells less output at a price higher than it would charge in a competitive market.

The lower output will mean a lower marginal cost of food production, thus an increase in the marginal cost of clothing production. Then, the marginal rate of transformation will decrease because $MRT_{FC} = MC_F/MC_C$. We might end up, for example, at A on the production possibilities frontier in Figure 16.9.

Producing too little food and too much clothing is an output inefficiency because firms with market power use different prices in their output decisions than consumers use in their consumption decisions.

A similar argument would apply to market power in an input market. Suppose that unions gave workers market power over the supply of their labor in the production of food. Too little labor would then be supplied to the food industry at too high a wage (w_F) and too much labor to the clothing industry at too low a wage (w_C). In the clothing industry, the input efficiency conditions would be satisfied because $MRTS_{LK}^C = w_C/r$. But in the food industry, the wage paid would be greater than the wage paid in the clothing industry. Therefore, $MRTS_{LK}^F = w_F/r > w_C/r = MRTS_{LK}^C$. The result is input inefficiency because efficiency requires that the marginal rates of technical substitution be equal in the production of all goods.

Incomplete Information

Lack of information may give producers an incentive to supply too much of some products and too little of others. In other cases, while some consumers may not buy a product even though they would benefit from doing so, others buy products that leave them worse off.

Lack of information may also prevent some markets from ever developing. These informational problems can lead to competitive market inefficiency.

Externalities

Sometimes, however, market prices do not reflect the activities of either producers or consumers. There is an *externality* when a consumption or production activity has an indirect effect on other consumption or production activities that is not reflected directly in market prices.

As we explained in Section 9.2, the word *externality* is used because the effects on others (whether benefits or costs) are external to the market. An externality causes both input and output inefficiencies.

Public Goods

- **public good** Nonexclusive, nonrival good that can be made available cheaply but which, once available, is difficult to prevent others from consuming.

A market may fail to supply goods that many consumers value. For example, suppose a firm is considering whether to undertake research on a new technology for which it cannot obtain a patent. Once the invention is made public, others can duplicate it. As long as it is difficult to exclude other firms from selling the product, the research will be unprofitable.

EXAMPLE 16.5 INEFFICIENCY IN THE HEALTH CARE SYSTEM

The United States spends a larger fraction of its GDP on health care than do most other countries. Is the U.S. health care system less “efficient” than other health care systems? The system may be *technically efficient* in production, in the sense of utilizing the best combination of such inputs as hospital beds, physicians, nurses, and drugs to obtain better health outcomes? Second, being *output efficient* would mean that the benefits from the marginal dollar spent on health care are greater than the opportunity cost of other goods and services that might be provided instead.

There is reason to believe that the health care industry is operating below its production possibilities frontier, so that if inputs were used more efficiently, better health outcomes could be achieved with little or no increase in resources. It appears that substantially more time and expense is devoted to claim reporting, verification, and billing requirements relative to other developed countries. In addition, a number of low cost, highly effective treatments seem to be under-prescribed in the United States.

EXAMPLE 16.5 INEFFICIENCY IN THE HEALTH CARE SYSTEM

What about *output efficiency*? It has been suggested that the increasing fraction of income being devoted to health expenditures in the United States is evidence of inefficiency. But, as we saw in Example 3.4, this could simply reflect a strong preference for health care on the part of the U.S. population, whose incomes have generally been increasing.

The study underlying that example calculated the marginal rate of substitution between health related and nonhealth related goods and found that as consumption increases, the marginal utility of consumption for non-health related goods falls quickly. As we explained, this should not be surprising; as individuals age and their incomes increase, an extra year of life expectancy becomes much more valuable than a new car or a second home. Thus an increasing share of income devoted to health is entirely consistent with output efficiency.

17.1 Quality Uncertainty and the Market for Lemons

- **asymmetric information** Situation in which a buyer and a seller possess different information about a transaction.

Used cars sell for much less than new cars because *there is asymmetric information about their quality*: The seller of a used car knows much more about the car than the prospective buyer does. As a result, the prospective buyer will always be suspicious of its quality—and with good reason.

The implications of asymmetric information about product quality were first analyzed by George Akerlof and go far beyond the market for used cars. The markets for insurance, financial credit, and even employment are also characterized by asymmetric information about product quality.

The Market for Used Cars

Suppose two kinds of used cars are available—high-quality cars and low-quality cars. Also *suppose that both sellers and buyers can tell which kind of car is which*. There will then be two markets.

In reality, the seller of a used car knows much more about its quality than a buyer does. (Buyers discover the quality only after they buy a car and drive it for a while.)

When making a purchase, buyers therefore view all cars as “medium quality,” in the sense that there is an equal chance of getting a high-quality or a low-quality car. However, *fewer high-quality cars and more low-quality cars will now be sold*.

As consumers begin to realize that most cars sold (about three-fourths of the total) are low quality, their perceived demand shifts. *This shifting continues until only low-quality cars are sold*.

The lemons problem: With asymmetric information, low-quality goods can drive high-quality goods out of the market.

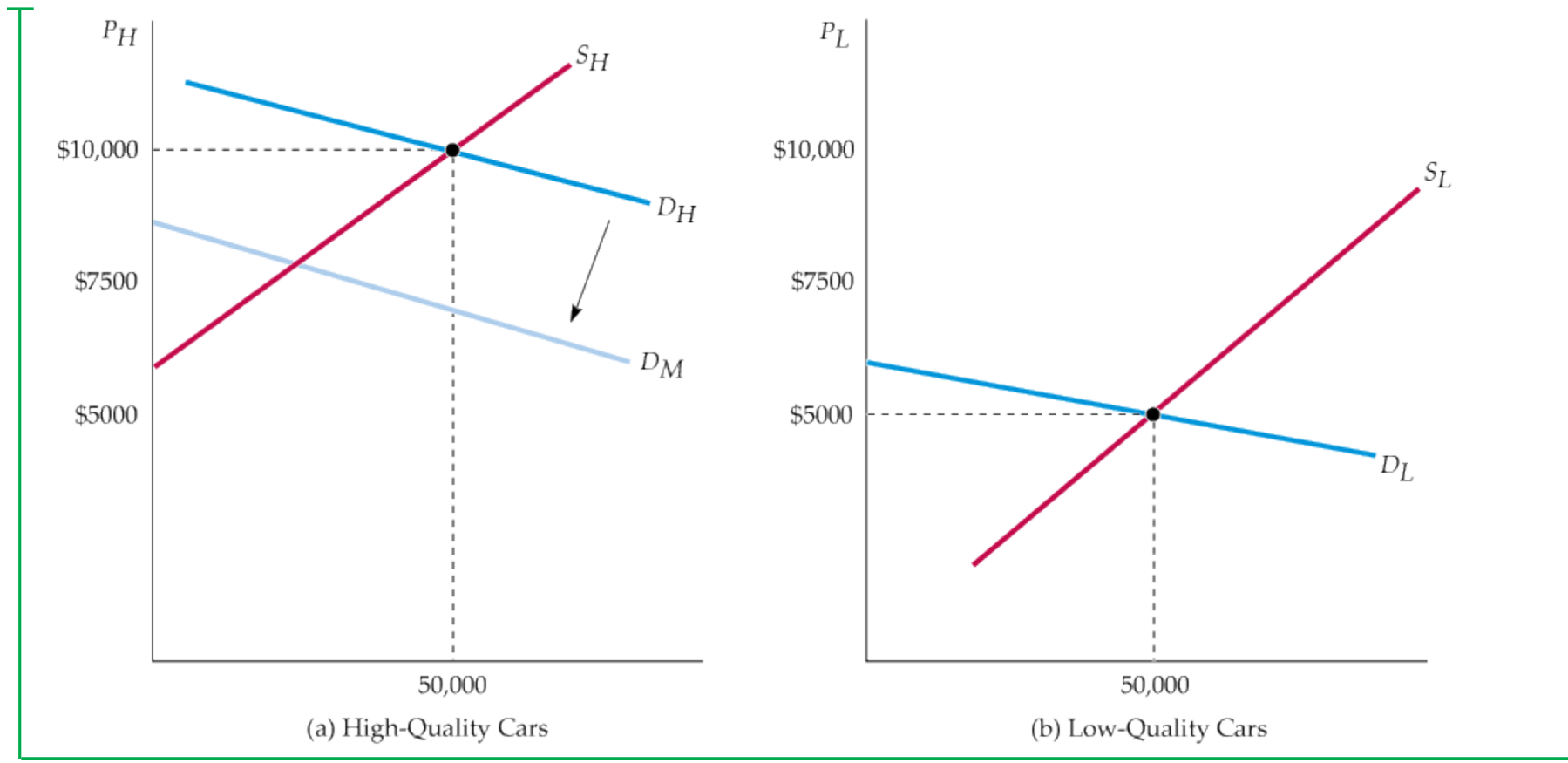


FIGURE 17.1 (1 of 2)

THE MARKET FOR USED CARS

When sellers of products have better information about product quality than buyers, a “lemons problem” may arise in which low-quality goods drive out high quality goods.

In **(a)** the demand curve for high-quality cars is D_H .

However, as buyers lower their expectations about the average quality of cars on the market, their perceived demand shifts to D_M .

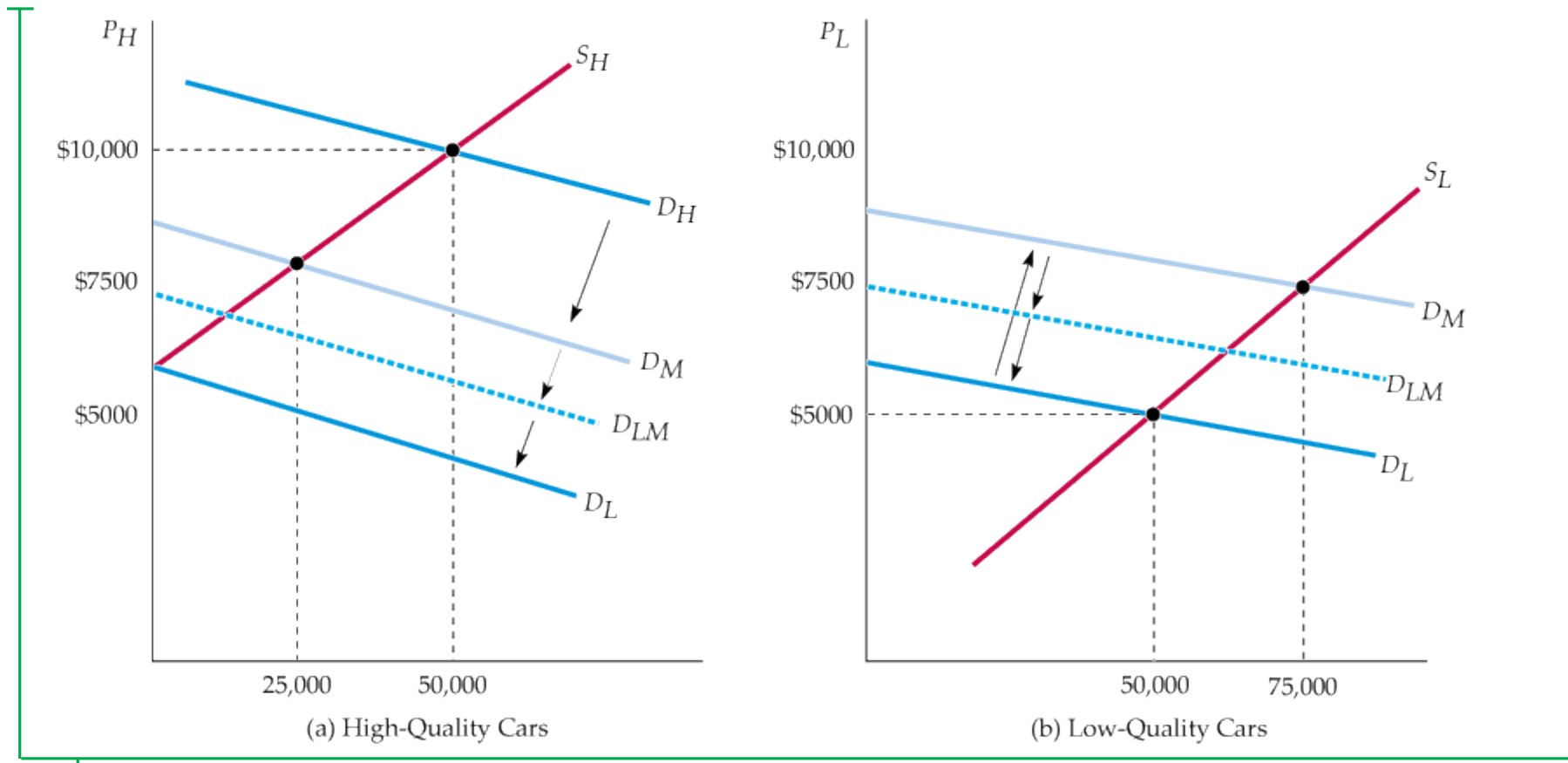


FIGURE 17.1 (2 of 2)

THE MARKET FOR USED CARS

Likewise, in (b) the perceived demand curve for low-quality cars shifts from D_L to D_M . As a result, the quantity of high-quality cars sold falls from 50,000 to 25,000, and the quantity of low-quality cars sold increases from 50,000 to 75,000. Eventually, only low quality cars are sold.

Implications of Asymmetric Information

Our used cars example shows how asymmetric information can result in market failure. Consumers cannot in fact easily determine the quality of a used car until after they purchase it. As a result, the price of used cars falls, and high-quality cars are driven out of the market.

Market failure arises, therefore, because there are owners of high-quality cars who value their cars less than potential buyers of high-quality cars. Both parties could enjoy gains from trade, but, unfortunately, buyers' lack of information prevents this mutually beneficial trade from occurring.

ADVERSE SELECTION

- **adverse selection** Form of market failure resulting when products of different qualities are sold at a single price because of asymmetric information, so that too much of the low-quality product and too little of the high-quality product are sold.

THE MARKET FOR INSURANCE

People who buy insurance know much more about their general health than any insurance company. As a result, adverse selection arises, much as it does in the market for used cars. Because unhealthy people are more likely to want insurance, the proportion of unhealthy people in the pool of insured people increases. This forces the price of insurance to rise, so that more healthy people, aware of their low risks, elect not to be insured. This further increases the proportion of unhealthy people among the insured, thus forcing the price of insurance up more. The process continues until most people who want to buy insurance are unhealthy. At that point, insurance becomes very expensive, or—in the extreme—insurance companies stop selling the insurance.

One solution to the problem of adverse selection is to *pool risks*. For health insurance, the government might take on this role, as it does with the Medicare program. By providing insurance for *all* people over age 65, the government eliminates the problem of adverse selection. Likewise, insurance companies offer group health insurance policies at places of employment. By covering all workers in a firm, whether healthy or sick, the insurance company spreads risks and thereby reduces the likelihood that large numbers of high-risk individuals will purchase insurance.

THE MARKET FOR CREDIT

How can a credit card company or bank distinguish high-quality borrowers (who pay their debts) from low-quality borrowers (who don't)? Clearly, borrowers have better information—i.e., they know more about whether they will pay than the lender does. Again, the lemons problem arises. Low-quality borrowers are more likely than high-quality borrowers to want credit, which forces the interest rate up, which increases the number of low-quality borrowers, which forces the interest rate up further, and so on.

In fact, credit card companies and banks *can*, to some extent, use computerized credit histories, which they often share with one another, to distinguish low-quality from high-quality borrowers. Many people, however, think that computerized credit histories invade their privacy. Should companies be allowed to keep these credit histories and share them with other lenders? We can't answer this question for you, but we can point out that credit histories perform an important function: They eliminate, or at least greatly reduce, the problem of asymmetric information and adverse selection—a problem that might otherwise prevent credit markets from operating. Without these histories, even the creditworthy would find it extremely costly to borrow money.

The Importance of Reputation and Standardization

Asymmetric information is also present in many other markets. Here are just a few examples:

- **Retail stores:** Will the store repair or allow you to return a defective product?
- **Dealers of rare stamps, coins, books, and paintings:** Are the items real or counterfeit?
- **Roofers, plumbers, and electricians:** When a roofer repairs or renovates the roof of your house, do you climb up to check the quality of the work?
- **Restaurants:** How often do you go into the kitchen to check if the chef is using fresh ingredients and obeying health laws?

In all these cases, the seller knows much more about the quality of the product than the buyer does. Sellers of high-quality goods and services, therefore, have a big incentive to build a *reputation*. Since reputation may be difficult to build, *standardization* can solve the lemons problem. For example, you *know* exactly what you will be buying at McDonald's.

EXAMPLE 17.1 **MEDICARE**

Health care reform has been at the forefront of policy debates in the United States and worldwide for years. A core issue in the United States is whether everyone should have health insurance, and whether participation in some kind of public or private insurance program should be mandatory.

Indeed, mandatory participation is what makes Medicare work. Remember that there is asymmetric information: people know much more about their health, than insurance companies can possibly know. Those seniors who have chronic diseases are much more likely to buy the insurance than those who are in excellent health and thus expect lower costs. This creates an adverse selection problem.

All people over 65 participate in Medicare—those expecting low health care costs along with those who expect high costs. Of course, the low-cost participants are subsidizing those with high costs. But because adverse selection is not a problem with a mandatory program, the overall cost of Medicare is lower than the cost of most private insurance systems. Indeed, Medicare has earned a reputation as one of the most successful and efficient public programs in the United States.

EXAMPLE 17.2 LEMONS IN MAJOR LEAGUE BASEBALL

In a lemons market, because purchasers of second-hand products will have limited information, resold products should be lower in quality than products that rarely appear on the market.

After six years of major league service, players can now sign new contracts with their original teams or become free agents and sign with new teams. The availability of many free agents creates a second-hand market in baseball players.



Asymmetric information is prominent in the free-agent market. One potential purchaser, the player's original team, has better information about the player's abilities than other teams have. If a lemons market exists, we would expect free agents to have higher disability rates than players who are renewed. Less desirable candidates would become free agents.

TABLE 17.1 **PLAYER DISABILITY**

	DAYS SPENT ON DISABLED LIST PER SEASON		
	PRECONTRACT	POSTCONTRACT	PERCENTAGE CHANGE
All players	4.73	12.55	165.4
Renewed players	4.76	9.68	103.4
Free agents	4.67	17.23	268.9

17.3 Moral Hazard

- **moral hazard** When a party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event.

The possibility that an individual's behavior may change because she has insurance is an example of a problem known as *moral hazard*.

The concept of moral hazard applies not only to problems of insurance, but also to problems of workers who perform below their capabilities when employers cannot monitor their behavior ("job shirking").

Moral hazard is a problem not only for insurance companies. It also alters the ability of markets to allocate resources efficiently.

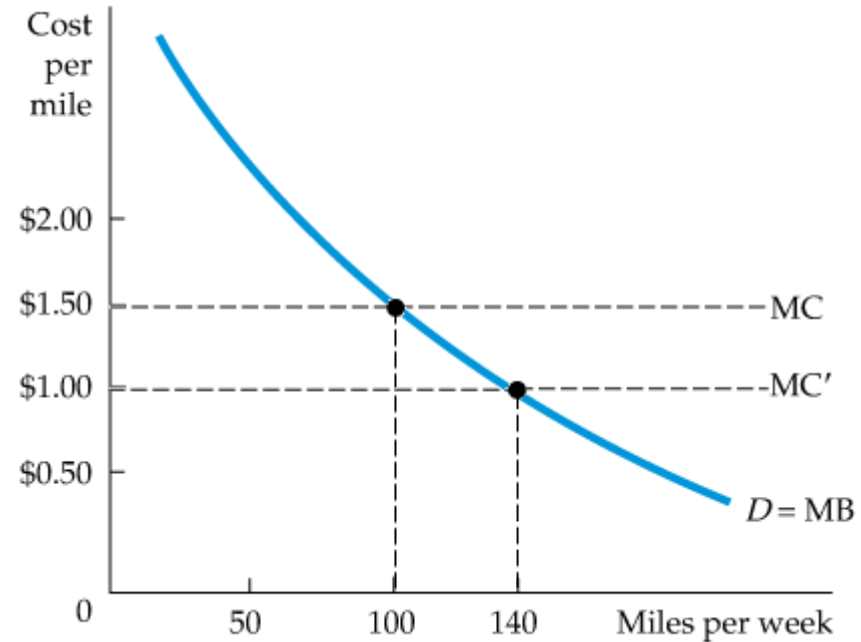
FIGURE 17.3

THE EFFECTS OF MORAL HAZARD

Moral hazard alters the ability of markets to allocate resources efficiently. D gives the demand for automobile driving.

With no moral hazard, the marginal cost of transportation MC is \$1.50 per mile; the driver drives 100 miles, which is the efficient amount.

With moral hazard, the driver perceives the cost per mile to be $MC = \$1.00$ and drives 140 miles.



EXAMPLE 17.4 **REDUCING MORAL HAZARD: WARRANTIES OF ANIMAL HEALTH**

For buyers of livestock, information about the animals' health is very important.

Because of asymmetric information in the livestock market, most states require warranties on the sale of livestock.

Although warranties solve the problem of the seller having better information than the buyer, they also create a form of moral hazard.

In response to the moral hazard problem, many states have modified their animal warranty laws by requiring sellers to tell buyers whether livestock are diseased at the time of sale.



17.4 The Principal–Agent Problem

- **principal–agent problem** Problem arising when agents (e.g., a firm’s managers) pursue their own goals rather than the goals of principals (e.g., the firm’s owners).

An *agency relationship* exists whenever there is an arrangement in which one person’s welfare depends on what another person does.

- **agent** Individual employed by a principal to achieve the principal’s objective.

A principal–agent problem arises when agents pursue their own goals rather than the goals of the principal.

- **principal** Individual who employs one or more agents to achieve an objective.

The Principal–Agent Problem in Private Enterprises

Managers can often pursue their own objectives, rather than focusing on the objective of the stockholders, which is to maximize the value of the firm.

One view is that managers are more concerned with rapid growth and larger market share, which provide more cash flow and in turn allows managers to enjoy more perks. Another view emphasizes the utility that managers get from their jobs, the power to control the corporation, the fringe benefits and other perks, and long job tenure.

However, there are limitations to managers' ability to deviate from the objectives of owners. First, stockholders can complain loudly when they feel that managers are behaving improperly. Second, a vigorous market for corporate control can develop unless managers pursue the goal of profit maximization. Third, there can be a highly developed market for managers. If managers who maximize profit are in great demand, they will earn high wages and so give other managers an incentive to pursue the same goal.

EXAMPLE 17.5 CEO SALARIES

CEO compensation has increased sharply over the past few decades. The average annual salary for production workers in the U.S. went from \$18,187 in 1990 to \$32,093 in 2009. But in constant dollar terms, the 2009 average salary was only \$19,552 (in 1990 dollars), which represents only a 7.5% increase.

At the same time, the average annual compensation for CEOs has grown from \$2.9 million to \$8.5 million, or about \$5.2 million in 1990 dollars.

In other words, while production workers have seen a 7.5% increase in their real wages over the past two decades, real CEO compensation has risen nearly 80%. Why? Have top managers become more productive, or are CEOs simply becoming more effective at extracting economic rents from their companies?

The answer lies in the principal–agent problem, which is at the heart of CEO salary determination.

EXAMPLE 17.5 CEO SALARIES

Managers have steadily increased their ability to extract economic rents. How has this happened? Most boards of directors do not have the necessary information or independence to negotiate effectively with managers. Directors often cannot monitor executives' activities and therefore cannot negotiate compensation packages that are tightly linked to their performance.

Research has shown that high levels of CEO pay are *negatively* correlated with a firm's accounting value and profitability. In other words, the higher the CEO's pay, the lower the firm's profitability is likely to be. In addition, CEOs with unusually high pay were more likely to stay at a company despite poor economic results. These effects are intensified at companies where the board is entrenched and shareholder rights are limited.

“Golden parachutes,” generous severance packages that CEOs can negotiate with their boards, have also come under fire recently. Some argue that such guarantees free CEOs from board and shareholder pressure to focus on short-term growth and enable them to focus instead on their firms' long-term growth. However, it has been shown that CEOs with golden parachutes are less likely to worry about long-term growth, and—when negotiating the sale of their firm to another company—are more likely to agree to acquisition terms that hurt shareholders.

The Principal–Agent Problem in Public Enterprises

Because it is also costly to monitor the behavior of public managers, there are no guarantees that they will produce the efficient output.

Although the public sector lacks some of the market forces that keep private managers in line, government agencies can still be effectively monitored.

First, managers of government agencies care about more than just the size of their agencies. Indeed, many choose lower-paying public jobs because they are concerned about the “public interest.”

Second, much like private managers, public managers are subject to the rigors of the managerial job market. If they are perceived to be pursuing improper objectives, their ability to obtain high salaries in the future might be impaired.

Third, legislatures and other government agencies perform an oversight function. At the local rather than the federal level, public managers are subject to even more checks.

Competition among agencies can be as effective as competition among private firms in constraining the behavior of managers.

In this chapter we study *externalities*—the effects of production and consumption activities not directly reflected in the market—and *public goods*—goods that benefit all consumers but that the market either undersupplies or does not supply at all.

When externalities are present, the price of a good need not reflect its social value. As a result, firms may produce too much or too little, so that the market outcome is inefficient.

The marginal cost of providing a public good to an additional consumer is zero, and people cannot be prevented from consuming it. We distinguish between those goods that are difficult to provide privately and those that could have been provided by the market.

18.1 Externalities

- **externality** Action by either a producer or a consumer which affects other producers or consumers, but is not accounted for in the market price.

Externalities can be *negative*—when the action of one party imposes costs on another party—or *positive*—when the action of one party benefits another party.

Negative Externalities and Inefficiency

- **marginal external cost** Increase in cost imposed externally as one or more firms increase output by one unit.
- **marginal social cost** Sum of the marginal cost of production and the marginal external cost.

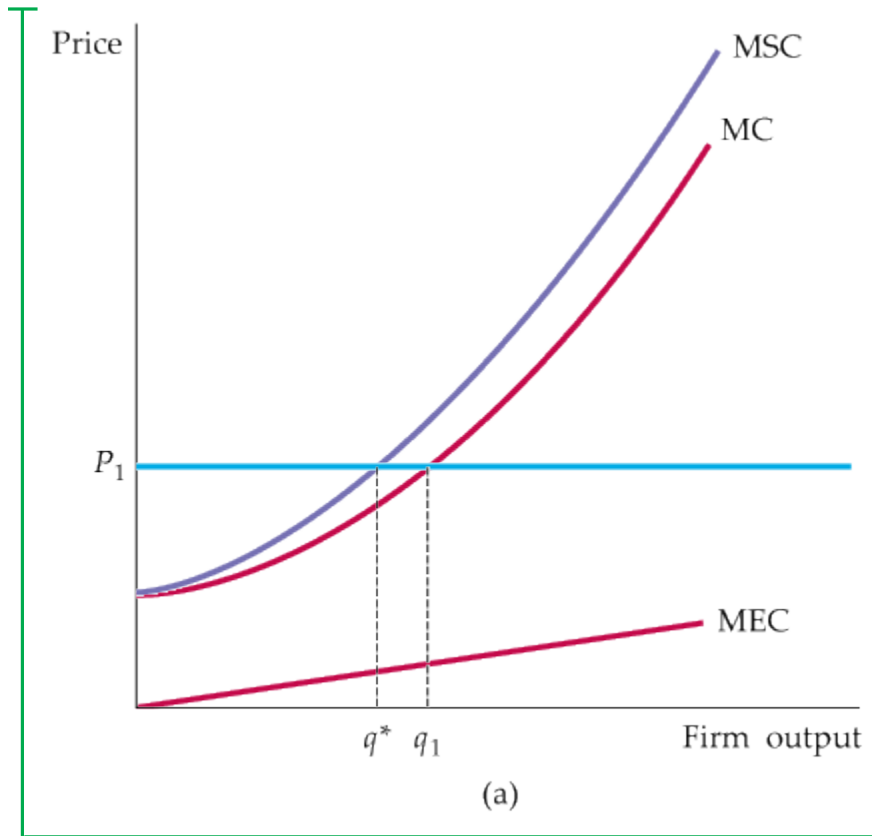


FIGURE 18.1 (1 of 2)

EXTERNAL COST

When there are negative externalities, the marginal social cost MSC is higher than the marginal cost MC.

The difference is the marginal external cost MEC.

In **(a)**, a profit-maximizing firm produces at q_1 , where price is equal to MC.

The efficient output is q^* , at which price equals MSC.

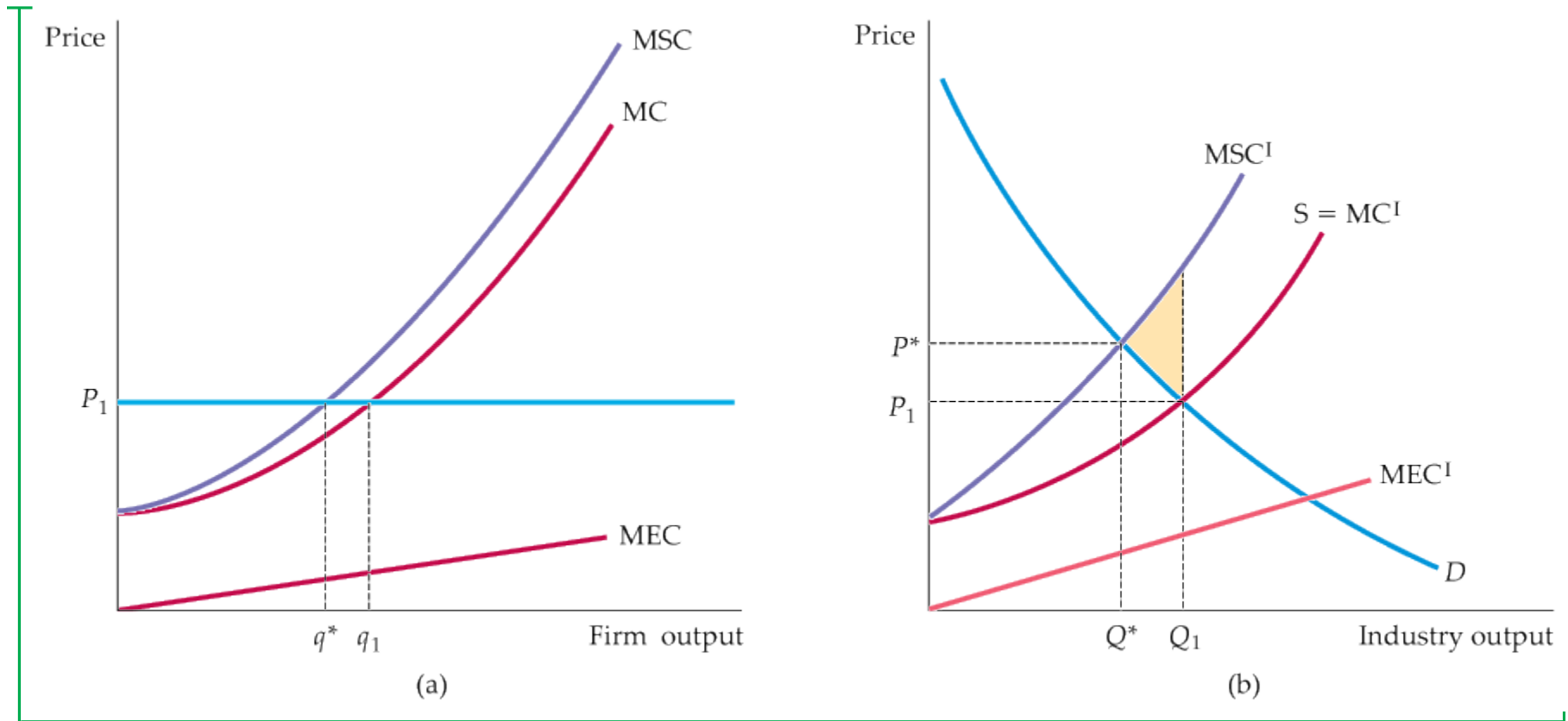


FIGURE 18.1 (2 of 2)

EXTERNAL COST

In **(b)**, the industry's competitive output is Q_1 , at the intersection of industry supply MC and demand D .

However, the efficient output Q^* is lower, at the intersection of demand and marginal social cost MSC .

The aggregate social cost is as the shaded triangle between MSC^I , D , and output Q_1 .

Positive Externalities and Inefficiency

- **marginal external benefit** Increased benefit that accrues to other parties as a firm increases output by one unit.
- **marginal social benefit** Sum of the marginal private benefit plus the marginal external benefit.

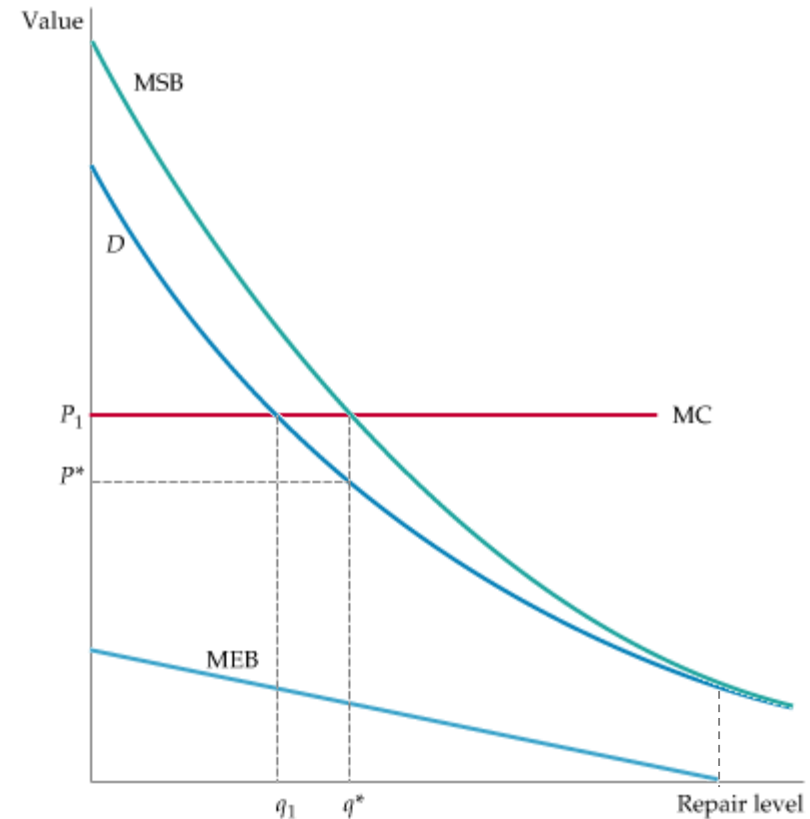
FIGURE 18.2

EXTERNAL BENEFITS

When there are positive externalities, marginal social benefits MSB are higher than marginal benefits D .

The difference is the marginal external benefit MEB .

A self-interested homeowner invests q_1 in repairs, determined by the intersection of the marginal benefit curve D and the marginal cost curve MC . The efficient level of repair q^* is higher and is given by the intersection of the marginal social benefit and marginal cost curves.

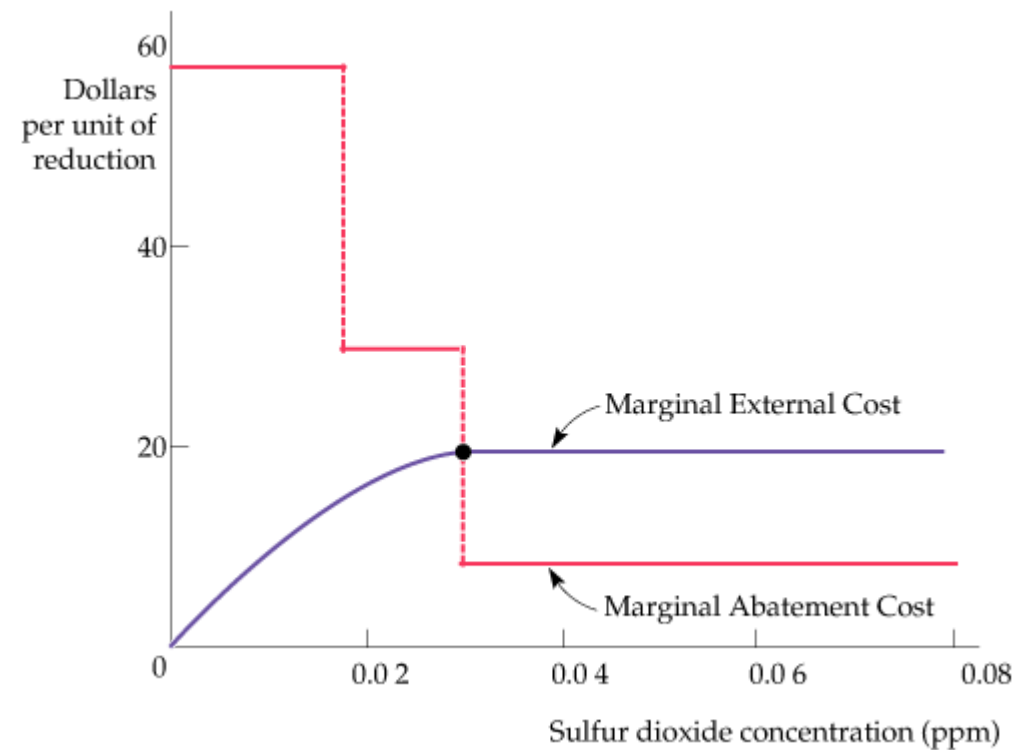


EXAMPLE 18.1 THE COSTS AND BENEFITS OF SULFUR DIOXIDE EMISSIONS

Although sulfur dioxide gas can be produced naturally by volcanoes, almost two-thirds of all sulfur dioxide emissions in the United States come from electric power generation that depends on burning fossil fuels such as coal and petroleum. In addition to human health, acid rain causes damage to water and forests as well as to man-made structures.

FIGURE 18.3 SULFUR DIOXIDE EMISSIONS REDUCTIONS

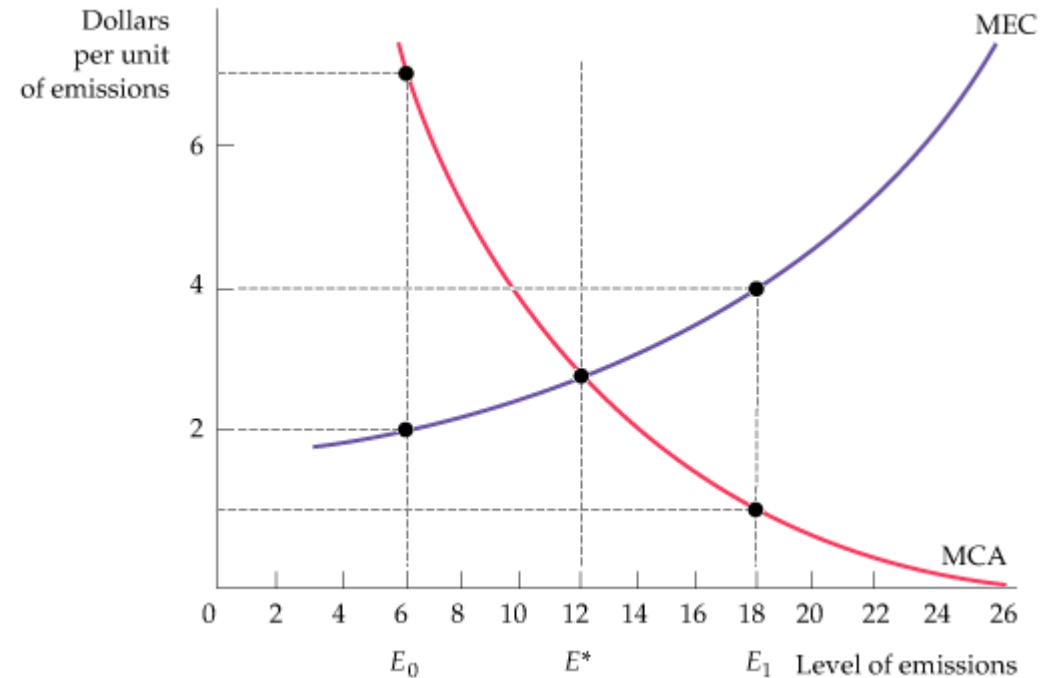
The efficient sulfur dioxide concentration equates the marginal abatement cost to the marginal external cost. Here the marginal abatement cost curve is a series of steps, each representing the use of a different abatement technology.



18.2 Ways of Correcting Market Failure

FIGURE 18.4 THE EFFICIENT LEVEL OF EMISSIONS

The efficient level of factory emissions is the level that equates the marginal external cost of emissions MEC to the benefit associated with lower abatement costs *MCA*. The efficient level of 12 units is E^* .



We can encourage the firm to reduce emissions to E^* in three ways: (1) emissions standards; (2) emissions fees; and (3) transferable emissions permits.

18.6 Public Goods

- **public good** Nonexclusive and nonrival good: The marginal cost of provision to an additional consumer is zero and people cannot be excluded from consuming it.

NONRIVAL GOODS

- **nonrival good** Good for which the marginal cost of its provision to an additional consumer is zero.

NONEXCLUSIVE GOODS

- **nonexclusive good** Good that people cannot be excluded from consuming, so that it is difficult or impossible to charge for its use.

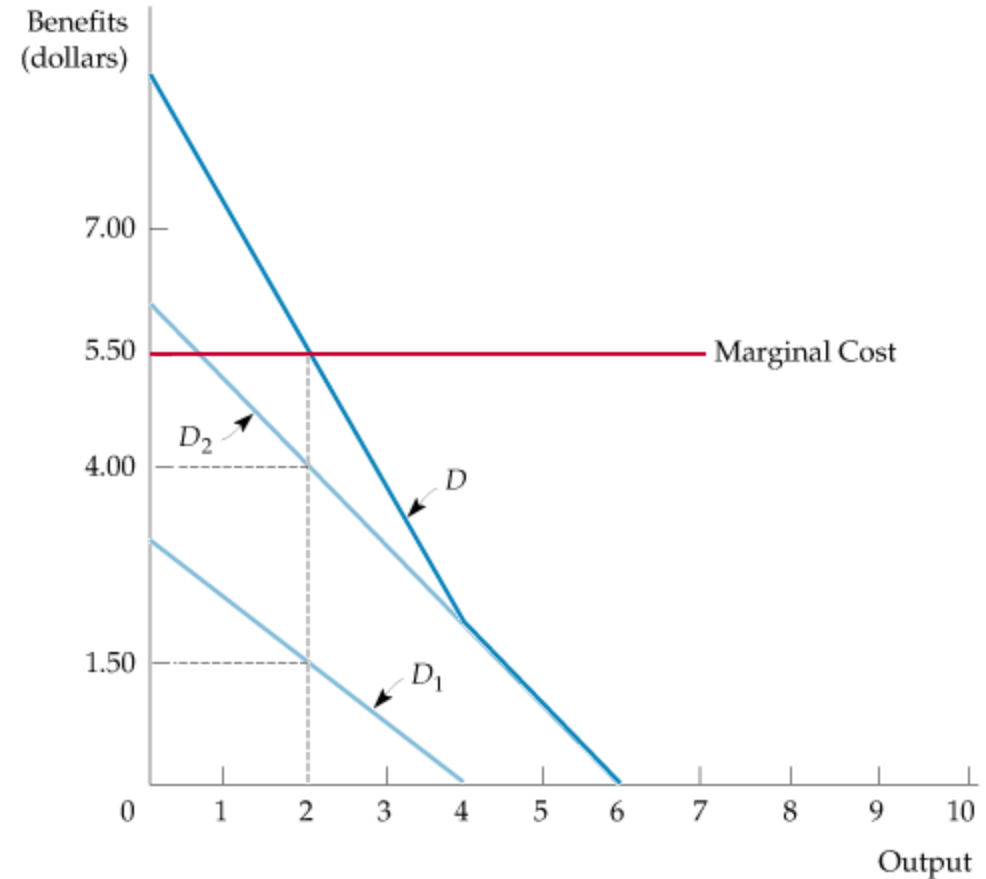
Some goods are exclusive but nonrival. Others are nonexclusive but rival. Many publicly provided goods are either rival in consumption, exclusive, or both. High school education and national parks are examples of these types of goods.

- Efficiency and Public Goods

FIGURE 18.13
EFFICIENT PUBLIC GOOD PROVISION

When a good is nonrival, the social marginal benefit of consumption, given by the demand curve D , is determined by vertically summing the individual demand curves for the good, D_1 and D_2 .

At the efficient level of output, the demand and the marginal cost curves intersect.



- **Public Goods and Market Failure**

Suppose you want to offer a mosquito abatement program for your community. You know that the program is worth more to the community than the \$50,000 it will cost. Can you make a profit by providing the program privately? You would break even if you assessed a \$5.00 fee to each of the 10,000 households in your community. But you cannot force them to pay the fee, let alone devise a system in which those households that value mosquito abatement most highly pay the highest fees.

Unfortunately, mosquito abatement is nonexclusive: There is no way to provide the service without benefiting everyone. As a result, households have no incentive to pay what the program really is worth to them.

- **free rider** Consumer or producer who does not pay for a nonexclusive good in the expectation that others will.

With public goods, the presence of free riders makes it difficult or impossible for markets to provide goods efficiently. Perhaps if few people were involved and the program were relatively inexpensive, all households might agree voluntarily to share costs. However, when many households are involved, voluntary private arrangements are usually ineffective. The public good must therefore be subsidized or provided by governments if it is to be produced efficiently.

EXAMPLE 18.8 THE DEMAND FOR CLEAN AIR

Clean air is nonexclusive: It is difficult to stop any one person from enjoying it. Clean air is also nonrival: My enjoyment does not inhibit yours. We can infer people's willingness to pay for clean air from the housing market—households will pay more for a home located in an area with good air quality than for an otherwise identical home in an area with poor air quality.



FIGURE 18.14

THE DEMAND FOR CLEAN AIR

The three curves describe the willingness to pay for clean air (a reduction in the level of nitrogen oxides) for each of three different households (low income, middle income, and high income). In general, higher-income households have greater demands for clean air than lower-income households. Moreover, each household is less willing to pay for clean air as the level of air quality increases.

