



Organization and Management of the Firm

PREVIEW QUESTIONS

When you finish studying this chapter, you should be able to answer the following questions:

What is a firm?

Why do we have production organized in firms?

What is the goal of the shareholders (owners) of a firm?

What rule does a firm follow to maximize profits?

What are the problems created by team production?

How do agency costs affect the structure of contracts in a firm?

What is the difference between a moral hazard and an adverse selection problem?

Why do investments in specific assets cause the holdup problem?

In February 1990, Forbes *predicted* potential for growth in the shipping stocks. At the time, Forbes *economic fundamentals* looked good. Shipping was growing faster than cargo rates were increasing. The potential for higher profits was excellent. But in June 1993, Forbes admitted that its analysis hadn't worked out as planned. Higher insurance rates, costly new regulations following the Exxon Valdez oil spill in Alaska, and the 1990–1991 recession worked against its forecast. Investors who bought the shipping stocks mentioned in the first article lost an average of 28 percent. Investors who bought stock in some self-liquidating firms—firms formed to buy secondhand vessels for sale in the future—lost almost 90 percent. Particularly annoying to Forbes was the likelihood that the managers of these self-liquidating firms were paying themselves fat fees from cash flow while investors suffered huge losses. How can management do this? If it is true, can it be prevented? What is it about the structure of the modern business firm that occasionally leads to tales such as this?

Our exposure to modern business firms is multifaceted: We are customers when we purchase goods and services; we are employees in the workplace; and we are investors when we purchase bonds or shares of stock. Each of these activities casts a different light on business firms, but each

activity is an integral part of the structure of the organization we call a firm. Generally, these activities are managed within the firm to increase the wealth of the firm's owners. We begin our analysis of firms and their behavior with the view that the present structure—rules, contracts, and procedures—increases the wealth of the firm's owners.

But not every activity within a firm is consistent with maximizing the wealth of the firm's owners. Mistakes are sometimes made, which can be very costly. A newly recruited manager may not work out, for example, and valuable time has been lost in the process of sorting out this fact. To better understand the problems that can arise, we explore several aspects of the business firm, including its generally accepted objective of profit maximization; behavioral problems that arise as a firm tries to manage its business activities; and situations that affect how managers of a firm interact with employees, customers, and suppliers. We focus on several fundamental questions: Why is most production organized in firms? (The answer here helps explain why firms exist in the first place.) Why do owners choose the profit-maximizing goal? How can owners align the goals of managers with the goal of maximizing profit? We also discuss many agency problems, including problems of shirking, moral hazard, adverse selection, and end-of-period contracts, and we explain how firms adjust to these problems. Finally, we consider other forms of organizations, particularly nonprofit firms, and explain how many nonprofit firms are organized and operated.

7.1 WHAT IS A FIRM?

As a practical matter, the modern business firm is a legal entity formed by charter with a state government. The charter and federal and state laws determine much of what a firm can and cannot do. In economic terms, however, a business firm takes on much more meaning and shape than simply a legal entity subject to state and federal laws. For example, it may or may not have a charter from the state. More generally, it is an organization formed to produce goods and services to sell for a profit. The firm hires workers, hires or buys capital and other resources, applies management skills, and takes risks to pursue its goals. If a business firm survives over time as an independent organization, then it is at least one efficient means of providing goods and services. To an economist, a firm is more than a legal entity; it is an integral part of the marketplace, playing an important role by supplying goods and services at least cost to consumers.

Firm

An organization in which there is more than one employee working as part of a team to produce a good or service. The team is linked together by explicit and implicit contracts.

WHY DO FIRMS EXIST?

In economic terms, firms exist because they can provide goods and services to customers at less cost than the customers can produce the items themselves. Some consumers make their own ice cream, for example, but the vast majority buy it at grocery stores or franchise outlets. Many companies have lawyers and accountants on their payrolls while others buy these services from other firms.

Some consumers choose to mow their lawns and clean their own gardens while others use professional help for these activities. Some firms own their own delivery trucks (United Parcel Service is an example) while other firms rent delivery trucks from trucking companies such as Ryder System, Inc. Although it may be tempting to suggest that the size of a firm explains how firms are organized, this would be incorrect. These examples make a distinction between firms that have organized production of certain activities within their own structure and those who rely on the *marketplace* for certain inputs. Essentially, the question “Why do firms exist?” becomes “What determines the extent to which a firm chooses to make or to buy the goods and services that it uses in production?”

Consider what would happen if production activities were not integrated within firms, but instead *all* production activity relied on the marketplace. Individuals would contract with each other for goods and services. In effect, all production activity would be in the form of a “cottage industry.” There would be no managers and employees, just entrepreneurs creating products without the assistance of others. But in contemporary terms, this is not how most production is organized. Most production is organized in business firms, some with few and some with many employees, who acquire *some* inputs to the production process from the marketplace, *but not all*.

IN-HOUSE OR MARKET-BASED PRODUCTION

To determine whether to use the marketplace to acquire inputs, a firm acts in its self-interest. As a consequence, a firm compares the cost of using the marketplace to the cost incurred from its own production. When a firm uses the marketplace to supply inputs, there are transaction costs. These costs arise for at least four important reasons:¹

1. Monitoring the quality of production or delivery of services is costly.
2. Negotiating price and delivery schedules is costly.
3. Monitoring contract performance is costly.
4. It is costly to enforce contracts; that is, the use of the court system is costly.

When a firm produces within its own structure, or in-house, as opposed to relying on the marketplace, it incurs managerial costs. Managerial costs include the costs of monitoring production to ensure quality, contracting costs, and other costs of coordinating production activities within the firm. It should be clear that managerial costs include some of the same costs incurred when a firm uses the marketplace. Monitoring to ensure quality, for example, is a cost that arises in both cases. The difference is that the size of the monitor-

Transaction Costs
Costs that arise from negotiating and completing a transaction with another firm or independent party.

Managerial Costs
The costs of organizing, monitoring, and coordinating production within the firm.

¹ The transaction cost approach to the existence of firms has a host of contributors. The first article to develop the idea was by 1991 Nobel laureate Ronald Coase: “The Nature of the Firm,” *Economica* 4 (1937), 386–405. Many of the subsequent contributions, including a discussion of teamwork, are summarized in Armen A. Alchian and Susan Woodward, “Reflections on the Theory of the Firm,” *Journal of Institutional and Theoretical Economics* 143 (March 1987), 110–136.

ing cost may vary depending on whether the firm uses the market or produces in-house. In addition, the remedies a firm may seek differ between the two approaches, which affects their relative cost. In-house production lets a firm single out specific individuals or parts of the organization to discipline if the production process is not operating correctly, whereas using the market does not generally allow this flexibility. If the firm uses the market and is not satisfied, then it may renegotiate, end its relationship with the other party, or use the courts to seek a remedy, but it cannot tell the other party how to run its business—how to reorganize its production process or who to fire—primarily because it does not have the information necessary to solve the other firm's problem.

A firm compares the cost of using the marketplace to the managerial cost of in-house production to determine how to organize its production process. If the cost of purchasing a given input to the production process from the marketplace is less than the managerial cost of producing it in-house, then the firm purchases this input from the marketplace. If the reverse is true, then the firm produces in-house. These arguments allow us to make the following observation about why firms exist:

The parts of the production process are organized and managed within a firm when this is less costly than using the market to supply these parts of the production process.

Clearly, in many cases, the frequency of use tips the scale in favor of in-house production. A firm that regularly prints and mails promotional material often will find it advantageous to develop an in-house printing service. Firms that print brochures only once a year will probably purchase these services from the marketplace. A well-organized firm makes a comparison between the costs of using the market and the costs of in-house production on a regular basis, so that it can produce its output at least cost, making it a strong competitor in its output market.

7.2 THE PROFIT-MAXIMIZING GOAL

Given that firms exist, what goal do they try to accomplish? Do firms try to maximize profits? A firm could conceivably maximize its sales, employment, growth rate, or any number of possible variables. Let's explore why firms are assumed to maximize profits and in later sections discuss the many practical problems that affect the attainment of the profit-maximizing goal.

Shareholder
An owner of shares in a corporation; shareholders own the rights to the firm's residual payments.

WHY MAXIMIZE PROFITS?

One compelling reason why managers are given the goal of maximizing profits is to provide the firm's owners with the greatest increase in their wealth. A **shareholder**, who is an owner of the firm's profits (profits are also called the **residual** after paying prior claims, which makes shareholders

Residual
The residual of a firm is its profits, that is, the difference between total revenues and total costs, including the opportunity cost of all resources used.

Residual Claimants
The owners of a firm's profits. If the firm is a corporation, then the owners are the shareholders.

residual claimants), finds that his or her budget constraint is relaxed, so that bundles containing more goods can be purchased, when income increases. The change in the budget constraint allows the shareholder to choose a more preferred bundle of goods. Goals other than profit maximization may increase shareholders' income, *but not by as much as the profit-maximizing goal*. Thus, by offering the *greatest* increase in wealth, the profit-maximizing goal offers the greatest potential increase in shareholders' satisfaction.²

SELECTING THE OPTIMAL OUTPUT

Assuming that managers wish to maximize profits, how do they decide on the optimal output rate? If there is a simple rule to follow, then everyone—employees, managers, and owners—will gain when the rule is known to all. There is a general rule: marginal revenue equals marginal cost. Let's see how it works.

Let Q denote the firm's output rate; $R(Q)$ the total revenue generated from an output rate of Q units per period; and $C(Q)$ the costs of producing Q units of output, where costs include the direct expenses plus the opportunity costs of all resources used in production. Both total revenue and total cost are a function of the output rate, so profits are also a function of the output rate. Thus, profits of a firm, denoted by $\pi(Q)$, may be written as

$$\pi(Q) = R(Q) - C(Q) \quad (7.1)$$

Note that $C(Q)$ is the cost function of the firm *given its present organizational structure*. Costs may be higher or lower than those of similar firms in the industry, depending on how successful the firm's structure is in aligning the behavior of employees, managers, and outside vendors with the profit-maximizing goal of its owners.

THE MARGINAL-REVENUE-EQUALS-MARGINAL-COST RULE

Because owners desire to maximize profits, they seek to follow a rule or procedure that will maximize equation (7.1). This problem is solved using the *equimarginal principle* first discussed in Chapter 1. To apply this principle, we want to find the output rate at which marginal benefits are equal to marginal costs. Using equation (7.1), we see that the marginal benefits to the firm arise from changes in total revenue. Similarly, marginal costs arise from changes in total cost. Analytically, the slope of the revenue function at a given output rate, $\Delta R(Q)/\Delta Q$, is called the marginal revenue of the firm, and the slope of the cost function, $\Delta C(Q)/\Delta Q$, is called the marginal cost of the firm at a

² Shareholders may consider other goals for a firm, such as maximizing the utility of wealth, not just maximizing wealth. Louis Makowski's research entitled "Competitive Stock Markets" [*Review of Economic Studies* 50 (April 1983), 305–330] has shown that shareholders unanimously prefer wealth maximization as a goal, even if they are individually averse to risk.

given output rate. In effect, **marginal revenue** is the change in total revenue for a small change in output, and **marginal cost** is the change in total cost for a small change in output. From equation (7.1), we can see that the marginal change in profit, $\Delta\pi(Q)/\Delta Q$, equals the difference between marginal revenue and marginal cost:

$$\frac{\Delta\pi(Q)}{\Delta Q} = \frac{\Delta R(Q)}{\Delta Q} - \frac{\Delta C(Q)}{\Delta Q} = 0 \quad (7.2)$$

Equation (7.2) offers a general rule for profit maximization:

A firm continues to increase production until it finds an output rate at which marginal revenue is equal to marginal cost:

That is,

$$MR(Q) = MC(Q) \quad (7.3)$$

Why must equation (7.3) hold? We can think of a firm's managers as operating in steps to maximize profits. They are always asking themselves whether the next step will increase or decrease profits. The steps here are the additional output the firm produces. To determine whether an addition to the output rate increases profits, we must compare the increase in total revenue to the resulting increase in costs. If the change in total revenue exceeds the change in total costs, then the additional output increases profit, and the managers should produce the extra output. But where does this process stop? There will be some point at which an increase in the output rate raises total revenue and total cost by the same amount. In this circumstance, the firm breaks even on the additional output. It should stop here, because if it goes further, it will find that the increase in total costs exceeds the increase in total revenue, which implies that profit is falling. This result is exactly what is implied by condition (7.3). Marginal revenue is the change in total revenue for a small change in output, and marginal cost is the change in total cost for a small change in output. Thus, by finding the output rate at which marginal revenue equals marginal cost, the firm's managers have exhausted all opportunities to increase profits by increasing the output rate. This condition is telling the managers not to go further; that is, they should stop while they are breaking even with the last units added to output.

There is a technical condition that is also required to hold if equation (7.3) is to define maximum profits instead of minimum profits:

The slope of the marginal cost curve must exceed the slope of the marginal revenue curve.

In most all cases this condition will hold, but you must keep it in mind because there are unusual cases in which the condition is not satisfied.

In summary, we can say that if the managers of a firm follow the rule that marginal revenue equals marginal cost, specified in equation (7.3), they will produce an output rate that fulfills the owners' goal of maximizing profits. It cannot be overemphasized, however, that the organizational structure of a firm affects its costs. In poorly managed firms, a rule or procedure change that

Marginal Revenue
The amount by which total revenue changes when output changes by a small amount—usually by one unit.

Marginal Cost
The amount by which total cost changes when output changes by a small amount—usually by one unit.

changes employee incentives may lower costs, which then affects marginal cost and, consequently, the firm's optimal output rate and corresponding maximum attainable level of profits.

LEARNING EXERCISE 7.1

Assume that $MR(Q) = 50$ and that $MC(Q) = 20 + 0.2Q$. Solve for the profit-maximizing level of output.

MATH NOTEPAD

A Numerical Example of Profit Maximization

To see how to use the profit-maximizing rule, let's consider a numerical example. Suppose the firm can sell its output at the market price of \$10 per unit; then $R(Q) = 10Q$. Let's also say that costs can be approximated by a quadratic equation, $C(Q) = 10 + 5Q + 0.1Q^2$. Marginal revenue is equal to the change in total revenue when output changes by a small amount. If the output rate changes by 1 unit, say, then marginal revenue is equal to \$10, that is, $MR(Q) = \$10$. Similarly, marginal cost for this cost function may be written as $MC(Q) = 5 + 0.2Q$. Technically, $MC(Q) = [C(Q + \Delta Q) - C(Q)]/\Delta Q$ as ΔQ approaches zero. Substituting for the cost function gives $MC(Q) = [10 + 5(Q + \Delta Q) + 0.1(Q + \Delta Q)^2 - 10 - 5Q - 0.1Q^2]/\Delta Q$. Canceling terms and assuming that $(\Delta Q)^2$ is infinitesimally small as ΔQ approaches zero yields $MC(Q) = 5 + 0.2Q$. The marginal-revenue-equals-marginal-cost rule in equation (7.3) implies that the profit-maximizing output is the solution to $10 = 5 + 0.2Q$. Rearranging terms yields $Q^* = (5/0.2) = 25$. At 25 units of output, profits are given by

$$\pi(Q) = (10 \times 25) - 10 - (5 \times 25) - (0.1 \times 25^2) = \$52.50$$

The firm earns \$52.50 per period by producing 25 units of output. No other output rate offers as high a profit rate. We know this from checking the second-order conditions. That is, the slope of the marginal cost function equals 0.2 and the slope of the marginal revenue function equals 0, so the second-order condition is satisfied. We can also derive this result by trying any other output rate in the profit expression; the profit rate you calculate will be less than \$52.50 per period. As a final exercise, you should compute the output rate at which profits are zero (or nearly zero). You should find that the answer is between 2 and 3 units of output.

7.3 THE CONTRACT-BASED APPROACH TO FIRM STRUCTURE

We've developed a simple rule for managers to follow to maximize profits, but why would managers act this way? If they don't work hard, they gain more leisure time. Employees could follow the managers' example and gain more leisure time, too. Fairly soon, the output rate of the firm would be lower than

its profit-maximizing rate. The managers and employees would be better off, but, of course, the owners of the firm would be worse off. Thus, the simple rule developed above ignores a basic problem that owners face: How do they align the goals of managers and employees with their own goal of maximizing profits?

The contract-based approach to firm structure and organization is one way that firms address this issue. Using this approach, we can determine whether managers and employees have or don't have incentive to maximize profits. We can also investigate which contracts provide optimal incentives and which ones create problems, and we can discuss some problems that cannot be solved with simple contractual arrangements. Let's explore the implications of this approach further, starting with a discussion of team behavior.

THE BEHAVIOR OF TEAMS

Most, if not all, of the output that is produced within a firm is the result of teamwork. Employees and managers alike are part of a team that works together to produce the firm's output. A team will stay in existence if it can produce more output than the sum of the output that team members can produce when they work independently. If this is not true, the managers of the firm have an incentive to disband the team to allow its members to work independently.

Team

A collection of individuals working jointly to produce a product or service, or a specific part of a product or service.

A team does not come by its output advantage magically but rather through a combination of the production technology and the contracts that are agreed to between team members and the firm. The production technology dictates what is possible with team production versus individual production. In a simple case, two individuals can move furniture for a moving company much more quickly and with less damage than a single individual. Some furniture pieces, in fact, may not be movable by a single individual. So, team production dominates in the furniture-moving industry.

The contracts between the firm and team members define the benefits of team production as well as the restrictions the firm places on individual team members. The benefits include a paycheck if output is produced in a timely manner and, generally, an implicit understanding that the paycheck will continue as long as team production within the firm is cheaper than using the marketplace. These contracts may also specify restrictions on the behavior of team members. Some restrictions include firing only for cause, the hours during which the team must work and limits on each member's ability to contract with others for similar services—for example, an employee cannot also work for a competing firm.

LEARNING EXERCISE 7.2

Team production also occurs in a household, particularly for the raising of children. Yet, there has been an enormous increase in the purchase of market-produced child-care services in the past two decades. What are some of the reasons why households have substituted market services for "in-house" services?

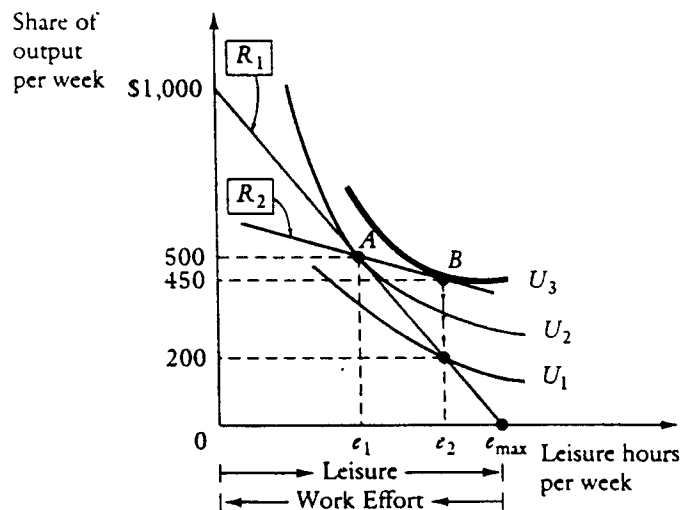
THE INCENTIVE TO SHIRK

Shirking

Changing work effort in a manner that imposes a cost on other team members.

Team production generally increases output relative to individual production, but it also creates costs that are not present in individual production. One cost is the possibility of **shirking**: members of a team have an incentive to perform less than expected, or shirk, if their behavior may not be detected. Shirking can take many forms, from not completing an assignment on time to failing to vigorously block a pass rusher in a football game. Because the output of a team cannot be attributed to an individual member, the costs of shirking by one member are spread across all other members. In contrast, when output is produced individually, the cost of shirking is born by the person who shirks.

The incentive to shirk is shown in Figure 7.1. This diagram is similar to the labor versus leisure trade-off we discussed in Chapter 5. We have assumed that output is produced using five team members. For simplicity, let's assume that these five individuals design, assemble, and market Hawaiian kites. The reward line labeled R_1 shows the relationship between leisure (or more work effort) for a single team member and a team member's share of output *under the assumption that no one in the team shirks*. Basically, we can interpret reward

**FIGURE 7.1**

The Incentive for an Individual Team Member to Shirk

Reward line R_1 shows the trade-off between leisure and income for a single team member when all team members share equally in the output and work equally hard. Initially, the individual selects bundle A as the optimal bundle. This bundle contains e_1 units of leisure and \$500 per week of income. Reward line R_2 is available to the individual if he or she alone changes consumption of leisure; the other team members must continue to consume e_1 units of leisure per week. Bundle B on reward line R_2 is optimal; it offers more satisfaction than bundle A . This individual consumes e_2 units of leisure per week in bundle A . Income for *all* team members is reduced to \$450 per week. Because shirking increases satisfaction for one team member, all team members have an incentive to shirk, thereby destroying the viability of the team.

line R_1 as the trade-off a single team member faces when all team members supply the *same* amount of effort to the job. We will assume that team members share equally in the value of the kites produced. In effect, then, reward line R_1 splits the output of the team equally among all five team members.

Optimizing Behavior

For simplicity, we also assume that team members have identical preferences, so they will have identically shaped indifference curves. Three indifference curves are shown in Figure 7.1: U_1 , U_2 , and U_3 . The absolute value of the slope of these curves at any point is a measure of the marginal rate of substitution between leisure and income produced from working with the other team members. Recall that a consumer is optimizing in his or her choice of leisure and income when the marginal rate of substitution is equal to the wage rate. In this case, the wage paid per period is determined by the output produced by all five team members. The absolute value of the slope of reward line R_1 is equivalent to the wage rate for the individual we are analyzing. So, optimal behavior requires the individual to select the amount of leisure (or equivalently, work effort) at which the reward line is tangent to an indifference curve. At the point of tangency, the marginal rate of substitution between leisure and work equals the absolute value of the slope of the reward line.

If all five team members choose to work all the time—a zero level of leisure—then *each* team member will receive \$1,000 per week, which is equal to the total value of kites produced divided by 5 (\$5,000/5). With *no shirking*—that is, we are on reward line R_1 —the marginal rate of substitution equals the absolute value of the slope of the reward line at point A . In this optimal bundle, each team member selects e_1 units of leisure per week, which produces \$2,500 in total output value that pays \$500 in weekly income to each team member.

Shirking Allowed

Now, if we allow shirking, reward line R_1 will no longer be the relevant one for the shirking team member. Shirking occurs when one team member increases his or her leisure while the other team members do not change their leisure consumption. If one member of the team shirks, then output will fall, but the shirking team member will not bear the full cost of the decrease in output because it is shared equally with the other members of the team. If the shirking team member selects a leisure rate equal to e_2 units—holding the effort of the other team members at e_1 —then total output value will fall by \$250, reducing each team member's weekly pay to \$450. The shirking team member is moving along reward line R_2 while the other team members remain at point A on reward line R_1 . Reward line R_2 offers more income at each leisure rate for leisure rates to the right of e_1 . In effect, the other team members are paying for four-fifths of the cost of the extra leisure consumed by the shirking member. The shirking team member now finds that bundle B is optimal. The satisfaction achieved by the shirking member at bundle B —given by indifference curve U_3 —has increased relative to the satisfaction received at the no-shirking bundle, A . The shirking team member is better off by shirking *if none of the other team members change their behavior*.

The other team members are not likely to enthusiastically accept the shirking by one member. If all team members change their leisure rate to e_2 , then they are no longer subsidizing the shirking team member. Total output of kites falls as a result, which decreases the weekly pay of each team member to \$200. The level of satisfaction also declines— U_2 and U_3 compared to U_1 . So shirking by one team member reduces the incentive of the whole team to work, which makes *all* team members worse off.

MANAGING A TEAM TO PREVENT SHIRKING

You may reason, of course, that there may be no end to the shirking created by the example in Figure 7.1. Team members may continue to shirk until there is no output produced, that is, until the leisure rate is equal to $e_{\max}$, the maximum leisure that can be consumed in a week. Obviously, if this occurs, the team is no longer a team. Two aspects of the problem may create this result.³ First, team production leads to a sharing of kite output, so the full cost of shirking is not borne by the shirking team member. Second, the team stays together until the bitter end. If members can be “fired” by other team members and new members “hired” to replace them, then there may exist a sufficient threat to prevent the shirking cycle from reaching a point at which the team falls apart. The threat of firing causes individual team members to shirk less than if there was no possibility of firing. Although kite output is still reduced by shirking when firing is possible, the threat of firing makes the team itself viable.

Because shirking behavior decreases output, it is likely to decrease a firm's profits, so shareholders have an incentive to reduce such behavior. We can see a clear role for managers in such situations. Managers monitor the team for shirking behavior and implement appropriate penalties if it is detected. The nonshirking team members are made better off if the managers can effectively perform this task. By monitoring and possibly firing shirking employees, managers can generally reduce the quantity of shirking, but they cannot totally eliminate it. In effect, firms try to internalize the cost of shirking to those who are shirking. The use of profit sharing contracts is one way firms try to internalize the losses caused by shirking. Various other approaches are used, too, and many of these are discussed below.

LEARNING EXERCISE 7.3

In Figure 7.1, why is the share of output on the shirking reward line, R_2 , below the share of output on the no-shirking reward line, R_1 , when the leisure rate is below e_1 ?

³ The 100 percent leisure solution may not occur if the individual indifference curves are relatively flat at $e_{\max}$. If four workers shirk and provide no work effort, the fifth worker receives only one-fifth of any output he or she chooses to produce. This worker may choose to work if the slope of indifference curve is less than (in absolute value) one-fifth the slope of reward line R_1 .

CONTRACTING FOR PROFIT-MAXIMIZING BEHAVIOR

Because a firm is composed of many parts, contracts are necessary to define the relationship between these parts. The contract-based approach to the theory of a firm explains the behavior of a firm as influenced by the incentives created by the contracts it adopts. According to this approach, the firm's employment rules, debt contracts, contracts with outside vendors, contracts with customers, and all other contracts can be interpreted in light of how they help to maximize profits.

Poor performance of a firm, relative to other firms in the same industry, may be attributed to poorly designed contracts. In such a case, the existing contracts in a firm do not provide some part of the firm—often it is the managers—with an incentive to maximize profits. Poor performance may lead shareholders to change the firm's contracts, which can be accomplished in various ways. Mergers with other firms, leveraged buyouts by management groups, and hostile takeovers can often be viewed as an attempt to restructure a firm's contracts so that they provide *all* parts of a firm with an incentive to maximize profits.

7.4 COORDINATING AND MONITORING PRODUCTION

As owners, shareholders face numerous problems when they try to align the incentives of others with their own profit-maximizing objective. In this section, we review some of these problems, emphasizing the agency problem, the high cost of coordinating production when the firm has many owners, the problems of moral hazard and adverse selection, and the problem of end-of-period incentives. In retrospect, we will find that much of the organizational structure of a firm is designed to reduce shirking as well as mitigate these many other problems in order to maximize profits for shareholders.

THE AGENCY PROBLEM

The agency problem is a permanent fixture on the corporate landscape, but it also permeates nearly all economic transactions in one way or another. To illustrate the problem, suppose you contract with a builder to construct an addition to your house. The addition is of a simple design—four sides and a roof, three windows, one outside door, two interior walls, and electrical connections—that does not require complicated construction techniques. You sign a contract with JustRite Builders to construct the addition. As the structure is nearing completion, you notice—entirely by accident—that the interior walls have a hollow sound when you tap on them. A closer inspection reveals that the studs used to frame these walls are too far apart. The contractor assures you that the walls are structurally sound, but you are still doubtful. What has happened here? The contractor has saved some money and time by building substandard interior walls. The contractor's incentive is to cut cost to increase profits when cost-cutting measures cannot normally be detected; your goal is to purchase a durable structure. These two goals conflict with one another, as tapping the interior walls has revealed.

Principal
The individual or party who initiates some action.

Agent
The individual or party responsible for performing the action requested by the principal.

Agency Costs
Costs the principal incurs because of some action by an agent.

In this example, you are the **principal**, because you initiated the project, and the contractor is the **agent**, the one charged with carrying out your goals. Legally, the agent is one who is authorized to act for, or in place of, another. In this case, the agent is acting for the principal.

The agency problem arises because the goals of the agent are not always aligned with the goals of the principal.

When the two goals diverge, there are agency costs that the principal may incur because of some action the agent takes. In the house addition example, the agency costs are the monitoring costs to detect the problem plus the costs you may incur in the future to fix the problem if it goes undetected during construction.

THE MANY FORMS OF AGENCY

In a firm, principal and agent relationships exist on many levels. These levels are described in Figure 7.2. The two most common agency problems in a firm are:

1. The divergence in goals between the owners or shareholders and the managers, which may represent itself as a conflict between the shareholders and the board of directors and then, possibly, the board of directors and the managers

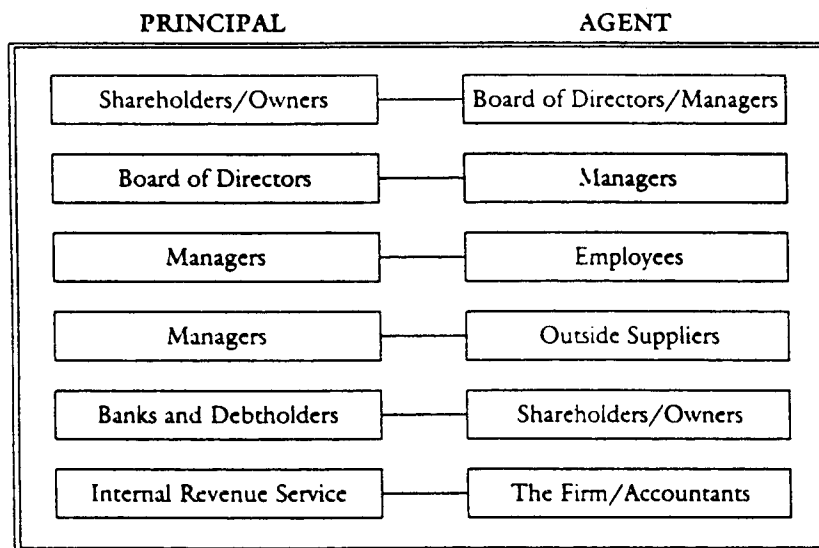


FIGURE 7.2

The Agency Relationships in a Firm

Six typical principal-agent relationships are described. The first four are internal to the firm and its organizational structure. The last two are principal-agent relationships that arise between the firm and outsiders.

2. The incentive of shareholders to transfer wealth from bondholders or, collectively, debtholders

Note that the **board of directors** is the governing body of a company; its members are elected by a vote of the company's shareholders.

In the first instance, the conflict arises because managers own less than 100 percent of the firm, so they may have an incentive to shirk or otherwise increase their satisfaction at the expense of shareholders. Executive perks, such as first-class travel, posh offices, art galleries in the executive suites, and country club memberships, are a few of the purported examples of how managers increase their satisfaction (or benefits) at the expense of shareholders. Managers may also work relatively slowly to find new investments that offer a positive net present value if the return on these investments accrues only to shareholders.

Although shareholder/manager conflict surely exists, shareholders can anticipate such problems, and they can adjust management contracts and the value they place on ownership in the firm to allow for such problems. Consider, for example, how a firm typically evolves over time. Initially, firms are small, with only a few owners, limited capital funds, and an innovative idea or product. The owners are nearly always the managers of such small firms—called owner-manager firms. These firms grow if their idea or product is successful in the marketplace. The now classic example is Apple Computer, which started in a garage and grew to become a multibillion-dollar company in less than ten years. At some point in the firm's development, the owner-managers find that they need additional funds to continue the firm's growth. It is usually at this point that the owner-manager firm becomes a shareholder-*and*-manager firm, with the managers now owning less than 100 percent of the firm. If the agency problem between shareholders and managers is *fully anticipated*, then the price that the new investors (shareholders) offer the owner-managers for shares in the firm reflects a discount for the agency costs the managers are expected to impose on shareholders.

The original owner-managers bear all of the agency costs resulting from anticipated conflicts between shareholders and managers.

Board of Directors

A group elected by the shareholders to represent their interests with the firm's managers. The board of directors has the fiduciary responsibility to monitor the firm's managers.

CONFLICTS BETWEEN SHAREHOLDERS AND DEBTHOLDERS

The agency problem that arises between shareholders and debtholders can take many forms, but all instances involve an attempt to transfer wealth from debtholders to shareholders. When a debt contract is written, it will specify, at a minimum, the interest rate the firm must pay and a repayment schedule. The interest rate on the debt presumably represents the opportunity cost of the funds borrowed plus a premium for the riskiness of the firm. The riskiness of the firm is usually determined by the planned use of the funds, the likelihood of bankruptcy, and the variability of returns on the firm's past investments. A more risky firm is charged a higher interest rate because there is a higher probability that the debtholders will not receive all of their investment back. Once the interest rate is set, however, shareholders may encourage managers to find

and invest in riskier projects. Such projects would normally carry a higher interest charge from debtholders, but, because shareholders have locked in the interest rate, debtholders are stuck with a lower-than-market interest rate. In effect, debtholders are subsidizing shareholders by not charging them enough for the funds they have borrowed.

To prevent such behavior by shareholders, many debt contracts contain covenants that specify how the funds are to be used, restrictions on the riskiness of the firm's future investments, restrictions on the firm's ability to change its financial structure, and other restrictions. The Trust Indenture Act of 1939 contains a host of such "boilerplate" restrictions that debtholders typically incorporate in their contracts with firms.⁴

One benefit to shareholders of leverage, or debt, is that such contracts may help reduce the agency costs caused by managers. When a firm obligates itself to a debtholder, it guarantees a minimum level of performance in the contract. Interest and principal payments are scheduled on a regular basis, which means that managers must produce enough earnings to make these payments. If the payments are not made, the debtholders may become the owners of the firm through bankruptcy proceedings. Managers are then likely to lose their jobs and to find other employment more difficult to obtain—they are tainted by their own failure. Because of the consequences of bankruptcy, a large debt burden may cause managers to work harder to maximize profits, thereby reducing some—but never all—of the agency costs present between shareholders and managers.

UNANTICIPATED AGENCY COSTS

It is possible that shareholder and manager conflicts, shareholder and debtholder conflicts, and other agency conflicts may be mitigated by the contracts initiated when these relationships are first formed, but this view does not allow for *unanticipated* agency costs. Shirking by managers may be cleverly disguised and can change over time. Shareholders at the turn of the century worried about managers riding in private railroad cars or sleeping in luxurious suites on ocean liners crossing the Atlantic, but they surely did not anticipate the growth of air travel or the likely increasing value of the artwork found in some executive suites. So, while anticipated perks and shirking can be used to discount a stock's price, unanticipated perks and shirking continue to pose a problem.

For debtholders, new financial instruments seem to be the greatest worry. Interest rate swaps—contracts in which two parties exchange different interest payments on the same size principal amount—were a nearly nonexistent market in the early 1970s, for example, and are a multitrillion dollar market today. Such transactions may change the riskiness of the firm, which may increase the likelihood of default on debt contracts, thus costing the debtholder a bankruptcy expense that was not fully anticipated.

⁴ For an extensive analysis of bond covenants—that is, the clauses that restrict a firm's behavior after bonds are issued—see Clifford W. Smith and Jerold B. Warner, "On Financial Contracting: An Analysis of Bond Covenants," *Journal of Financial Economics* 7 (1979), 117–161.

SSS Price Theory in Practice**THE AGENCY PROBLEM AT THE IRS**

The problem a government faces as it tries to collect taxes from its citizens is a principal-agent problem. The problem arises from the implicit contract that exists between the government and taxpayers. The government—the principal—provides public services, and in return, citizens—the agents—pay the taxes necessary to provide these services. The problem is that many of the government's services are public goods; that is, they are produced for the benefit of all, without the ability to exclude anyone (e.g., national defense, interstate highways, law enforcement). In addition, nearly one-half of government expenditures are transfer payments that, in effect, take from one group and give to another. With public goods and transfer payments, each individual has an incentive to make someone else pay the cost while he or she still receives the benefits.

The Internal Revenue Service (IRS) is charged with the job of collecting the taxes owed by citizens. The task is complicated because it is difficult to discover tax cheating. Cheating behavior is often not observable—in other words, the government does not always know whether an individual purposely failed to report income or has simply made a mistake preparing a tax return. To fulfill its implicit contract, the government must monitor taxpayers, thereby providing an incentive for them to live up to their part of the implicit contract and pay their taxes.

Each year, the IRS audits over 100,000 taxpayer and corporate returns. Even with this effort, the IRS estimates that substantial income is not reported. The IRS estimated, for example, that \$9 billion in taxes was not paid in 1991 because individuals did not file tax returns and over \$50 billion was not paid because individuals underreported their income.

When the IRS does conduct an audit, however, the amount recovered is substantial. In 1990, for example, the IRS handled 4,322,000 delinquent returns at a cost of \$2.52 billion. Errors, cheating, or omissions led to the recovery of \$24.2 billion in taxes owed for a return of 860 percent on the IRS's investment.⁵

The IRS is fairly well organized in its program of audits. It is less expensive to catch an error (or cheating) on a simple return than on a complicated return. So, the average taxpayer is more likely to be caught than the wealthy individual or corporation. Because of the more than 1 billion W-2 and 1099 forms that businesses must file each year with the IRS, the actual income of the average taxpayer is partly observable. Those forms make it possible for the IRS to compute tax returns for nearly 40 percent of the country's taxpayers, primarily those with incomes under \$100,000.

In 1990, for example, the IRS billed a Connecticut college student \$125 in back taxes and another \$125 in penalties and interest. The student had worked several part-time jobs as a student during 1987 but did not file a tax return

⁵ *IRS Annual Report* Commissioner of the Internal Revenue Service, U.S. Treasury, GPO Publication 55, 1992.

because she believed she was exempt. The IRS computers used the information from W-2 forms to compile a tax return and send her a bill.

In contrast, IRS computers are not yet sophisticated enough to compute the exact taxes owed by wealthy taxpayers and corporations; they can only estimate taxes owed for these groups, and the estimates are often incorrect. To collect taxes on complicated tax returns, the IRS must devote significant labor resources to an audit. Budget constraints at the IRS limit its ability to conduct such audits; hence, sophisticated taxpayers and many firms have less incentive to reveal all their income.

As a result, there are differences in how the IRS monitors taxpayers. The IRS does not investigate nearly one-half of the people with incomes *over* \$100,000 who they think have failed to file tax returns. When some of those nonfilers file a return for a later year, nearly 11 percent receive refund checks even though they might actually owe money from a previous year. In contrast, IRS computers compile a tax bill for every person with income *under* \$100,000 who fails to file a return. No one in that group who files a return in a subsequent year receives a refund until the amount previously owed is paid. Although the monitoring approach of the IRS is discriminatory, it may be optimal given the cost of auditing sophisticated tax returns.

LEARNING EXERCISE 7.4

Under present laws, fines and prison terms may be imposed on individuals who are convicted of criminal tax fraud. Yet, there is still substantial underreporting of income. How would an increase in fines for cheating affect the amount of cheating? Does your answer depend on the IRS continuing its current monitoring policies? What do you think will happen to the amount of cheating if the individual tax rate is decreased?

END-OF-PERIOD PROBLEMS

The end-of-period problem is a special type of agency problem that arises when there is a terminal period specified in a contract. As the terminal period approaches, the incentive to perform under the contract changes. A worker who is about to retire, for example, may not work as hard as another worker who is many years from retirement. The last few airplanes produced under a government contract that is to be transferred to another firm may be of lower quality than airplanes produced before the firm discovered the contract was not to be renewed. In a corporate restructuring, key managers who expect to lose their jobs may spend their time looking for new employment instead of continuing to work productively in their present firm.

The end-of-period problem has an *unraveling* characteristic that must be taken into account in contracts. Suppose that you are a trusted bank teller and you are told that you will be fired in 30 days. On the thirtieth day, you have little incentive to remain trustworthy—for simplicity, let's say that there are no moral issues here and that the bank cannot pursue you after you leave the

company—so you might dip into the cash box for a little extra money. But if this is true on the thirtieth day, then it is at least partly true on the twenty-ninth day, so you will be less trustworthy on this day, too. What is partly true for the twenty-ninth day is again in some part true for the twenty-eighth day, and so forth. The problem unravels back to the day you are informed that you will be fired. From that day forward, your trustworthiness changes.

To help overcome the unraveling aspect of end-of-period problems, firms adopt contingent contracts. A worker nearing retirement, for example, may receive retirement benefits based on wages paid during each of the last five years, so workers have an incentive to be productive in the five-year period before retirement to keep their wages high. In the trustworthy employee case, workers may receive a severance package that is forfeited if they are caught cheating. The dollar value of the severance package is expected to be high enough to deter cheating activity. In other cases, such as the firing of a radio disc jockey, firms frequently give no notice that the employee is to be dismissed. On the day the person is fired, locks may be rekeyed and the employee may be “locked out” of the building. Such drastic action occurs when an employee has the potential to impose a large cost on the firm by his or her actions. By using obscenities over the airwaves, a radio disc jockey could cause a firm to be fined or to lose its FCC license.

The end-of-period problem often affects the design of a firm’s contracts. The firm attempts to overcome the problem by specifying contingencies that prevent contracts and incentives from unraveling.

LEARNING EXERCISE 7.5

What will happen to class attendance in your economics course if the final exam is made optional two weeks before the end of the semester?

7.5 THE SEPARATION OF OWNERSHIP AND CONTROL

Because there are typically many shareholders, there are potentially many “bosses” in a firm. If each “boss” tried to manage the firm’s production activities, there would be chaos. Shareholders of the modern business firm avoid such chaos by delegating or contracting with others to perform certain tasks within the firm, such as the coordination of production activities and the selection and planning of future investments. In effect, shareholders have set up a structure in which the *control* of most of a firm’s activities is transferred to others for a limited time period. In spite of the resulting agency problems—which include shirking by managers—most organizations are characterized by a *separation of ownership and control*.

BOARD OF DIRECTORS

Shareholders provide the capital a firm needs for its investment plans while also giving up a great deal of the control over how such funds are invested. In exchange for such control, managers set performance goals and reveal how

well the firm's investments are expected to perform. Given such information, shareholders can decide whether to invest in the firm's future. Of course, managers could always lie about their expectations and paint a rosy scenario to seduce shareholders to invest. To prevent such opportunistic behavior, shareholders elect a small group from their number to monitor the firm's top management. This group, called the board of directors, transfers managerial control to top managers for only a limited time period.

Generally, the board of directors consists of both outsiders and insiders, that is, people who do not work for the firm and people who do. Usually, the outsiders are individuals who have extensive business or academic experience and/or individuals who own large amounts of the firm's stock. The insiders are the managers the board interacts with most often, usually the president and the chief executive officer (CEO) of the firm.

Managers present their expectations of future investment returns to the board on a regular basis—at least quarterly in most companies. If the top managers acted opportunistically to misrepresent their expectations or they are simply wrong (and it is costly to be wrong), then the board of directors is charged with the duty to dismiss the top managers of the firm when the facts are known and to find top managers to replace those dismissed. So, in exchange for control over the use of shareholder's funds, top managers accept the consequences that follow when their expectations are not realized—they are fired.

WHO MONITORS THE MONITORS?

A board of directors appears to represent a sensible solution to the problem of too many "bosses"; that is, shareholders choose a small number of "bosses" to monitor their investments. But is it really a workable solution? For example, who monitors the board of directors to ensure that they are really acting on the behalf of the broader shareholder population? It is quite possible that the board of directors may be susceptible to nonpecuniary bribes from the firm's top managers. In other words, to keep their positions and the perks of board membership, the board may cast a positive light on the firm's financial performance, even if it is abysmal and top management is completely responsible for the bad performance. The broader shareholder population then has a really *big* problem—whom can it trust?

Generally, no single shareholder has much incentive to monitor the performance of a firm for all the other shareholders.

A shareholder who spends resources to monitor incurs all of the expense but enjoys only part of the gain; the rest of the shareholders share in the gain but not in the cost.

So, each shareholder will underinvest in monitoring, and the total monitoring effort will be less than that found in a firm owned by a single individual. The board of directors is expected to perform the monitoring function, but how can the board be trusted? Because of the agency problem, top managers may not always act to maximize profits; if they can coerce the board of directors

into believing that what is being done is acceptable, then the board is no longer acting as an effective monitoring body.

Three solutions have evolved to help solve the problem of who monitors the monitors. The first is that members of the board of directors are legally fiduciary agents of the shareholders, so they can be sued if they misrepresent the truth. In fact, they may be personally liable under certain circumstances for any fraud that they knowingly perpetrate as board members, and it is unlikely that so-called director's insurance will cover them in such situations. So, board members must think carefully about their actions if they could possibly misrepresent the truth by what they do.

The second solution is for the shareholders to transfer the monitoring function to individual board members for only a limited time. If a director is acting inappropriately, shareholders may choose to vote for another nominee to fill that director's place on the board when his or her term expires.

The third and most important solution involves a market for corporate control that greatly limits the discretion of the board of directors and top management.⁶ Suppose the agency problem begins to manifest itself in a way that lowers the value of ownership in the firm—that is, the price of a share of stock falls. Then, among the investing public, some individual or group of individuals may think there is a profit opportunity to be had by correcting the agency problem. The profit opportunity will appear if the investors can buy *all or nearly all* of the shares of the firm. By buying all or nearly all of the firm's shares, these investors will solve the problem of underinvesting in monitoring, because they will reap the entire return from this activity. A corporate takeover solves the existing agency problem and eliminates, for a while, the problem of who monitors the monitors. Thus, the market for corporate control—the threat of a takeover—may be the ultimate limit on the behavior of managers and the board of directors.

POISON PILL CONTRACTS

Partly in response to the wave of merger activity in the 1980s, many firms adopted antitakeover provisions to fight off attempts by other firms, called suitors, to take over or buy the firm outright. Table 7.1 shows the merger trend from 1970 to 1990. There was a notable increase in merger activity in the 1980s, particularly for mergers worth over \$100 million (in nominal terms). As activity increased in the market for corporate control, many top managers requested and received special provisions—called **poison pills**—to fight the takeovers they deemed undesirable. These provisions are designed to impose extra costs on a potential suitor. For example, Knight-Ridder, Inc., which owns newspapers in several major cities in the United States, adopted a poison pill provision that requires potential suitors, in effect, to pass a “journalistic ethics and morality test” before the board of directors approves a

Poison Pills
Special provisions adopted by a firm, often without the vote of shareholders, that make a corporate takeover more costly for the acquiring company.

⁶ For an early discussion of the market for corporate control, see Henry G. Manne, “Mergers and the Market for Corporate Control,” *Journal of Political Economy* 73 (1965), 110–120.

TABLE 7.1**Merger Activity in the United States, 1970–1990**

Year	Value of Mergers (billions)	Constant Dollar Value of Mergers (billions)	Number of Mergers	Number of Mergers Valued at	
				\$100 Million or More	\$1,000 Million or More
1970	\$16.4	\$39.0	5,152	10	1
1971	12.6	28.4	4,608	7	0
1972	16.7	35.9	4,801	15	0
1973	16.7	33.7	4,040	28	0
1974	12.5	23.0	2,861	15	0
1975	11.8	19.9	2,297	14	1
1976	20.0	31.7	2,276	39	1
1977	21.9	32.5	2,224	41	0
1978	34.2	47.4	2,106	80	1
1979	43.5	55.3	2,128	83	3
1980	44.3	51.7	1,889	94	4
1981	82.6	87.9	2,395	113	12
1982	53.8	53.8	2,346	116	6
1983	73.1	70.4	2,533	138	11
1984	122.2	113.5	2,543	200	18
1985	179.7	161.9	3,001	270	36
1986	173.1	152.0	3,336	346	27
1987	163.7	139.1	2,032	301	36
1988	246.9	203.5	2,258	369	45
1989	221.1	175.1	2,366	328	35
1990	108.2	82.3	2,074	181	21

Notes: This data is collected by Merrill Lynch Business Advisory Services; Merrill Lynch reports the value of mergers that disclose transaction price; the number of mergers is based on announced transactions in a given year—canceled mergers are subtracted from the total in the year they are announced; the constant dollar value of the merger series is based on 1982 dollars.

merger or takeover. The consequences of not passing the test and continuing with the takeover are many, including the dilution of the suitor's investment with a new stock issue and expensive payments—"golden parachutes"—to top managers who lose their jobs in the process.

Some shareholders have tried to fight back, realizing that even if there is no actual takeover, the threat of one may help to reduce agency costs and, consequently, to increase profits. To fight back, shareholder groups have sought to repeal many of the more onerous poison pill provisions. For example, the California State Teachers' Retirement System, with over \$20 billion in investments, has in several instances proposed the repeal of board-adopted poison pill provisions.

Table 7.2 reprints the California State Teachers' 1987 proposal to the shareholders of Colgate-Palmolive Company and the position of Colgate's

TABLE 7.2

Shareholder Proposal on Rights Plan for Colgate-Palmolive Co., 1987 Proxy Statement

Management has been advised that the California State Teachers' Retirement System, P.O. Box 15275-C, Sacramento, CA 95851, owner of 137,126 shares, intends to submit the following proposal at the meeting and that the California Public Employees' Retirement System, Lincoln Plaza-400 P Street, Sacramento, CA, owner of 298,999 shares, intends to co-sponsor the proposal.

RESOLVED, that it is recommended that the Board of Directors of Colgate-Palmolive rescind or submit for shareholder approval, at the earliest possible date, the Common Share Rights Plan adopted on October 11, 1984.

Shareholder Supporting Statement

On October 11, 1984, the Board of Directors unilaterally and without shareholder participation or approval, adopted the Common Share Purchase Rights Plan. These "Rights" when distributed to holders of the Corporation would, in our view, significantly deter a non-negotiated takeover of the Corporation. The "Rights" more commonly known as "poison pills," will be "triggered" by (i) the acquisition of 20% or more of the Company's outstanding common stock, or (ii) a tender offer for 30% or more of the Company's outstanding shares of common stock.

In our opinion, this "poison pill" will not only deter non-negotiated takeovers of the Corporation, but would serve to entrench current management, all to the detriment of the shareholders.

We as a \$20 billion public school teachers' fund, become concerned when we see corporations such as Colgate-Palmolive, enacting "poisoning pills."

And we are not alone.

In commenting on "poison pill" proposals the SEC stated: "Tender Offers can benefit shareholders by offering them an opportunity to sell their shares at a premium and by guarding against management entrenchment. However, because poison pills are intended to deter non-negotiated tender offers, and because they have this potential effect without stockholder consent, poison pill plans can effectively prevent shareholders from even considering the merits of a takeover that is opposed by the board." SEC Release No. 34-23486 (July 31, 1986).

Your Board recommends a vote AGAINST this proposal.

This proposal is similar to others that these two organizations have submitted to a number of other companies. It appears to the Board that they intend a general campaign against plans like our Rights Plan without regard to the particular corporation adopting the plan.

During the past few years, takeover activity has markedly increased. Even though a third party may offer a premium over the current market price of a corporation's stock, that premium may not necessarily recognize the inherent value of that corporation. In some cases, these third parties make substantial open market purchases of a corporation's stock from professional investors who have acquired that stock with the sole objective of selling out at a quick profit. A third party, of course, can be expected to act only in its own self interest, with little or no regard for the interests of the stockholders or other constituencies of a corporation. Your directors, on the other hand, are obligated as fiduciaries to exercise their business judgment and act in

TABLE 7.2

Shareholder Proposal on Rights Plan for Colgate-Palmolive Co., 1987 Proxy Statement (Continued)

what they reasonably determine in good faith to be in all stockholders' best interests and in the best interests of all constituencies of the Company.

The Delaware Supreme Court has held that adoption of a rights plan is a valid exercise of a board's business judgment in that a rights plan helps a board to fulfill its fiduciary responsibilities. While redeeming the Rights Plan may enable some investors to reap quick profits in the event of a non-negotiated offer for the Company's stock, the Board does not believe that stockholder value is enhanced through Strategic Initiatives of the type undertaken since 1984 when the Rights Plan was adopted. The Board believes that the implementation of the Strategic Initiatives—the business restructuring, the divestment of non-core businesses, the emphasis on new products, the corporate reorganization and the common stock repurchase—have greatly influenced Company results and attendant stockholder value.

The Rights Plan does not prevent the making of an acquisition proposal or the acceptance of an acquisition proposal that the Board finds to be in the interests of stockholders. Rather, it is designed to strengthen the ability of the Board, in the event of such an offer, to negotiate and maximize stockholder value. Experience shows that there have been acquisition offers made to many corporations that have adopted rights plans as well as many situations in which the board of directors of a corporation has determined to redeem its rights plan in connection with the acquisition of that corporation. Indeed, there have been a number of instances where, with a rights plan in place, directors have been able to improve stockholder returns even in the face of an initial, above-market offer. This confirms our belief that the question of whether to redeem the Rights Plan should only be answered in the context of a specific acquisition proposal. In determining whether to redeem our Rights Plan in the context of a specific proposal, your Board has an obligation to meet its fiduciary duties and exercise its business judgment.

board regarding the proposal. The board recommended that shareholders "vote AGAINST this proposal." As you can see, Colgate's board claimed that its poison pill was "designed to strengthen the ability of the Board, in the event of such an offer, to negotiate and maximize stockholder value." The California Teachers' position was just the reverse: "In our opinion, this 'poison pill' will not only deter non-negotiated takeovers of the Corporation, but would serve to entrench current management, all to the detriment of the shareholders." In effect, the poison pill would dilute the value of ownership in Colgate-Palmolive Company. In this instance, the Board's position prevailed; only 18 percent of the votes cast supported the California Teachers' proposal.

Poison pills have had the effect of making a takeover more costly to potential suitors. As a result, the ability of the market for corporate control to limit opportunistic behavior by managers (and the board of directors) and to reduce agency costs has been restricted.

SSS Price Theory in Practice**THELMA GIBSON AND THE SEPARATION OF OWNERSHIP AND CONTROL**

Do managers act in their self-interest or in the interest of shareholders? Instead of asking an economist or a business executive, it might be informative to ask someone you might expect to be your next-door neighbor, Thelma Gibson, a retired registered nurse from Miami.

Gibson was on the board of directors of the Miami savings and loan CenTrust when it failed in 1990 under a mountain of bad loans. As federal regulators looked beneath the rubble, they found that CenTrust's managers had engaged in questionable business practices, practices not necessarily intended to maximize profits for shareholders.

While leading CenTrust to large losses, managers—headed by Chairman David Paul—spent \$175 million to build a corporate office tower that the government later sold for \$44 million. CenTrust's offices in the tower were adorned with gold-plated bathroom fixtures and multimillion-dollar “old masters” paintings, including Rubens's “Portrait of a Man as the God Mars,” purchased with depositors' money in 1988 for \$29 million. For a time, some of these paintings had hung in Chairman Paul's private residence.

In the aftermath of the thrift's failure, Gibson and the other directors became the target of a federal lawsuit that charged them with failing to fulfill their fiduciary duty to monitor the firm's managers on behalf of the shareholders. The directors say they acted only on the advice of lawyers, accountants, and consultants. Nevertheless, the federal government sought \$245 million in damages.

The CenTrust case illustrates the hazard of serving as a director of a company and the problem created by agency costs. Directors, such as Thelma Gibson, are expected to represent the shareholders and ensure that top managers, such as David Paul, are operating the firm for the benefit of the shareholders, not themselves. Paul, for example, has been accused by the government of spending \$15.8 million of CenTrust's money on himself, which the government is trying to recover. Paul has also been accused of using CenTrust to help convicted junk bond wizard Michael Milken manipulate the junk bond market during the 1980s. Paul was named in a \$6.8 billion government lawsuit against Milken and the firm he worked for, the now defunct Drexel Burnham Lambert. The suit charges that Milken, Paul, and several others conspired to inflate junk bond prices artificially. CenTrust fell into receivership when the government forced it to reduce the value of its junk bond portfolio to its market value.

The government's action against CenTrust's directors and its chairman may not end with its claims in civil court. As Table 7.3 shows, many executives of failed savings and loans have been accused, convicted, and sentenced for criminal behavior.

TABLE 7.3**Prison Sentences Related to Savings and Loan Failures**

Name and Position	Institution	Prison Term
William R. Runnells, Jr. Founder	Landbank Equity Co. Norfolk, VA	40 Years
Wailen H. York Borrower/Developer	Empire Savings and Loan Mesquite, TX	35 Years
Marika Runnells President	Landbank Equity Co. Norfolk, VA	31 Years
Woody F. Lemons Chairman	Vernon Savings and Loan Dallas, TX	30 Years
Paul Sau-ki Cheng Co-owner	Guaranty Savings Dallas, TX	30 Years
Simon Edward Heath Co-owner	Guaranty Savings Dallas, TX	20 Years
Janet Faye McKenzie Consultant	North American Savings and Loan Santa Ann, CA	20 Years
Ralph Strader Borrower/Developer	Sunbelt Savings Dallas, TX	10 Years
Lowell Rosenthal Borrower/Developer	Sunbelt Savings Dallas, TX	10 Years
Charles Keating Chairman	Lincoln Savings and Loans Phoenix, AZ	12 Years
Don R. Dixon Owner	Vernon Savings and Loan Dallas, TX	5 Years

The CenTrust case is not just an example of the problems directors face monitoring managers; it also illustrates the problem created by the U.S. deposit insurance system. The deposit insurance system encourages bank and savings and loan executives to take risks, such as investing in junk bonds, because the insurance fund will bail out depositors if those investments do not pay off. Shareholders may receive large dividends from banks and savings and loans before these risky investments fail. Chairman Paul, for example, owned a large fraction of CenTrust's stock, and he received substantial compensation in the form of dividends. The deposit insurance system, then, tends to magnify the problems created by the separation of ownership and control in banks and savings and loans.

LEARNING EXERCISE 7.6

If Chairman David Paul had owned 100 percent of CenTrust, do you think the firm's investment behavior (e.g., junk bonds, gold-plated bathrooms, art) would have been any different? How would your answer change if there was no deposit insurance?

Policy Application and Evaluation**EXECUTIVE PAY***Issue Are corporate executives overpaid?***Background**

Executive salaries at American corporations were the subject of critical news articles over several years. Invariably, when total cash compensation is revealed, usually in the first quarter of the year, some executive at a major corporation is reported to have earned tens of millions of dollars. In 1992, Thomas Frist, the chief executive of HCA Hospital Corporation of America, reported cash compensation of \$126 million. In the same year, Sanford Weill, CEO at Primerica Corporation, earned \$64 million. Nearly all these earnings are from stock options. Stock options offer an executive the option to purchase company stock at a price established, generally, several years before the options are exercised. If the company's profits improve and the stock price increases, the options increase in value. The United States is the leader in the use of stock options for corporate executives. Even without stock options, however, executives in the United States appear to earn more than their overseas counterparts. In 1992, the 20 highest-paid executives in the United States earned on average \$4.8 million in salary and bonuses.⁷ In Germany the comparable average was \$1.8 million, and in Japan the average was \$530,000.

The Case for Shareholder Concern

Should shareholders worry about the relative pay of chief executive officers? The success that some German and Japanese firms have had competing head-to-head with American companies suggests that executive pay needs a careful review. If the governance structure of a corporation favors existing management—poison pill provisions and golden parachutes for executives—shareholders can lose wealth to managers over time. Before the development of poison pills, shareholders could rely on corporate raiders or the market discipline imposed by a falling share price to signal that managers were not performing up to expectations. But with poison pills, the threat of a hostile takeover is diminished, so a greater opportunity exists for management to extract some wealth from shareholders, which the relative pay comparisons may reflect.

The “Much Ado About Nothing” View

Absolute and relative pay comparisons are seriously incomplete as commonly reported. Thomas Frist earned the stock options that resulted in \$126 million compensation over 25 years. He just chose to exercise them in a single year, which vastly overstates his annual pay. In addition, when an executive's options are issued, they are priced at the current market price, so there is no gain to be had from exercising them immediately; only if the stock price increases will the

⁷ See *Forbes*, “The Global Boss’ Pay: Where (and How) the Money Is,” June 7, 1993.

executive gain. But if the executive gains, so do the shareholders as their holdings become more valuable. Comparisons with Germany and Japan are also incomplete. The United States has strict laws on what information corporations must report about executive compensation. Germany and Japan operate under different rules, which allow corporations to report less information about executive compensation. All comparisons are therefore based on estimates and educated guesses. What we know is that these countries have higher tax rates for high-income individuals, so corporations offer a “mix” of benefits to their executives. Cars, housing allowances, vacation packages, country club memberships, education allowances, and board memberships at related companies are just a few of the in-kind payments companies provide in order to avoid the higher tax rates on income. In addition, many multinational companies in Japan and Germany issue several checks to each of their top executives. These checks are from accounts in their overseas subsidiaries, which makes them subject to the overseas tax rate on income. Because the information is not available to correctly measure executive pay in Japan and Germany, it is unclear whether the relative pay comparisons frequently made are correct.

Questions for Evaluation

In 1993, IBM searched for a new CEO and had trouble finding a prominent executive who would accept the job. If CEOs are overpaid, why did IBM have trouble finding someone for the top spot? Should the government do anything about the pay to corporate executives? If the CEO's pay is cut, what signal does that action send to lower-level managers in the company? Will these lower-level managers work harder to move up the corporate ladder?

7.6 MORAL HAZARD AND ADVERSE SELECTION PROBLEMS

Contributing to the agency costs of a firm are two special problems that shareholders (and individuals) face because they have limited information and because monitoring is costly. The **moral hazard** problem arises when the agent (managers) takes some action that the principal (shareholders) cannot observe or that would be costly to observe.⁸ The action taken advances the interests of the agent at the expense of the principal. The problem is referred to as a *moral* hazard because the behavior creates a moral conflict. Morally speaking, the agent should inform the principal about the situation and renegotiate, if necessary. But the agent gains from taking the action, so a moral hazard for the principal arises.

Moral Hazard

A problem arising when agents discover information that is valuable to the principal *after* the principal has contracted for their services.

⁸ Technically, moral hazard problems can be divided into two subcategories: hidden action and hidden information problems. With the hidden action problem, the agent takes some action that is unobservable or costly to observe. With the hidden information problem, the agent has information that cannot be observed. The hidden action problem formally subsumes the hidden information problem because the information is not generally of any consequence unless some action is taken.

The adverse selection problem is slightly different. In **adverse selection**, managers have information that shareholders do not know at the time the principal-agent contract is formed. The knowledge is valuable to shareholders and may or may not be valuable to managers, but in any event it is withheld from those who would use it. With the information, the principal might select or contract differently with the agent. Thus, without the information the principal may make an adverse selection. In contrast, the moral hazard problem assumes that the principal and agent have identical information at the time the contractual arrangement is formed. Each of these problems is developed below.

Adverse Selection
A problem arising when agents possess information that is valuable to the principal *before* the principal has contracted for their services.

THE MORAL HAZARD PROBLEM

We can return to the previous renovation example to illustrate the moral hazard problem, this time with more information. Recall that you accidentally discovered that there were too few studs in the interior walls. Now you have another problem. What neither you nor the builder knew was that your house rests on soft ground, so the addition will require more reinforcing steel in its concrete footings, which are poured during the first few days of construction as part of the foundation. If the extra steel is not added to the footings, the soft ground will make the addition structurally weak, causing it to gradually sink. Such sinking or settling causes cracks and other problems in the structure that appear over several years. In short, you have a much bigger problem than the lack of studs in interior walls.

What action the builder takes in this situation depends on a number of factors. First are the terms of your contract. If you can make the builder pay for the extra steel rods, the builder may have an incentive to remain silent about the soft ground if he discovers it first. If the contract allows for renegotiation after the fact, with you paying to solve the problem, the builder may tell you the unfortunate news and outline the costs of a solution. And, if you can discover the problem in the near future may affect the builder's behavior.

The moral hazard problem just described has two key elements:

1. You—the principal—have contracted with the builder—the agent—*before* the information is known to either of you.
2. The builder's gain (or loss) from any action taken may be different from what you lose (or gain) from such actions.

The first element highlights the role played by **asymmetric information**. Information about the problem is symmetric *before* you sign the contract—that is, neither of you knows about the problem—but asymmetric afterwards. Because both you and the builder are “in the dark” about the soft ground before you sign the contract, you cannot adjust the initial contract price for the addition to cover the problem. Information about the problem is asymmetric after the fact because the builder discovers the problem but you do not.

Asymmetric Information
Information that is known to one party to a contract or transaction but is not known to the other party.

The second element of the problem provides information about the likelihood that any detrimental action will be taken. Suppose that the cost of monitoring the agent is higher than the present value of the *anticipated* losses—which are equal to zero here because you are uninformed, which is why you face this problem. Then you will not monitor, so you will not discover the

problem unless the builder reveals it. In this case, the builder decides what to do on the basis of the existing contract and the gains or losses that will result from revealing the information. If the contract calls for the builder to pay to correct the problem—a fixed-price contract—then there is little or no incentive to reveal it.⁹ If the contract calls for you to pay to fix *unforeseen* problems, then the builder may reveal the problem in order to avoid any difficulties that might arise later when you complain about cracks in the new addition.

In general, if the builder faces a cost when information is *not* revealed, you can design a contract that provides an incentive to reveal such information. Suppose, for example, that the cost to the builder to add the extra steel in the footings is \$1,000. The cost and headache you will suffer from cracks and correcting the problem later has a present value of \$5,000. Your complaints to neighbors about the lousy builder who did not fix the problem to begin with are expected to cost the builder, in present value, \$600 in lost business. One can clearly see that if the builder must pay all the costs to correct the problem, the information will not be revealed ($\$1,000 > \600). And if you pay all the costs, the information will be revealed ($\$600 > 0$).

But the information will also be revealed if you do not pay all the costs. Suppose the contract calls for you and the builder to each pay *one-half* the costs of correcting the problem. You will be glad to pay \$500 now rather than the present value of \$5,000 in costs. The builder will be glad to pay \$500 now rather than the present value of \$600 in costs. You are still both better off, even with a contract that shares the costs. What this example shows is that you do not (always) bear *all* of the costs of correcting a moral hazard problem if the contract is designed with the proper incentive structure.

LEARNING EXERCISE 7.7

Let's change the numbers in the moral hazard problem you face building a house addition. Suppose that you split the costs 50/50 with the builder and it costs \$2,000 to correct the situation. Will the builder reveal the problem to you?

THE ADVERSE SELECTION PROBLEM

A growing problem in companies today is employee theft. Estimates of annual losses due to employee theft range between \$40 and \$120 billion, with the large variation due to differences in how theft is measured.¹⁰ When such theft is discovered, employees are typically fired. The previous employer can greatly limit a larceny-prone employee's chances of finding a new job by revealing

⁹ We assume that there are no external costs to the builder from withholding the information, such as a loss of reputation capital when the building begins to crack many years later or costs arising from a possible negligence lawsuit. Such costs, of course, may affect the builder's decision to reveal such information.

¹⁰ For example, some researchers measure tangible losses due to theft, and others measure intangibles—such as late arrivals or fake illness—when preparing estimates of losses. For a discussion of these differences, see Neil Snyder, Karen Blair, and Tina Arndt, "Breaking the Bad Habits Behind Time Theft," *Personnel Management* 40 (October-December 1990), 31–33.

what occurred at the previous job. Because of this possibility, potential employees are unlikely to reveal to future employers the name of a previous employer. This implies that employers face an adverse selection problem when they hire new workers. These workers have information about their past employment history and behavior that employers do not have and may not be able to obtain at low cost. The adverse selection problem is caused by asymmetric information, but unlike the moral hazard problem, the asymmetric information exists *before* the principal and agent enter a contractual relationship, not after.

Some Examples

The lack of information on the part of employers in the above example is potentially costly. A larceny-prone employee is likely to lower profits instead of raise them if the opportunity exists for such activity. In another example, banks face an adverse selection problem when they make loans. Suppose that the current interest rate on real estate debt is 10 percent. An applicant for a real estate development loan appears to qualify, but the loan officer has some doubt about the viability of the project and the applicant's intent; that is, the applicant might run away with the money. Because the project is more risky than the standard commercial loan, the bank may want to charge a higher-than-market interest rate—say, 15 percent. If the applicant intends to cheat the bank anyway, however, a higher interest rate will not deter him or her. The bank faces an adverse selection problem; it does not truly know the applicant's intent.

Some Solutions

Employers and banks understand the costly dilemma posed by adverse selection problems, and there is typically no costless solution to these problems. Employers worried about employee theft invest in monitoring equipment in offices and at job sites, such as the cameras that gambling casinos use to monitor their employees. Employers may also delve into a potential employee's past history, looking for information that might be highly correlated with an employee's tendency to steal. A past history of credit card delinquency could indicate financial hardship and a need for extra income that may lead to on-the-job theft. An employer may thus use (imperfect) signals to help decide whether a potential employee is likely to steal. A bank approaches the problem somewhat differently. In a typical real estate loan, a bank limits the withdrawal of loan funds to match actual construction expenses. For a large real estate project, banks require that some fraction of the project be "presold" before any money is released. These practices are costly to the bank, but they help lower the costs imposed by the adverse selection problem.

As is the case with moral hazard, adverse selection causes companies to adopt business practices and contracts to protect them from information that they do not know but that could potentially affect their profits.

LEARNING EXERCISE 7.8

List three cases in which the moral hazard problem arises and three cases in which the adverse selection problem arises. Remember that they differ on the basis of whether information is known before or after the contract is agreed to.

7.7 SPECIFICITY AND THE HOLDUP PROBLEM

A firm's choice between using the marketplace to purchase goods and services for its production process or producing these inputs itself may also be influenced by the investments it makes to produce these products. Some of these investments may be specific to the firm itself because they are more valuable to the firm than to the general marketplace. When a firm (or individual) makes specific investments as part of a contract, the *holdup problem* arises. In the holdup problem, one party to the contract may take advantage of the other because of the presence of a specific investment in the relationship. In other words, one party may hold up the activities—production, distribution, or marketing—of the other party, thus imposing a cost on the other party. To understand the holdup problem in more detail, let's consider several examples.

SPECIFIC ASSETS

Specific Asset

A good, service, or intangible that is more valuable in its present use than in any alternative use. Some specific assets have no alternative use, making them a sunk cost.

A **specific asset** is a good, a service, or an intangible that is worth more in its present use inside the firm than it would be worth if it were sold in the market. For example, a company may invest in signs bearing its name in large, bold letters. Signs help customers find the location of the company, but they have little or no resale value in the marketplace. (What would you pay for a sign that says "Mike Gordon's Seafood Bazaar"?) Companies that have patents or exclusive rights on products may acquire special machines to make these products. Boat companies, for example, copyright the design of the boats they build, so the molds they own to make these boats are specific to the particular boat design. The molds have no value in the market by themselves; they are valuable only when the copyright is sold or licensed with the mold, so that the acquirer can legally produce the boat.

An investment in a specific asset is often necessary to fulfill the terms of a contract. The classic example is the case of an electric plant with coal-fired generators locating next to a coal mine. The electric company has agreed to locate next to the mine in return for a long-term contract that fixes the price of coal (correcting for inflation). As part of the contract, a railroad line is to be constructed between the coal mine and the electric plant. The rail line is specific to the long-term supply contract between the two firms and has little value in the market without such a contract. The Fisher Body Company, now a part of General Motors, had a long-term contract to supply the bodies for many of GM's cars. Under this contract, Fisher Body invested significant funds in the dies and molds used to make these car bodies. These investments had little value to anyone other than GM.

Often, specific assets are created from human capital investments. A harbor pilot, for example, invests in learning the safest method of navigating into a given port or harbor. Because tides and weather change, such knowledge is acquired only after years of work experience. Ship owners pay harbor pilots to bring their vessels safely into port. In part because of the responsibility they have, harbor pilots earn above-average incomes. Much of the knowledge they have of a given port or harbor, however, is not transferable to another port or

harbor. Such knowledge is a specific asset. When a firm installs a new computer system to keep track of its sales and inventory, certain employees must learn to use the system. An investment of this sort is transferable only to firms that use the same computer system. If there are no other firms using the system, then the investment is a specific asset.

THE HOLDUP PROBLEM

Investments in specific assets generally have a large sunk cost component. **Sunk cost** is the monies that cannot be recovered by subsequent resale of an asset. After the investment is made, sunk costs are ignored for profit-maximizing decisions. But before the investment is made, a firm expects to earn a return on its investment—it is not sunk until it is actually made. Because of the before and after difference in value of a specific asset, firms making such investments are subject to the **holdup problem**.

Suppose your firm buys a new computer system and the company that installed the system offers to train you for \$1,500. Note that this is a system that no one else owns. If you pay for the training, you have invested \$1,500 in a specific asset, that is, knowledge of your firm's new (and unique) computer system. But you would like your firm to reimburse you for your investment. What is the firm's incentive to pay you for your specific investment *after* you have made it? Certainly a firm wants happy and loyal employees, but its incentive to pay for the full cost of your training is less than before you undertook the training. Your investment is a sunk cost to you; the firm does not have to pay you, after the fact, for the specific investment. You are likely, however, to anticipate this problem and to ask the firm to pay the \$1,500 for your investment and to pay you your current hourly wage while you are in training. Without such an arrangement, you have little or no incentive to learn the new computer system.

The holdup problem may materialize in many settings, all of which involve a specific asset to some degree. Children who organize an informal game of baseball may have been exposed to the holdup problem at one time or another. One child invariably owns the baseball. If it is the only baseball readily available, this child has a specific asset. The other children may accede to this child's demand that he or she be the pitcher (even if he or she is not a good pitcher) in order to use the child's baseball. If the child's demands are not met, he or she may simply leave and there will be no game.

The holdup problem offers a partial explanation for why many secretaries were initially reluctant to switch from their typewriters to word processing in the early 1980s. Secretaries may have noticed that innovation occurs rapidly in the computer industry, so investing in a word-processing system that may be obsolete in the near future is potentially a poor investment. The incentive to learn word-processing skills overcame any such drawbacks, however, when it became clear that enormous productivity gains were to be had and that word-processing software and skills were at least partially transferable to newer computers, as well as an asset in the job market.

What does the holdup problem imply about the decision to use the market versus in-house production? If two firms, such as GM and Fisher Body, con-

Sunk Cost

An investment that has a zero opportunity cost.

Holdup Problem

When one party takes an action that prevents another party from fully earning the normal return on its investment in a specific asset.

tract through the marketplace for goods and services that are produced using large, specific investments, one firm is dependent on the other for a return on its specific investment. GM, for example, may offer a lower price to Fisher Body after Fisher has invested in the assets necessary to build GM car bodies. Because Fisher Body's investment is (partly) specific, it is a sunk cost. Looking forward, then, Fisher Body may accept the lower price GM offers *after the fact*. Because Fisher Body is subject to holdup by GM, this is a *unilateral* holdup problem; that is, only one firm can holdup the other. If Fisher Body can retaliate by delaying delivery of car bodies, which holds up GM's assembly line process, then we have a *bilateral* holdup problem, which implies that both firms have investments that are specific to their contractual arrangement. Both unilateral and bilateral holdup problems make it expensive for firms to use the marketplace to purchase inputs. The fact that GM bought Fisher Body is partly a sign that in-house production is cheaper than trying to cope with market-determined contracts that require investments in specific assets.

Generally, then, when a large investment in specific assets is necessary for a production relationship to exist, a firm may find it advantageous to use in-house production—for example, through a merger or takeover—instead of the marketplace to avoid the holdup problem.

LEARNING EXERCISE 7.9

Suppose you invest \$50 in paint brushes, rollers, and painting equipment that you will use during the summer to earn income. A friend thinks you have a good idea and wants to work with you. She will use the roller while you use the paint brush. She wants to split the earnings equally with you. Is there a potential holdup problem here? How would you split the earnings with your friend if she refuses to repay you for the rollers?

7.8 SIGNALING AND MARKET FRAUD

Firms may try to tell customers and suppliers that they will not act opportunistically when they produce a product or service. If they are believable, such signals—often in the form of advertising—may lead to long-term relationships that help avoid agency costs and holdup problems. Firms have an incentive to invest in such signals when they are the least-cost method of providing information inside and outside the firm and particularly when they produce a product that others might copy or counterfeit. Let's investigate signaling and the potential for fraud in the marketplace.

THE ROLE OF SIGNALING

Credible Signal

An action taken or message sent by an individual or firm that is believed by the marketplace.

One way firms can show that they are legitimate and that their products will work as claimed is to send a **credible signal** to consumers. A fuse or circuit breaker, for example, is an item that you install in an electric panel in a household or in appliances and electronic equipment, such as computers, VCRs, and

stereos. Both a fuse and a circuit breaker protect equipment from a surge of electricity, but these items are unusual because they do not work until they are needed to work. If they are defective when they are needed, the consequences may be very costly to correct. Many house fires, for example, are caused by faulty wiring. If they operate correctly, fuses or circuit breakers can shut off electricity to a circuit that is defective, possibly preventing a fire.

The firms that manufacture fuses and circuit breakers understand that consumers need assurance that their products will work when they are needed. Independent testing laboratories, such as Underwriters Laboratory and Consumers Union, test various products for reliability and durability. Firms making high-quality products welcome such tests because they provide a signal to the market that their products will work as claimed.

Firms typically use signals to indicate a product's quality or to reveal information about the firm's future profitability. Quality signals abound in the market for many products. The Gemological Society of America offers a rating service to jewelers who want to confirm the color, clarity, and perfection of diamonds and other gemstones. High-power microscopes are used to rate "certificate" diamonds, so there is little room for debate about the quality of the gemstone. Such diamonds are frequently sold sight unseen (subject to a liberal return policy) because customers know exactly what they are buying. On a different level, firms often screen applicants for jobs on the basis of academic credentials. These firms use school reputation, class rank, and test scores as a signal of the candidate's quality and expected ability.

A firm's directors use *dividends* as a signaling tool. Shareholders find it expensive to individually monitor a firm's performance, particularly if the process involves an analysis of quarterly and annual financial statements. Management may use dividends to signal to shareholders (and bondholders) that they are meeting their profitability objectives. By paying dividends on a frequent basis, a firm signals its ongoing success.

SCAMS AND FRAUD

Scams are illegal. But they are also quite profitable if the perpetrators are not caught. Most scams offer you some way to make a million dollars with some ridiculous rate of return on your investment, say, double your money in two months. One of the more interesting scams we know of is a stock market scam. This particular scam seemed to start out innocently enough. The perpetrator mailed 10,000 letters to subscribers of a popular financial newspaper. The letters introduced the perpetrator as an expert (or, should we say, wizard) on the stock market. The letters also contained a prediction on the direction of the market—up or down—on the following Monday. As the weeks went by, more letters were mailed with similar predictions.

Below the surface an elaborate scheme was developing. In the initial mailing, 5,000 letters said "The market will go up next Monday" and 5,000 letters said "The market will go down next Monday." As the weeks went by, the perpetrator repeated the mailing, but each time the letter was sent to only the group who received the correct prediction. So in the second round, only 5,000

letters were sent: 2,500 saying “up” and 2,500 saying “down” to those who had received an accurate prediction the preceding week. After three weeks, a letter was sent to the remaining individuals who had received three accurate predictions, asking them to send \$5 for the next week’s prediction. A large majority sent the \$5.

The “split prediction” mailings continued, and the amounts requested for the next week’s prediction increased. Eventually, only a handful of individuals remained who had received accurate predictions, but these predictions were “perfect”—there were no misses over many, many weeks of letters. Some of these individuals were willing to pay hundreds of dollars for the next prediction letter.

We hope you can see that this is a scam. The perpetrator did not know any more about the future direction of the market than the man in the moon might know. The successes recorded were the result of chance and the split mailings. In effect, the perpetrator was right half the time, but to the individuals receiving the “correct” predictions it looked like he was right all the time.

COUNTERFEIT GOODS AND CRIMINALS

Scams and fraud make consumers and others wary of the intentions of many firms, particularly those who offer products that are priced significantly below the competition. Such products are often found to be of lower quality. To relieve consumers’ anxiety, a firm might invest in a credible signal, which is usually some asset that is specific to the firm or the claims made about the product. As we show in Chapter 10, the firm receives a higher price for a higher-quality product only when it invests in specific assets (or signals) that indicate its product is of high quality. In effect, investments in specific assets act as *collateral* or a guarantee to consumers, increasing the chance that firms will perform according to their claims. With the higher price, however, comes a risk that someone will disobey the laws of the land for short-term gain. Counterfeiting high-quality products is a very profitable enterprise if a counterfeiter can get away with the crime. Counterfeit designer blue jeans, computers, and drugs are frequently discovered by legitimate manufacturers.

If consumers cannot tell the genuine product from the counterfeit product, then there is an incentive to counterfeit. To help prevent counterfeiters from devaluing their investments in credible signals, firms may enter into exclusive marketing arrangements. Under these arrangements, their products are initially sold only by certain retailers. Consumers buying the product elsewhere are wary—they may not be buying the genuine product. Rolex watches are sold in this manner. There are factory-authorized dealers for these watches, who charge more than unauthorized retailers. The higher price at the authorized dealer allows the dealer to earn a return on the signal and specific assets it has purchased. Because on these investments, consumers are almost certain that authorized dealers do not sell counterfeit Rolex watches.

Sometimes firms must adjust to the behavior of criminals. The Tylenol poisoning scare in 1982 led Johnson & Johnson Company, the manufacturer of Tylenol, to develop a new packaging system for its pain relief drug.

Someone had tampered with the Tylenol capsules, substituting cyanide for acetaminophen (the pain relief drug), and placed the altered capsules back in stores for sale to the public. Several people died as a result. To eliminate the tampering problem, Johnson & Johnson initially placed special seals on Tylenol boxes and on the bottles inside. The public was reassured and Tylenol began to reclaim lost sales, but the company remained concerned that a clever criminal could still find a way to tamper with the capsules. In 1986, Johnson & Johnson stopped the sale of capsules and introduced Tylenol in gelcaps. Like capsules, gelcaps are easy to swallow and leave no aftertaste, but unlike capsules, they are solid and thus are highly tamper-resistant.

Firms and consumers exist in an environment in which there are scams, criminals, and counterfeit goods. Specific assets, acting as collateral, send a signal to consumers and others that the firm making such investments is not likely to act opportunistically by misrepresenting product quality.

SSS Price Theory in Practice

TELEMARKETING FRAUD

In 1991, more than 8,000 consumers who fell for a phony telephone sales pitch from three oil and gas companies got back nearly all the money they lost, thanks to the efforts of the U.S. Federal Trade Commission (FTC). The \$47 million in refunds obtained by the FTC was its biggest fraud settlement that involved telemarketing.

When a firm sells a product or a service to a consumer, it is usually assumed that both parties to the transaction are acting in good faith, but, as this FTC case shows, that is not always the case. One party may lack information or may be unable to observe all the actions of the other party. With asymmetric information, the buyer or the seller may take actions to defraud or otherwise harm the other, as did the firms in the FTC case.

The fraudulent scheme in the FTC case was run by three South Florida firms: U.S. Oil & Gas Corporation, Eagle Oil & Gas Corporation, and the Stratford Company. The firms' telephone solicitors sold consumers a service that filed applications in their name for a federal lottery that awarded the rights to oil and gas resources on federal land.

The companies charged several thousand dollars to file several applications, but only a fraction of that money was used for filing fees. The companies falsely claimed that they had exclusive knowledge of the most valuable land parcels and the chance of winning a lease. The firms also offered investors an insurance plan that would return their original investments after seven years whether or not they won a lease. The companies used investors' money to buy the insurance; however, the investors were not made beneficiaries of the policies.

In all, consumers invested more than \$51 million in the scheme, with the average investment between \$5,000 and \$10,000. Under the settlement, investors received about 90 cents of each dollar they lost.

The FTC was able to arrange the \$47 million in refunds by adopting a new tactic. Instead of just prosecuting the firms that masterminded the fraud, the FTC took action against a number of other firms that had allegedly helped the

principal firms. These secondary firms agreed to out-of-court settlements totaling \$47 million. These secondary firms included the Better Business Bureau of South Florida, which had allowed the three oil and gas companies to use it as a reference. The South Florida Bureau and its national council paid \$4.5 million.

The action against the secondary participants in the fraud became possible when a Federal district court in Miami froze \$12 million of the assets of the three oil and gas companies in 1983. At the request of the FTC, the court then authorized the lawyers acting as receiver of the companies to sue any other firms and individuals who allegedly helped make the scam possible. The actions of the receiver allowed the FTC to take action against banks, insurance companies, and nonprofit groups allegedly involved in the fraud, even though the commission does not have jurisdiction over them.

The new thrust, which was highly touted by FTC officials, may greatly affect such organizations as the Better Business Bureau, in addition to accountants and lawyers. Such organizations will now be required to know their customers' or members' businesses in much more detail than in the past.

LEARNING EXERCISE 7.10

How do you think the Better Business Bureaus across the nation will change their practices as a result of the FTC's successful action? Will it be more expensive to join the Better Business Bureau?

7.9 NONPROFIT ORGANIZATIONS

Our discussion has focused on the incentives within a firm that chooses to maximize profits for the benefit of its owners. Using the profit-maximizing goal, we can explain many characteristics of the modern business firm, such as profit sharing contracts that align the incentives of managers with those of the owners, pension contracts that determine payments based on productivity in the last few years of employment, and the role of managers in monitoring the output of team members. Not all firms, however, are purportedly in business to maximize profits. Many firms, such as churches, hospitals, schools and universities, museums, and foundations, are chartered with the expressed goal of being a nonprofit firm. All the revenues of a **nonprofit firm** are spent within that firm, usually for the purpose of furthering the cause of the organization. These organizations operate with the intention of making zero annual profits; they have no shareholders and they pay no dividends.

The American Cancer Society, for example, is a nonprofit firm. This organization raises money to help find a cure for cancer. The Muscular Dystrophy Foundation operates in a similar manner, raising funds to find a cure for muscular dystrophy. Nearly every college and university is chartered as a nonprofit firm. Private universities charge students tuition, but these charges and research grants cover only part of the costs of education; the remaining cost is paid for by donations. Universities try to cover their annual costs, but they don't seem to strive to earn more than their costs. Churches are also nonprofit

Nonprofit Firm
An organization that has no shareholders, restricts the distribution of its assets, and tends to equate annual revenues to annual costs.

firms. Some church revenues come from services, such as bingo games and carnivals, but most revenues are earned from donations.

OPERATING STRUCTURE OF NONPROFIT FIRMS

The operation of a nonprofit firm is expected to be different from that of a for-profit firm. There are no shares for sale in a market, so there is no formal market for control of such organizations. Takeovers or leveraged buyouts cannot occur in the same manner as in for-profit firms. Top managers are thus not subject to the same degree of *external* control as they are in for-profit firms. The actions of the managers of a nonprofit firm will then depend on the *internal* incentives such organizations adopt.

A board of directors is usually responsible for setting policies and defining incentives in a nonprofit firm. The board is restricted by a set of by-laws that provide guidance on the goals and activities of the firm. The by-laws, for example, provide a method of electing new members to replace retiring members of the board so that the organization can continue its activities. The by-laws may also restrict the investment activities of the nonprofit organization, such as preventing the organization from investing outside the United States.

The actions taken by the board of directors, including the incentive structure it adopts, are largely determined by how the board of directors is elected or chosen. Those who sit on nonprofit boards owe their allegiance to those who voted for or chose them. If it is valuable to sit on the board of a nonprofit firm, then we would expect board members to adopt policies that cater to the very group that elected them. In this respect, a nonprofit firm is similar to the local, state, and federal government because elected officials, if they value reelection, cater to the groups that voted them into office.

Sometimes the existing board of directors is the same body that votes on the election of new members, which is usually the case for museums. This election scheme is likely to lead to a board of directors composed of mutual friends and acquaintances. The policies that such a board adopts are expected to reflect the individual preferences of its members. With members electing their friends, one might expect to find fairly homogeneous preferences on such a board. A museum may thus tend to exhibit works of art that are liked by the members of the board of directors, which may or may not be a practice that attracts the most visitors or the best art.

In other cases, the board of directors is elected by a broader group, such as the election to the board of overseers for Harvard University, which is voted on by the alumni of Harvard. The board of overseers at Harvard is expected to implement policies favored by existing alumni. We would expect the board of overseers to oppose any decline in the admissions standards at Harvard because such changes could depreciate the value of Harvard's degree programs and its outstanding degrees. For the same reason, the board of overseers may oppose deleting an existing degree program, even though it currently has only a few students enrolled, if such a program once produced many graduates.

DO NONPROFITS MAXIMIZE PROFIT?

Our discussion of nonprofit firms suggests that there is wide variety in organizational structures and incentives. Certainly, there is more room for individual preferences to affect the behavior of nonprofit organizations than for-profit organizations. When individual preferences conflict with the profit maximizing goal of for-profit firms, we have noted above that these organizations adopt rules and incentive structures to eliminate or reduce such conflicts. We cannot say the same for nonprofit firms. When individual preferences cause a conflict, such as in the choice of art for a museum to purchase, the members of the board of a nonprofit firm may simply argue and scream at one another. They are likely to resolve the conflict only when new members are elected to the board or existing members retire or quit.

On occasion, the profit motive pushes itself into the decision-making process in nonprofit organizations. Many nonprofit firms solicit funds from wealthy patrons to help support program and operational expenses. Obviously, the preferences of these patrons—toward art in museums, for example—affects the decisions made by nonprofits. By offering programs and activities that donors are willing to support, a nonprofit can increase revenues. If it can control costs in these programs, its behavior may appear consistent with the goal of profit maximization.

WHY DO NONPROFIT FIRMS EXIST?

As is the case with for-profit firms, it is reasonable to ask why nonprofit firms exist. There is no simple answer here. Many nonprofit foundations—for example, the Ford Foundation, the Rockefeller Foundation, and the Carnegie Foundation—were first chartered and operated according to the goals of a single individual. Clearly, the desire of these individuals to continue to pursue certain goals, even posthumously, gave these foundations a reason to exist.

In other cases, such as churches and universities, nonprofit status may actually produce more revenue than a for-profit charter. Contributions to nonprofit organizations are tax-deductible, which provides a revenue source that is typically not available to for-profit firms. In addition, a nonprofit organization cannot distribute its assets in the form of dividends, so all contributions stay within the firm.

The restriction that a nonprofit firm cannot distribute its assets—except to other nonprofit firms—may also help explain why some nonprofits exist. Churches and universities produce products whose quality is difficult to judge. We would thus expect such firms to invest in specific assets to send a signal to consumers that they will not act opportunistically, that is, that they will not suddenly lower the quality of their product. If such organizations could distribute assets, there would be a gain, to someone, from opportunistic behavior. With the restriction that assets cannot be distributed, because there are no shareholders, these organizations further restrict their ability to act opportunistically, which tends to perpetuate their existence. In fact, churches and univer-

sities have typically outlived for-profit firms. Harvard University, for example, began operations in 1636.

Nonprofit firms are not as simple to analyze as for-profit firms. They may exist for various reasons, and they may have widely differing goals and incentive structures. In some instances, though, their organizational structure, such as a restriction on the distribution of assets, may be necessary for them to attract customers and to remain viable over time.

Chapter Summary

1. A firm is a set of contracts, explicit and implicit, that link employees, managers, owners, and outside suppliers together for the purpose of producing an output.
2. Production is organized in firms when it is the least-cost method of creating a good or service, that is, when the cost of using the marketplace exceeds the managerial cost of in-house production.
3. To choose an output rate that maximizes profits, a firm finds the output rate at which marginal revenue is equal to marginal cost. The marginal revenue curve is determined by the demand for the firm's product, and the marginal cost curve is determined by the production process and the price paid for inputs, which includes monitoring and agency costs.
4. Team production may be costly to monitor, and individual team members have an incentive to shirk. Shirking reduces the effort a team member expends, without making that individual pay the full cost of shirking. Output will fall with shirking, but the cost imposed on the firm is spread across all team members.
5. The shareholders (owners) ask the managers of a firm to design contracts to maximize profits. This goal expands the shareholders' feasible set of goods, thereby increasing shareholders' satisfaction.
6. Agency costs arise because the goals of the principal are not always aligned with the goals of the agent. When it is costly to observe an agent's actions, it is costly to develop schemes or incentives to align the goals of the agent with those of the principal. To reduce agency costs, firms monitor performance and adopt contracts that offer agents a part of the return paid to the principal.
7. Moral hazard arises when a principal and agent (for example, a shareholder and manager) contract with each other for goods or services and valuable information is revealed to the agent *after* the contract is made. The incentive to use the valuable information to benefit the agent at the partial or full expense of the principal causes the moral hazard problem. Adverse selection arises when the valuable information is known to the agent *before* the contract is made. Again, the information may be costly to the principal.
8. Specific assets are more valuable to the firm or a given contract than they are to the broader marketplace. If a firm invests in specific assets as part of a contractual relationship, the investment becomes a fixed cost after it is made. The other party to the contract may then try to

“hold up” the firm by renegotiating the contract so that the firm does not earn a return on its specific investment.

Trouble Spots

Concept	Reminder
The Contract-Based Approach to Firm Structure	The concepts of teamwork, costly monitoring, and shirking go hand in hand. Output efficiency in teams creates a benefit to teamwork. Against this benefit is the cost of determining what each team member actually contributes to the production process. Shirking may arise when it is costly to monitor such activities and when the shirker does not bear the full cost of his or her actions. Shirking does not arise because some team member is of low character but rather because there is a gain to such activities that exceeds their cost.
The Profit-Maximizing Goal	Firms are not endowed with the goal of maximizing profits; rather, managers and employees are given an incentive to behave this way by the owners of the firm—that is, the shareholders. One reason the owners prefer this goal over other goals is that it provides owners with more income than other goals—that is, any other goal to which all of the owners can agree. More income relaxes the owners’ budget constraints, thereby increasing the size of the feasible set of goods and services they can consume and increasing their satisfaction.
Moral Hazard and Adverse Selection Problems	Sometimes moral hazard is thought to be a problem faced just by insurance companies. When an insurance policy is written, the policyholder may change his or her behavior as a result of the insurance. Although insurance is an example of the moral hazard problem, the problem itself is much broader than just insurance, as our discussion of insider trading suggests. Remember, the key to identifying a moral hazard problem is that information is known <i>after</i> a contract or agreement between two parties; the information was not known before the agreement. For the case of auto insurance, the past driving record may be known when the policy is written, but the unknown information is the degree to which the driver is less careful when an insurance company—instead of the driver—will pay for an accident.
Specificity and the Holdup Problem	Specific assets can take many different forms. They may be a human capital investment, such as a computer training program; they may be a site investment, such as the railroad tracks leading to an electric plant; and they may be a firm or contract investment, such as a sign on a building. The one feature these investments have in common is that their highest and best use is as planned; the market value is much

less for other uses. The specific nature of the investment combined with the fact that there is a difference between the actual investment and market value creates the holdup problem.

7.10 Review Questions

1. What does a firm do? How are teams important to the notion of a firm?
2. State and explain four factors that produce transaction costs.
3. How does a profit-maximizing firm choose its optimal output?
4. How should a manager change output if marginal revenue exceeds marginal cost at the present operating position?
5. Is a firm really a collection of contracts? Is there anything that a firm does to produce that does not involve contracts with one party or another?
6. Why is there a shirking problem? Will going to church eliminate such a problem?
7. Explain why the owners of a firm benefit when the top managers act to maximize profits.
8. Why is the profit-maximizing goal preferred to a sales-maximizing goal?
9. Give two examples of the agency problem inside a firm.
10. Why do firms separate the ownership or capital investment function from the control or managerial function?
11. What is the difference between a moral hazard and an adverse selection problem?
12. Explain the relationship between the holdup problem and investments in specific assets.
13. How do credible signals help prevent fraud and counterfeiting?
14. Who benefits from shirking? What if it is anticipated before the contractual arrangement is made?

7.11 Price Theory Problems

1. "The way to have the best of both worlds (low transaction costs and low managerial costs) is to have employees and suppliers working on piecework and to pay them according to just how much they produce." If this statement were accurate, we would expect to see few, if any, workers paid according to their time input. Yet the vast majority of employees are paid by the hour, week, or month. The evidence is in conflict with the assertion. What do you think has been overlooked here?
2. "Because 'proxy fights'—the attempted takeover of a corporation by a united block of stockholders—are partly a phenomenon of the 1980s, they obviously cannot be a very important factor in

keeping inefficient managements in line.” Is this statement true or false? Why?

3. We speak of transaction costs as the costs of using the market to purchase goods and services, but, except for flea markets, where you pay an entrance fee, most markets do not charge a fee for their use. What are the transaction costs of using these no-entrance-fee markets?
4. Complete the table below, and then find the profit maximizing output rate and the optimal level of profits.

Output (Units/wk.)	Price (\$/Unit)	Total Revenue (\$/wk.)	Total Cost (\$/wk.)	Marginal Cost (\$/wk.)	Marginal Revenue (\$/wk.)
0	100	0	200	—	—
1	100	100	250	50	100
2	100	?	?	30	100
3	?	300	300	20	?
4	?	400	330	?	100
5	100	500	380	50	?
6	100	600	460	?	100
7	100	?	560	100	?
8	100	800	?	140	100
9	100	?	900	?	100

5. Assume that the firm can sell all of its output at \$1,000 per unit, so its total revenues are then $R(Q) = \$1,000Q$. Its costs are given by the relationship $C(Q) = 100 + 50Q - Q^2$, where $MC(Q) = 50 + 2Q$. Find the profit maximizing output rate and the optimal level of profits for this firm.
6. Redraw the shirking diagram, Figure 7.1, to show the indifference curve that the nonshirking team members are on when a single team member shirks. Do they receive more or less satisfaction than prior to the shirking by a single team member?
7. In the shirking diagram, Figure 7.1, how does the solution change if monitoring by other team members can immediately detect any change in effort by a single team member? Does your answer depend on the consequences from shirking?
8. Every major corporation has its financial statements audited by an independent accounting firm. Why don't corporations audit their own books? In addition, large companies are audited by large (not small) accounting firms, that is, firms who have many customers, so that a single customer is not a significant portion of its business. Why do large corporations choose large accounting firms to audit their financial statements?
9. “Golden parachutes” for corporate executives are often thought of as antitakeover measures. Can you think of another explanation for such contingent compensation packages based on the specific investments that corporate executives make in their businesses?

10. In some firms, employees and shareholders are one and the same. How will such an arrangement affect the management structure of these firms? Under what conditions will such firms adopt the profit maximizing goal? How is your answer to these questions affected if the shares can be sold to outsiders?
11. Determine whether a moral hazard or adverse selection problem could arise in the following situations:
 - a. Using a doctor for minor aches and pains after but not before you have purchased health insurance
 - b. Complaining to a professor after finding out your grade that you were sick during an exam
 - c. Buying beef wrapped in an opaque plastic container at the grocery store
 - d. Dealing with Monty Hall on *Let's Make a Deal*, a syndicated TV game show
 - e. Seeking a second opinion from another doctor before you submit to exploratory surgery
 - f. Revealing to some of your friends exactly where you caught a 9-pound bass
 - g. The purchase of a used car
12. Explain which of the following items you believe represent an investment in a specific asset. Is the investment in these assets sunk, or is part of it recoverable?
 - a. Monogrammed ties
 - b. A cherry-red automobile
 - c. A brown UPS truck
 - d. A warehouse
 - e. A television advertisement
 - f. A business card
 - g. A pair of tennis shoes
13. Most insurance companies charge a "deductible" of several hundred dollars for each accident claim under an auto insurance policy. The policyholder must pay any charges up to the amount of the deductible, after which the insurance company pays. What is the purpose of such a charge? If a law is passed to eliminate the deductible, what will happen to insurance premiums? Will the number of claims increase or decrease without the deductible?
14. Suppose a "lemon law" is passed that requires used car dealers to refund a customer's money if he or she is not satisfied with a used car. Before the law, customers faced a(n) _____ problem. After the law is passed, dealers face a(n) _____ problem. (Fill in the blanks with either *moral hazard* or *adverse selection*.) How will the market price of used cars change as a result of the new law? What will be the price paid for "returned" cars if the dealer is required to inform potential buyers that a car has been returned?

7.12 Writing Exercise

Look at the Yellow Pages for a type of business with which you are familiar. Select two or more firms for analysis. Contact these firms and report on their organizational structure. What do they produce? How many managers and employees do they have? How are these individuals compensated? Use the many concepts developed in this chapter to explain the organizational structure of these two (or more) firms. Explain how these firms differ in their structure and why you think they are organized differently.