human behavior that is more subtle and complex than that found in conventional economic theory, but this view may also be more realistic.

This chapter covers a lot of ground. To do so, it offers not a full helping of these three topics but, instead, a taste of each. One goal is to show a few of the directions economists are heading in their effort to expand knowledge of how the economy works. Another goal is to whet your appetite for more courses in economics.

ASYMMETRIC INFORMATION

"I know something you don't know." This statement is a common taunt among children, but it also conveys a deep truth about how people sometimes interact with one another. Many times in life, one person knows more about what is going on than another. A difference in access to relevant knowledge is called an *information asymmetry*.

Examples abound. A worker knows more than his employer about how much effort he puts into his job. A seller of a used car knows more than the buyer about the car's condition. The first is an example of a *hidden action*, whereas the second is an example of a *hidden characteristic*. In each case, the uninformed party (the employer, the car buyer) would like to know the relevant information, but the informed party (the worker, the car seller) may have an incentive to conceal it.

Because asymmetric information is so prevalent, economists have devoted much effort in recent decades to studying its effects. And indeed, the 2001 Nobel Prize in Economics was awarded to three economists (George Akerlof, Michael Spence, and Joseph Stiglitz) for their pioneering work on this topic. Let's discuss some of the insights that this study has revealed.

Hidden Actions: Principals, Agents, and Moral Hazard

moral hazard
the tendency of a person who is imperfectly monitored to engage in dishonest or otherwise undesirable behavior

agent
a person who is performing an act for another person, called the principal

principal
a person for whom another person, called the agent, is performing some act

Moral hazard is a problem that arises when one person, called the **agent**, is performing some task on behalf of another person, called the **principal**. If the principal cannot perfectly monitor the agent's behavior, the agent tends to undertake less effort than the principal considers desirable. The phrase *moral hazard* refers to the risk, or "hazard," of inappropriate or otherwise "immoral" behavior by the agent. In such a situation, the principal tries various ways to encourage the agent to act more responsibly.

The employment relationship is the classic example. The employer is the principal, and the worker is the agent. The moral-hazard problem is the temptation of imperfectly monitored workers to shirk their responsibilities. Employers can respond to this problem in various ways:

- *Better monitoring.* Parents hiring nannies have been known to plant hidden video cameras in their homes to record the nanny's behavior when the parents are away. The aim is to catch irresponsible behavior.
- *High wages.* According to *efficiency-wage theories* (discussed in Chapter 19), some employers may choose to pay their workers a wage above the level that equilibrates supply and demand in the labor market. A worker who earns an above-equilibrium wage is less likely to shirk because, if he is caught and fired, he might not be able to find another high-paying job.

- *Delayed payment.* Firms can delay part of a worker's compensation, so if the worker is caught shirking and is fired, he suffers a larger penalty. One example of delayed compensation is the year-end bonus. Similarly, a firm may choose to pay its workers more later in their lives. Thus, the wage increases that workers get as they age may reflect not just the benefits of experience but also a response to moral hazard.

Employers can use any combination of these various mechanisms to reduce the problem of moral hazard.

There are also many examples of moral hazard beyond the workplace. A homeowner with fire insurance will likely buy too few fire extinguishers because the homeowner bears the cost of the extinguisher while the insurance company receives much of the benefit. A family may live near a river with a high risk of flooding because the family enjoys the scenic views, while the government bears the cost of disaster relief after a flood. Many regulations are aimed at addressing the problem: An insurance company may require homeowners to buy fire extinguishers, and the government may prohibit building homes on land with high risk of flooding. But the insurance company does not have perfect information about how cautious homeowners are, and the government does not have perfect information about the risk that families undertake when choosing where to live. As a result, the problem of moral hazard persists.

Hidden Characteristics: Adverse Selection and the Lemons Problem

Adverse selection is a problem that arises in markets in which the seller knows more about the attributes of the good being sold than the buyer does. In such a situation, the buyer runs the risk of being sold a good of low quality. That is, the "selection" of goods sold may be "adverse" from the standpoint of the uninformed buyer.

adverse selection
the tendency for the mix of unobserved attributes to become undesirable from the standpoint of an uninformed party

The classic example of adverse selection is the market for used cars. Sellers of used cars know their vehicles' defects while buyers often do not. Because owners of the worst cars are more likely to sell them than are the owners of the best cars, buyers are apprehensive about getting a "lemon." As a result, many people avoid buying vehicles in the used car market. This lemons problem can explain why a used car only a few weeks old sells for thousands of dollars less than a new car of the same type. A buyer of the used car might surmise that the seller is getting rid of the car quickly because the seller knows something about it that the buyer does not.

A second example of adverse selection occurs in the labor market. According to another efficiency-wage theory, workers vary in their abilities, and they may know their own abilities better than do the firms that hire them. When a firm cuts the wage it pays, the more talented workers are more likely to quit, knowing they are better able to find other employment. Conversely, a firm may choose to pay an above-equilibrium wage to attract a better mix of workers.

A third example of adverse selection occurs in markets for insurance. For example, buyers of health insurance know more about their own health problems than do insurance companies. Because people with greater hidden health problems are more likely to buy health insurance than are other people, the price of health insurance reflects the costs of a sicker-than-average person. As a result, people

FYI

Corporate Management

Much production in the modern economy takes place within corporations. Like other firms, corporations buy inputs in markets for the factors of production and sell their output in markets for goods and services. Also like other firms, they are guided in their decisions by the objective of profit maximization. But a large corporation has to deal with some issues that do not arise in, say, a small family-owned business.

What is distinctive about a corporation? From a legal standpoint, a corporation is an organization that is granted a charter recognizing it as a separate legal entity, with its own rights and responsibilities distinct from those of its owners and employees. From an economic standpoint, the most important feature of the corporate form of organization is the separation of ownership and control. One group of people, called the shareholders, own the corporation and share in its profits. Another group of people, called the managers, are employed by the corporation to make decisions about how to deploy the corporation's resources.

The separation of ownership and control creates a principal-agent problem. In this case, the shareholders are the principals, and the managers are the agents. The chief executive officer and other managers, who are in the best position to know the available business opportunities, are charged with the task of maximizing profits for the shareholders. But ensuring that they carry out this task is not always easy. The managers may have goals of their own, such as taking life easy, having a plush office and a private jet, throwing lavish parties, or presiding over a large business empire. The managers' goals may not always coincide with the goal of profit maximization.

The corporation's board of directors is responsible for hiring and firing the top management. The board monitors the managers' performance, and it designs their compensation packages. These packages often include incentives aimed at aligning the interest of shareholders with the interest of management. Managers might be given bonuses based on performance or options to buy the company's stock, which are more valuable if the company performs well.

Note, however, that the directors are themselves agents of the shareholders. The existence of a board overseeing management only shifts the principal-agent problem. The issue then becomes how to ensure that the board of directors fulfills its own legal obligation of acting in the best interest of the shareholders. If the directors become too friendly with management, they may not provide the required oversight.

The corporation's principal-agent problem became big news around 2005. The top managers of several prominent companies, such as Enron, Tyco, and WorldCom, were found to be engaging in activities that enriched themselves at the expense of their shareholders. In these cases, the actions were so extreme as to be criminal, and the corporate managers were not just fired but also sent to prison. Some shareholders sued directors for failing to monitor management sufficiently.

Fortunately, criminal activity by corporate managers is rare. But in some ways, it is only the tip of the iceberg. Whenever ownership and control are separated, as they are in most large corporations, there is an inevitable tension between the interests of shareholders and the interests of management.

in average health may be discouraged from buying health insurance by the high price.

When markets suffer from adverse selection, the invisible hand does not necessarily work its magic. In the used car market, owners of good cars may choose to keep them rather than sell them at the low price that skeptical buyers are willing to pay. In the labor market, wages may be stuck above the level that balances supply and demand, resulting in unemployment. In insurance markets, buyers with low risk may choose to remain uninsured because the policies they are offered fail to reflect their true characteristics. Advocates of government-provided health insurance sometimes point to the problem of adverse selection as one reason not to trust the private market to provide the right amount of health insurance on its own.

Signaling to Convey Private Information

Although asymmetric information is sometimes a motivation for public policy, it also motivates some individual behavior that otherwise might be hard to explain. Markets respond to problems of asymmetric information in many ways. One of them is **signaling**, which refers to actions taken by an informed party for the sole purpose of credibly revealing his private information.

signaling
an action taken by an informed party to reveal private information to an uninformed party

We have seen examples of signaling in previous chapters. As we saw in Chapter 16, firms may spend money on advertising to signal to potential customers that they have high-quality products. As we saw in Chapter 20, students may earn college degrees to signal to potential employers that they are high-ability individuals. Recall that the signaling theory of education contrasts with the human-capital theory, which asserts that education increases a person's productivity, rather than merely conveying information about innate talent. These two examples of signaling (advertising, education) may seem very different, but below the surface, they are much the same: In both cases, the informed party (the firm, the student) is using the signal to convince the uninformed party (the customer, the employer) that the informed party is offering something of high quality.

What does it take for an action to be an effective signal? Obviously, it must be costly. If a signal were free, everyone would use it, and it would convey no information. For the same reason, there is another requirement: The signal must be less costly, or more beneficial, to the person with the higher-quality product. Otherwise, everyone would have the same incentive to use the signal, and the signal would reveal nothing.

Consider again our two examples. In the advertising case, a firm with a good product reaps a larger benefit from advertising because customers who try the product once are more likely to become repeat customers. Thus, it is rational for the firm with a good product to pay for the cost of the signal (advertising), and it is rational for the customer to use the signal as a piece of information about the product's quality. In the education case, a talented person can get through school more easily than a less talented one. Thus, it is rational for the talented person to pay for the cost of the signal (education), and it is rational for the employer to use the signal as a piece of information about the person's talent.

The world is replete with instances of signaling. Magazine ads sometimes include the phrase "as seen on TV." Why does a firm selling a product in a magazine choose to stress this fact? One possibility is that the firm is trying to convey its willingness to pay for an expensive signal (a spot on television) in the hope that you will infer that its product is of high quality. For the same reason, graduates of elite schools are always sure to put that fact on their résumés.

CASE STUDY GIFTS AS SIGNALS

A man is debating what to give his girlfriend for her birthday. "I know," he says to himself, "I'll give her cash. After all, I don't know her tastes as well as she does, and with cash, she can buy anything she wants." But when he hands her the money, she is offended. Convinced he doesn't really love her, she breaks off the relationship.

What's the economics behind this story?

In some ways, gift giving is a strange custom. As the man in our story suggests, people typically know their own preferences better than others do, so we might expect everyone to prefer cash to in-kind transfers. If your employer substituted merchandise of his choosing for your paycheck, you would likely object to this means of payment. But your reaction is very different when someone who (you hope) loves you does the same thing.

One interpretation of gift giving is that it reflects asymmetric information and signaling. The man in our story has private information that the girlfriend would like to know: Does he really love her? Choosing a good gift for her is a signal of his love. Certainly, the act of picking out a gift, rather than giving cash, has the right characteristics to be a signal. It is costly (it takes time), and its cost depends on private information (how much he loves her). If he really loves her, choosing a good gift is easy because he is thinking about her all the time. If he doesn't love her, finding the right gift is more difficult. Thus, giving a gift that suits the girlfriend is one way for him to convey the private information of his love for her. Giving cash shows that he isn't even bothering to try.

The signaling theory of gift giving is consistent with another observation: People care most about the custom when the strength of affection is most in question. Thus, giving cash to a girlfriend or boyfriend is usually a bad move. But when college students receive a check from their parents, they are less often offended. The parents' love is less likely to be in doubt, so the recipient probably won't interpret the cash gift as a signal of lack of affection. ●

"NOW WE'LL SEE HOW MUCH HE LOVES ME."

Screening to Induce Information Revelation

screening
an action taken by an uninformed party to induce an informed party to reveal information

When an informed party takes actions to reveal his private information, the phenomenon is called signaling. When an uninformed party takes actions to induce the informed party to reveal private information, the phenomenon is called **screening**.

Some screening is common sense. A person buying a used car may ask that it be checked by an auto mechanic before the sale. A seller who refuses this request reveals his private information that the car is a lemon. The buyer may decide to offer a lower price or to look for another car.

Other examples of screening are more subtle. For example, consider a firm that sells car insurance. The firm would like to charge a low premium to safe drivers and a high premium to risky drivers. But how can it tell them apart? Drivers know whether they are safe or risky, but the risky ones won't admit it. A driver's history is one piece of information (which insurance companies in fact use), but because of the intrinsic randomness of car accidents, history is an imperfect indicator of future risks.

The insurance company might be able to sort out the two kinds of drivers by offering different insurance policies that would induce them to separate themselves. One policy would have a high premium and cover the full cost of any accidents that occur. Another policy would have low premiums but would have, say, a $1,000 deductible. (That is, the driver would be responsible for the first $1,000 of damage, and the insurance company would cover the remaining risk.) Notice that the deductible is more of a burden for risky drivers because they are more likely to have an accident. Thus, with a large enough deductible, the low-premium policy with a deductible would attract the safe drivers, while the high-premium policy without a deductible would attract the risky drivers. Faced with these two policies, the two kinds of drivers would reveal their private information by choosing different insurance policies.

Asymmetric Information and Public Policy

We have examined two kinds of asymmetric information: moral hazard and adverse selection. And we have seen how individuals may respond to the problem with signaling or screening. Now let's consider what the study of asymmetric information suggests about the proper scope of public policy.

The tension between market success and market failure is central in microeconomics. We learned in Chapter 7 that the equilibrium of supply and demand is efficient in the sense that it maximizes the total surplus that society can obtain in a market. Adam Smith's invisible hand seemed to reign supreme. This conclusion was then tempered with the study of externalities (Chapter 10), public goods (Chapter 11), imperfect competition (Chapters 15 through 17), and poverty (Chapter 20). These examples of market failure showed that government can sometimes improve market outcomes.

The study of asymmetric information gives us a new reason to be wary of markets. When some people know more than others, the market may fail to put resources to their best use. People with high-quality used cars may have trouble selling them because buyers will be afraid of getting a lemon. People with few health problems may have trouble getting low-cost health insurance because insurance companies lump them together with those who have significant (but hidden) health problems.

Although asymmetric information may call for government action in some cases, three facts complicate the issue. First, as we have seen, the private market can sometimes deal with information asymmetries on its own using a combination of signaling and screening. Second, the government rarely has more information than the private parties. Even if the market's allocation of resources is not first-best, it may be second-best. That is, when there are information asymmetries, policymakers may find it hard to improve upon the market's admittedly imperfect outcome. Third, the government is itself an imperfect institution—a topic we take up in the next section.

QUICK QUIZ A person who buys a life insurance policy pays a certain amount per year and receives for his family a much larger payment in the event of his death. Would you expect buyers of life insurance to have higher or lower death rates than the average person? How might this be an example of moral hazard? Of adverse selection? How might a life insurance company deal with these problems?

POLITICAL ECONOMY

As we have seen, markets left on their own do not always reach a desirable allocation of resources. When we judge the market's outcome to be either inefficient or inequitable, there may be a role for the government to step in and improve the situation. Yet before we embrace an activist government, we need to consider one more fact: The government is also an imperfect institution. The field of **political economy** (sometimes called the field of *public choice*) applies the methods of economics to study how government works.

political economy
the study of government using the analytic methods of economics