Incentive Conflicts and Contracts

CHAPTER 10

CHAPTER OUTLINE

One of the largest takeovers in history occurred in 1988—the purchase of RJR-Nabisco by Kohlberg, Kravis, Roberts & Company. Public accounts report lavish expenditures and decisions of questionable merit by RJR executives preceding the takeover. For example, Burrough and Helyar in their best-seller, *Barbarians at the Gate,* write,

> *It was no lie. RJR executives lived like kings. The top 31 executives were paid a total of $14.2 million, or an average of $458,000. Some of them became legends at the Waverly for dispensing $100 tips to the shoeshine girl. [Ross] Johnson's two maids were on the company payroll. No expense was spared decorating the new headquarters, highlighted by the top-floor digs of the top executives. It was, literally, the sweet life. A candy cart came around twice a day dropping off bowls of bonbons at each floor's reception areas. Not Baby Ruths but fine French confections. The minimum perks for even lowly middle managers was one club membership and one company car, worth $28,000. The maximum, as nearly as anyone could tell, was Johnson's two dozen club memberships and John Martin's $105,000 Mercedes.*

In addition, it appears that major investment decisions at RJR often were driven by the preferences of managers rather than by value maximization. For instance, Ross Johnson, chief executive officer of RJR, reportedly continued to invest millions of dollars in developing a smokeless cigarette long after it was obvious that the project would never be profitable.

More recently other executives have been charged with even more extreme examples of excessive behavior. For example, in July 2002 the U.S. Justice Department charged that

John Rigas and his two sons "looted Adelphia on a massive scale" and used it as a "personal piggy bank." Over the past five decades Rigas had built a small cable company in rural Pennsylvania into Adelphia Communications—listed on Nasdaq and the sixth largest U.S. cable company. The government's complaint charged the Rigas family with using Adelphia's assets to buy company stock, timberland, New York condos, and a National Hockey League team; to build a golf course on family-owned property; to bankroll movies produced by a Rigas daughter; and to pay for automobiles on behalf of a Rigas-owned dealership.[1]

The behavior of RJR and Adelphia executives raises at least four interesting issues:

- In previous chapters, we assumed that managers *always* maximize profits. Apparently, they do not. To understand management problems *within the firm,* we need a richer characterization of the firm and managerial decision making.
- Both RJR and Adelphia suggest that material conflicts of interest can exist between owners and managers: Shareholders are interested in the firm's value, whereas the managers are interested in their own utility. What other conflicts of interest exist within firms?
- These cases suggest that owner-manager conflicts can result in reduced productivity and waste. Unchecked, such conflicts of interest can destroy a firm. How do firms limit unproductive actions to enhance value and avoid failure?
- If techniques to limit unproductive actions exist, why did the owners (shareholders) at RJR and Adelphia allow the managers to engage in such dysfunctional behavior?

In this chapter, we examine these and related issues. We begin by enriching our understanding of the definition of a firm. We then use this more explicit understanding to discuss various conflicts of interest that exist within firms. Next, we examine how contracts help reduce or control these conflicts. We focus particular attention on the problems created by costly information. Finally, we discuss how reputational concerns can control incentive conflicts within firms.

Firms

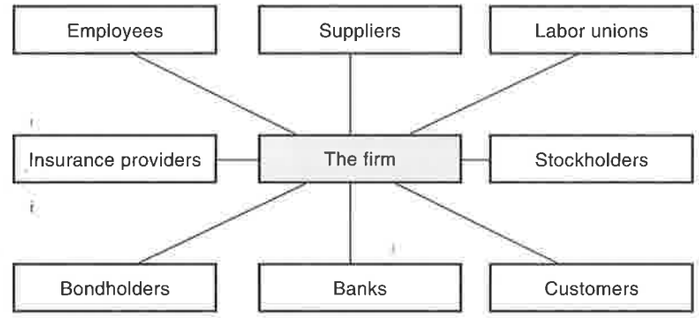
In Chapter 3, we characterized the firm in terms of administrative decision making: Markets use prices to allocate resources; firms use managers. This prompted a discussion of the relative efficiency of firms and markets. Throughout our analysis thus far in the book, we have treated the firm as if it had one central manager who acts to maximize the firm's value. This characterization is employed widely in economics and has proved quite useful in explaining production and pricing decisions of firms.

The actual decision-making process within firms, however, is extremely complex and differs from this simple characterization in at least three ways. First, there are many decision makers within firms. In large corporations, the board of directors makes major policy decisions such as naming the CEO. The CEO, in turn, retains certain important decision rights while delegating many operating decisions (for instance, pricing, production, and financing decisions) to lower-level managers. Even the lowest-paid employee in the firm usually has some decision-making authority. Second, the primary objective of most of these decision makers is not to maximize the value of the firm: The investment behavior of the RJR executives certainly suggests interests in things other than value maximization. Third, firms often use internal pricing systems (transfer prices) to allocate internal resources.

[1]D. Lieberman and G. Farrell (2002), "Five Former Adelphia Arrested," *USA Today* (July 24); and R. Grover (2002), "Adelphia vs. Deloitte in a Game of Blame," *BusinessWeek Online* (June 27).

Figure 10.1 The Firm as a Focal Point for a Set of Contracts

The firm is a creation of the legal system that has the standing of an individual in a court of law. The firm serves as one party to the many contracts that make up the firm.



Analyzing organizational issues *within the firm* requires a richer concept of the firm. Several useful definitions have been developed by economists.[2] We focus on one definition that is particularly useful for our purposes[3]: The firm is a focal point for a set of contracts. This definition focuses on the fact that the firm ultimately is a creation of the legal system; it has been granted the legal standing of an individual (it can enter contracts, sue, be sued, and so on). The term *focal point* indicates that the firm always is one of the parties to each of the many contracts that constitute the firm. Examples of these contracts are employee contracts, supplier contracts, customer warranties, stock, bonds, loans, leases, franchise agreements, and insurance contracts. This contract view of the firm is illustrated in Figure 10.1.

Definition
The *firm* is a focal point for a set of contracts.

Some contracts are explicit legal documents, whereas many others are implicit. And even within a relationship that has been formalized with an explicit contract, there is a broad array of aspects of the relationship that are not spelled out within the written agreement—they are implicit. An example of an implicit contract is an employee's understanding that if a job is done well, it will result in a promotion. Implicit contracts are often difficult to enforce in a court of law. Later in this chapter, we discuss how reputational concerns can help ensure that individuals honor implicit contracts.

Incentive Conflicts within Firms[4]

Economic theory characterizes individuals as creative maximizers of their *own utility.* Thus, the collection of individuals that contract with the firm are not likely to have objectives that are automatically aligned. The owners of the firm have title to the residual

[2]O. Hart (1989), "An Economist's Perspective on the Theory of the Firm," *Columbia Law Review* 89, 1757–1774.

[3]M. Jensen and W. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3, 305–360.

[4]This section draws on M. Jensen and C. Smith (1985), "Stockholder, Manager, and Creditor Interests: Applications of Agency Theory," in E. Altman and M. Subrahmanyam (Eds.), *Recent Advances in Corporate Finance* (Irwin Professional Publishers: Burr Ridge, IL), 95–131.

Enforceability of Implicit Contracts

While implicit contracts are common, some lawyers argue "they aren't worth the paper they are not written on." Even though such contracts are hazy, most companies strive to avoid breaches because of their threat to productivity and the resulting employee turnover such breaches can engender. Lawyers advise that if you are offered an implicit contract, beware of managers promising something they cannot guarantee, such as lifetime employment. Also, try to document meetings where expectations are discussed and implicit promises are made. Such records can prove a useful paper trail if future litigation results.

Source: M. Culp (1998), "Implicit Contracts: 'Not Worth the Paper They Are Not Written On,'" *Democrat and Chronicle* (August 16), 1G.

profits (what is left over after other claimants are paid) and are likely to be interested in maximizing the present value of these profits. Other individuals within the firm do not share this goal necessarily. We now discuss some of the more important incentive conflicts that arise within firms. We then discuss how contracts can be used to reduce and control these conflicts.

Owner-Manager Conflicts

Owners often delegate the management of firms to professional managers. For instance, in large corporations, the residual profits are owned by shareholders who delegate significant decision authority to top executives. At least five sources of conflict arise between owners and managers:

- **Choice of effort.** Additional effort by managers generally increases the value of the firm, but since the managers expend the effort, additional effort reduces their utility.
- **Perquisite taking.** It is in the interests of owners to pay sufficient salaries and bonuses to attract and retain competent managers. However, owners do not want to overpay managers. In contrast, managers are likely to want not only higher salaries but also perquisites such as exclusive club memberships, lavish office furniture, luxurious automobiles, stimulating day care for children, and expensive French confections.
- **Differential risk exposure.** Managers typically have substantial levels of human capital and personal wealth invested in the firm. This large investment can make managers appear excessively risk-averse from the standpoint of the owners, who (at least in a large public corporation) typically invest only a small fraction of their wealth in any one firm.[5] Hence, managers might forgo projects that they anticipate would be profitable simply because they do not want to bear the risk that the project might fail and lead to a reduction in their compensation.
- **Differential horizons.** Managers' claims on the corporation generally are limited by their tenure with the firm. Therefore, managers have limited incentives to care about the cash flows that extend beyond their tenure. Owners, on the other hand, are interested in the value of the entire future stream of cash flows, since it determines the price at which they can sell their claims in the company.
- **Overinvestment.** Managers can be reluctant to reduce the size of a firm, even if it has exhausted available profitable investment projects; they prefer to empire-build. Also, managers often are understandably reluctant to lay off colleagues and friends in divisions that are no longer profitable. Managers who fire their colleagues bear personal costs (disutility), whereas shareholders receive most of the benefits.

[5]To be more precise, we do not assume that the underlying preferences (utility functions) of owners and managers differ. Rather we focus on the fact that the risk of owners' claims on public firms can be managed more easily through diversification than can those of managers. The most valuable component of most managers' wealth is their human capital, and managers typically have but one job.

The Spectrum of Organizations

The firm can be viewed as a focal point for a set of contracts. One particularly important feature of these contracts is the distribution of the residual profits. Organizations vary remarkably along this dimension. In a sole proprietorship like Esptein's Deli, the owner/manager is the residual claimant. In a partnership like the law firm of Nixon-Peabody, the claims are shared by the partners. In a large public corporation like Amazon.com, these claims often are held by thousands of shareholders who take little direct interest in managing the company. In a mutual like the Prudential Insurance Company, ownership and customer claims are merged. In a cooperative like Ocean Spray, supplier and ownership claims are merged. In an employee-owned firm like United Airlines, the claims are owned by the employees. Finally, in a not-for-profit institution like the American Red Cross there are no owners of the residual cash flows. In most of these large organizations, management authority is delegated to professional managers, who often have small or no ownership positions in the organization. According to Coase, individuals have incentives to select the form of organization that minimizes total contracting costs (see Chapter 3).

Our discussion of conflicts between owners and managers suggests that problems arise in public corporations because of the separation of ownership and control. These problems are costly to resolve. Given these costs, what are the offsetting benefits that promote the prominence of large corporations? One of the most significant benefits is that capital is raised from many investors who share in the risk of the company. Individual shareholders place only a small amount of their wealth in a given company, and thus avoid "placing all their eggs in one basket." This diversification makes risk-averse investors (see Chapter 2) willing to supply capital to corporations at a lower cost. This benefit, however, comes at the cost of having to control the incentive conflicts between managers and owners. Thus, in smaller operations, where raising large amounts of capital is less of an issue, one should expect to find sole proprietorships and small partnerships (where there is less separation of ownership and control). Indeed, this is what is observed.*

*Note: There are also tax-related reasons that affect the choice of organizational form. See M. Scholes and M. Wolfson (1992), *Taxes and Business Strategy* (Prentice-Hall: Englewood Cliffs, NJ).

Other Conflicts

Similar types of incentive conflicts are likely to arise among most contracting parties in the firm. For example, top managers worry about effort and perquisite-taking problems with lower-level employees. The firm's creditors and shareholders can have disputes over the optimal dividend, financing, and investment policies of the firm. Firms can have incentives to default on warranties with customers. Managers often quarrel with labor unions. For example, Alcatel-Alsthom SA, a French conglomerate, was unable to divest any of its low-margin plants without engendering an uproar from its unions.[6]

Owners of firms would like to acquire high-quality inputs at low prices, whereas owners of supplying firms would like to provide inexpensive inputs at high prices. This

[6]D. Lavin (1998), "Union and Regulators Restrain Alcatel's Restructuring," *The Wall Street Journal* (August 7), A8.

Buyer-Supplier Conflicts

Large firms have become increasingly aggressive at demanding price concessions from suppliers. A survey by the National Association of Purchasing Management of 300 large manufacturers indicates that the average price paid to suppliers decreased by about 1 percent in 1992. This price decline contrasts with price increases ranging from 2 to 5 percent over the previous five years. Large manufacturers also have become more likely to switch suppliers in an attempt to decrease costs. Such activities have increased the strain between buyers and suppliers and have made small suppliers less likely to enter into exclusive contracts with large firms. The co-owner of a small aerospace-industry supplier that derives two-thirds of its sales from Boeing says, "Pressure from Boeing to reduce prices has gotten worse in the past couple of years. They haven't learned to cut costs internally so they are beating up on the vendors. We are looking for new customers wherever we can." In some industries, the conflicts are particularly severe. According to a survey in 1992 by *Ward's Auto World* (a trade publication) more than half of 154 auto-industry suppliers say GM's cost-cutting reorganization was unfavorable to them. GM has been aggressive especially in demanding price cuts from suppliers.

Source: M. Selz (1993), "Some Suppliers Rethink Their Reliance on Big Business," *The Wall Street Journal* (March 29), B2.

tension produces conflicts between buyers and suppliers. Supplying firms worry about buying firms demanding price concessions, and buying firms worry that suppliers will either shirk on quality (to reduce cost) or raise prices. In Chapter 19, we provide a detailed analysis of buyer-supplier relationships.

Incentive conflicts also arise with joint ownership. For example, in a large accounting firm, the actions of each partner affect the profits of the organization, which are shared among the partners. This arrangement can motivate partners to *free-ride* on the efforts of others. Each partner hopes the other partners will work diligently to keep the firm profitable. However, each partner has an incentive to shirk: Individual partners gain the full benefit of their shirking but bear only part of the costs (their share of the reduced profits). Free-rider problems are common in most group activities and, if left unchecked, greatly reduce the output of teams. (We shall refer to such free-rider problems throughout this book.)

Controlling Incentive Problems through Contracts

What keeps these incentive conflicts from undermining cooperative undertakings and destroying all organizations? For example, might the fear that managers will use all company resources for their personal benefit dissuade owners from delegating operating authority to managers?[7] Fortunately, there are mechanisms that help control incentive conflicts. Among the most important are contracts.[8]

Contracts (both implicit and explicit) define the firm's organizational architecture—its decision right, performance evaluation, and reward systems. This architecture provides an important set of constraints and incentives that helps resolve incentive problems. For instance, if a contract specifies that Erin O'Malley, the firm's chief financial

[7]In fact, some authors suggest that this concern ultimately will cause the collapse of the public corporation. See A. Berle and G. Means (1932), *The Modern Corporation and Private Property* (Macmillan: New York).

[8]Other important mechanisms are the market for corporate control and the product market. Managers have incentives to increase a firm's profits because firms with inefficient managers can be taken over by other firms and the management team replaced. Indeed, this is what happened at RJR-Nabisco. Also, inefficient firms eventually go out of business in a competitive market.

Experimental Evidence on Free-Rider Problems

More than 50 years ago a German scientist named Ringelmann asked workers to pull as hard as they could on a rope attached to a meter that measured the strength of their efforts. Subjects worked alone and in groups of two, three, and eight.

While the total amount of force on the rope increased as group size rose, the amount of effort by each person seemed to drop. While one person pulling alone exerted an average of 63 kg of force, this dropped to about 53 kg in groups of three and was reduced to about 31 kg in groups of eight. The greater the number of people performing the task, the less effort each one expended.

The impact of any social force directed toward a group from an outside source (for example, a manager) is divided among its members. Thus, the more persons in the group, the less the impact such force will have upon each. Because they are working with others, each group member feels [that others] will take up any slack resulting from reduced effort on their part. And since all members tend to respond in this fashion, average output per person drops sharply.

Source: A. Furnham (1993), "Wasting Time in the Board Room," *Financial Times* (March 10).

officer, will receive an annual salary of $200,000, she can be fired if she unilaterally pays herself more: She does not have the decision right to set her own compensation.[9] If Erin is evaluated on firm profits and rewarded with a large bonus for good performance, she has incentives to care about the firm's profits.

Costless Contracting

Under some circumstances, contracts can resolve incentive problems at low cost. As an example, consider Jerold Concannon, CEO of the Bagby Printing Company. Jerry gains utility U, from both his monetary compensation C and perquisites P such as company expenditures on luxury cars and club memberships:

$$U = f(C, P) . \tag{10.1}$$

Incentive Conflicts throughout the World

Incentive conflicts are not just an American business phenomenon, nor do they occur only in private firms. Rather, these conflicts exist throughout the world in both the private and public sectors. For example, government officials taking bribes is an example of a basic incentive conflict between government officials and the people they represent.

In 1999, Indonesian President B. J. Habibie's political party, Golkar, allegedly siphoned off $66 million from a nationalized bank, PT Bank Bali, to help fund the president's reelection campaign. After the allegations were made, the government hired PriceWaterhouseCoopers to audit the transactions. They cited "numerous indications of fraud."[a]

A similar event occurred in China where a bureaucrat confessed to using a safe-deposit box in Hong Kong to stash away more than $1.2 million in cash bribes from companies attempting to get pieces of real-estate deals she controlled. Meanwhile, in the banking sector, the premier of China is attempting to change the common practice by bankers of ignoring credit standards and awarding loans to people "with connections." In one case, eight bankers received stiff sentences, including the death penalty, for accepting bribes in return for loans.[b]

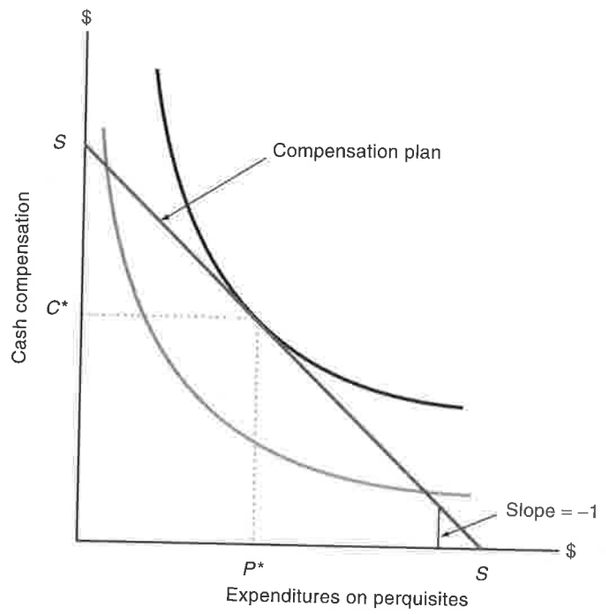
[a]J. Solomon (1999), "Bali High Jinks: In Indonesia, Crisis and Corruption Create Financial Vigilantes," *The Wall Street Journal* (September 21), A1.

[b]J. Barnathan (1993), "A Crackdown—Of Sorts," *Business Week* (July 26), 47.

[9]Restricting an agent's decision-making authority can reduce incentive problems. However, it also can mean that authority has not been granted to the individual with the best knowledge to make the decision. This tension is a fundamental concern in designing organizational architecture and is a central focus of Chapter 11.

Figure 10.2 Optimal Perquisite Taking

The manager is paid a cash salary S, as long as the manager maximizes profits. If the manager fails to maximize profits by taking perquisites (for example, too many club memberships, paying excessive salaries to top subordinates, or buying expensive company cars), the owners reduce the compensation by the amount of the lost profits. Given this compensation scheme, the manager chooses the combination (C^*, P^*). This choice is Pareto-efficient.



If the firm provides no perquisites to Jerry, it must pay him a salary S in cash compensation; otherwise, he will work for another firm. The owners of the firm are willing to pay Jerry S if he consumes no perquisites. However, as CEO, Jerry has numerous opportunities to consume company resources. These opportunities present an incentive problem: Jerry wants to spend company resources on himself, whereas the owners do not want Jerry to reduce the firm's value by consuming excess perquisites. As we will see, some amount of perquisites actually increases value. But beyond this level of perquisite consumption, value falls.

Suppose for now that the owners of the firm have precise knowledge of the maximum profit of the firm, Π_M (if Jerry is paid S and consumes no perquisites). In this case, realized profits of the firm, Π_R (if he is paid S and consumes perquisites, P) are the difference between maximum profits and Jerry's excess perquisite consumption:

$$\Pi_R = \Pi_M - P \tag{10.2}$$

With this information, the owners can solve the potential incentive problem by offering Jerry the following compensation contract:

$$C = S - (\Pi_M - \Pi_R) \tag{10.3}$$

This contract, which reduces Jerry's salary by the difference between realized and maximum profits, is equivalent to charging Jerry the full cost of his perquisites—that is, $C = S - P$.

Figure 10.2 displays Jerry's choice of perquisites. His objective is to maximize his utility subject to the constraint that he is paid according to his compensation plan. Jerry chooses the combination (C^*, P^*), which occurs at the tangency point between his indifference curve and the compensation constraint. This combination places Jerry on

Jack Welch's Perquisites

In 1996, General Electric entered into an employment agreement with its then CEO, Jack Welch, to keep him working until 2000. Rather than taking a "special one-time payment of tens of millions of dollars," Mr. Welch accepted an agreement that gave him lifetime access to G.E.'s "planes, cars, offices, apartments, and financial planning." This is an example of a CEO trading off cash compensation and perquisites. Since retiring Mr. Welch has used "a palatial Manhattan apartment complete with wine, flowers, cook, housekeeper and other amenities, as well as access to General Electric's Boeing 737 jets, helicopters and a car and driver for Mr. Welch and his wife. Also included were tickets for the couple at a number of top sporting events and the opera." Securities and Exchange Commission rules require publicly traded corporations to disclose any personal benefits over $50,000 or 10 percent of a top executive's salary plus bonus. Concerned that such perks might appear excessive, Welch requested G.E. take back many of them and G.E.'s board of directors agreed. Welch said that he always pays for his personal meals and travel and rarely uses G.E's seats for cultural and sporting events. (Chapter 14 discusses tax and cost efficiency reasons as to why such fringe benefits often can be beneficial to the firm's shareholders.)

Source: G. Fabrikant and D. Johnson (2002), "G.E. Perks Raise Issues about Taxes," *The New York Times* (September 9), C1–C2.

the highest indifference curve possible given the compensation plan. This choice is Pareto-efficient. The owners are indifferent to Jerry's choice: They always pay the equivalent of S (they pay him $S - P$ in cash and P in perquisites). Jerry, however, is better off being able to choose the combination of salary and perquisites that he prefers. For example, Jerry had a back injury and prefers a more expensive, ergonomically designed desk chair to the company's standard office furniture, even though he knows that his compensation is reduced to reflect the additional expense. Also, Jerry might prefer a combination of salary and perquisites to a pure salary because perquisites frequently are untaxed.[10]

Note how the compensation plan aligns Jerry's and the owners' incentives. Jerry is given the decision right to choose how much the firm spends on his perquisites. The contract, however, charges Jerry the full cost of his perquisite consumption. In essence, he is rewarded for consuming fewer perquisites. This reward structure gives him private incentives to limit his perquisite consumption.

In this analysis the owners establish the firm's total compensation expense associated with Jerry's employment, S, Jerry chooses his optimal level of perquisite consumption, P^*, and this determines his cash compensation, C^* $(= S - P^*)$. This mechanism probably seems far-fetched. Yet such an outcome can be approximated closely through negotiation. If at the beginning of the period Jerry negotiates for a perquisite level of P^*, the owners recognize that their total compensation expense will be the sum of his cash compensation plus his perquisite consumption. Thus, they will set his cash compensation at C^* $(= S - P^*)$.

This example suggests that some perquisite taking by managers is likely to be efficient (from the standpoint of both the managers and the firm) because some perquisites increase productivity and because of the differential tax treatment for perquisites and salary. Thus, the perquisite taking by RJR executives was not necessarily inconsistent with the shareholders' objective of value maximization. Without the perquisites, the shareholders might have had to pay higher salaries to attract and retain the management

[10]This tax effect is reflected in Jerry's indifference curves. Over some range, Jerry is willing to trade more than a dollar of cash for a dollar's worth of perquisites because on an after-tax basis, he is better off. Over this range, the slope of the indifference curve has a slope with an absolute value greater than one. The optimal choice of salary and perquisites occurs at the point where the indifference curve's slope is -1.

Agency Problems with Owner-Managers

Baan Co., a leading provider of enterprise business software that competes with SAP and Oracle, was founded in 1978 by brothers Jan and Paul Baan in Holland. In 1998 the brothers owned 39 percent of the public company and also owned several private companies. Headquartered in a nineteenth-century chateau with a moat and decorated with Dutch master paintings, the Baan Co. did not own the building. It paid an undisclosed amount of rent to the Baan brothers' private company that owned the building. The private Baan company bought software from the public company and resold it. Because the public had little access to the private companies' operations or financial status, it was extremely difficult for investors to assess the health of the combined operation accurately. Investor concerns about potential conflicts of interest and stagnating software sales caused the stock price to drop from a high of $49 at the start of 1998 to a low of about $10 per share at the end of 1998. One day in July 1998 after the Baan brothers disclosed the extent of some of the ties between the public and private companies and after announcing steps to separate the parts of their empire, Baan Co. stock jumped 11 percent to $41. The brothers since have sold or donated much of their stock in the public company and are no longer actively involved in management. This example illustrates several important lessons. First, managers with large controlling ownership interests in their firm have opportunities to enrich themselves at the expense of shareholders. Second, the capital market discounts the stock price to reflect the expected amount of this self-dealing, given the available information.

Source: M. Maremont and M. Rose (1998), "Dutch Software Firm Has Extensive Links to Founder's Interests," *The Wall Street Journal* (July 10), A1.

team. Evidence from the stock market, however, suggests that the behavior of RJR executives was excessive. The stock price of RJR went from about $55 per share at the beginning of the takeover contest in October 1988 to about $110 per share when the company was taken over. Furthermore, the management team subsequently was replaced. Thus, the old RJR management team does not appear to have been maximizing the firm's value.

Costly Contracting and Asymmetric Information

We have shown how, in some cases, well-designed contracts can resolve incentive problems at low cost. Yet the example of RJR suggests that contracts often are unsuccessful in accomplishing this objective.

Unlike our hypothetical example, contracts in practice are not costless to negotiate, write, administer, or enforce. For instance, suppose that the owners of Bagby Printing delegate executive compensation decisions to its board of directors. In this case, Jerry might be able to convince board members not to enforce his contract to reduce his salary for perquisite consumption. (Indeed, Ross Johnson at RJR apparently attempted to keep board members loyal and supportive by paying them large retainers.) Board members participating in such collusion with senior managers can be replaced, but only at a cost. Legal fees alone can be substantial for writing and enforcing contracts (the legal profession's total receipts were estimated at $141.8 billion in 1998[11]).

A major factor limiting the ability of contracts to resolve incentive conflicts is costly information. In contrast to our example, it is unlikely that the owners of Bagby Printing actually would know the profit potential of the firm. Information is likely to be *asymmetric:* Jerry simply knows more than the owners about the firm's profit potential as well as his perquisite taking. Given this distribution of information, controlling

[11]U.S. Census Bureau (2000), *Statistical Abstract of the United States,* 772.

Jerry's perquisite taking by using a compensation contract that requires perfect information about the profit potential of the firm clearly is infeasible.

There are two general types of information problems that arise in contracting. The first problem is informational asymmetries before the contract is negotiated. The second is the problem of informational asymmetries during the implementation of the contract. Below, we elaborate on each of these problems. We begin with the postcontractual problems because of their importance in this text.

Postcontractual Information Problems

Agency Problems

An *agency relationship* consists of an agreement under which one party, the *principal,* engages another party, the *agent,* to perform some service on the principal's behalf. Many agency relationships exist within firms. Shareholders appoint boards of directors as their agents to oversee the management of firms. Boards delegate much of the operating authority to senior executives; they, in turn, assign tasks to lower-level employees. As we have discussed, there is good reason to believe that the incentives of principals and agents are not aligned automatically. There are *agency problems:* After the contract is set, agents have incentives to take actions that increase their well-being at the expense of the principals. For instance, as in the case of RJR, managers might shirk, consume perquisites, and choose investment and operating policies that reduce profits but increase the managers' expected well-being.

Asymmetric information typically precludes costless resolution of these contracting problems. Since the principal cannot observe the actions of the agent costlessly, the agent generally can engage in activities such as shirking and perquisite taking without those activities invariably being detected by the principal. Nonetheless, the principal usually can limit such behavior by establishing appropriate incentives for the agent through the contract and by incurring *monitoring costs.* Also, agents might incur *bonding costs* to help guarantee that they will not take certain actions or to ensure that the principal will be compensated if they do. (For example, agents might bond themselves by purchasing insurance policies that pay the principal in the case of theft.) The agent is willing to incur these expenses to increase the amount paid to the agent by the principal for the agent's services. If it is costly to control these contracting problems, then it generally will not pay for either party to incur sufficient costs to ensure that the agent will follow the wishes of the principal completely (at some point marginal cost exceeds the marginal benefits of additional expenditures to increase compliance). The dollar

Pilots of Private Jets

Corporate jets often have to refuel on intercontinental flights, usually in Kansas or Nebraska. A typical refueling costs $1,800. Refuelers at the same airport compete by offering pilots frozen steaks, wine, or top-of-the-line golf gear. These freebies are usually offered only if the pilot forgoes discounts on fuel and almost always are bestowed so that the corporation owning the plane never knows why the pilot chose to refuel at that particular place. Suppose the pilot chooses a refueler who charges $150 more than the least-cost option because the pilot gets $80 worth of gifts. There is a wealth transfer from the shareholders to the pilot (unless the behavior is anticipated) and a wealth reduction by the shareholders of $150, and hence a residual loss of $70.

Source: S. McCartney (1998), "We'll Be Landing So the Crew Can Grab a Steak," *The Wall Street Journal* (September 8), A1.

Technology to Reduce Monitoring Costs

Between 1997 and 2001 the percentage of companies recording and reviewing employee phone conversations has remained constant at around 10 percent. Those monitoring voice-mail messages have remained around 6 percent. But e-mail and Internet usage monitoring by employers has exploded from 15 percent to 46 percent of large U.S. companies. Firms are turning to monitoring employee use of e-mail and the Internet for good reason. Various surveys report that 90 percent of employees surf non-work-related websites at the office, 15 percent of employees spend over two hours a day surfing nonbusiness sites, and 10 percent receive 21 or more personal e-mails. Companies also fear expensive litigation resulting from an employee accessing sexually explicit material or circulating offensive e-mails.

Firms worried that employees are spending too much time on personal e-mails or surfing non-business-related sites are turning to technology to reduce the problems. One type of software blocks sites companies want to prevent employees from accessing, such as sex, gambling, shopping, and job search sites. Other software monitors how long each employee is on line, the websites visited, and the time spent on each site. Managers look for unusual patterns and report them to the employee's supervisor, who usually talks to the employee and then blocks the sites. Blocking and usage monitoring software is relatively inexpensive, costing firms about $15 per employee per year.

Source: A. Cohen (2001), "Worker Watchers," *Fortune/CNET Technology Review* (Summer), 70–80.

equivalent of the loss in gains from trade that results from this divergence of interests within the agency relationship is known as the *residual loss. Total agency costs* are the sum of the *out-of-pocket costs* (monitoring and bonding costs) and the residual loss.[12]

Example of Agency Costs

To illustrate the concepts of agency costs and asymmetric information, consider Good Tire Company and the Brown & Brown law firm. Good Tire wants outside legal counsel for contracting and litigation, as well as for general legal advice. Brown & Brown is capable of supplying these services.

Good Tire's marginal benefit, MB, for hours of legal services is

$$\text{MB} = \$200 - 2L \tag{10.4}$$

where L equals the hours per week of legal services provided to the firm. Good Tire faces some important legal issues, and thus the marginal benefits for legal services are quite high for the first few hours. But as these fundamental issues are resolved, the company receives advice on successively less important issues. Therefore, the marginal benefit of additional hours of legal services declines with the total number of hours provided.

Brown & Brown's marginal cost (MC) for providing additional hours of legal services is constant at $100 per hour:

$$\text{MC} = \$100 \tag{10.5}$$

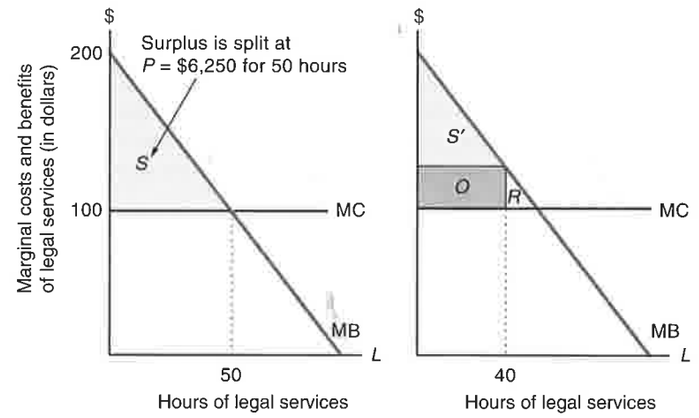
Value is maximized—all potential gains from trade between Good Tire and Brown & Brown are realized—at the point where the marginal benefits of legal services equal their marginal costs:

$$\begin{aligned} \text{MB} &= \text{MC} \\ 200 - 2L &= 100 \\ L^* &= 50 \text{ hours} \end{aligned} \tag{10.6}$$

[12]Thus, agency costs consist of that component of total contracting costs that arises from postcontractual information problems. M. Jensen and W. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3, 305–360.

Figure 10.3 Agency Costs in Legal Contracting

The left panel shows the marginal benefit (MB) to Good Tire for hours of legal services (L) and the marginal cost (MC) to Brown & Brown for providing these services. Assuming no incentive problems, the optimal number of hours is 50. The total gains from trade, $2,500, are shown by the triangle labeled S. The right panel reflects the contracting costs between the two firms—Brown & Brown might bill for more hours than hours worked. The two firms spend $400 each for monitoring and bonding costs. These out-of-pocket costs are shown by the rectangle labeled O. Since it does not pay to solve the incentive problem completely, we assume that Brown & Brown ends up providing only 40 hours of legal services. The triangle R represents the residual loss of $100. The original surplus S is reduced by the sum of the out-of-pocket costs and the residual loss. The resulting surplus, labeled S', is $1,600. How this surplus is split depends on the price charged for the legal services.



It is not optimal to provide more than 50 hours of legal services because the marginal benefits would be lower than the marginal costs. Correspondingly, it is suboptimal to provide fewer than 50 hours because the marginal costs of providing additional hours would be lower than the marginal benefits.

Assuming no contracting costs, the optimal contract simply might specify 50 hours per week of legal services. For example, Good Tire could agree to pay Brown & Brown $6,250 a week for 50 hours of legal work. This outcome is pictured in the left panel in Figure 10.3. The total gain from the exchange (surplus) is $2,500, as depicted by the triangle labeled S. At a price of $6,250 for legal services, the gains are split evenly between the two companies.[13] The fee covers Brown & Brown's costs of $5,000 (50 × $100) and provides it with a profit of $1,250. Good Tire receives gross benefits of $7,500. However, it pays a fee of $6,250, yielding net benefits of $1,250. If the two firms negotiate other prices for the 50 hours of legal services, the split in gains would be different. If the market for legal services is perfectly competitive, the price would be $5,000 ($100 per hour), and all gains would go to Good Tire. But as long as total hours are set at 50, the agreement is efficient and total surplus is $2,500.

[13]Recall that total benefits (TB) are equal to the area under the marginal benefit curve, while total costs (TC) are the area under the marginal cost curve. Thus, at 50 hours of legal service, the total surplus is $S = \text{TB} - \text{TC}$.

A potential incentive problem can confound this relationship: It is costly for Good Tire to observe how many hours of legal work Brown & Brown actually provides to the firm (there is asymmetric information). Thus, Brown & Brown might work fewer than 50 hours but still claim it worked the full amount. Indeed, the problem might be so severe that Good Tire does not hire Brown & Brown at all. In this case, the total potential gains from trade are lost. This contracting cost is a residual loss: The lost surplus that results because it is simply too costly to resolve this incentive problem.

More generally, the two firms might be able to promote a mutually advantageous exchange by controlling this incentive problem through expenditures on monitoring and bonding. For example, Good Tire might spend $400 per week to hire a manager specifically to oversee Brown & Brown's work, and Brown & Brown might spend $400 per week to document that it is actually conducting legal work for the firm. But it is unlikely that it will pay the two parties to expend sufficient resources to guarantee that Brown & Brown will do no overbilling. For example, the end result might be that, after the $800 expenditures on monitoring and bonding, Brown & Brown provides 40 hours of legal service and bills for 50 hours. Both parties anticipate this outcome and might negotiate a price of $5,200 for the legal service.[14] This price is lower than in the case where information is costless and there are no incentive problems: Good Tire is unwilling to pay as much for the anticipated 40 hours as it would if it were sure it would receive 50 hours of legal services.

The right panel in Figure 10.3 illustrates this outcome. The triangle, labeled *R*, is the residual loss of $100—the lost surplus that results because it is not efficient to resolve the incentive problem completely. In addition, the two companies pay $400 each for monitoring and bonding. These payments reduce the surplus by $800, as shown by the rectangle labeled *O*.[15] The remaining surplus is $1,600. This surplus is equal to the original surplus of $2,500 minus the total contracting costs of $900—the sum of the out-of-pocket costs (monitoring and bonding costs) and the residual loss. In the end, Brown & Brown earns a net profit of $800 [$= \$5,200 - (40 \times 100) - 400$]. Good Tire obtains net benefits of $800 [$= \$6,400 - \$5,200 - \$400$].[16] Both firms are $450 per week worse off than in the case where there was neither asymmetric information nor incentive problems.

Precontractual Information Problems

Information normally is asymmetric at the time of contract negotiations, as well. For example, in negotiating a labor contract, the prospective employee typically has superior information on what wage is acceptable, whereas the employer knows more about what the firm is willing to pay. Precontractual informational asymmetries also generate contracting costs and can cause at least two major problems—bargaining failures and adverse selection.

[14]Good Tire cannot observe the actual hours worked by Brown & Brown. Nonetheless, it can have *rational expectations* (an unbiased forecast given the information that it does have) that Brown & Brown will work 40 hours, yet bill for 50. Note that the $5,200 price is chosen somewhat arbitrarily in this example; as we will see, it is the price that splits the surplus.

[15]The placement of this rectangle is arbitrary. All that is important is that the area of the original surplus be reduced by the $800 out-of-pocket expenses.

[16]The $6,400 is the gross surplus for Good Tire. It is the area under the marginal benefit curve between zero and 40 hours.

Do Firms Really Have Incentive Problems with Their Law Firms?

Our example of incentive problems with law firms illustrates a real problem faced by businesses every day—figuring out whether their lawyers are "playing it straight." According to *Business Week,*

> The task is time-consuming and often unpleasant, but for companies battling ever diminishing budgets can be fruitful. General Dynamics, for example, lopped off $186,000, or 42 percent from just one bill when it discovered a law firm charging for what ended up to be useless research. Motorola Inc. saved a pocketful when it confronted counsel for billing it for hours spent preparing documents that, because of a statute passed a year earlier, were no longer required.

In addition to doing useless research to pad their bills, some lawyers fraudulently increase the number of hours worked. For example, William Duker was ordered to pay $2.6 million to the Federal Deposit Insurance Corp. Mr. Duker's law firm was hired by the FDIC to seek damages from junk-bond king Michael Milken. Mr. Duker personally took home between $1 million and $5 million a year for this work. But in addition he added hours each day for work performed by other lawyers in his firm, typically inflating the firm's overall bills by more than 10 percent. In addition to the fines and penalties, Mr. Duker also faced a prison term of 1 to 4 years.

Sources: L. Himmelstein (1993),"The Verdict: Guilty of Overcharging," *Business Week* (September 6), 62; P. Barrett (1997), "Lawyer Was a Critic of Law Firm Fraud; Now He Faces Prison," *The Wall Street Journal* (September 30), A1.

Bargaining Failures

Asymmetric information can prevent parties from reaching an agreement even when in theory a contract could be constructed that would be mutually advantageous. Suppose that Sheri Merriman is willing to accept a job for as little as $2,500 per month and Jon Park, the human resources manager, is willing to pay as much as $3,000 per month. In principle, a mutually advantageous contract could be negotiated at any price between $2,500 and $3,000. Neither side, however, is likely to know the other side's reservation price (the highest price that Jon is willing to offer and the lowest price that Sheri is willing to accept). In an attempt to get the best price possible, both parties might overreach, resulting in a bargaining failure. In her initial interview, Sheri might ask for $3,500. Hearing this, Jon might discontinue negotiations because he doubts that he can hire Sheri for less than $3,000 (his reservation price). This phenomenon helps to explain the existence of labor strikes that end up hurting both labor and the company. (Strikes result in lower productivity and sales; thus there are fewer profits to be divided between labor and the company.)

Adverse Selection

A second problem caused by precontractual informational asymmetries is *adverse selection.* Adverse selection refers to the tendency of an individual with private information about something that affects a potential trading partner's costs or benefits to extend an offer that would be detrimental to the trading partner.

As an example, consider the market for health insurance.[17] Table 10.1 displays three individuals and their expected medical costs for the year. Angela is the healthiest and expects to spend only $100 on medical expenses, whereas Cindy is the least healthy and expects to spend $900; Bruno is in the middle with expected expenditures of $500. The average expected expenditure for all three individuals is thus $500 per person.

[17]Managers often are involved in designing or modifying fringe-benefit policies. Understanding the following problem is important in this activity. We discuss this issue in greater detail in Chapter 11.

	Expected Annual Medical Expenditure
Angela Wilson	$100
Bruno Lopez	$500
Cindy Lo	$900
All three individuals	$500 per person

Table 10.1 Example of Adverse Selection in Insurance Markets

This table shows the expected annual medical expenditures for three individuals. If an insurance company sells insurance to all three at a price above $500 per year, it expects to make a profit. However, if the company prices insurance at $500, Angela is unlikely to purchase the insurance. Bruno and Cindy have average expected expenditures of $700 per person. Thus, if Bruno and Cindy are the sole purchasers, the company must sell the insurance at above $700 to break even. In this case, Bruno might not buy the insurance. The end result can be a market failure, where the company prices the insurance at $900 and sells only to Cindy.

It is likely that each individual knows more about his or her health than an insurance company does: Individuals know how they have been feeling and their health habits, whereas an insurance company is likely to have information that is restricted to the typical expenditures for readily observed categories within the population (for example, age and gender categories). In this spirit, suppose that each individual knows his or her expected expenditure whereas the insurance company knows only the expected expenditure for the three individuals as a group—$500 per person. If the company expects to make a profit, it must sell insurance policies at premiums that exceed the expected expenditures of the buyers.

The information structure in this example can dissuade some potential customers from transacting in the market, thereby reducing the gains from trade. For instance, assume that the insurance company tries to sell insurance at $510. If all three parties bought the insurance, the company would expect to make a profit. However, at this price, Angela might not want to purchase insurance. She expects to spend only $100 on medical expenses; from her perspective, the insurance appears extremely expensive.[18] At a premium of $510, if only Bruno and Cindy bought the insurance, the company on average would lose money: Expected losses would be $190 per policyholder since their expected expenses would be $700. The insurance company might anticipate that healthy individuals will not buy the insurance at $510 and attempt to raise the price. For example, if it offered the insurance policies to both Cindy and Bruno and they purchased at $710, it would make a profit. However, at this price Bruno is less likely to buy the insurance because the price is substantially above his expected expenditure of $500. In the end, the insurance company might price insurance at a cost above $900 and sell only to Cindy—the least healthy of the three.

The company might be able to sell insurance to all three parties by becoming better informed about the individual health status of each of its applicants so that it could quote more customized rates. For example, it might require a medical exam of all applicants, as well as access to their medical records. In this case, different rates could be charged, depending on the health of the individual. Collecting information, however, is

[18]Since Angela is risk-averse, she would be willing to spend more than $100 for insurance (see Chapter 2). However, suppose she concludes that $510 is too expensive.

Battling Informational Problems in the Automobile Insurance Industry

Robert Plan Corporation specializes in providing automobile insurance to high-risk customers in urban areas. Most insurance companies have stayed away from this market because of high risks from both adverse selection and fraud. Robert Plan has been successful in this market by addressing both problems aggressively. The company carefully scrutinizes applications to assess the proper premium. It claims that virtually 100 percent of its applications are "misstated," with applicants fibbing about items such as whether they drive to work or where their primary residence is. Robert Plan uses its own private investigators to check out potential fibs. They may visit applicants' homes and follow them as they drive their cars (to determine if they are driving to work).

The company also is concerned about the problem of excessive claims. The company is notorious for being aggressive in ensuring that it does not pay excessive claims. Company investigators say one maneuver that "works well" is letting the air out of a tire to see if someone claiming a back injury "feels well enough to change it." Senior management of the company does not "condone this action and says if it is going on it will stop it." However, the company recognizes that if it is going to survive while serving this market, it must conduct "hand-to-hand combat with fraud."

Source: S. Woolley (1993), "Smile, Cheater, You're on Candid Camera," *Business Week* (October 4).

costly, and thus there is an incentive to consider these costs in the design of the organization and its policies.[19] For instance, since the cost of the additional information is fixed, the insurer might require exams of applicants requesting broader coverage limits but not for those willing to accept narrower coverage.

In some cases, adverse-selection problems can be reduced by the clever design of contracts. An insurance company might be able to offer a menu of contracts with different deductibles, coinsurance requirements, and prices that would motivate these individuals to *self-select* based on their private information. For example, Angela might choose a low-priced insurance contract with a high deductible, whereas Cindy might choose a high-priced contract that provides full insurance. In this case, the company might be able to sell insurance to all three customers at a profit.

Sometimes, it is possible for individuals to communicate, or *signal,* their private information to other parties in a credible fashion. For example, Angela might be able to convince the insurance company that she is quite healthy and should be sold insurance at a low rate. (She might document that she participated in six marathon races during the year.) Angela's communication to the company will be convincing to the company only if the cost to Bruno and Cindy for sending the same signal is higher than Angela's. (For example, because they are not in excellent health, they are unable to participate in marathons.) Otherwise, they could take the same action to claim they were healthy, and then there would be no reason for the company to believe any of their claims.

Adverse-selection problems are not limited to insurance markets; they occur in many settings. Prospective employees are likely to know more about their talents and productivity than employers. Similarly, the seller of a used car knows more about the quality of the car than the buyer. Thus, at a given price, sellers are more likely to offer "lemons" than high-quality cars.[20] In these settings, traders often develop mechanisms that help

[19]The company also might overcome the problem by selling group insurance to a company that employs all three individuals. In this case, the individuals do not select whether or not to be covered. Thus, the insurance company can make a profit at a premium above $500 per person.

[20]G. Akerlof (1970), "The Market for Lemons: Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics* 84, 488–500.

Coke's Implicit Contract

Coke, one of the most valuable brand names in the world, has an implicit contract with its consumers for high quality and consistency. Thus, Coca-Cola faced a big problem when in June 1999, 200 people in Belgium and France, many of them children, came down with nausea and dizziness after drinking Coke. A number of European countries immediately banned Coke. Coca-Cola identified poor-quality carbon dioxide and a fungicide to treat wooden pallets in the warehouse as the source of the smell and taste that might have caused the illness.

Coke's Chairman and CEO M. Douglas Ivester immediately flew to Europe and published a personal apology in the leading newspapers in an attempt to restore consumer confidence. Coca-Cola said it would charge earnings $60 million related to the 14-million-case recall. In the seven trading days following the incident, Coke's stock price fell about 8 percent from $66 to $61.

Source: "Coke's Hard Lesson in Crisis Management," *Business Week* (July 5, 1999), 102.

reduce adverse-selection problems. Used-car dealers offer warranties that guarantee that if the car is a lemon, the dealer will repair or exchange it at the dealer's expense. Also, there are diagnostic mechanics that provide prospective buyers with a professional assessment of the quality of a car.

Implicit Contracts and Reputational Concerns

Implicit Contracts

Many of the contracts that constitute the firm are implicit: They consist of promises and understandings that are not formalized by legal documents. Examples include promises of promotions and salary increases for a job well done and informal understandings that suppliers will not shirk on quality. By definition, implicit contracts are difficult to enforce in court; they depend largely on private incentives of individuals to honor their terms. Given the incentive conflicts that we discuss in this chapter, why would individuals ever expect others to honor terms of implicit contracts? Specifically, why would an employee ever trust an unwritten promise by a manager to give the employee a raise for a job done well? Doesn't the manager always have incentives to abrogate the contract after the job is complete? After the task is complete, the benefits are sunk. Not granting the raise would appear to reduce costs, increase profits, and thereby increase the manager's bonus.

Reputational Concerns

The answer to these questions is that reputational concerns act as a powerful force to motivate contract compliance. In particular, the market can impose substantial costs on institutions and individuals for unscrupulous behavior. Thus, market forces can provide powerful private incentives to act with integrity. (Chapter 22 contains an extended discussion on promoting ethical behavior within corporations.)

As an example, consider a firm that has a long-term contract to provide a metal part to a manufacturing firm each month at a price of $10,000. The cost of producing this product is $9,000, so the profit per unit is $1,000. It is possible for the supplier to produce a low-quality product for $2,000. However, it has agreed to provide a high-quality product. Suppose the quality of the part is known to the buyer only after the purchase; it would be possible for the supplier to make a profit of $8,000 by producing

Corporate Scandal Affects Personal Reputations

The Bank of Credit & Commerce International (BCCI) collapsed in a 1991 fraud and money-laundering scandal. Mesba Islam, a 54-year-old former senior manager at the bank, who was never involved in the scandal, has been out of work ever since. He has mailed 540 résumés, but when he lists BCCI as his last place of employment, he gets rejected. Mr. Islam and 358 former BCCI employees in England want the bank to pay for the stigma caused to their careers. For instance, a former employee claims one company refused to hire him because of "adverse publicity" surrounding his previous employer. The House of Lords allowed the case to go to trial, saying a business could be forced to pay damages for breaking its implicit contract with employees to operate honestly.

Source: D. Pearl (1999), "Ex-BCCI Employees Say Bank's Notoriety Left Them Unhirable," *The Wall Street Journal* (March 1), A1.

a low-quality part, yet claiming it to be high-quality. The buying firm, however, will detect the quality of the part after purchase and will cancel future purchases if it is cheated. The supplying firm thus faces a trade-off. It can gain an additional $7,000 in the short run by cheating. However, it loses a $1,000 per month future profit stream. The supplier has a strong incentive to be honest so long as the present value of the future profit stream is greater than the short-run gain from cheating.

Typically, the costs of cheating on quality are higher if the information about such activities is more rapidly and widely distributed to potential future customers. Within a market like the diamond trade in New York, misrepresenting quality to another merchant is quite rare. This market is dominated by a close-knit community of Hasidic Jews; information about dishonest behavior spreads rapidly throughout this market. In other broader markets, specialized services that monitor the market help ensure contract performance. *Consumer Reports* evaluates products from toasters to automobiles, the *Investment Dealer's Digest* reports on investment bankers, and *Business Week* ranks MBA programs. By lowering the costs for potential customers to determine quality, these information sources increase the costs of cheating.

More generally, reputational concerns are more likely to be effective in promoting contract compliance when (1) the gains from cheating are smaller, (2) the likelihood of detecting cheating is higher, and (3) the expected sanctions imposed if cheating is detected are higher. (For instance, sanctions are likely to be higher if the relationship is anticipated to extend over a longer period.) When these conditions are not met, reputational concerns are less effective in motivating contract compliance. In many settings, reputational concerns are extraordinarily important in promoting cooperation and integrity. The ability to enter into self-enforcing agreements can reduce the costs of contracting within an organization materially: Fewer resources are used for negotiating and enforcing formal contracts.

Incentives to Economize on Contracting Costs

It is important to understand that everyone has incentives to resolve contracting problems in the least costly manner. By so doing, there are additional gains from trade to share among the parties. In the Good Tire example, if their incentive problems could be resolved costlessly, there would be an additional $900 of surplus to split between Good Tire and Brown & Brown. (If they didn't have to spend money on auditors and compliance, they could divide the resulting savings between themselves.)

Can the SEC Reduce Contracting Costs?

Audit committees, a group within a company's board of directors, oversee and provide a check on the firm's financial controls. Audit committees hire and supervise the independent CPA firm engaged to conduct the audit. The outside auditor reports its findings to the audit committee. Audit committees thus perform an important monitoring function within public corporations.

In response to a number of recent corporate accounting frauds, the Securities and Exchange Commission appointed a blue-ribbon panel. Their recommendations involve a tougher set of requirements for audit committee members. Directors are disqualified from audit committees if family members work for or do business with the firm. At least one member of the audit committee must have an accounting or finance background. These proposals are aimed at preventing unqualified members or those too close to the company from serving on audit committees.

The question arises as to how these proposals can increase the level of monitoring and thereby control incentive problems. The contracting parties already have incentives to minimize total contracting costs. If they fail to do this, the value of the firm is lower. Government regulation might lower contracting costs if there are externalities in the sense that financial frauds lower investor confidence in capital markets. (Chapter 20 further discusses various aspects of government regulation.)

Source: J. Lublin and E. MacDonald (1999). "More Independent Audit Committees Are Sought." *The Wall Street Journal* (February 8).

Basic Principle: Value Maximization

Incentive problems generate costs that reduce value. It is in the interests of all parties to a contract to develop efficient solutions to agency problems. More value is created, which can be shared among the contracting parties.

It is in the self-interest of individuals to minimize total contracting costs in any relationship.[21] Incentives exist to negotiate contracts that provide monitoring and bonding activities to the point where their marginal cost equals the marginal gain from reducing the residual loss. This means that incentives exist within the contracting process to produce an efficient utilization of resources (at least from the standpoint of the contracting parties).

Viewing contracts as efficient responses to the particular contracting problem can be an extremely powerful tool in explaining observed organizational architectures. As a simple example, consider the difference between the way fruit pickers are paid compared to the way employees who assemble airplanes are paid. Agricultural workers usually are paid on a piecework basis: The more fruit they pick, the more pay they receive. Alternatively, employees who assemble airplanes often are paid a straight salary (the same salary is paid independent of output). What accounts for this difference in observed contracts? In general, output increases if people are paid on a piecework basis. A person will pick more pieces of fruit per hour if paid by the piece than by the hour. However, piecework payments generate their own set of incentive problems. These payments motivate people to focus more on output and less on quality. In fruit picking, a supervisor can monitor the quality of the output inexpensively through direct inspection of the harvested fruit. In the case of airplanes, quality problems may not be detected until after the employee leaves the job (for example, after the plane is delivered, put into service, and—in the most extreme case—crashes). In this situation, the contracting costs of piecework payments are larger than the benefits. We apply this type of logic throughout the book to explain the design of organizations.

[21]Technical note: For this statement to be strictly true, production costs must be separable from agency costs and there must be no wealth effects. (The choices of the principal and agent are independent of their individual wealth levels.) When these conditions are violated, the individuals might not want to minimize total agency costs. Nonetheless, they still have strong incentives to consider these costs in designing contracts. For our purpose, it is reasonable and convenient to ignore these technical considerations.

CASE STUDY: *eBay.com*

eBay is the world's largest online auction. In late 1999, the service listed over 2,000 categories of items from sports memorabilia to automobiles. In total, eBay hosted more than 2.5 million auctions a day. Sellers pay a few dollars to eBay to list their items. They provide a description of the item, photographs, the minimum acceptable bid, accepted forms of payment, and other relevant information. Bidders submit electronic bids over the Internet. After the auction closes (auctions usually last several days), the high bidder receives an e-mail. The high bidder must contact the seller within 3 business days to claim the item as well as arrange for payment and delivery of the item. eBay provides other support services.

- *The Feedback Forum* is a place where eBay users leave comments about each other's buying and selling experiences. If you're a bidder, you can check the seller's Feedback Profile easily before you place a bid to learn about the other person's experience with previous buyers. If you're a seller, you can do the same with your bidders.
- Every eBay user is covered by *insurance* at no additional charge under the terms of eBay's program. If a buyer pays for an item and never receives it (or receives the item, but it was less than expected), eBay reimburses the buyer up to $200, less a $25 deductible.
- *SafeHarbor,* eBay's safety staff, investigates alleged misuses at eBay such as fraud, trading offenses, and illegally listed items. Potential resolutions include things like banning a person from future trading on eBay.
- Buyers and sellers can use an *escrow service* in transactions involving expensive items. eBay's escrow partner, i-Escrow, holds a buyer's payment and sends it to the seller only after the buyer has inspected the merchandise and gives approval. Sellers have the same opportunity to inspect and approve a returned item before the buyer gets a refund.

To obtain more detailed information, go to www.ebay.com.

Discussion Questions

1. How does eBay create value?
2. What potential contracting problems exist on eBay?
3. How does eBay address these problems?
4. What are the contracting costs at eBay?
5. eBay claims that it has only a small problem with fraud and misuse of the system. Does this imply that it is overinvesting in addressing potential contracting problems? Underinvesting? Explain.

Summary

Treating a firm as if it were an individual decision maker who maximizes profits is a useful abstraction in some contexts. For example, this characterization has been used in previous chapters in analyzing output and pricing decisions. But to analyze organizational issues within the firm requires a richer definition. A particularly useful definition for our purposes is that the *firm is a focal point for a set of contracts.*

Since individuals are creative maximizers of their own well-being, there are likely to be incentive conflicts among the parties that contract with the firm. Examples include owner-manager, buyer-supplier, and free-rider conflicts. Contracts (explicit and implicit) specify a firm's *organizational architecture* (its decision right, performance evaluation, and reward systems). This architecture establishes a set of constraints and incentives that can reduce the costs of incentive conflicts. Contracts are unlikely to resolve incentive problems completely because they are costly to negotiate, administer, and enforce. *Asymmetric information* causes particularly important problems.

An *agency relationship* consists of an agreement under which one party, the *principal,* engages another party, the *agent,* to perform some service on behalf of the principal. Many agency relationships exist within firms. Agents do not act in the best interests of principals automatically—there are *incentive problems.*

Asymmetric information usually implies that incentive problems cannot be resolved costlessly by contracts. The principal usually can limit the divergence of interests by structuring the contract to establish appropriate incentives for the agent and by incurring *monitoring costs* aimed at limiting dysfunctional activities by the agent. Also, agents might incur *bonding costs* to help guarantee that they will not take certain actions or to ensure that the principal will be compensated if they do. Generally, it does not pay to resolve incentive conflicts completely. The dollar equivalent of the loss in the gains from trade that results due to the divergence of interests in the agency relationship is known as the *residual loss.* Total agency costs are the sum of the *out-of-pocket costs* (monitoring and bonding costs) and the opportunity cost of the residual loss.

Precontractual informational asymmetries can cause breakdowns in bargaining and *adverse selection.* Adverse selection refers to the tendency of individuals, with private information about something that affects a potential trading partner's costs or benefits, to make offers that are detrimental to the trading partner. Costs of adverse selection reduce the gains from trade and can cause market failures. Precontractual information problems can be mitigated by information collection, clever contract design, credible communication, and mechanisms such as warranties.

Many of the contracts within firms are *implicit contracts* rather than formal legal documents. Implicit contracts are difficult to enforce in a court of law and depend largely on the private incentives of individuals for enforcement. *Reputational concerns* can provide incentives to honor implicit contracts. These concerns are more likely to be effective when (1) the gains from cheating are smaller, (2) the likelihood of detecting cheating is higher, and (3) the expected sanctions imposed if cheating is detected are higher. It sometimes is possible to structure organizations in ways that increase the likelihood that reputational concerns will be more effective in encouraging individuals to behave with integrity.

Parties to a contract have incentives to resolve contracting problems in the least costly manner. By so doing, there are additional gains from trade to share among the parties. Viewing observed contracts as efficient responses to the particular contracting problem provides a powerful tool for explaining organizational architecture.

Suggested Readings

O. Hart (1989), "An Economist's Perspective on the Theory of the Firm," *Columbia Law Review* 89, 1757–1774.

M. Jensen and W. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3, 305–360. Pay particular attention to the first 11 pages.

M. Jensen and C. Smith (1985), "Stockholder, Manager, and Creditor Interests: Applications of Agency Theory," in E. Altman and M. Subrahmanyam (Eds.), *Recent Advances in Corporate Finance* (Richard D. Irwin: Burr Ridge, IL), 93–131.

J. McMillian (1992), *Games, Strategies, and Managers* (Oxford University Press: New York).

G. Miller (1992), *Managerial Dilemmas: The Political Economy of Hierarchy* (Cambridge University Press: Cambridge).

Review Questions

10–1. What is a firm?

10–2. Give examples of incentive conflicts:
- **a.** Between shareholders and managers
- **b.** Between coworkers on teams

10–3. What is asymmetric information? How can it limit contracts from solving incentive conflicts?

10–4. Name the two parties involved in an agency relationship.

10–5. What potential problems exist in agency relationships?

10–6. Is it worthwhile for shareholders to seek to completely eliminate incentive problems with managers and directors through means such as monitoring? Why or why not?

10–7. What is adverse selection? Give an example.

10–8. How do reputational concerns aid in the enforcement of contracts?

10–9. Schmidt Brewing Company is family-owned and -operated. The family wants to raise some capital by selling 30 percent of the common stock to outside shareholders. The company has been profitable, and the family indicates that it expects to pay high dividends to shareholders. The family will maintain 70 percent ownership of the common stock and continue to manage the firm. The rights of shareholders are specified in the company's corporate charter. The charter specifies such items as voting rights (procedures and items subject to a vote), meeting requirements, board size, rights to cash flows, and so on. Once adopted, a charter can only be changed by a vote of the shareholders. What types of provisions in the corporate charter of Schmidt Brewing might motivate minority shareholders to pay higher prices for the stock? Explain.

10–10. Which of the following examples is an adverse-selection problem and which is an incentive problem? Explain why. In each case, give one method that the restaurant might use to reduce the problem.
- **a.** A restaurant decides to offer an all-you-can-eat buffet that is sold for a fixed price. The restaurant discovers that the customers for this buffet are not its usual clientele. Instead, the customers tend to have big appetites. The restaurant loses money on the buffet.
- **b.** A restaurant owner hires a manager who promises to work long hours. When the owner is out of town, the manager goes home early. This action results in lost profits for the firm.

10–11. In 1992 the state of California charged Sears Auto Centers with overcharging customers for unneeded or unperformed repairs. Sears agreed to a settlement that could cost as much as $20 million. Sears had compensated its salespeople with commissions based on total sales. Following the settlement, Sears dropped the commissions and went to a straight salary. Sears recently indicated that it is planning to reinstate commissions for salespeople in their Auto Centers. It even plans on paying commissions for selling customers brake jobs and wheel alignments. These two products were the core of the 1992 scandal. Sears says that it has taken steps to prevent a recurrence of past problems. In particular, the decision right to recommend repairs is granted to mechanics who are paid a straight salary. Sales consultants are paid commissions for selling repair services but are not authorized to recommend repairs. Under the old system that caused problems, these individuals diagnosed repair problems and sold the corresponding service to customers. Why do you think Sears wants to reinstall commissions for its salespeople? Do you think that the new safeguard that separates diagnosing problems from selling services will prevent a recurrence of past problems? Explain.

10–12. The Sonjan company currently purchases health insurance for all of its 1,000 employees. The company is considering adopting a flexible plan whereby employees can either have $2,000 in cash or purchase an insurance policy (which currently costs $1,000). Do you see any potential problems with the new plan? Explain.

PART THREE

Designing Organizational Architecture

Organizational Architecture

CHAPTER 11

CHAPTER OUTLINE

Founded in 1919, Brabantia is one of Europe's largest manufacturers of household products such as ironing boards, waste bins, food storage canisters, kitchen tools, and mailboxes. Headquartered in the Netherlands with 850 employees and 1998 sales of about $80 million, the company specializes in steel and stainless steel utensils. Through the 1980s and 1990s Brabantia faced increased competition for its products. With the European Economic Union creation of a "single market," other European companies entered Brabantia's local markets. As Europe's population growth slowed, the household utensil market became saturated. And large, mass-marketing retailers entered the European market driving out Brabantia's traditional outlets—small household specialty stores.[1]

Brabantia needed new products and new channels of distribution. It needed to become more efficient. It had high rates of rework and scrap, low levels of productivity, and high rates of employee absenteeism. The firm was organized quite centrally with traditional formal hierarchies, task specialization, and a functional structure. New products and programs were "top down" in nature and usually excluded input from lower-level operational staff. The firm assessed its performance based on cost, margins, and meeting output goals—not on measuring quality or customer satisfaction. Pay increases were based on seniority and company-wide pay settlements.

[1]Sources: "New Forms of Work Organization: Case Studies," European Commission, Directorate-General for Employment, Industrial Relations and Social Affairs, Unit V/D.3 (June 1998); and www.Brabantia.com.

To address its problems of increased competition, shrinking channels of distribution, low worker productivity, and a stale product line, Brabantia instituted a series of organizational changes that were designed to enhance performance. These changes involved three important aspects of the organization that we refer to as the firm's organizational architecture:[2]

- The assignment of decision rights within the firm
- The methods of rewarding individuals
- The structure of systems to evaluate the performance of both individuals and business units

Senior managers set the overall policies of the firm, including its organizational architecture. One change involved giving lower-level managers greater control over their work and substantial authority to make and implement decisions. Semiautonomous work teams were given considerable freedom in ordering raw materials, scheduling production, and recruiting new team members. A new mission statement was written with input from all employees: "Our ambition is simple: to develop household products that retain their beauty and performance for the next 20 years. It's what drives the company, it's who we are." In other words, Brabantia decentralized the assignment of decision rights within the organization.

The company began to focus on innovation, new product development, rather than cost or output. It changed how employees were rewarded, placing greater emphasis on rewarding teams and individuals. It also restructured its information systems to monitor performance using a broader range of objectives, such as quality and customer satisfaction. Employees were trained to work in groups and to apply continuous improvement techniques with an emphasis on staff involvement. Formal policy statements explain the new organizational architecture and mission statement to all employees.

The results have been impressive. The time to develop new products was reduced 20 percent. Quality and productivity have improved. Scrap and rework rates have fallen. Employee satisfaction has improved as evidenced by employee absenteeism falling from 15 to 7 percent.

This example of Brabantia illustrates that organizational architecture is an important determinant of the success or failure of firms. The purpose of this chapter is to introduce the concept of organizational architecture and to provide a broad overview of the factors that are likely to be important in designing the optimal architecture for a particular organization. The remaining six chapters of Part 3 contain a more detailed discussion of each of the three components of organizational architecture.

Understanding organizational architecture provides managers with powerful tools for affecting their firm's performance. As we shall see, managers must be careful and thoughtful in their use of these tools or the results can be counterproductive. This book presents material designed to help managers employ these tools more effectively.

We begin by discussing the fundamental problem facing firms and markets. We then examine how organizational architecture can help solve this problem.[3]

[2]The importance of these three features of organizations has been recognized by a number of authors in economics and management. For instance, see M. Jensen and W. Meckling (1995), "Specific and General Knowledge, and Organizational Structure," *Journal of Applied Corporate Finance* 8:2, 4–18; P. Milgrom and J. Roberts (1992), *Economics, Organization & Management* (Prentice Hall: Englewood Cliffs, NJ); and D. Robey (1991), *Designing Organizations* (Richard D. Irwin: Burr Ridge, IL).

[3]The first part of this chapter draws on M. Jensen and W. Meckling (1992), "Specific and General Knowledge, and Organizational Structure," *Journal of Applied Corporate Finance* 8:2, 4–18.

The Fundamental Problem

The primary goal of any economic organization is to produce the output customers want at the lowest possible cost. The challenge of discovering customer demands while reducing costs, both for economic systems and within individual firms, is complicated by the fact that important information for economic decision making generally is held by many different individuals. Furthermore, this information often is quite expensive to transfer (that is, the information is *specific* as opposed to *general*). For example, a scientist is likely to know more about the potential of a specific research project than are executives higher in the firm. Similarly, individual machine operators normally know more about how to use their particular machines than do their supervisors. In both cases, communicating such information to headquarters for approval prior to acting on the information is likely to be cumbersome, resulting in many lost opportunities.

A second complication is that decision makers might not have appropriate incentives to make more effective decisions even if they have the relevant information. As discussed in Chapter 10, there are *incentive problems.* For example, a scientist might want to complete a research project out of scholarly interest, even if convinced the project is unprofitable. Similarly, machine operators might not want to use machines efficiently if this would mean additional work for them.

In sum, the principal challenge in designing firms (as well as entire economic systems) is to maximize the likelihood that decision makers have both the relevant information to make good decisions and the incentives to use the information productively.

There are many alternative ways of organizing economic activity to try to achieve these objectives. Economic transactions can occur within markets or firms. Firms can be organized as corporations, mutuals, partnerships, supplier cooperatives, employee-owned companies, or sole proprietorships. In each case, there are many different possible organizational architectures. All these alternatives involve costs as well as benefits. As we have discussed in previous chapters, individuals have incentives to select value-maximizing forms of organization. By maximizing the "size of the pie," there is more to share among the parties to the transaction. To achieve this objective, it is important to have a detailed understanding of the architectures of both markets and firms.

Architecture of Markets

The price system helps solve information and incentive problems in markets. In market economies, individuals have private property rights. If Jorge Ortega owns a building, he decides how it will be used. If Aldo Deng knows how to make better use of the building, Aldo can bid more for the building than it is worth to Jorge. Jorge can sell it and pocket the proceeds. He has strong incentives to use the building productively because he bears the wealth effects.

Hence, the market provides an architecture that promotes efficient resource use. First, through market transactions, decision rights for resources are rearranged so that they tend to be held by individuals with the relevant specific knowledge for using those resources most productively. Individuals with the relevant specific knowledge will profit the most by owning the resources and thus are likely to be willing to pay a higher price to own them. Second, the market provides a mechanism for evaluating and rewarding the performance of resource owners: Owners bear the wealth effects of their actions. This mechanism generates important incentives to take efficient actions. A valuable feature of the price system in a market economy is that this architecture is created spontaneously, with little conscious thought or human direction.

Spontaneous Creation of Markets: Evidence from Prisoner-of-War Camps

One interesting feature of markets is how they often arise with limited human direction. As an example, economist R. A. Radford studied economic activity inside prisoner-of-war camps during World War II. In these camps, prisoners obtained rations from the Red Cross consisting of food, cigarettes, and other items. Of course, not all prisoners valued individual items the same. The English preferred drinking tea to coffee, whereas French prisoners preferred coffee to tea. Some prisoners smoked heavily, whereas others were nonsmokers. Potential gains from trade quickly motivated exchanges among prisoners. Before long, an organized market evolved. Cigarettes became the common currency. Prisoners quoted prices for goods in terms of the number of cigarettes. The price of individual items depended on supply and demand. For example, the price of chocolate would drop dramatically if a new Red Cross shipment increased supply substantially. The markets at the prisoner-of-war camps were quite active and emerged without a central planner saying "let's create a market." The welfare of the prisoners was significantly enhanced by the presence of these markets—although they benefited substantially more when they were liberated!

Source: R. Radford (1945), "The Economic Organization of a P.O.W. Camp," *Economica* 12, 189–201.

Architecture within Firms

Within firms, there are no automatic systems either for assigning decision rights to individuals with information or for motivating individuals to use information to promote a firm's objectives. Organizational architecture is created by executives through the implicit and explicit contracts that constitute the firm (see Chapter 10). For instance, decision rights are granted to employees through formal and informal job descriptions, whereas performance evaluations and rewards are specified in formal and informal compensation contracts. At Brabantia, both the old and new architectures were designed and implemented by senior management.

Decision Rights

Although transfer prices are used to allocate selected resources in some firms, most resources are allocated by administrative decisions.[4] For example, the CEO of a company typically transfers a manager from one division of the company to another by a simple command. Similarly, the utilization of a plant can be changed by administrative order. A critical responsibility of senior management is to decide how to assign decision rights among employees of the firm.[5] For instance, does the CEO make most major decisions, or are these decisions delegated to lower-level managers? Can machine operators deviate from procedures outlined in company manuals?

Controls

Through the delegation of decision rights, employees are granted authority over the use of company resources. Employees, however, are not owners: They cannot sell company property and pocket the proceeds. Therefore, employees have fewer incentives to worry about the efficient use of company resources than do owners. To help control these incentive problems, managers must develop a *control system.* That is, managers must

[4] In Chapter 17, we discuss the economics of transfer pricing.

[5] In small firms, senior management and owners often are the same. In large firms, owners (the shareholders) delegate most decision rights to the board of directors and the CEO. These parties are charged with developing the architecture for the firm. In this chapter, we did not distinguish between senior managers and owners. In subsequent chapters, we expand our analysis to discuss potential contracting problems between these two groups.

Organizational Architecture at Century 21

Century 21 International is the largest residential real estate firm in the world. In 1990, Century 21 brokers and sales associates assisted over 800,000 families in buying or selling properties, translating into an estimated $80 billion in real estate worldwide and approximately $2.2 billion in commissions. By 1999, its system consisted of 6,300 independently owned and operated offices with 110,000 brokers and agents worldwide—Century 21 operates throughout the United States and in 24 other countries, including Japan, the United Kingdom, and France.

Given the geographic and cultural diversity facing Century 21, it would not be productive for the U.S. headquarters to make all major decisions. Such centralized decision making would be especially problematic for the international operations, where laws and cultures may be far different than in the United States. To quote Century 21's management,

> We provide the international regions with whatever knowledge we possess on how they can help their franchisees develop better offices. What they use is basically up to them and will reflect their housing market and real estate traditions. We allow our master subfranchisors a great deal of flexibility in running their regions, and internationally we want them to be able to accommodate their services to their culture. We are not going overseas with our system and saying, "This is the way it is, you can't change it." We wouldn't get very far that way. There has to be some flexibility.

Decentralized decision making requires a control system that promotes productive effort. At Century 21, most of the local operators are franchisees. Franchisees essentially are owners of their units and keep a large share of their units' profits. This ownership provides strong incentives to increase sales and value. Also, Century 21 reserves the right to terminate individual franchises that fail to maintain acceptable levels of service.

Sources: C. Shook and R. Shook (1993), *Franchising: The Business Strategy That Changed the World* (Prentice Hall: Engelwood Cliffs, NJ); and Century21.com (1999).

structure the other two basic pieces of the organization's architecture—the reward and performance-evaluation systems that help align the interests of the decision makers with those of the owners. As we discuss below, an optimal control system depends on how decision rights are partitioned in the firm, and vice versa.

Trade-Offs

Once the firm grows beyond a certain size, the CEO is unlikely to possess the relevant information for all major decisions. Consequently, the CEO faces three basic alternatives in designing organizational architecture. First, the CEO can make most major decisions, despite lacking relevant information. In this case, there are limited incentive problems and the development of a detailed control system is less critical.[6] However, lacking relevant information the CEO is likely to make suboptimal decisions. Second, the CEO can attempt to acquire the relevant information to make better decisions. This option can enhance decision making. Yet obtaining and processing the relevant information can be both costly and time-consuming. Third, the CEO can decentralize decision rights to individuals with better information. This choice assigns decision-making authority to employees with the relevant information. But delegating decision rights gives rise to increased incentive problems, which requires that control systems be developed. Another potential drawback of decentralization involves the costs of transferring information between the CEO and other decision makers in coordinating efforts across the organization.

Of course, CEOs can choose a mix of these basic alternatives. For example, executives generally choose to retain some decisions while delegating others. The optimal choice,

[6]The manager still has a contracting problem in motivating lower-level employees to follow detailed instructions. However, this contracting problem is likely to be less severe than when the manager gives the lower-level employees considerable discretion in making decisions.

as we discuss below, depends primarily on the business environment and strategy of the firm. In some cases—especially in smaller firms operating within relatively stable industries—senior managers are likely to have most of the relevant information for decision making, and thus decision rights are more likely to be centralized at headquarters. In other cases—especially larger firms experiencing rapid change—senior managers and their corporate staff often will not be in the best position to make a broad array of decisions. In such cases, decision rights are more likely to be decentralized, with corresponding control systems adopted and implemented.

This discussion indicates that the CEO plays a major role in framing the basic architecture for the firm. Organizational decisions, however, are made by managers throughout the organization. For example, when the CEO delegates a set of decision rights to middle-level managers, these managers must decide which decisions to make themselves and which decisions will be delegated to lower-level managers. These lower-level managers then are faced with similar organizational questions. The overall architecture of a firm is determined through this process, ultimately involving managers throughout the organization.

Architectural Determinants

As suggested above, optimal architectures will differ across companies. Such structural differences are not random but vary in *systematic* ways with differences in certain underlying characteristics of the companies themselves. To illustrate the point, companies operating in the same industry tend to develop similar architectures. If an important aspect of an industry's environment changes, most companies in that industry will react by readjusting their decision rights and internal control systems.

In Figure 11.1, we summarize those factors which are likely to be most important in designing the optimal architecture for a given firm. At the top of the figure are three aspects of the firm's *external business environment: technology, markets,* and *regulation.* For

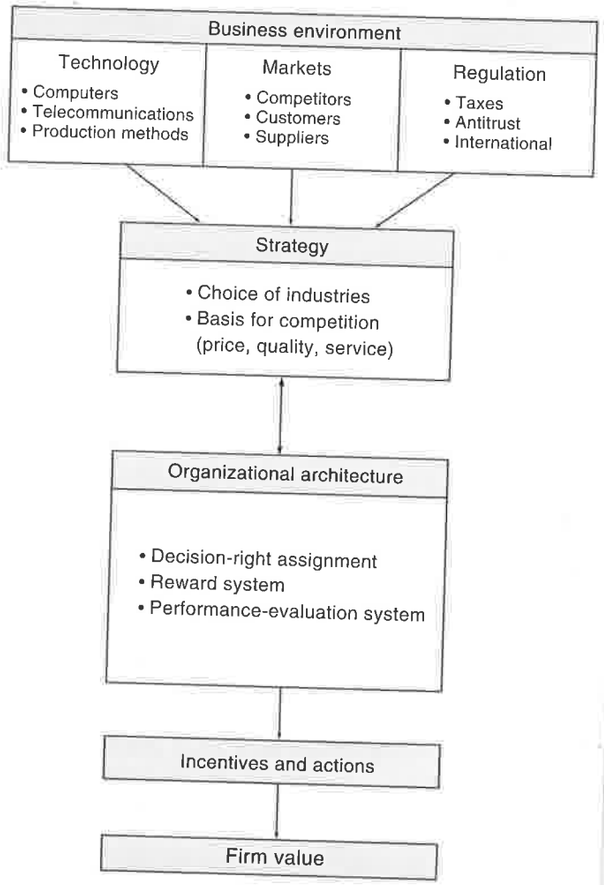
Technology Changing the Energy Industry

Hydrogen is likely to replace oil as the major energy source and thus completely change several industries ranging from automobiles, to oil refineries, to public utilities. Today, most of our energy comes from fossil fuels (coal, oil, natural gas). But within a few decades, experts predict that most of our energy will come from hydrogen. Electrochemical reactors called fuel cells convert hydrogen into electricity twice as efficiently as traditional methods, without the pollution caused by burning fossil fuels. Hydrogen gas is produced from water using the simple process of electrolysis. When pumped into fuel cells, the resulting electricity can power cars, and heat and cool homes. Big electric generating plants might be replaced by washing-machine-sized fuel cells in every home. If the predictions hold true, hydrogen will put an end to oil. Already, major oil companies such as Royal Dutch/Shell and British Petroleum (BP) are quietly investing large sums on hydrogen power. The greatest hurdle to the change is cost. Fuel cells will remain costly until economies of scale kick in. Moreover, the infrastructure to produce hydrogen and deliver it on a massive scale to gas stations and people's homes is enormous. Yet, in 1997 and 1998 Ford, Daimler-Chrysler, General Motors, Honda, Toyota, and other auto companies announced plans to produce fuel-cell cars by 2004. The auto industry is spending between $500 million and $1 billion a year on this project. The invention and further refinement of the fuel cell illustrates how technological change causes entire industries to change. Companies in the industry and related industries react to the new technology by reformulating their internal strategies. For example, BP now refers to itself as the "beyond petroleum company." Companies then change their investment policies to implement their new strategies.

Source: D. Stipp (2001), "The Coming Hydrogen Economy," *Fortune* (November 12), 90–100.

Figure 11.1 The Determinants of Strategy, Organizational Architecture, and Firm Value

Market conditions, technology, and government regulation are important determinants of strategy, which in turn helps determine organizational architecture. Two-way arrows are drawn to show important feedback effects. Both strategy and architecture affect the incentives and actions of employees within the firm and thus help determine the firm's value.



any firm, these three factors—technologies that affect the production of or demand for its products, its methods of production, and its information systems; the structure of its markets (competitors, customers, and suppliers); and the regulatory constraints on its activities—are likely to have the greatest influence on its *strategy*. By *strategy*, we mean that broad set of issues discussed in Chapters 8 and 9, including the firm's primary goals—nonfinancial as well as financial; the firm's sources of comparative advantage; its choice of industry, products, and services; its target customers; and pricing policies.

Take the case of AT&T in the early 1980s, before it was separated into a long-distance carrier and regional operating companies called the Baby Bells. Regulation dictated many aspects of the firm's strategy—what services it could offer, what customers it could serve, and how much it could charge them. After the breakup of AT&T and the accompanying deregulation of the telecommunications industry, both the Baby Bells and the new AT&T were forced to devise new strategies to provide new products, serve new customer bases, and develop new pricing structures.

As depicted in Figure 11.1, the ultimate goals of the firm, as reflected in its strategy, in turn affect its optimal organizational architecture. As the celebrated architect Louis

Cell Phones Reduce Demand for Manual Transmissions

Cell phones may be the last nail in the coffin for the stick shift. Certain car buffs would only buy models with manual transmissions because of the sense of control and power they provide. However, trying to use cell phones while eating breakfast and shifting during the morning commute is too arduous for most drivers. As Americans are bringing more nondriving activities into their cars (Cadillac has announced Internet connections for some of its 2000 models), automobiles are being turned into minihomes. Something had to give, and the big loser is manual transmissions. The percentage of cars with stick shifts fell from 17.5 percent in 1989 to 13.6 percent in 1997. (Some high-end specialty autos like the Audi offer an automatic transmission that lets the driver shift gears with a stick but without a clutch.) This example illustrates how new technology in an apparently unrelated market (cell phones) can affect the strategy of companies in other markets.

Source: S. Goo (1998), "Americans Shift Down and Out of Manual Transmissions," *The Wall Street Journal* (August 19), B1.

H. Sullivan—designer of the first skyscraper and founder of the American school of architecture—once observed, "Form ever follows function." Applying the same principle within organizations, we see that significant changes in the business environment and hence in strategies typically call for major changes in decision-making authority, performance measures for evaluating employees, and incentive-compensation systems.

Returning to our telecommunications example, in the early 1980s a regulated AT&T faced little competition or pressure for technological innovation. It operated within a reasonably stable environment—one where it made sense for a huge formal bureaucracy to make the most important decisions from the top down. Since the breakup of the company, the telecommunications industry has experienced almost continuous upheaval, with deregulation, increased competition, and rapid technological change. In 1992, after a nearly decade-long series of incremental moves toward decentralization, AT&T established a large number of fairly autonomous profit centers run by managers on pay-for-performance plans tied to their units. In 1995, AT&T broke itself into three separate publicly traded companies and laid off 40,000 employees. And by 1999, following a series of acquisitions, AT&T had expanded its scope and served more cable subscribers than any other cable company (including Time Warner).[7]

Although in our discussion we have emphasized the effects of strategy on architecture, the effects are not all in one direction—note the two-headed arrow in Figure 11.1. Strategy also can be influenced by organizational architecture. A company might decide to enter a new market in part because its decision and control systems are especially well-suited for this new undertaking (see Chapter 8). For instance, before the 1980s, Atlanta, Georgia, was widely acknowledged as the banking center of the South. Yet at the beginning of the twenty-first century, Charlotte, North Carolina, claims the title. Bank branching historically was regulated by the states. Georgia limited its banks' ability to branch, while North Carolina permitted statewide branching. As restrictions on interstate banking fell in the 1980s, the North Carolina Banks—especially NCNB (now Bank of America), First Union, and Wachovia—exploited their experience acquired in establishing and managing statewide systems to create regional and then national banks. These banks have been quite successful, in part because their organizational architectures were better-suited to the new regulatory environment.

As another example of how changes in the environment can affect organizational architecture, consider the case of increased foreign competition in the 1980s and 1990s.

[7]D. Lieberman (1999), "AT&T Tries to Keep Balance," *USA Today* (October 7), B1–2.

Accelerating Technological Change

In 1996, when Denver-based Qwest Communications began laying 96-strand optical cable, each fiber was designed to carry 8 WDM (wavelength-division multiplexing) channels. With technology changing so fast, two years later it had been upgraded to 16 channels, doubling capacity. In 1995, optical technology used an 8-color 2.5-gigabit laser in each color to send data at 20 gigabits per second. In 1996, throughput doubled by using 16-color bands. In 1997, 40-color rainbows and 10-gigabit lasers pumped out 400 gigabits a second, 20 times more than two years earlier. In 1998, the company announced plans for 80-band and 160-band systems to be installed in 1999 and 2000. This doubling of bandwidth reduces cost and price, and increases the quantity of data demanded by consumers. Some experts forecast that the entire contents of the Library of Congress can be delivered to a customer every single second. This rapid technological change is altering the way information is flowing to consumers.

Source: O. Port (1998), "Through a Glass Quickly," *Business Week* (December 7), 96–98.

For years, many large American companies (for example, ITT, IBM, General Motors, Eastman Kodak, and Xerox) faced limited competition in their product markets. Many of these companies had substantial market power and had little external impetus to focus on rapid product development, high-quality production, or competitive pricing. Their organizations were highly bureaucratic, with quite centralized decision making and limited incentive compensation. Many of these firms experienced a dramatic increase in foreign competition over the past two decades—especially from the Japanese. This competition forced these large firms to rethink their basic strategies and increase their emphasis on quality, customer service, and competitive pricing. To accomplish these objectives, firms often had to change their architectures. They frequently pushed decision rights lower in the organization, where specific knowledge about customer demands was located (recall the example of Brabantia). They also increased their use of incentive compensation and developed performance-evaluation systems that focused on quality and customer service.

In some ways, Figure 11.1 provides an overly simplified view of the determinants of strategy, architecture, and firm value. The figure admittedly ignores potentially important feedback effects among the environment, business strategy, and architecture. Consider, for example, how Microsoft invests resources to develop software that, in turn, alters the basic technology facing the firm. Large firms also often have political power that can be used to influence government regulation. Even though these types of feedback effects at times can be important, in most circumstances managers must take the business environment

Changing Organizational Architecture at JC Penney

Purchasing decisions at JC Penney used to be relatively centralized. Buyers in New York would decide on the company's clothing lines for the year. Unfortunately, this procedure did not incorporate much of the relevant specific information about what products would sell best at particular stores in different parts of the country. During the 1980s, Penney's invested in satellite communications that provided the firm with closed-circuit television. This technology allowed central buyers in New York to display goods to local store managers, who could stock their stores based on their specific knowledge of local tastes and fashions. This type of decentralized decision making was feasible because of the new communications technology.

Source: H. Gilman (1986), "J.C. Penney Decentralizes Its Purchasing: Individual Stores Can Tailor Buying to Needs," *The Wall Street Journal* (May 8), A1.

Changing Organizations Too Frequently: Not a New Phenomenon

We trained hard, but it seemed that every time we were beginning to form into teams we would be reorganized. I was to learn later in life that we tend to meet any new situation by reorganizing, and what a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency, and demoralization.

Petronius Arbiter, 210 BC.

essentially as given. This environment, in turn, largely determines what the firm can expect to accomplish (its strategy) and its architecture. Figure 11.1 provides managers with a structured way of thinking about the factors that are likely to affect their firm's architecture. We use this structure throughout the book for analyzing organizational decisions.

Changing Architecture

Although changes in market conditions, technology, or government regulation can affect appropriate organizational design, organizational change is by no means a costless process. It is important to assess the costs as well as the benefits in evaluating the merits of an organizational restructuring. Organizational change should be undertaken only when the expected incremental benefits exceed the expected incremental costs.

First, there are direct costs. The new architecture has to be designed and communicated to employees throughout the company. Moreover, changes in architecture frequently require costly changes in the firm's accounting and information systems. Sometimes, what appears to be a straightforward change in the performance-evaluation system is a major and costly project for the firm's data processing and accounting departments. Literally hundreds of computer programs might have to be modified to alter the accounting and information systems.

Second, and perhaps more important, are indirect costs. Changes in architecture are likely to affect some employees positively—for example, by increasing their responsibility

Changing Organizational Architecture Requires Careful Analysis

At any point in time, a particular set of prominent management techniques is touted as the key to success. Popular techniques in the 1990s included reengineering, benchmarking, total quality management, broadbanding, worker empowerment, the learning organization, and skill-based pay. Most of these techniques involved fundamental changes in organizational architecture. For example, advocates of total quality management commonly recommended delegating decision rights to teams and not paying incentive compensation based on individual performance.

Adopting the most recent business trend or fad can get a firm in trouble unless the change is warranted by the actual circumstances facing the firm. Unfortunately, many firms appear to adopt changes without careful analysis of the relevant costs and benefits. To quote *The Wall Street Journal,* "Many companies try management fads, only to see them flop."* In fact, surveys indicate that a majority of companies are dissatisfied with the results of organizational changes.

Managers should not change their organization simply because it is the current fad. Certainly, some organizational changes can enhance value. However, managers should consider carefully whether the benefits of a change are larger than the costs, given their particular circumstances. (See Chapter 23 for a detailed analysis of management innovations.)

*F. Bleakley (1993), "The Best Laid Plans: Many Companies Try Management Fads, Only to See Them Flop," *The Wall Street Journal* (July 6), A1.

and possibilities for rewards—but others negatively. Thus, the attitudes toward change are likely to vary among employees. Dealing with the associated incentive problems of implementing change in a firm can be expensive (see Chapter 20). In addition, frequent changes in architecture can have undesirable incentive effects. Increasing the likelihood that workers will change assignments in the near future reduces their incentives to invest in learning current job assignments, devising more efficient production processes, and developing effective relations with coworkers. Frequent restructuring within a firm causes uncertainty about job assignments and will promote actions that focus more on short-run payoffs and less on long-run investments (see Chapters 9 and 10).

Interdependencies within the Organization

It is important to understand that the components of organizational architecture are fundamentally interdependent. The appropriate control system depends on the allocation of decision rights, and vice versa. For example, if decision rights are decentralized, it is important to have a control system that provides incentives for employees to make value-enhancing decisions. Reward and performance-evaluation systems have to be developed that compensate employees based on performance outcomes. Similarly, if a firm adopts a compensation plan to motivate employees, it is important to grant employees decision rights so that they can respond to these incentives. In this sense, the components of organizational architecture are like *three legs of a stool.* It is important that all three legs be designed so that the stool is balanced and functional. Changing one leg without careful attention to the other two is typically a mistake. For example, it is unlikely that Brabantia would have been as successful if managerial decision rights had been changed without accompanying changes in the firm's compensation plan.

Organizational architecture interacts with an array of other interrelated policies and systems within the firm. For example, incentive-compensation schemes for lower-level managers often are based on accounting performance for their particular business units. Changing business-unit structure and associated compensation plans therefore can require changes in the firm's accounting system. Similarly, it might be effective to pay the manager of a subsidiary based on the stock market performance of the subsidiary. But, for this policy to be implemented, shares in the subsidiary must be publicly traded. Thus, there can be interdependencies between the organizational architecture and the

When the Legs of the Stool Don't Balance

A major airline had a plane grounded for repairs at a particular airport. The nearest qualified mechanic was stationed at another airport. The decision right to allow the mechanic to work on the airplane was held by the manager of the second airport. The manager's compensation was tied to meeting his own budget rather than to the profits of the overall organization. The manager refused to send the mechanic to fix the plane immediately because the mechanic would have had to stay overnight at a hotel and the hotel bill would have been charged to the manager's budget. The mechanic was dispatched the next morning so that he could return the same day. A multi-million-dollar aircraft was grounded, costing the airline thousands of dollars. However, the manager avoided a $100 hotel bill. Presumably, the mechanic would have been dispatched immediately had the manager been rewarded on the overall profit of the airline or, alternatively, if the decision right had been held by someone else with this objective.

Source: M. Hammer and J. Champy (1993), *Reengineering the Corporation* (Harper Business: New York).

firm's financing policies. As another example, consider the design of the firm's organizational architecture and its computer/information systems. New computer programs provide expert systems that allow low-skilled workers to complete complicated tax returns, assess the qualifications of mortgage applicants, and perform other tasks that previously required extensive training and experience. These programs have allowed financial services companies to decentralize additional decision rights to lower-level employees. For example, lower-level employees in some financial institutions now have the rights to approve mortgage applications without supervisor approval if the computer program indicates that the applicant is qualified.

Corporate Culture

Corporate culture is one of the more frequently used terms in the literature on organizations. Corporate culture usually encompasses the ways work and authority are organized, the ways people are rewarded and controlled, as well as organizational features such as customs, taboos, company slogans, heroes, and social rituals. Managers are exhorted to develop high-powered, productive cultures. Yet, little concrete guidance is provided on how to accomplish this goal.

Our focus on organizational architecture is consistent with this concept of corporate culture. Indeed, our definition of organizational architecture corresponds to key aspects of what frequently is discussed as corporate culture. For example, the architecture specifies how authority (decision rights) is distributed among employees and how rewards are determined. An advantage of our approach is that it defines the key components of a firm's corporate culture and analyzes how managers might affect culture through identifiable actions.

As an example, recall our discussion of Merrill Lynch in Chapter 2. The old corporate culture at Merrill could be characterized as an environment where dishonest analysts regularly misled customers. After the scandal became public, Merrill had to find a way to change this corporate culture. Our approach provides direct guidance on how this change might be accomplished—in this case, by changing the compensation scheme.

Some dismiss the "softer" elements of corporate culture—for example, role models, company folklore, and rituals—as being unimportant. Rather, they stress formal architecture as being the primary, if not sole, determinant of a firm's value.[8] Economics, however, suggests at least two important roles for these elements of corporate culture: enhancing communication and helping to set employee expectations.

Corporate Culture and Communication

Most organizations do not write down all important features of their organizations in detailed procedures manuals. Rather, these features typically are communicated to employees in less formal yet frequently more effective ways. Aspects of the corporation such as slogans, role models, and social rituals can be methods of communicating organizational architecture to workers in a particularly memorable way. A slogan like *At Ford, Quality Is Job 1* emphasizes that workers are expected to focus on quality and customer service and that this focus will be rewarded by the company. Given this slogan

[8]For instance, managers that subscribe to the teachings of Frederick Taylor believe that the designs of work processes and incentive systems are the primary determinants of firm value. F. Taylor (1923), *The Principles of Scientific Management* (Harper & Row: New York).

Changing Culture: Continental Airlines

For years morale at Continental Airlines was low due to layoffs, bankruptcies, and wage cuts. Colleagues bickered with one another as planes departed half-loaded. People had lost trust in management.

A turnaround occurred when Continental hired a new CEO, Gordon Bethune. Since then the airline has ranked first or second in measures such as on-time performance, baggage handling, and customer satisfaction. Bethune eliminated 20 of 60 vice presidents. He brought employees into downsizing decisions, established a phone line to handle employee complaints, and invited employees to call his personal voice mail. Mechanics began fabricating their own noncritical parts. Boeing 737 jets, which had never fit into Continental's maintenance facility, began to be serviced by mechanics who found that by jacking up the nose to lower the tail, they could slide them in for service. Bethune also began to measure every department on what mattered to customers.

Bethune says, "If I tell you how I'll measure success, I can change your behavior." He paid every employee $65 every month Continental finished in the top half of the federal rankings of on-time flights and $100 if it finished first. And these checks were sent home—not part of the employee's regular pay. Instead of arguing over whose job it was to deliver wheelchairs to the gate, ramp workers and gate agents began to cooperate and help customers. One employee remarked, "Getting the plane off the gate isn't my job or your job, we act like it's everybody's job."

In 1998 *Fortune* magazine named Continental one of the best 100 companies to work for and the most improved company of the decade. This example illustrates that changing corporate culture involves changing all three legs of the stool along with supporting employee communication programs.

Source: S. McCartney (1996), "Piloted by Bethune, Continental Air Lifts Its Workers' Morale," *The Wall Street Journal* (May 15), A1.

and other reinforcing signals from top management, employees at Ford have a reasonably clear idea of how to respond to situations such as angry customers, even without formal policies to follow. Similarly, social rituals, such as training sessions and company parties, can help disseminate information by increasing the interaction among employees who might not see each other on a frequent basis. Singling out role models or heroes for special awards is another way of communicating explicitly what the company values.

Less tangible features of organizations, such as rituals and role models, can be important in reinforcing and communicating organizational architecture. However, they also can increase the costs of changing architecture. Managers can change formal evaluation and compensation schemes and clearly communicate these changes to the relevant employees. But getting employees to change their heroes, customs, and social rituals can be more time-consuming and difficult. These features often are created through informal communication channels: They take time to dismantle as well as to create.

Corporate Culture and Employee Expectations

In the appendix to Chapter 9, we illustrated how the decisions of employees to exert effort and to cooperate with other employees can depend on their expectations about how other individuals will respond. In this example, employees work hard only if they think that other employees will work hard as well. Expectations of how other individuals will behave are shaped, in part, by the formal architecture of the firm. If Ehud Rabin observes that Colleen O'Shea is paid a commission on sales, it is reasonable for Ehud to forecast that Colleen will exert some effort in trying to increase sales. Expectations, however, also are affected by less formal aspects of corporate culture. For example, Microsoft has developed a reputation for hiring creative, hard-working individuals. If

two Microsoft employees are placed together on a team, it is reasonable for each to expect that the other is clever and industrious.

This analysis suggests that it generally will be advantageous for managers to use both the formal architecture as well as the less formal aspects of corporate culture to foster expectations that promote productive choices by employees. For instance, suppose that employees are most likely to focus on quality if they think other employees have the same focus. A manager interested in increasing manufacturing quality thus might supplement changes in the formal evaluation and reward systems with slogans, executive speeches, employee relations campaigns, and clever use of the media, all aimed at creating a "quality-centered" culture.

A System of Complements

Features of organizations like rituals and role models can be effective in reinforcing and communicating the goals of the firm, and they possess the potential to produce influential aspects of a coherent architecture. Their effectiveness in specific cases has led some management gurus to claim that a productive corporate culture can be molded with no attention to formal evaluation and compensation schemes. Some people—for instance, quality expert W. Edwards Deming—argue that incentive pay actually is detrimental to a productive organization. Our analysis suggests that it is a mistake to think of these hard and soft aspects of the organization as mutually exclusive or in competition with each other; both can play a valuable role in increasing firm value. The various elements of the organization are more likely to be *complements* than substitutes. In Chapter 20, we present a detailed discussion of Xerox's early efforts to increase product and service quality. Xerox CEO, David Kearns, initially focused on softer elements—slogans,

Corporate Culture at Mary Kay Cosmetics

Total sales at Mary Kay Cosmetics increased from about $198,000 in 1963 to over $1 billion in 1999. Mary Kay has built a sales force of more than 500,000 in 29 countries around the world. In the United States more than 100 women have obtained the status of Independent National Sales Director with incomes well into six figures.

The organizational structure at Mary Kay focuses directly on sales. All sales consultants purchase products directly from Dallas at the same price. Rewards are based solely on sales and recruiting additional sales consultants. There is no cap on what sales consultants earn. As sales and the recruiting of consultants rise, so do commissions. Past résumés and credentials are unimportant—"You say you were a brain surgeon in your last job? Fine. Get a beauty case and start dialing."

What is interesting about Mary Kay is how many features of the firm's culture reinforce one another in a consistent manner. Stories of role models are prevalent throughout the organization. Almost every employee knows the story of Mary Kay Ash, who started out as a young salesperson for Stanley Home Products. She was so poor that she had to borrow $12 to travel from her Houston home to Stanley's 1937 convention in Dallas. Through hard work, she built the Mary Kay Cosmetic Company and amassed a family fortune of over $300 million. Stories of other successful sales consultants permeate the organization. These stories reinforce the architecture and help motivate hard work and increased sales. The company also is famous for rewarding its successful sales consultants lavishly in a very public manner. The annual sales meeting is an extravaganza where individuals are rewarded with complementary pink Cadillacs, jewelry, color-coded suits, badges, emblems, and being crowned as "queens."

The message at Mary Kay is clear. Success is measured by sales and recruiting efforts. Do these things well and you will be rewarded, both financially and through public recognition. This message is consistently communicated through compensation plans, stories of role models, company rituals, and ceremonies.

Sources: A. Farnham (1993), "Mary Kay's Lessons in Leadership," *Fortune* (September 20) 68; and MaryKay.com (1999).

speeches, and media campaigns—in his efforts to foster a quality culture within his organization. He soon realized that to be effective, he also had to change the company's formal evaluation and reward systems.

When Management Chooses an Inappropriate Architecture

Sometimes, managers are either unable or unwilling to design value-increasing architectures or strategies. Consider the management at RJR-Nabisco in the late 1980s, as highlighted in Chapter 10. In cases such as RJR-Nabisco, value can be created by replacing existing management with new managers who are willing and able to choose architectures and strategies that increase value.

Firing the Manager

In public corporations, the board of directors has the decision rights to hire, fire, and compensate senior managers. Evidence indicates that boards are most likely to fire managers when firm performance is poor (as measured by stock returns and accounting earnings).[9] Consider Eastman Kodak in 1993. The company was performing poorly, and senior managers acknowledged that a poorly designed architecture was among the company's most significant problems. These managers were unable to design a better one. The board of directors fired the CEO and hired a new one. The new CEO, George Fisher, rapidly changed both the architecture and the strategy of the company. The stock market greeted these actions with a substantial increase in the Kodak stock price. At the end of this chapter, we present a case study of this example.

Although firing the CEO is a relatively rare event, firings at other management levels are more common. When middle managers perform poorly by implementing ineffective strategies and inappropriate architectures for their business units, they can be fired or reassigned by senior managers. Middle managers, in turn, have decision rights to replace lower-level managers.

Market for Corporate Control

Another mechanism for replacing poor management is the market for corporate control—for example, tender offers and mergers. During the last few decades, the wealth of shareholders has increased by billions of dollars due to corporate takeovers. Typically, when a poorly performing company is acquired by another company, its management is replaced.[10] The architecture and strategy also are changed as a result. ITT's poor performance in 1988 motivated takeover speculation. Existing management took actions to increase the firm's value, and a takeover did not materialize. In contrast, the former management team at RJR-Nabisco did not make the necessary changes to increase its firm's value, and the company was acquired by Kohlberg, Kravis, Roberts & Company. KKR subsequently replaced the management team and implemented significant changes in RJR's architecture and strategy.

[9] J. Warner, R. Watts, and K. Wruck (1988), "Stock Prices and Top Management Changes," *Journal of Financial Economics* 20, 461–492; and M. Weisbach (1988), "Outside Directors and CEO Turnover," *Journal of Financial Economics* 20, 431–460. Similar evidence is observed in the nonprofit sector; see J. Brickley and L. van Horn (2000) "Incentives in Nonprofit Organizations: Evidence from Hospitals" (Working paper, University of Rochester).

[10] For a summary of the evidence on corporate takeovers, see G. Jarrell, J. Brickley, and J. Netter (1988), "The Market for Corporate Control: The Empirical Evidence since 1980," *Journal of Economic Perspectives* 2, 49–68. For evidence on management turnover after takeovers, see K. J. Martin and J. J. McConnell (1991), "Corporate Performance, Corporate Takeovers, and Management Turnover," *Journal of Finance* 46, 671–688.

Product Market Competition

When all else fails, inefficient firms eventually go out of business. In Chapter 6, we discussed how competitive pressures tend to drive prices toward marginal cost. If a firm is inefficient and cannot cover its total costs at these prices, it eventually has to shut down. As discussed in Chapter 1, this competitive process resembles natural selection in biology—*the strong survive.* It is a process we refer to as economic Darwinism. Enron is a dramatic example of a firm that became insolvent due to the poor design of its architecture.

Managerial Implications

Organizational architecture provides a powerful framework for addressing management problems throughout the organization. In many cases, a problem can be traced directly to defects in organizational architecture (consider Enron and Merrill Lynch). By using this framework, managers can identify problems more quickly and craft solutions more effectively. In analyzing business problems and cases, students and managers often find it useful to refer to Figure 11.1 and ask themselves the following set of questions:

- Does the strategy fit the business environment (technology, market conditions, and regulation) and the capabilities of the firm?
- What are the key features of the current architecture?
- Does the current architecture fit the business environment and strategy? In particular, does the architecture link *specific knowledge* and decision rights in an effective manner and provide *incentives* to use information productively?
- Are the three legs of the stool mutually consistent? Given the decision-right system, does the control system fit, and vice versa?

Marmots and Grizzly Bears

Business writers, consultants, and government regulators frequently claim that existing business practices are inefficient, and they propose changes that allegedly would improve productivity. The principle of economic Darwinism, however, suggests that many of these claims are likely to be misguided. In a competitive world, if organizations survive over the long run with a particular architecture, it is unlikely that there is some *obvious change* that could be implemented to increase profits. Sometimes the reasons for survival of a particular practice might not be clear to an outside observer. Existing practices, however, should not be deemed inefficient without careful analysis.

The interaction between marmots and grizzly bears serves to illustrate this point. Marmots are small groundhogs and are a principal food source for certain bears. Zoologists studying the ecology of marmots and bears observed bears digging and moving rocks in the autumn in search of marmots. They estimated that the calories expended searching for marmots exceeded the calories obtained from consuming marmots. Thus, searching for marmots appeared to be an inefficient use of the bear's limited resources. Given Darwin's theory of natural selection, bears searching for marmots should become extinct. A well-meaning consultant or government regulator, therefore, might recommend that bears quit searching for marmots.

Fossils of marmot bones near bear remains, however, suggest that bears have been searching for marmots for quite a long time. An explanation is that searching for marmots provides benefits to bears in addition to calories. For instance, bears sharpen their claws as a by-product of the digging involved in hunting for marmots. Sharp claws are useful in searching for food under the ice after winter's hibernation. Therefore, the benefit of sharpened claws and the calories derived from marmots offset the calories consumed gathering the marmots. The moral is that in biology or business, an outside observer should be cautious in concluding that long-standing practices are inefficient without careful study.

Source: J. McGee (1980), "Predatory Pricing Revisited," *Journal of Law & Economics* 23:2, 289–330.

- If the answers to any of the previous questions suggest a problem, what changes in strategy and architecture should the firm consider?
- What problems will the firm face in implementing these changes?

Evaluating Management Advice

In a competitive marketplace, surviving firms tend to be those firms with the most productive strategies and architectures, given their business environments. This principle suggests that architectures are not random. There are sound economic explanations for the existing architectures within most industries. Consultants, however, frequently argue that long-standing practices obviously are inefficient and that companies would be better off by following their advice in changing the architecture. For example, many recent books on *empowerment* argue that most firms have made mistakes over a long time period in not delegating more decision rights to lower-level employees. Correspondingly, profits would be improved by further empowering workers. Although this advice clearly makes sense for some firms in some environments (especially if the environment recently has undergone some fundamental change that favors decentralization of decision rights), our analysis suggests that managers should be cautious in condemning prevailing organizational architecture without careful analysis. The discussion in the subsequent chapters provides important material to help conduct this analysis.

Benchmarking

Firms frequently *benchmark* other firms in an attempt to determine value-increasing policies. For example, a firm considering a change in its executive compensation plan is likely to collect information on the compensation plans of other firms. This practice has obvious merit. Firms that survive in the marketplace tend to have strategies and architectures that fit their environment, and studying these firms has the potential to yield valuable insights. Our analysis has at least three implications for effective benchmarking. First, different architectures are appropriate for different environments. It is important to benchmark firms facing similar environments. Second, since it is unusual to find firms in identical environments, it is important to understand any differences in the environments of the benchmarked firms and to take these differences into account when analyzing the data on firms' policy choices. Third, it is important to view the architecture of other firms as a system of complements. Studying a single feature of another firm's architecture, without considering how it fits with other complementary elements of its architecture, can produce erroneous conclusions.

Qwerty versus Dvorak

Most keyboards are arranged using the QWERTY system—named for the first five letters on the third row. Invented in 1867 by Christopher Sholes, he devised the layout to reduce key jamming. The Sholes layout placed the most commonly used keys in the third row and under the left hand rather than on the second (home) row where typists keep their fingers. As a result, typing on a QWERTY keyboard can be tiring.

Once typewriter design evolved to reduce key jamming, a new keyboard layout was designed by August Dvorak in 1932. He placed the most frequently used keys under the right hand on the home row. Dvorak typists' fingers travel less and they can achieve higher speeds than QWERTY typists. Then why do QWERTY keyboards remain so prevalent today? The survival of QWERTY technology illustrates that the costs of change are potentially enormous. If a company converts all its computers to Dvorak keyboards, which would not be very expensive, then everyone has to be retrained, including all new hires.

Source: J. Diamond (1997), "The Curse of QWERTY," *Discover* (April) 34–42. (For additional discussion of these issues, see S. Liebowitz and S. Margolis [1990], "The Fable of the Keys," *Journal of Law and Economics* 33, 1–25.)

Overview of Part 3

The next six chapters provide a detailed discussion of the three components of organizational architecture—the three legs of the stool. Chapters 12 and 13 analyze the assignment of decision rights. Through the assignment of decision rights, firms define jobs. Two important characteristics of jobs are the variety of the assigned tasks and the authority in making decisions on how to complete these tasks. Chapter 12 examines the issue of decision authority, and Chapter 13 focuses on the assignment of tasks.

Once jobs are created, firms must design reward systems that will attract and retain qualified individuals. Chapter 14 analyzes the level of pay and the components of the compensation package—the mix between salary and fringe benefits. The focus in this chapter is how to design pay packages that allow firms to attract and retain qualified employees at the lowest cost. Although the level of pay attracts individuals to jobs, incentive compensation generally provides a primary motivation for employees to complete the assigned tasks. Chapter 15 provides a detailed analysis of incentive compensation.

Incentive plans base their payoffs on measures produced by the performance-evaluation system. Chapter 16 focuses on performance measurement of individual employees, while Chapter 17 examines performance measurement of subunits within the firm—for example, divisions and subsidiaries.

Benchmarking the Lincoln Electric Company

Lincoln Electric company has had a long history of delivering large profits. Often, this record is attributed to Lincoln's unique reward system, which places a heavy emphasis on incentive compensation (we describe this system in detail in Chapter 13). Managers from all over the world come to the Lincoln Electric headquarters at Cleveland, Ohio, to study the system. Our analysis suggests that these managers should consider Lincoln's business environment, strategy, and other elements of organizational architecture (for instance, its decision-right system) in their benchmarking. Lincoln's success should not be attributed to its reward system alone but to how well this feature fits with its environment and overall architecture.

Interestingly, Lincoln managers made the costly mistake of ignoring these considerations themselves. During the 1980s, the management at Lincoln decided to export its incentive system internationally through a series of mergers throughout Europe, Asia, and Latin America. Unfortunately, the system did not fit the business environments at many of their new locations. For instance, the influence of unions in Germany and labor laws in Venezuela made it impossible for Lincoln to implement its compensation system successfully. Lincoln ended up losing millions of dollars on these ventures. Lincoln might have avoided these mistakes if in its decision-making process it had applied carefully the framework discussed in this book.

CASE STUDY: *Eastman Kodak*

For many years, Eastman Kodak had a virtual monopoly in film production. This market power resulted in large profits. It also permitted Kodak to control the timing for introducing new products to the marketplace and responding to changes in consumer demands.

By the 1980s, Kodak's market environment had changed materially. The Fuji Corporation produced high-quality film that eroded Kodak's market share. Increased competition also came from generic store brands. In addition, the 1980s witnessed a technological explosion. Improved communications, design capabilities, and robotics allowed companies to bring new products to market within months rather than years.

These changes in the market environment placed significant pressure on Kodak. Kodak's stock price dropped from over $85 per share in 1982 to just over $71 in 1984. This 16 percent decline in stock price appears particularly dramatic when it is compared to the substantial increase in stock prices for the market as a whole. Earnings per share at Kodak also dropped substantially. The company realized it had to change its organization to regain profits and market share. To quote Colby Chandler, former CEO of Kodak, at the 1984 annual meeting:

> *Like many companies, we are not used to working in an environment where there is rapid technological transfer from laboratory to the marketplace. But we know that will be important in our future.*

During 1984, Kodak undertook a major corporate restructuring. Prior to the restructuring, decision making at Kodak was quite centralized. Top-level approval was required for most major decisions. The restructuring created 17 new business units with profit-and-loss responsibility. Business-unit managers were given increased decision-making authority for new products, pricing, and other important policy choices. By decentralizing decision rights, senior management hoped to make the company more responsive to changing customer demands and market conditions. To quote the 1984 annual report:

> *In short, Kodak is finding new ways to stimulate the innovative nature of its people. The result: a spirit of independence, new ideas and a quickened pace in the process which turns new ideas into commercial realities.*

Unfortunately for Kodak, changing the *assignment of decision rights* did not have a significant impact on the company's performance. In response, Kodak adopted the Management Annual Performance Plan (MAPP) in 1987. Under this plan, the base salary of management employees was reduced by 10 percent and replaced with a variable bonus. The bonus was to average 10 percent, ranging from 0 to 20 percent. Bonus payments were based on individual, unit, and company objectives.

The idea behind MAPP was that changing the *performance-evaluation and reward systems* would motivate managers to be more creative and industrious. The plan, however, did not have a large impact on managerial incentives or corporate profits. In 1993, Kodak officials were quoted as saying (1) that management had not really been held accountable for its failure to deliver results, (2) that management had to develop tougher work standards and demote failing employees, and (3) that in the past, managers who advanced at Kodak had excelled in office politics but not necessarily leadership.* Frustrated by the continued lack of success, Kodak's board of directors fired its CEO in late 1993.

Discussion Questions

1. What factors motivated Kodak to change its organizational architecture?
2. What mistakes did Kodak make in changing its architecture?
3. What might it have done differently?
4. How does this example relate to the concept of economic Darwinism?

**Democrat and Chronicle* (June 27, 1993).

Summary

Organizational architecture includes three important components of organizational design that are major determinants of the success or failure of firms:

- The assignment of decision rights
- The methods of rewarding individuals
- The structure of systems to evaluate the performance of both individuals and business units

The fundamental problem facing both firms and economic systems involves trying to ensure that decision makers have the relevant information to make good decisions and that these decision makers have appropriate incentives to use their information productively. The price system provides an architecture that helps solve this problem in markets. Through market transactions, decision rights tend to be transferred to individuals with the relevant knowledge to make productive use of the resources. The market also provides a mechanism for evaluating and rewarding the performance of resource owners—owners bear the wealth effects of their actions. A valuable feature of markets is that this architecture is created spontaneously with little conscious thought or human direction.

Markets are not always the most efficient method for organizing economic activity—frequently, firms are more efficient. Within firms, there is no automatic system for either assigning decision rights to individuals with information or motivating individuals to use information to promote the firm's objectives. Organizational architecture has to be created. The appropriate architecture depends on the environment facing the firm. In some firms, senior management will have most of the relevant information for decision making, and relatively centralized decision making is more likely to be adopted. In firms where lower-level employees have the relevant information, decision rights are more likely to be decentralized. In this case, reward and performance-evaluation systems must be developed to control incentive problems and to promote better decision making.

Market conditions, technology, and government regulations interact to determine the firm's appropriate strategy and architecture. The strategy and architecture, in turn, are major determinants of the firm's value.

Changes in the external business environment can motivate changes in the firm's organizational architecture. Changing architecture, however, is costly. In addition to the direct costs of designing and implementing new procedures, there are potentially important indirect costs. Thus, changing architecture should be done only following careful analysis.

The components of organizational architecture are highly interdependent. They are like three legs of a stool. Changing one leg without careful attention to the others is usually a mistake. Organizational structure also is related to other policies and systems within a firm, including the accounting and information systems, marketing, and financial policy.

Corporate culture is a frequently used term. Corporate culture usually is meant to encompass the ways work and authority are organized and the ways people are rewarded and controlled, as well as organizational features such as customs, taboos, company slogans, heroes, and social rituals. Our focus on organizational architecture is consistent with this concept of corporate culture. Indeed, our definition of organizational architecture corresponds to key aspects of what is frequently defined as corporate culture. The advantage of our approach is that it defines the key components of corporate culture and analyzes how managers might affect culture through conscious action. It also helps explain why corporate cultures of firms vary systematically

across industries—different environments motivate different architectures. Elements of corporate culture like customs, social rituals, folklore, and heroes perform at least two important roles: enhancing communication and fostering more productive expectations among employees. These elements, however, are likely to be less effective unless they are reinforced by the formal architecture of the firm.

Sometimes, managers are unable or unwilling to adopt value-maximizing architectures or strategies. In such cases, value can be created through management replacement. Management replacement occurs through firings and corporate takeovers. If a firm remains inefficient, it eventually will go out of business in a competitive marketplace.

This chapter introduces the concept of organizational architecture and provides a broad overview of the factors that are likely to be important in determining the optimal architecture for a particular organization. The next six chapters contain a more in-depth discussion of each of the three components of organizational architecture: the assignment of decision rights, the reward system, and the performance-evaluation system.

Suggested Readings

M. Jensen (1983), "Organization Theory and Methodology," *The Accounting Review* 58, 319–339.

M. Jensen and W. Meckling (1995), "Specific and General Knowledge, and Organizational Structure" *Journal of Applied Corporate Finance* 8:2, 4–18.

D. Kreps (1990), "Corporate Culture and Economic Theory," in J. Alt and K. Shepsle (Eds.), *Perspectives on Positive Political Economy* (Cambridge University Press: Cambridge).

P. Milgrom and J. Roberts (1995), "Complementarities and Fit: Strategy, Structure and Organizational Change in Manufacturing," *Journal of Accounting and Economics* 19, 179–208. Focus particular attention on pages 191–208.

Review Questions

11–1. Describe the three aspects of organizational architecture.

11–2. What is a major difference between the architectures of markets and firms?

11–3. Suppose that a manager decides that a company's decision making is too centralized. Will simply delegating more decisions to lower-level employees solve the problem? Explain.

11–4. Traditionally, many public utility companies (such as telephone and electric companies) have been highly regulated by the government. Thus, they have operated in stable environments, shielded from competition and rapid change. Recently, deregulation has substantially altered the environments of some of these companies. For the first time, they are being exposed to intense competition from other companies. Discuss how this change in the environment is likely to affect the optimal organizational architecture of utility companies.

11–5. In most restaurants, waiters receive a large portion of their compensation through tips from customers. Generally, the size of the tip is decided by the customer. However, many restaurants require a 15 percent tip for parties of eight or more. Using the concepts from this chapter, discuss (a) why the practice of tipping has emerged as a major method of compensating the wait staff, (b) why the customer typically decides on the amount of the tip, and (c) why restaurants require tips from large parties.

11–6. How might the softer elements of corporate culture help increase productivity in an organization? Give some examples of how managers might foster these elements to implement desired change in an organization.

11–7. Prominent management consultants sometimes argue that decision making in teams is usually more productive than decision making by individuals (important synergies arise when teams operate that are absent when individuals work by themselves). These consultants suggest that most companies have long failed to make proper use of teams. Their advice is that most firms should increase their use of teams significantly. Critique this advice.

11–8. Assume that some firms within the same industry are observed to be multidivisional whereas others are functionally organized. Assume further that all firms are about the same size and have existed for a long period of time in their current organizational structures. Is this observation inconsistent with the "survival of the fittest" concept discussed in class? Explain.

11–9. Evaluate the following argument:

Management fads make no sense. One day it's TQM. The next, it is empowerment or business-process reengineering. There is no economic justification for these fads. Management are just like sheep following each other to the slaughter.

11–10. Some of the electric generating plants of the Tennessee Valley Authority are powered by coal. Coal is purchased by a separate procurement division and is transferred to the plants for use. Plant managers often complain that the coal is below grade and causes problems with plant maintenance and efficiency. What do you think is causing this problem? What changes would you make to help correct this problem?

Decision Rights: The Level of Empowerment

CHAPTER 12

CHAPTER OUTLINE

Honda Motor Company was founded in 1948 by Soichiro Honda.[1] Initially, decision making within the company was quite centralized. Mr. Honda made virtually all product and design decisions, whereas finance and marketing decisions were made by his partner, Takeo Fujisawa.

In 1973, Honda retired. Successors adopted a more decentralized decision system. Major decision-making authority was spread among nearly 30 senior executives, who spent much of their time gathered at conference tables hammering out policies in informal sessions called *waigaya*—a Honda word meaning "noisy-loud." Engineers in research and development had significant control of the design of new automobiles. Under this so-called Honda System, the company grew and prospered.

[1]Details of this example are from C. Chandler and P. Ingrassia (1991), "Just as U.S. Firms Try Japanese Management, Honda Is Centralizing," *The Wall Street Journal* (April 11), A1; M. Williams (1993), "Redesign of Honda's Management Faces First Test with Unveiling of New Accord," *The Wall Street Journal* (September 1), B1; E. Thornton, L. Armstrong, and D. Woodruff (1998), "Honda: A Heckuva Time to Switch Drivers," *Business Week* (August 31), 42–44.

By the late 1980s Honda's growth had stalled and profits declined. Honda lost market share in the Japanese auto market, falling from third to fourth behind Mitsubishi, Nissan, and Toyota. Part of Honda's problem was that it failed to respond to changing tastes in the Japanese auto market. Many Japanese consumers wanted to purchase sporty cars with distinctive styling, yet Honda concentrated on producing four-door family sedans.

In April 1991, the new CEO, Nubuhiko Kawamoto, announced that he was changing the decision-making system at Honda radically by taking direct control of the company's automotive operations in Japan. He reasoned that the company had grown too large for group decision making. To quote Kawamoto,

> *We'd get the people from research, sales, and production together and everyone would say "not this" or "not that." We'd talk but there would be no agreement. Product planning would be on a tight schedule but we would have another discussion, another study and more preparation. Finally, the decision would come months later.*

The centralization of decision rights at Honda was seen as a cultural revolution. Even after Kawamoto obtained the retired Honda's support for this radical change, Honda employees resisted. Yet in spite of this resistance, the system was changed. In 1993, powerful "car czars" ran the development of new models, middle managers had clear job responsibilities, and according to some insiders, Kawamoto's power exceeded even that once held by Honda.

The first real test of the new management structure was the unveiling of the 1994 Accord in fall 1993. The vehicle was priced competitively and was widely acclaimed a success. The Accord was named one of the Top 10 Cars of 1994 by *Car and Driver* magazine and Import Car of the Year by *Motor Trend* magazine. In 1998 a new CEO, Hiroyuki Yoshino, took over at Honda. For 2002 Honda reported profits of $2.7 billion on revenues of $53 billion. The Accord is manufactured in 10 countries in Asia, North America, and Latin America as well as in Japan, and it is sold in approximately 140 countries.

Honda is just one of many firms that changed the assignment of decision rights within their organizations in the 1990s. In contrast to Honda, many firms decentralized decision rights—for example, through *empowering* employees. An example, again from the automobile industry, is Fiat. In 1992, Fiat announced that it was decentralizing certain decision rights, assigning them to the operating levels and reducing management positions. Other firms that decentralized decision rights in the 1990s include General Electric, Motorola, and United Technologies to name but a few. A common action has been to decentralize decision rights to teams of employees rather than to individuals. The financial press is replete with stories about how companies have improved profits, quality, and customer satisfaction through employee empowerment and other changes in their decision-making systems.

These examples raise a number of important organizational questions:

- Can altering the assignment of decision rights really have an important impact on productivity and value?
- What factors affect the optimal allocation of decision rights within the firm?
- When is it optimal to delegate decision rights to a team of employees rather than to specific individuals?

The purpose of Chapters 12 and 13 is to address these and related questions. This chapter focuses on a single decision right and asks where that right should be located within the firm. Chapter 13 considers multiple decision rights and examines how combinations of rights are bundled into jobs and subunits (for example, divisions) of the firm.

This chapter begins by providing a more detailed discussion of the problem of assigning tasks and decision rights within the firm. We then present a simple example that illustrates some of the factors that are important in determining the optimal assignment of a specific decision right—in this case, pricing a product. We use this example to discuss centralization versus decentralization, as well as the placement of a right among employees within the same hierarchical level. We also use this example as a springboard to discuss the trade-offs between assigning a decision right to an individual versus a team of individuals. Next, we consider the decision process in more detail and define the terms *decision management* and *decision control*, terms that are especially helpful in making the concept of empowerment more precise. Finally, we examine how the incentives of employees trying to influence decision makers can affect the optimal assignment of a decision right within the firm. The appendix to this chapter provides a more detailed analysis of some of the problems that can arise in team decision making.

Assigning Tasks and Decision Rights

Firms transform inputs into outputs, which are sold to customers. This *process* typically involves many *tasks*. For example, at Honda Motor Company, vehicles have to be designed, assembled, sold, and delivered. An important element of organizational architecture is partitioning of the totality of tasks within the organization into smaller blocks and assigning them to specific individuals and/or groups.

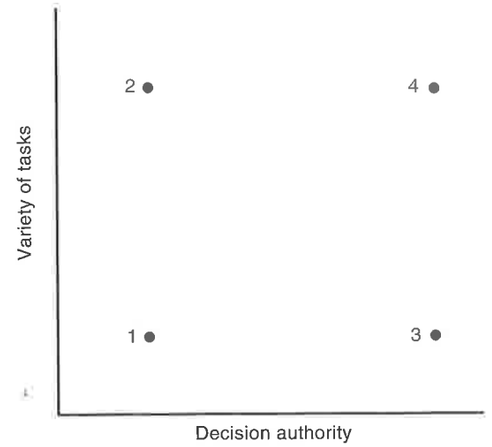
Through the process of designing the organization, specific *jobs* are created. For example, if a set of clerical tasks is bundled together and assigned to an individual, a secretarial job might be created. Jobs have at least two important dimensions: the *variety of tasks* that the employee is asked to complete and the *decision authority* to determine when and how best to complete those tasks.

Jobs vary substantially in terms of the variety of tasks and scope of decision authority. Figure 12.1 depicts four possibilities. Point 1 displays a combination of few tasks and limited decision authority. An example is a typist in a typing pool who concentrates on a single task and has limited discretion as to what to do or how to do it. Point 2 shows a combination of many tasks and limited decision authority. For instance, clerical jobs typically involve numerous tasks (filing, typing, answering the phone, and scheduling meetings, for example) but limited decision authority. Point 3 depicts a narrow set of tasks with broad decision authority. As an example, consider a sales representative who has broad decision rights concerning which customers to call, what sales pitch to make, what prices to charge, and so on. Yet the person concentrates on one principal task—selling products to customers. Recently, there has been a trend toward creating jobs like point 4 that are less specialized and where employees have broader decision authority. Reasons for this trend will become evident as we proceed through the next two chapters.

As a manager moves up in the corporation, these design issues consume larger amounts of the person's time. For example, the manager of a purchasing department plays an important role in defining the tasks each employee within the department performs. Unfortunately, the problem of partitioning tasks into jobs is extremely complex. It involves the assignment of literally thousands of tasks and decision rights. It also involves simultaneous consideration of other corporate policies such as performance evaluation and compensation policy—the other two legs of the organizational architecture stool.

Figure 12.1 Dimensions of Job Design

Two important dimensions of job design are the variety of tasks and scope of decision authority. This figure illustrates four possible combinations. Traditionally, many firms have created jobs like point 1, which involve few tasks and limited decision authority. Lately, there has been a trend toward jobs like point 4, which involve many tasks and broad decision authority. However, it is easy to give examples of jobs like point 2, which involve many tasks and limited decision authority—for instance, certain clerical jobs. Similarly, it is easy to point to examples of jobs like point 3, which involve few tasks and broad authority—for instance, certain sales jobs.



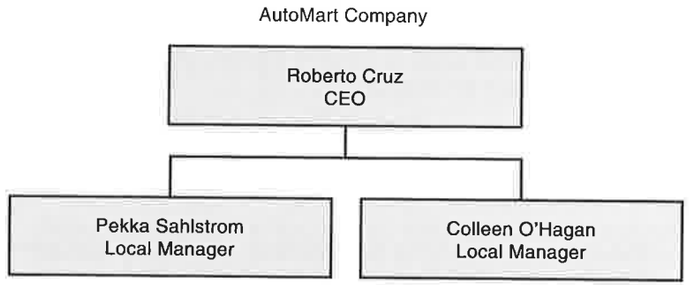
Although current theory is not sufficiently well developed to provide a detailed solution to this general problem, through some relatively simple examples we can derive important insights. In this chapter, we present such an example to explore the issue of decision authority. The next chapter considers the problems of *bundling* tasks into jobs and jobs into subunits of the firm. Thus, this chapter concentrates on the horizontal axis in Figure 12.1 (decision authority), whereas Chapter 13 concentrates on the vertical axis (variety of tasks).

Our primary example in this chapter involves AutoMart, a firm selling automobiles in two cities. As pictured in Figure 12.2, the management of the firm consists of Roberto (Bob) Cruz, the CEO, and two local managers, Pekka Sahlstrom and Colleen O'Hagan. The local managers oversee the operations in the two cities. We concentrate on one specific task/decision right, pricing. Assigning an individual the right to set prices at a local unit increases that person's decision authority. If Bob grants local managers the right to set prices, he reduces his decision authority and correspondingly increases the decision authority of the local managers. Initially, we assume that either Bob sets the prices at the local units or he grants the right to set prices to the local managers. In reality, Bob can grant the local managers some decision authority without giving them full pricing rights. For example, Bob might allow the managers to set prices within a given range. We consider these additional possibilities later in this chapter.

The issue of *centralization versus decentralization* focuses on which level of the firm's hierarchy to place the decision right. The firm is said to have centralized decision making if the right is assigned to Bob and decentralized decision making if the right is assigned to the local managers. A second issue is *choosing where within a given hierarchical level a decision should be made.* The decision authority of both local managers is increased if both are given decision rights for pricing. Alternatively, Bob might decide to increase the decision authority of only one of the local managers—for example, by letting Colleen make all pricing decisions. We begin by discussing centralization versus decentralization. We subsequently consider the lateral issue of where across a hierarchy to place the right.

Figure 12.2 Organizational Structure of AutoMart Company

AutoMart markets automobiles in two cities. Roberto (Bob) Cruz is the CEO. The two local managers oversee the operations in the two cities. The one important decision right in this example is the pricing decision. The first question involves centralization versus decentralization. Should Bob make the pricing decisions or should they be decentralized to Colleen and Pekka? The second question involves horizontal placement of decentralized decision rights. If pricing decisions are decentralized, Bob could (1) grant each manager the pricing right for that manager's own location, (2) grant both decision rights to one manager who would make all pricing decisions, or (3) grant the decision rights for the two locations to both managers and ask them to work as a team.



Centralization versus Decentralization

Most of the analysis of assigning decision rights has focused on the question of whether to centralize or decentralize decision rights.[2] We employ AutoMart to illustrate the major implications of this analysis. The basic question is should Bob set the prices at the two locations or should the pricing decisions be decentralized to the local managers? The answer to this question depends on the benefits and costs of decentralized decision making (relative to centralized decision making).

Benefits of Decentralization

Effective Use of Local Knowledge

Local managers are likely to have important information about local markets. For example, they are likely to have better information than Bob about the demands and price sensitivities of particular customers. They are also likely to know more about the quality and condition of their used cars. This information is potentially costly to transfer. If Bob makes all pricing decisions, the firm either incurs information transfer costs or bears the cost of making decisions absent relevant knowledge. Decentralizing decision rights links decision-making authority with local specific knowledge and can reduce the costs of information transfer and processing. More effective use of local knowledge is thus one of the major benefits of decentralized decision making.

Centralized decisions require local managers to seek permission to change prices. Local information has to be transferred to Bob or be ignored. Subsequently, Bob has to deliberate and convey his decisions back to local managers for implementation. This process takes time, and decision making is slower as a result. Such delays can lead to lost sales. Granting decision rights to the local managers promotes more rapid decision making and quicker responses to changing market conditions.[3]

Conservation of Management Time

If Bob makes local pricing decisions, substantial opportunity costs might be incurred: Using top-management time for pricing decisions means that time cannot be used for other decisions. Often, it is better to decentralize operating decisions to local managers and focus senior managers' attention on strategic decisions (for example, which car lines

[2]As an example of the standard treatment of this topic, see R. Kaplan and A. Atkinson (1989), *Advanced Management Accounting* (Prentice Hall: Englewood Cliffs, NJ). Also see M. Jensen and W. Meckling (1995), "Specific and General Knowledge, and Organizational Structure," *Journal of Applied Corporate Finance* 8:2, 4–18; and A. Christie, M. Joye, and R. Watts (2003), "Decentralization of the Firm: Theory and Evidence," *Journal of Corporate Finance* (forthcoming). For a more technical discussion of these issues, see. S. Athey, J. Gans, S. Schaefer, and S. Stern (1994), "The Allocation of Decisions in Organizations," working paper (Stanford University: Palo Alto, CA); M. Aoki (1986), "Horizontal vs. Vertical Information Structure of the Firm," *American Economic Review* 76, 971–983; J. Cramer (1980), "A Partial Theory of the Optimal Organization of Bureaucracy," *Bell Journal of Economics* 11, 683–693; J. Marshak and R. Radner (1972), *The Economic Theory of Teams* (Yale University Press: New Haven, CT); and R. Sah and J. Stiglitz (1988), "Committees, Hierarchies and Polyarchies," *Economic Journal* 98, 451–470.

[3]In the Honda example, decentralized decision making was slower than centralized decision making. However, in Honda's case, decision rights were decentralized to a team of employees rather than to an individual. Thus, the bottleneck was in the centralized coordination of the inputs from a number of team members. Later in this chapter we discuss how team decision making can be time-consuming.

Improving Performance through Decentralization: The Zebra Team

Eastman Kodak manufactures about 7,000 black-and-white film products that are used for a variety of purposes such as printing, X rays, and even spy satellites. Annual sales of these products are about $2 billion. Prior to 1989, Kodak used a very centralized decision-making process for manufacturing film. Manufacturing was divided into functions such as emulsion mixing (used for coating film), film coating, and film finishing. People in each of these functions reported up the line to functional managers.

In the late 1980s, poor performance motivated Kodak to reorganize the manufacturing of black-and-white film. Primary responsibility for the entire flow of the process was decentralized to a team of managers. A key feature of the new organization was the use of self-directed work teams.

The results of this reorganization were impressive. The "Zebra Team" cut production costs by some $40 million and inventory by about $50 million. In film finishing, what had taken 4 to 6 weeks was accomplished routinely in 2 days. In film coating, what had taken 42 days now was done in less than 20. New products were brought to market in half the time.

A good example of how the Zebra Team made effective use of local specific knowledge is the development of Cholach's Chariot. *Accumax* is a film product used in the manufacturing of circuit boards. Any dust on the film translates into a broken wire on a circuit board and thus renders the film worthless. Accumax is finished and slit into final products in a high-tech, ultraclean room. Unfortunately, the old supply cart used to transport the film to storage was not dust-free and thus much film was wasted. Bob Cholach was a slitter operator with specific knowledge about how the problem could be fixed—an airtight transport cab. Through his efforts, such a cab was designed and built, resulting in significant benefits to the company. Comparing the new empowered work environment with the old system, Cholach noted,

> In the old days I'd have been told, "That's not your job—don't worry about it." But here I was given the power and finances to design and build something that would help my teammates. It wasn't like dropping a piece of paper into a suggestion box, either. They let me run with it from start to finish.

Source: S. Frangos with S. Bennett (1993), *Team Zebra* (Oliver Wight Publications: Essex Junction, VT).

Railroads Decentralize after Centralizing

Union Pacific Corp. centralized its railroad management by moving operating managers and train dispatchers out of local offices to Omaha, Nebraska. Relying on computers and technology to link operations with the field, centralization was aimed at cutting cost. Burlington Northern Santa Fe Corp and CSX also spent millions of dollars to build network operations centers.

When service problems began developing in the field after Union Pacific took over Southern Pacific, Union Pacific concluded that it had lost touch. Service delays and freight jams began in Texas and spread to the western United States. Customers cut production and had to pay higher freight costs. Union Pacific poured additional crews and locomotives into the area. It cut its dividend and raised $1.5 billion for infrastructure. Union Pacific announced it was reorganizing into three regional groups, each with a vice president, and acknowledged, "The railroad is too large to operate from one location." Each railroad dispatcher will report to one of the three teams. Burlington and CSX also pushed managers back into the field.

Source: D. Machalaba (1998), "Union Pacific to Reverse Centralization," *The Wall Street Journal* (August 20), A3.

to sell and how to promote them). As Alfred Sloan, former CEO of General Motors and an early proponent of decentralization, described,

> *My office force is small. That means we do not do much routine work with details. They never get up to us. I work fairly hard, but it is on the exceptions . . . not on routine or petty details.*[4]

Training and Motivation for Local Managers

It is important for firms to attract talented employees and to train them as eventual replacements for senior management. Decentralizing decision rights promotes both objectives. Granting responsibility helps attract and retain talented, ambitious local managers who are likely to value this aspect of the job. It also provides experience in decision making that is important training for more senior positions. Finally, with the power to choose projects, lower-level managers can have stronger incentives to exert effort in finding and evaluating new projects, assuming they benefit from implementing their projects.

Costs of Decentralization

Incentive Problems

Decentralizing decision rights marries authority with local specific knowledge. However, the local managers do not necessarily have strong incentives to act to maximize a firm's value. For example, the managers might sell cars to their friends at low prices or obtain kickbacks from customers in return for selling at low prices. Developing an effective control system to motivate desired actions is not always easy or inexpensive. Also, there is a residual loss because it generally does not pay to resolve incentive problems completely. Incentive problems usually are larger the further down in the organization decision rights are placed.[5]

[4]A. Sloan (1924), "The Most Important Thing I Ever Learned about Management," *System*, 124.

[5]There are incentive problems even with centralized decision making—the decision maker is concerned that employees might not follow orders. These incentive problems usually are less severe than the incentive problems from decentralized decision making.

Technology Spurs Centralization in Financial Services

John Meyer, president of Diversified Financial Services unit of the consulting firm EDS, argues that advanced networks are creating huge operational changes in financial service firms, in particular, centralization. Call centers and loan processing used to be distributed (decentralized). Electronic networks are centralizing and consolidating these services. Some credit-scoring applications are being handled remotely with no human involvement, and others can be run from kiosks in shopping centers connected via video conferencing to central locations.

Source: "ROI for Networks," *CFO* (March 1999), 75.

Ideally, Bob would like to measure the effect of the local managers' decisions on the value of the firm. If Bob could, it would be relatively easy to use compensation schemes to motivate value-maximizing behavior. Unfortunately, observing the effect of individual decisions within the firm on the value of the firm is usually impossible. Compensation schemes can be based on performance measures such as internal accounting numbers. For example, the local managers might be paid based on total profits for their units. However, as we will discuss in Chapters 14 through 17, developing effective compensation schemes and performance measures is difficult. The firm can use other mechanisms—for example, direct monitoring—to reduce incentive problems, but none of these techniques is costless and none will resolve these problems completely.

Coordination Costs and Failures

If the two local managers set prices independently, they might ignore important interaction effects. For instance, lowering the price in one city might divert sales from the other city, especially if they are nearby and share local media. It also might be wasteful for both managers to conduct the same type of market analysis to decide on their pricing policies if their markets are similar. For instance, most of the information might be obtained by conducting only one survey, or more precise estimates might be derived by pooling the data.

Less Effective Use of Central Information

Local managers do not necessarily have all the relevant information to make good pricing decisions. Bob might have important information about product costs, upcoming promotions, and new products from the automobile manufacturer. Bob also might

Centralization and New Product Innovations

In 1997, Haagen-Dazs introduced a new ice cream flavor in Buenos Aires called *dulce de leche,* a popular local flavor in Argentina. Within weeks it was the store's best seller. One year later, consumers from Paris to Los Angeles could find the same flavor. In stores that carry *dulce de leche,* only vanilla sells better. To promote more effective transfer of the knowledge of hot products in one local market to other markets, firms are reorganizing decision rights. American companies such as Nike and Levi Strauss are reorganizing so that hot products in one region are spotted more readily and introduced into other regions. This often requires added centralization. Haagen-Dazs consolidated its international division, which offers seminars for its U.S. and foreign-based executives to swap ideas. Quaker Oats cut a layer of management and merged some foreign divisions to build better communications across regions. McDonald's reorganized its U.S. structure to resemble its foreign organization to encourage ad campaigns and tie-ins to cross borders better in the future.

Source: D. Leonhardt (1998), "It Was a Hit in Buenos Aires—So Why Not Boise?" *Business Week* (September 7), 56–57.

have important knowledge and expertise for solving pricing problems. Often, central managers obtain important information from observing the effects of various policies implemented through time and across multiple locations. In contrast, local managers generally have more limited experience and obtain direct information from only one location. There also can be economies of scale in having Bob make pricing decisions for all units within the firm (some decisions only have to be made once, rather than multiple times). And if industry conditions are such that rapid decision making involving central information is important, the benefits of centralization of decision rights are even greater.

This discussion implies that an important role of central management in a decentralized decision system is to promote information flows and coordination among decision makers in the firm. These activities are likely to be costly. For instance, transferring information to local decision makers can be expensive. The value of coordination and central information will be lower when the product demands and costs for the local units are more independent (for example, the locations are further apart) and more of the relevant knowledge for decisions is held by the local managers. The benefits and costs of decentralized decision making are summarized in the accompanying chart.

The Benefits and Costs of Decentralized Decision Making

Benefits	Costs
More effective use of local knowledge	Incentive problems
Conservation of the time of senior management	Coordination costs and failures
Training and motivation for local managers	Less effective use of central information

Illustrating the Trade-Offs

To illustrate the basic trade-offs in this example, assume that the pricing decision can be decentralized to the local managers in varying degrees. We use D to represent the degree of decentralization of the pricing decision. When $D = 0$, all pricing decisions are made by Bob; as D increases, the local managers are granted more decision rights. For example, at a low level of D, the managers might have the authority to alter centrally determined prices within a 5 percent band. At a sufficiently high D, the local managers have full authority to set prices. For simplicity, assume that D is continuous. Also, suppose that the benefits of decentralization can be written:

$$\text{Benefits} = B \times D \tag{12.1}$$

where B is a positive constant. The benefits include better use of local knowledge, conservation of senior management time, and training/motivation for local managers.

There are, however, costs associated with decentralization. For instance, there are increased incentive problems, and the decisions of the local managers have to be coordinated. Also, there are the increased costs of having to transfer central information to local decision makers. Assume the costs of decentralization are

$$\text{Costs} = (A \times D) + (C \times D^2) \tag{12.2}$$

where A and C are positive constants. The first term, AD, represents the contracting costs that arise from resolving the incentive problems of decentralization; the second term, CD, represents the coordination/central information costs. This formulation assumes that coordination/information costs increase at an increasing rate with decentralization.[6] For example, it becomes more and more difficult to coordinate decisions as decision rights become more decentralized.

The objective of the firm is to choose D to maximize the net benefits, where

$$\text{Net benefits} = \text{Benefits} - \text{Costs} = BD - AD - CD^2 \tag{12.3}$$

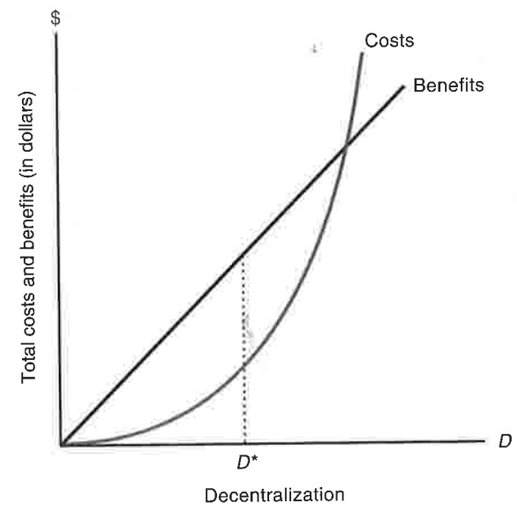
Figure 12.3 depicts the benefits and costs of decentralization. Net benefits are maximized where the vertical distance between the benefits and the costs is greatest. This condition occurs at

$$D^* = (B - A)/2C \tag{12.4}$$

[6]Coordination and central information costs do not have to be quadratic, and the other benefits and costs do not have to be linear. We use these functional forms to produce convenient solutions in our example, but the basic principles of our analysis do not depend on these simplifying assumptions.

Figure 12.3 A Graphical Illustration of the Trade-offs between Centralization and Decentralization of Decision Making at AutoMart

In this example, the local managers have important specific knowledge that is valuable for decision making, and timeliness of response is important. The benefits of decentralization are given by Benefits = BD, where D is the level of decentralization of pricing decisions and B is a positive constant. These benefits include better use of local knowledge, increased response times, conservation of the time of senior management, and training/motivation for local managers. The costs are given by Costs = $AD + CD^2$, where the first term, AD, represents the increased contracting costs from decentralization and the second term, CD^2, represents the increased coordination costs (A and C are positive constants). The optimal level of decentralization is $D^* = (B - A)/2C$. At this point, the marginal benefits and the marginal costs of decentralization are equal. (The slopes of the total benefit and cost curves are the same.)



Local Content Rules and Decentralization

Bombardier Inc., the Canadian railcar company, has 12 factories in Europe, is buying more, but could save millions by consolidating operations. But it won't. "Local presence is very important," says one manager. Although formal local-content rules, which require foreign companies to use local workers, are banned in Europe, informal practice still exists. Public authorities fear political fallout from awarding contracts to companies with workers elsewhere. One venture capitalist remarks, "If you look at who wins orders, local content is still very important." These political pressures are causing companies like Bombardier to be more decentralized than they would without the pressures. However, Bombardier is trying to centralize some functions (like engineering and purchasing) in Europe to reduce costs.

Source: S. Steinmetz and C. Chipello (1998), "Local Presence Is Key to European Deals," *The Wall Street Journal* (June 30), A15.

As is standard in problems of this type, D^* is the level of decentralization at which the marginal benefits of decentralization equal the marginal costs.[7] At this point, the additional benefits from more decentralized decision making just offset the additional costs. (Note that at levels of decentralization below D^*, a small increase in decentralization would add more to benefits than to costs so net benefits would rise. Conversely, at levels above D^*, a small increase would add more to costs than to benefits so net benefits would fall. Thus, the maximum net benefit occurs where the slopes of the cost and benefit curves are equal.)

Over time, it is likely that the costs and benefits of decentralization will change. For example, the importance of local knowledge can change with changes in competition in the industry or shifts in consumer demand. Also, the costs of transferring information and controlling incentive problems can fall due to new technologies (for example, consider fax machines and network computers). Changes in the benefits of decentralization can be represented by changes in B, the coefficient in the benefits equation. For example, if the importance of local knowledge increases with more global competition, B increases. Equation (12.4) and Figure 12.3 indicate that increases in B are associated with increases in the optimal amounts of decentralization. Changes in the contracting and coordination/information costs of decentralization can be represented by changes in A and C, respectively. Both Equation (12.4) and Figure 12.3 indicate that an increase in these costs is associated with a decrease in the optimal level of decentralization.

Our analysis of centralization versus decentralization can help us understand the changes in the assignment of decision rights at Honda Motor Company in 1991. Recall that after Soichiro Honda retired in 1973, the relevant specific knowledge for decision making was spread among many executives, making the benefits of decentralization high. In the context of our example, Honda could be viewed during this period as operating with an appropriately high level of decentralization. By 1991, however, Honda had grown tremendously and consensus decision making no longer was effective. Also, Nubuhiko Kawamoto, the new CEO, had been a Honda engineer and had detailed specific knowledge about designing automobiles. Thus, the benefits of decentralization were smaller

[7]Technical note: The solution to this maximization process can be obtained through elementary calculus. Alternatively, Equation (12.3) is quadratic, and thus you can use the quadratic formula to solve for the roots of the equation. The two roots, 0 and $(B - A)/C$, are where net benefits equal 0. The parabola is at a maximum midway between the two roots: $(B - A)/2C$. Note that the optimal point D^* is where the vertical distance between the benefits and costs is greatest. This point occurs where the slope of the benefit curve is equal to the slope of the cost curve. The slope of the benefit curve is the marginal benefit, whereas the slope of the cost curve is the marginal cost. Thus, the optimal point is where the marginal benefit of decentralization equals the marginal cost.

Not Everyone Likes Empowerment

An Eaton Corp. small forge plant in Indiana adopted worker-empowered teams. Many workers liked the idea of being their own boss, and not having time clocks or supervisors. Self-directed work teams were responsible for hiring and firing, disciplining their members, and organizing production. Managers now are called "vision supporters" and perform more the functions of coaching than directing. Everyone wears the same blue uniforms. New hires undergo a grueling interviewing process, often requiring 13 interviews—some with team members. Employees are careful about endorsing people because if that person fails, it reflects badly on the endorser.

However, many employees had difficulty adapting to the subtle control mechanisms of self-directed teams. Instead of one boss, employees now had a hundred bosses—everyone on their team. When one team mistakenly produced a batch of faulty parts, the entire team had to explain the mistake to the rest of the factory. Disciplining coworkers in open meetings turned out to be extremely uncomfortable for some people. One employee in discussing such disciplinary team meetings remarked, "I'd rather a 'vision supporter' dealt with stuff like that." This has produced one of the highest turnover rates among all of Eaton's factories, 10 percent annually.

Source: T. Aeppel (1997), "Empowerment Doesn't Suit All Workers," *The Wall Street Journal* (September 8), A1.

than in the past (when senior management possessed less of the relevant knowledge). In response to these changing conditions, Kawamoto decreased the level of decentralization. In the context of our example, there had been a reduction in the benefits of decentralization as well as an increase in the costs, resulting in a lower optimal level of decentralization.

Our graphical illustration simplifies the centralization/decentralization decision in many ways. For example, the analysis is much more complicated if the assignment of more than one decision right is considered. Also, the example takes the divisional structure of the firm as given (two operating divisions and a headquarters). More generally, the unit structure is determined along with the assignment of decision rights. (We discuss this issue in the next chapter.) It is particularly important to emphasize that when a firm changes its decision system, it typically is necessary to make corresponding changes in other organizational features, such as the performance-evaluation and reward systems. As we noted in Chapter 11, these aspects of organizational architecture are like three legs of a stool, and it is important to keep them in balance. It often is desirable to accompany decentralization with an increased emphasis on performance and incentive compensation to motivate the empowered decision makers. Our illustration is incomplete in that it does not incorporate simultaneous changes in these other organizational variables. (We discuss these issues in Chapters 14 through 17.) Despite these limitations, the example highlights some of the important trade-offs in deciding on the degree of decentralization.

Management Implications

Our analysis indicates that decentralization involves both costs and benefits. These costs and benefits are likely to vary across firms and time. We now examine how the optimal level of decentralization is likely to vary across firms. We then discuss factors motivating recent trends toward decentralization within many firms.

Across Firms

In Chapter 11, we discussed how the firm's business environment and strategy are major determinants of organizational architecture. We focused particular attention on three

aspects of the environment: technology, market conditions, and regulation. We expect that the net benefits of decentralization will be highest in rapidly evolving environments. Within unregulated industries where market conditions and production technologies frequently change, the timely use of local knowledge is likely to be particularly important. In more stable environments, companies can use centralized decision making and concentrate on gaining economies of scale through large-scale standardized production.

We expect that the benefits of decentralization are likely to increase as the firm enters more markets. If a firm offers a broad array of products, it is less likely that senior managers have the specific knowledge to select the most appropriate operating decisions across its various businesses. Although not always the case, decentralization frequently will be more important for firms following a strategy in which they develop differentiated products that command price premiums. Such a strategy requires effective use of information on customer demands and competitor offerings. Often, this information is held by people lower in the organization. With cost strategies that focus on low-cost production of standardized products, local knowledge frequently is less important.

Another element of strategy is the degree of vertical integration; for instance, whether a manufacturing firm should make its own inputs or provide its own retail distribution and service network—see Chapter 19. In general, we expect as the firm becomes larger, either through vertical integration or through geographic expansion, that the appropriate level of decentralization will increase. As a firm's size increases, more decisions have to be made. Time and mental-processing constraints simply will preclude central managers from making all major decisions.

Centralized decision making has particular advantages when coordination of activities within the firm is important. For instance, hub-and-spoke airlines schedule flights from the spokes to arrive at roughly the same time at a central hub. Passengers connect to their next flights that leave later. Airlines using centralized scheduling are able to coordinate the flight schedules and arrange baggage connections at lower cost, offering greater convenience to customers, than if schedules were determined by multiple decentralized decision makers (for example, the pilots). Similarly, it is important for large banks to coordinate the development of automatic teller machines centrally, so that all branches use the same system.

Information Transmission: The Rapid Response Team at McKinsey

Decentralized decision making takes advantage of local specific knowledge. However, local decisions require coordination. Also, these decisions often can be enhanced by providing local decision makers with useful information from other parts of the organization. An example of the importance of computers in transferring information to local decision makers involves McKinsey & Company.

McKinsey is one of the most prominent management-consulting firms in the world. In 2002, it had 82 offices plus 20 business technology offices spread across 44 countries. It is important for McKinsey to have relatively decentralized decision making because of the vast amounts of local specific knowledge held by on-site professionals. Nonetheless, for McKinsey to deliver consistent, state-of-the-art products, it is important to communicate throughout the organization.

In 1989, McKinsey formed their Rapid Response Team. The purpose of this team was to respond to requests about the best current thinking and practice by providing ready access to both documents and experienced consultants. This activity requires a computerized database that catalogs printed material and the experience profiles of consultants throughout the organization. In 1991, the Rapid Response Team responded to over 1,000 requests for information and assisted nearly a quarter of the firm's consultants and clients throughout the world.

Sources: J. Katzenbach and D. Smith (1993), *The Wisdom of Teams* (Harvard Business School: Boston) and McKinsey.com (2002).

Empirical evidence on some of these arguments is provided by Christie, Joye, and Watts, who examine decentralization of decision making between the CEO and the next layer of senior management (general managers) for a sample of 121 firms.[8] They find that larger firms with more local specific knowledge, higher diversification, and less regulation are more likely to have a greater degree of decentralization.

Recent Trends

In contrast to Honda Motor Company, the general trend over the last two decades has been toward greater decentralization. In Chapter 11, we suggested that changes in organizational architecture are motivated by changes in the basic economic environment. We now examine those factors which have changed in the environment to promote decentralization.

Over the past two decades, global competition has increased tremendously in many industries. Consider, as examples, the automobile, film, and computer industries. This competition has placed pressures on firms to cut costs, produce higher-quality products, and meet the demands of customers in a more timely fashion. The information for improving quality, customer service, and efficiency often is located lower in the organization. Thus, these competitive pressures have increased the benefits of decentralization for many firms.[9]

Technology has motivated changes in the level of decentralization for two reasons. First, the rate of technological innovation has increased dramatically. Firms must either respond quickly to the resulting changes in market conditions and production technologies or lose profits. This innovation can prompt firms to decentralize decision rights when important aspects of the knowledge of new technologies are not held by the central corporate office. Second, new technologies have altered the costs of information transfer significantly (for instance, cellular phones and e-mail). In some cases, these changes have worked to promote decentralization. For example, computers and telecommunications systems (satellites and fiber optics) have reduced the costs and time of transferring central information to local decision makers to coordinate and enhance decentralized decisions. Computers also have made it less expensive to track the sales and production costs of individual products. This reduction in costs has increased the feasibility of developing more precise performance standards for local decision makers to use in incentive compensation plans.

In other cases, the effect has been in the opposite direction: Local information has become less expensive to transfer to central headquarters, thus favoring more centralized decision making. For example, computerized cash registers allow central tracking of inventory and can increase the benefits of centralized purchasing. Many of the restocking decisions within Wal-Mart now are handled by an automated system through which suppliers restock items at individual stores whenever the computer system indicates that inventories have fallen to a specified level. Managers at individual stores have few decision rights over inventory levels.

Technological advances also have allowed many firms to flatten their management structures. Traditionally, firms have relied on middle managers to transmit information

[8] A. Christie, M. Joye, and R. Watts (2003), "Decentralization of the Firm: Theory and Evidence," *Journal of Corporate Finance* (forthcoming).

[9] Foreign competition also has weakened the power of labor unions in the United States to enforce inefficient work rules (for example, contract restrictions limiting the tasks that specific employees can perform). When competition largely was restricted to domestic, heavily unionized firms, there was limited pressure to change work assignments and decision rights in American firms. Competition from more efficient foreign and nonunion competitors altered this environment.

Technology and Bureaucracy: Cypress Semiconductors

Computer technology has allowed senior managers to communicate more directly with lower-level employees. As a result, this technology makes it less expensive for senior managers to control and coordinate the actions of individuals. Thus, it has reduced the demand for middle managers, who traditionally have played an important role in transmitting information from the top of the organization to lower levels. An example of the use of computer technology in this context is Cypress Semiconductors. T. J. Rodgers, CEO of Cypress, uses a computer system to track the daily objectives of every company employee. The company essentially has no middle management. To quote from *Fortune,*

> The computer system allows the CEO to stay abreast of every employee and team in his fast-moving organization. Each employee maintains a list of 10 to 15 goals like "Meet with marketing for new product launch," or "Make sure to check with Customer X." Noted next to each goal is when it was agreed upon, when it's due to be finished and whether it's finished yet or not.
>
> This way, it doesn't take layers of expensive bureaucracy to check who's doing what, whether someone has got a light enough workload to be put on a new team, and who's having trouble. Rodgers says he can review the goals of all 1,500 employees in about 4 hours, which he does each week.

Source: B. Dumaine (1991), "The Bureaucracy Busters," *Fortune* (June 17), 46.

and instructions from senior management to lower-level employees. Middle managers also have played an important role in coordinating and monitoring the actions of these lower-level employees. Internet-based technology, by facilitating communication between senior management and lower-level employees, has reduced demands for middle managers. Technology also has motivated changes in the roles of middle managers. In many firms middle management's role has shifted from being a conduit in the information flow to one that more closely resembles the coach of a sports team—assembling the optimal set of players, helping them design winning strategies, providing motivation, and so on.

Lateral Decision-Right Assignment

Although discussion of decision rights often focuses on centralization versus decentralization, lateral issues also can be important. In our AutoMart example, if Bob decentralizes decision rights, he can

- Grant the two managers the pricing decisions for their own locations, or
- Grant both decision rights to one manager who makes all pricing decisions, or
- Grant the decision rights for pricing at the two locations to both managers and ask them to work as a team in deciding on the pricing policy

As in the centralization versus decentralization problem, the relevant factors in making this choice include the distribution of knowledge and the costs of coordination and control. For example, granting decision rights to the managers separately takes greater advantage of local specific knowledge. But pricing at the two locations will not necessarily be well coordinated. Alternatively, granting all decision rights to one manager promotes coordinated decision making and takes advantage of any economies of scale in having one person make both decisions. But it comes at the potential expense of less effective utilization of the other manager's local knowledge. There also might be differences in contracting costs between these two alternatives. For example, it might be less expensive to monitor the decisions of one person than two. The value of the third

option, granting decision rights to a team of managers, depends on a number of factors that we discuss in the next section. Which of the three options is best depends on the specific circumstances facing the firm. For instance, having the two managers make independent decisions is likely to dominate when the two markets are more independent and more of the relevant knowledge for pricing is at the individual unit level.

Questions relating to the lateral placement of decision rights frequently arise within organizations. For example, should personnel decisions be made within each individual division, or should these rights be granted to a separate human resources department? Should a divisional manager be in charge of R&D, or should this function be performed elsewhere within the organization? Can the college of business operate its own career services center, or must it rely on centralized career services of the university?

Assigning Decision Rights to Teams

Our analysis of AutoMart suggests that a firm might want to assign a decision right to a team of employees rather than to one individual. In this discussion, we use the term *team* to refer broadly to the many different types of work groups that have decision-making authority (teams, committees, task forces, and so on); for our purposes, more refined definitions are unnecessary. Firms grant decision rights to teams of employees for at least three basic purposes[10]: to manage activities, to make products, and to recommend actions. Teams that manage activities often are composed of several individuals from different functional areas (for example, marketing and finance). Teams that make products frequently are located at the plant level. For instance, some firms have granted to teams of production employees the decision rights to set their own work schedules and assignments and to organize the basic production process. Both types of teams tend to be reasonably permanent. The assignment is to manage some particular business or process. Teams that recommend actions focus on specific projects and normally disband when the task is complete. An example is the Silver Bullet Team formed at Eastman Kodak to reduce the use of silver—the most expensive ingredient in making film. Kodak is the world's largest user of silver. We now discuss the benefits and costs of group decision making relative to assigning the decision right to a single individual.

Benefits of Team Decision Making

Improved Use of Dispersed Specific Knowledge

The relevant specific knowledge for decision making often is dispersed among many people within an organization. For instance, the relevant knowledge for designing new

Employing Teams to Assemble Knowledge

In 2002, the board of directors at Home Properties (a real estate investment trust) decided to change the process by which it approves acquisitions that arise between regularly scheduled board meetings. Acquisitions valued below $70 million had been approved by use of a mail ballot. But board members became concerned that this process limited potentially valuable discussions among the members of the board. A property committee was established consisting of those outside board members with the most extensive real estate experience. All but the smallest acquisitions now are vetted by this group prior to presentation to the full board for approval by mail. (Larger acquisitions still must be approved at a formal board meeting.)

[10]Katzenbach and Smith (1993).

products often is held by a variety of employees, including scientists, engineers, and sales personnel. Through the use of teams, those individuals with specific knowledge are involved directly in the decision-making process. By definition, specific knowledge is expensive to assemble and transfer to a single decision maker. Also, it can be important for the individuals with the relevant knowledge to share information among themselves. By sharing information in a group setting, new ideas might be generated that would not occur in a sequence of bilateral communications between a central decision maker and each of the individuals. By sharing information, employees also become better informed for future decisions and actions. Granting decision rights to a team encourages the members to communicate and to brainstorm. Final decisions are made through consensus or some type of voting mechanism.

Employee Buy-In

Employees often are suspicious that management-initiated decisions benefit managers at the expense of other employees; managers frequently suggest that they grant decision rights to groups of employees specifically to increase employee "buy-in." It is asserted that employees who take part in a decision process are more likely to support the final decision and be more active in its implementation. This occurs for at least three reasons: First, asymmetric information and uncertainty, in turn, prevent employees from knowing the full consequences of a decision. Second, a group of employees has less to fear if they make the decision themselves or if the decision is made by employees with similar interests (see also Chapter 20). Reduced concerns about the effects of the decision increase employee buy-in, even when the same decision might have been made by the central manager. Third, employees have stronger incentives to invest in implementing decisions that they recommend because their reputations depend on the ultimate outcomes of the decisions.

Costs of Team Decision Making

Collective-Action Problems

Collective decision making often is slower. Recall how senior executives at Honda Motor Company took months to reach a consensus on policy decisions. Also, group decisions are not always efficient or rational.[11] (Consider the old saying that a camel is a horse designed by a committee.) Group decision making also can be subject to manipulation and political influence. In the appendix to this chapter, we illustrate how the common decision rule of majority voting can be subject to manipulation; management implications of this analysis are highlighted.

Free-Rider Problems

Team members bear the full costs of their individual efforts but share the gains that accrue to the team. This arrangement encourages team members to free-ride on the efforts of others (see Chapter 10). As we discuss in subsequent chapters, free-rider problems can be reduced through appropriate performance-evaluation and reward schemes. However, these schemes are costly to design and administer.

[11]K. Arrow (1963), *Social Choice and Individual Values* (John Wiley & Sons: New York).

Monsanto Uses Two-Person Teams

CEO Robert Shapiro of Monsanto Inc., a chemical conglomerate, believes he can generate a competitive edge over his biotech rivals by bringing new genetic technologies to market faster than competitors. How?—By forming two-person teams that merge R&D and commercial skills. By genetically reengineering seeds, disease and pest-resistant plants can be produced. The team model consists of a scientist and a marketing or financial specialist who as codirectors oversee a Monsanto business, such as global cotton seed. The two work in adjoining cubicles and are called "box buddies." They jointly share all decision-making responsibilities and earn the same pay, benefits, and bonuses. In Monsanto's giant agricultural sector, 30 box buddies lead most of the crop teams. This is the way Monsanto tries to assemble relevant knowledge for decision making. But constant communications and good relationships are necessary. Besides adjacent offices, box buddies use advanced pagers, e-mail, and video conferencing. Most teams travel together. However, when Monsanto and American Home Products tried to merge, the deal fell through. The two CEOs were to be co-CEOs. The two simply could not agree on how to share the top job and become box buddies.

Source: T. Schellhardt (1998), "Monsanto Bets on 'Box Buddies,'" *The Wall Street Journal* (February 23), B1.

Management Implications

When Will Team Decision Making Work Best?

Some managers and consultants suggest that team decision making is virtually always better than individual decision making.[12] Our discussion indicates that this suggestion is not correct. Team decision making is more likely to be productive in environments where the relevant specific knowledge for the decision is dispersed among individuals and where the costs of collective decision making and controlling free-rider problems are lower.

Team decision making is a common component of total quality management programs. Many firms have increased their use of team decision making in the last few years through the implementation of TQM programs. Yet experience indicates that the *indiscriminate use* of teams in TQM programs can be counterproductive—in such cases, the costs exceed the benefits.

Optimal Team Size

Increasing the size of the team enhances the knowledge base of the team. However, it also increases the incentives to free-ride, as well as other costs associated with collective decision making. For instance, as team size grows, it can become difficult to make decisions and work in a coordinated fashion. Team size is optimal at the point where the additional costs of adding a new member equal the incremental benefits. The research of Katzenbach and Smith indicates that virtually all the effective teams they observed had no more than 25 members and most were much smaller (ranging from 2 to 25).

Decision Management and Control[13]

Thus far, our characterization of decision making has been rather simplified. In particular, we generally have assumed that an employee either has a decision right or does not. In reality, some aspects of a decision can be decentralized whereas others can be maintained

[12]For example, Katzenbach and Smith (1993).

[13]This section draws on E. Fama and M. Jensen (1983), "Separation of Ownership and Control," *Journal of Law & Economics* 26, 301–326.

Team-Based Organization: Hallmark Greeting Cards

It used to take about two years for Hallmark to bring a new card to market. A new card had to move through the various functional areas (for example, art, design, production, and marketing). Some of these functions were located in separate buildings. This all took time. Now Hallmark uses teams and organizes around specific holidays. For example, one team might work on cards for Mother's Day and another for Valentine's Day. Teams are given most of the decision rights for the design and marketing of particular cards. Through this process, Hallmark has cut its time to market new cards in half. For Hallmark, team decision making has proved more productive than centralized decision making.

Source: T. Stewart (1992), "The Search for the Organization of Tomorrow," *Fortune* (September 22), 92–98.

at a higher level. For example, at AutoMart, the managers might be granted the right to set prices within some range but have to obtain approval from Bob for larger price changes. Thus, the decision authority of an employee can be increased (see Figure 12.1) without granting the employee all rights to a particular decision.

A useful characterization divides the decision-making process into four steps:

- **Initiation.** Generation of proposals for resource utilization and structuring of contracts
- **Ratification.** Choice of the decision initiatives to be implemented
- **Implementation.** Execution of ratified decisions
- **Monitoring.** Measurement of the performance of decision makers and implementation of rewards

Definition

Decision management: The initiation and implementation of decisions.

Decision control: The ratification and monitoring of decisions.

Basic Principle: Allocating Decision Rights

If decision makers do not bear the major wealth effects of their decisions, decision management and decision control will be held by separate decision makers.

Often, firms assign initiation and implementation rights to the same employees. Fama and Jensen refer to these functions as *decision management;* they use the term *decision control* to refer to the ratification and monitoring functions.

Employees normally do not bear the full wealth effects of their actions—there are incentive problems. Granting an employee decision management and decision control rights for the same decision typically will lead to dysfunctional behavior. In the case of AutoMart, if the local managers make pricing decisions and there is no monitoring or other control, the managers are more likely to use the decision rights for their own benefit. For instance, the managers might sell cars to family and friends below cost. Whenever decision makers are not owners, separating decision management and decision control limits conflicts of interest. Only when the decision maker also is the major residual claimant—the person with the legal rights to the profits of the enterprise once all the other claimants of the firm (for example, bondholders and employees) are paid—does it make sense to combine decision management and control.

Separation of Decision Management and Control

A prominent example of separating decision management and decision control is the presence of a board of directors at the top of all corporations. In large corporations, the residual claimants are shareholders. The management of the firm is largely the responsibility of the CEO, who typically owns less than 1 percent of the firm's stock. To mitigate potential incentive problems, shareholders grant major decision-control rights to the board of directors. The board ratifies major decisions initiated by the CEO. The board also has monitoring authority and the rights to fire and compensate the CEO. However, since board members often are not major shareholders, there still is a role for other parties to "monitor the monitor." This role is performed by large blockholders (such as public pension funds) and takeover specialists. If board members do a poor job, they can be replaced through a proxy fight or corporate takeover.

The principle of separation of decision management and control helps explain the widespread use of hierarchies within organizations. In hierarchies, decision management is formally separate from decision control—that is, decisions of individuals are monitored and ratified by individuals who are above them in the hierarchy. The same employee might have both decision-control and decision-management functions. For example, divisional managers might have approval rights over certain initiatives of lower-level employees while at the same time have to request authorization for the division's capital expenditure plan. The important thing is that one employee not have both the decision management and decision control rights for the *same decision.* In smaller organizations, where one person (or a small number) has the relevant knowledge to make decisions, it is expensive to separate decision management from decision control. In this case, the two functions often are combined. In such cases the decision maker also tends to be the major residual claimant to avoid incentive problems. (For example, the company is organized as a sole proprietorship, partnership, or corporation where the managers own much of the stock.)

Although management and control rights for a decision often are granted to individuals at different levels in the organization, they sometimes are granted to separate individuals at the same level of the corporate hierarchy. For example, the quality of the output of a manufacturing division sometimes is monitored by a quality unit with equal status within the organization. Similarly, internal auditors often monitor units at the same hierarchical level.

Investigating Sexual Harassment at Compuware

In the spring of 1998, Sheila McKinnon charged her boss, Peter Karmanos, CEO of Compuware, with sexual harassment. Karmanos, with a 12 percent stake worth $656 million in Compuware, founded the company and built it into a $1.1 billion software company. At a May 29, 1998, meeting of the board of directors, Karmanos informed the board of McKinnon's allegations. Compuware's general counsel Thomas Costello presented an 18-page report from an outside investigator hired to look into the allegations. It concluded that there was "no independent support for McKinnon's claims." Within 90 minutes the board decided to terminate McKinnon. Two days later she was fired. And four days after that, McKinnon sued Karmanos and Compuware alleging sexual harassment and retaliation. In March 1999 the suit was settled out of court for an undisclosed amount.

The investigation of McKinnon's charges was supervised by Compuware's general counsel, Costello—one of the CEO's subordinates. The outside directors failed to take control of the investigation. They allowed Karmanos to retain the decision rights over an investigation into his own alleged behavior. Experts in employment law say, "Get out of the way. When such explosive charges reach all the way to the top, it's crucial that the board, not the CEO or other senior executives, take control of the matter immediately." The board has a fiduciary responsibility to the company and to the shareholders to ensure a thorough investigation. To meet this responsibility the outside directors should exercise the decision rights over the investigation, including hiring outside counsel and investigators. And they should report back to the board, not to the CEO.

Source: J. Muller (1999), "How Compuware Mishandled Its Explosive Sexual Harassment Case," *Business Week* (July 5), 74–84.

Empowerment

The concepts of decision management and decision control also are useful in making the term *empowerment* more precise. Managers sometimes are unclear about what rights are being granted when they announce that they are empowering employees. This ambiguity can lead to disputes and conflicts between management and employees—for example, when management reverses the decisions of employees who thought they were empowered. The principle of separation of decision management and control suggests that empowerment should not mean that an employee has all rights to a particular decision. An empowered employee might have explicit rights to initiate and implement decisions; however, there is still an important role for managers to ratify and monitor decisions. Ratification does not necessarily mean that an employee must seek approval for every decision. In some cases, managers might want to preratify decisions within a particular range—*boundary setting*. For instance, we discussed how the managers at AutoMart might be given authority to set prices within some range. In any case, Bob would want to maintain monitoring rights over the decision. Often, conflicts over empowerment can be avoided by clearly delineating what rights actually are delegated to the employee.

Decision Right Assignment and Knowledge Creation

Much of our discussion thus far has focused on how to assign decision rights given the existing distribution of knowledge. As we have discussed, a potentially important benefit of decentralization is that it provides employees with the opportunity to act on their specific knowledge. However this is only part of the potential benefits of decentralization: an important facet of the optimal assignment a decision rights involves the firm's ability to create *new* knowledge. If the firm can identify employees who make particularly productive use of their specific knowledge and they can generalize from that experience to produce new methods or procedures that can be transferred to other employees, the productivity of a larger group within the firm can be increased.

In chapter 8 we discussed how value is created when wetware is converted into software. This process requires that employees be encouraged to experiment, successful experiments be identified, and reasons for their success be understood, codified and implemented by others within the firm. Critical decision-control function for management within a decentralized organization is monitoring in order to identify superior performance. Therefore one important function of the firm's performance evaluation system is to identify excellence (see Chapter 16).

Note that this function does not have to be performed by managers at higher levels within the organization. For example, Home Properties is a real estate investment trust that owns and manages apartment communities. A critical responsibility of the training department is to identify whether solutions to property management problems developed at one location can be applied to other properties. Training evaluates the knowledge generated in the wetware of individual employees and whether that wetware can be transformed into software that can be employed more widely within the organization. On the Home Properties organizational chart, training and property management are at similar levels; this responsibility to create software thus represents a lateral, rather than hierarchical, assignment of responsibility. Another frequently employed technique to identify more productive procedures is to form teams of employees. As Parsons notes, records from the productivity studies at Western Electric's Hawthorne plant indicate that the workers regularly experimented with different procedures for assembling switches, monitored their resulting productivity changes, and encouraged co-workers to adopt efficiency enhancing innovations (see Chapter 1). In this case, the responsibility was assigned to a team. Through such processes, the knowledge embedded in the wetware of individual employees is transformed into software that can be used more widely within the organization.

Should CEO and Board Chair Be Separate?

Many commentators complain that boards of directors of U.S. companies fail to provide adequate discipline of senior managers. Of particular concern is the common practice of combining the titles of CEO and chair of the board. On the surface, this practice seems to violate the principle of separating decision management and decision control. Benjamin Rosen, chairman of Compaq Computer, voiced this concern succinctly:

> When the CEO is also Chairman, management has *de facto* control. Yet the board is supposed to be in charge of management. Checks and balances have been thrown to the wind.*

Large shareholder associations and pension funds in recent years have sponsored proposals at Sears, Roebuck and other large firms calling for separation of the titles. Government officials have considered regulations to force this change.

Contrary to the allegations of reformers, combining the CEO and chair titles does not necessarily violate the principle of separation of decision management and decision control. The extreme case of no separation exists only when the CEO is the board's sole member. Indeed, the boards of several large U.S. companies, including Dow, Ford, Mattel, Monsanto, Warnaco, and Xerox, have dismissed their CEOs/chair since 2000.

Estimates indicate that the titles are combined in over 80 percent of U.S. firms. In the vast majority of the remaining cases, the chair is the former CEO. Typically, when a new CEO is appointed, the old CEO/chair retains the position as board chair for a probationary period. With acceptable performance, the new CEO also receives the title of board chair and the old chair often retires. Proponents of regulations to force firms to appoint outsiders as chair essentially argue that almost all major firms in the United States are inefficiently organized. Although this assumption might be correct, reformers have presented no cogent argument for how such an important corporate control practice can be wealth-decreasing and still survive in the competitive marketplace for so long across so many companies.

**USA Today* (April 22, 1993).

Source: J. Brickley, J. Coles, and G. Jarrell (1997), "Leadership Structure: Separating the CEO and Chairman of the Board," *Journal of Corporate Finance* 3, 189–220.

Influence Costs[14]

To this point, we have assumed that decision-making authority is granted either to an individual or to a team within the firm. Once the right is granted, the employee or team is involved actively in decision making (subject to ratification and monitoring from others). Sometimes, firms use bureaucratic rules that purposely limit active decision making. For example, airlines allocate routes to flight attendants based on seniority—there is no supervisor who decides who gets which route. Similarly, some firms base promotions solely on years worked with the firm. Some universities prohibit grade changes once the grade is recorded.

One potential benefit of limiting discretion in making decisions is that it reduces the resources consumed by individuals trying to influence decisions. Employees often are quite concerned about the personal effects of decisions made within the firm. For example, flight attendants care deeply about which routes they fly. Employees are not

[14]This section draws on P. Milgrom (1988), "Employment Contracts, Influence Activities and Efficient Organization Design," *Journal of Political Economy* 96, 42–60.

Separate Decision Management and Control: Not a New Idea

The English merchant guilds were formed during the twelfth century. These precursors to the modern corporation were chartered by the crown and given a monopoly to conduct trade within their own towns, usually in return for a payment to the crown. Each guild would specialize in a particular trade (carpenters, stone cutters, pewterers, etc.). The guilds held property and elected officials to manage the trade and property. Incorporation by the crown created a legal entity that could conduct business.

In order to protect the members of the guild from embezzlement and mismanagement by their elected officers, charters of the guilds contained provisions for election of auditors from the general membership to audit the financial records of the guild. For example, The Worshipful Company of Pewterers of the City of London was audited by its members. The Book of Ordinances of 1564 contains the following "order for ye audytors":

> Also it is agreed that there shalbe foure Awdytours Chosen euery yeare to awdit the Craft accompte and they to parvese it and search it that it shall be perfect. And also to accompt it Correct it and allowe it So that they make an ende of the awdet therof between Mighelmas and Christmas yearely and if defaute made of ffenishings thereof before Christmas yearly euery one of the saide Awdytours shall paye to the Craft box vj s. viij d. pece.

Audits by members of the guild are early examples of separating decision management from control. The guild officers had decision management rights, but decision control rights in the form of annual monitoring of financial transactions were vested in member auditors.

Source: E. Boyd (1968), "History of Auditing," in R. Brown (Ed.), *History of Accounting and Accountants* (A.M. Kelley: New York), 79. Also, R. Watts and J. Zimmerman (1983), "Agency Problems, Auditing, and the Theory of the Firm: Some Evidence," *Journal of Law & Economics* 26, 613–633.

indifferent to which colleagues are laid off in an economic downturn. These concerns motivate politicking and other potentially nonproductive *influence activities.* For instance, employees might waste valuable time trying to influence decision makers. In vying for promotions, employees might take dysfunctional actions to make other employees look bad.

Not assigning the decision right to a specific individual lowers *influence costs*—there is no one to lobby. But such a policy can impose costs on an organization. Consider individuals who are competing for a promotion. These individuals have incentives to provide evidence to their supervisor that they are the most qualified for the promotion. This information often is useful in making better promotion decisions. However, this information comes at a cost: Employees spend time trying to convince their supervisor that they are the most qualified rather than focusing on other activities such as selling products. It makes sense to run a "horse race" so long as the incremental benefits from better information are greater than the incremental costs of the influence activity. But the race should be stopped at the point where the value of the additional information about individual qualifications is equal to the cost of the additional influencing activity.

In some cases, the firm's profits largely are unaffected by decisions that have an enormous impact on individual employee welfare. For example, firm profits might be totally unaffected by which flight attendant gets the Hawaii route versus the Sioux Falls route. It is in such settings that bureaucratic rules for decision making are most likely. The firm benefits from a reduction in influence costs but is little affected by the particular outcome of the decision process. (There still is a potential cost to the firm; by not taking individual employees' preferences into account in making job assignments, the firm may have to pay higher wages to attract and retain employees—we discuss this idea in Chapter 14.)

Influence Costs at Reynolds Tobacco

After a century of "one-for-all," the scramble to succeed Sticht as CEO split Reynolds into warring camps. People no longer pulled together for the company. Now they looked after the interests of the executive to whom they hitched their star: Wilson, Horrigan, or Abely. Preparing for a financial analysts' meeting, Wilson and Abely quarreled over who would speak first—a squabble Sticht finally had to settle. At a rehearsal for presentations to a companywide conference, Abely had run over his allotted time when Horrigan stomped into the room. "What's that . . . doing up there?" he stormed. "It's my time." Abely ordered a feasibility study on spinning off Sea-Land. Wilson, to whom Sea-Land reported, got wind of it and confronted John Dowdle, the treasurer, who was doing the study. "I'm sorry, I can't tell you about that," Dowdle said. "Abely will fire me if I tell you." Horrigan hired a public relations firm to get him nominated for the right kinds of business and humanitarian awards to enhance his résumé. Horrigan's big score: a Horatio Alger award.

Source: B. Burrough and J. Helyar (1990), *Barbarians at the Gate* (Harper Perennial: New York), 58.

CASE STUDY: *Medford University*

Medford University is a research university with about 10,000 students. It has a good liberal arts undergraduate program, a top-rated medical school, and a fine law school. It employs about 12,000 people. A majority of these employees work at the university hospital. Lately, the university has faced significant financial pressures. It is in intense competition for quality students with other colleges. Recent financial donations have been small. The hospital is under intense pressure to reduce costs because of changing health care regulation and insurance coverage.

The university currently spends about $100 million annually on fringe benefits (health insurance, retirement plans, and so on). It also faces large future payments of promised medical benefits to current and future retirees. The president of the university, Hiromi Kobayashi, has appointed a task force to design a new fringe benefit package. The task force consists of faculty and staff from departments throughout the university. The task force has been asked to consider the university's tenuous financial condition. President Kobayashi wants to reduce expenditures on fringe benefits (while maintaining the quality of the faculty and staff). The president has appointed the chief administrator of the hospital as the chair of the task force. The president also has appointed one of her key assistants, the vice provost, to serve as secretary of the task force (to take minutes and coordinate meeting schedules).

Discussion Questions*

1. Why did President Kobayashi appoint a task force to consider the issue of fringe benefits? She could have asked the university's human resources department to design a plan.
2. Should the president anticipate that all members of the task force will strive to cut university expenses? What actions can the president take to increase the likelihood that the task force members have this objective as a major priority?
3. Why did the president appoint the administrator of the hospital as the chair of the task force? The chair, in turn, has delegated much of the work to subcommittees (a health insurance committee, a retirement committee, and so on). What advice would you offer the chair in appointing subcommittee chairs? Explain.
4. Does the president want to commit to accepting the committee report or does she want to reserve the right to make modifications? Explain.
5. Why did the president appoint a key assistant as secretary of the task force?

*More complete answers to these questions can be developed by incorporating the material in the appendix to this chapter.

Summary

Firms transform inputs into outputs, which are sold to customers. An important element of organizations is partitioning the totality of *tasks* of the organization into smaller blocks and assigning them to individuals and/or groups within the firm. Through the design process, jobs are created. Jobs have at least two important dimensions: *variety of tasks* and *decision authority.* This chapter focuses on decision authority. The next chapter focuses on the bundling of tasks.

In *centralized decision systems,* most major decisions are made by individuals at the top of the organization. In *decentralized systems,* many decisions are made by lower-level employees. Decentralized decision making has both benefits and costs. Potential benefits include more effective use of local knowledge, conservation of senior management time, and training/motivation for lower-level managers. Potential costs include contracting and coordination costs and less effective use of central information. The optimal degree of decentralization depends on the incremental benefits and costs, which vary across firms and over time. There has been a recent trend toward greater decentralization, motivated in part by increased global competition and changes in technology.

Decision rights are not assigned just to a hierarchical level but to particular positions within the hierarchical level. Similar to the centralization versus decentralization problem, relevant factors in making this horizontal choice include the distribution of knowledge and the costs of coordination and control.

Sometimes, firms assign decision rights to *teams* of employees rather than to specific individuals. Firms assign decision rights to teams for at least three basic purposes: managing activities, recommending actions, and making products. The use of team decision making sometimes can increase productivity; but this is not always the case. Team decision making is most likely to be productive when the relevant information is dispersed and the costs of collective decision making and controlling free-rider problems are low.

Decision management refers to the initiation and implementation of decisions, whereas *decision control* refers to the ratification and monitoring of decisions. When individuals do not bear the major wealth effects of their decisions, it generally is important to separate decision management from decision control. This principle helps explain the presence of *hierarchies* in most organizations. It also can help make the concept of empowerment more precise.

Sometimes, firms adopt rules that limit the discretion of decision makers; for example, airlines assign routes to flight attendants based on seniority. One benefit of limiting discretion is that it reduces incentives of individuals to engage in excessive *influencing activities.* Some influencing activity is valuable in that it produces information that improves decision making. Firms are, therefore, most likely to limit discretion when the firm's profits are not very sensitive to the decisions, yet the decisions are of considerable concern to employees.

Appendix

Collective Decision Making[15]

Managers commonly delegate decisions to groups of employees through the use of teams, committees, and task forces. The presumption is that team members have important specific knowledge to make the decisions and that they are more likely to buy in to decisions when they participate in the decision-making process. Manager should realize that team members' interests are unlikely to be aligned either with each other or with the interests of the owners. Also, group decision processes sometimes can be

[15]This appendix draws on K. Arrow (1963), *Social Choice and Individual Values* (John Wiley & Sons: New York). See also Chapter 19.

manipulated by team members. It is critical to understand these potential problems with teams; they are the topic of this appendix.

The Example of Majority Voting

Suppose that Hassan Ragab, a senior executive, appoints a team of three managers to recommend a new marketing strategy. Patrick Stefan, Maria Lopez, and Sean MacDonald are from the finance, marketing, and sales departments, respectively. Hassan wants the three managers to recommend the strategy that would maximize the value of the firm. However, given their current compensation schemes and positions within the company, they are more closely aligned with the interests of their particular departments than with the firm as a whole. For instance, Sean is evaluated by the vice president of sales. Sean knows that his vice president will be unhappy with any recommendation that reduces the size or influence of the sales department. Sean thus has incentives to represent the vice president's views on the task force.

The managers are considering three options, labeled Plans A, B, and C. The top panel of Table 12.1 shows the preferences of the three managers. Each prefers a different plan. The managers decide to select a plan through a majority vote. When all three plans are considered together, each receives one vote and there is no winner. The managers, therefore, decide to conduct pairwise votes. The middle panel of Table 12.1 displays the outcomes of all possible pairwise votes. The bottom panel shows the ultimate outcomes from the three possible sequences of pairwise votes. Any one of the three plans can win, *depending on the order* in the election! This example suggests that agenda control can be critically important. If Maria has the right to select the order of voting (for instance, if she is appointed the team leader), she can manipulate the voting outcome in her favor.[16]

Majority voting is commonly used in group decision making—especially when the group is large. For instance, task forces of 20 or more people commonly vote on issues. Sometimes, other voting rules are used. For instance, some groups require unanimity for passage (each person has a veto). Others require a supermajority (for example, two-thirds of the votes). Small groups often do not vote on issues formally. Rather, they make decisions by consensus. Nonetheless, the basic points of our analysis continue to hold—the outcome need not be efficient, can be subject to manipulation, and can depend on the order in which proposals are considered. Indeed, Nobel prize–winner Kenneth Arrow has demonstrated that any collective decision-making mechanism, other than granting the decision right to an individual, is subject to the types of problems illustrated in this example (depending on the preferences of the individuals in the group).

The analysis in this appendix has several important implications for managers who delegate decisions to groups of employees:

- Managers should not presume that members of a team always will have the interests of the company as their primary objective—there are incentive problems. These problems must be considered in forming a team. Sometimes, people with important information should be excluded from a team if the contracting costs of including them on the team are substantial.

[16]Our example assumes that the managers vote their preferences in each round of the voting. Managers might choose to vote *strategically:* They might vote in a manner that is inconsistent with their preferences in the first round to achieve a preferred outcome in the final round of voting. (For example, some Democrats voted for John McCain in the 2000 Republican primary in Michigan, even though they planned to vote for Al Gore in the general election. They reasoned that the longer George W. Bush had to compaign against McCain, the more likely Gore would be successful in the general election.) Although strategic voting is a strong possibility in this setting, the basic point of our analysis remains: Managers can influence the outcome if they have agenda control. See Appendix Problem 2. Note also that majority voting does not always result in this type of order-dependence outcome. It depends on the preferences of the individual team members.

	Preferences		
	Most Favored	**Second Favored**	**Least Favored**
Pat	A	C	B
Maria	B	A	C
Sean	C	B	A

	Pairwise Votes		
	A versus B	**A versus C**	**B versus C**
Pat	A	A	C
Maria	B	A	B
Sean	B	C	C
Winner*	B	A	C

Sequence of Pairwise Votes		
Round 1	**Round 2**	**Ultimate Winner**
A versus B	B† versus C	C
A versus C	A† versus B	B
B versus C	C† versus A	A

*Majority-voting rules.
†Winner of the first round.

Table 12.1 Majority Voting and the Order of Consideration

This table presents an example of how the outcome of a series of pairwise votes can depend on the order in which the votes are taken. The top section shows the preferences of the three managers who are voting on the proposals, A, B, and C. The middle section shows the outcomes of all possible pairwise votes. The example assumes that the managers vote their preferences in each election. A majority-voting rule is used. The bottom section displays the ultimate outcome of a sequence of pairwise votes (the winner of the first vote is run against the remaining proposal). Any outcome is possible, depending on the order of consideration. In contrast to this example, the order of consideration does not always matter in majority voting—it depends on the individual preferences of the voters.

- Managers often can reduce the incentive problems on teams through incentive compensation plans. In our example, the existing compensation scheme motivated the managers to focus on their own departments rather than on the firm as a whole. Compensating the managers based on the firmwide valuation effects of the team's recommendation would alter these incentives. If all three managers were concerned about the overall value of the firm, there would be no problem.[17]
- Agenda control can be a powerful device in group decision making. Not only can the outcome be affected by the order of the voting (as in Table 12.1) but it also can be affected by the timing of the election. For instance, the vote might be set when it is known that a particular manager will be absent. Senior executives, therefore, have an interest in who is appointed to positions such as team leaders and committee chairs. In this example, the senior executive should favor a team leader who cares about firm-value maximization—agenda control would be used to benefit the overall firm.

[17]It is difficult to develop incentive schemes that completely resolve incentive problems within teams. As we discuss in the text, it is difficult to design schemes that hold individuals fully responsible for their own actions. Thus, there often are incentives to free-ride in teams. We discuss this issue in greater detail in subsequent chapters.

Appendix Problems

1. What factors should a manager consider when deciding on the composition of a team charged with making an important decision?
2. Suppose the managers in the example in this appendix do not necessarily vote according to their preferences in each round of the voting. Rather, they might vote for a less preferred option in the first round to obtain a preferred outcome in the final round. Suppose that Patrick has agenda control. How should he manipulate the agenda to achieve his preferred outcome?

Suggested Readings

E. Fama and M. Jensen (1983), "Separation of Ownership and Control," *Journal of Law & Economics* 26, 301–326.

M. Jensen and W. Meckling (1995), "Specific and General Knowledge, and Organizational Structure," *Journal of Applied Corporate Finance* 8:2, 4–18.

R. Kaplan and A. Atkinson (1998), *Advanced Management Accounting* (Prentice Hall: London).

G. Miller (1993), *Managerial Dilemmas: The Political Economy of Hierarchy* (Cambridge University Press: Cambridge).

Review Questions

12–1. Discuss the costs and benefits of decentralized decision making relative to centralized decision making.

12–2. Mark Wilson, chief of personnel, has been instructed to increase the hiring of women at the Morton Cement Company. Mark will be evaluated by the company president Josh Cohen on his success or failure in meeting this goal. Mark does not evaluate the performance of any of the division chiefs, and each chief must approve all new division employees. Do you expect Mark to succeed in this endeavor? Why or why not? Explain your reasoning.

12–3. Define the terms *decision management* and *decision control.* Under what circumstances might it be optimal to make one individual responsible for both decision management and decision control? What do you expect the ownership of common stock to look like in such a firm? Explain.

12–4. Jan van der Schmidt was the founder of a successful chain of restaurants located throughout Europe. He died unexpectedly at the age of 55. Jan was sole owner of the company's common stock and was known for being quite authoritarian. He personally made most of the company's personnel decisions. He also made most of the decisions on menu selection, food suppliers, and advertising programs. Employees throughout the firm are paid fixed salaries and were closely monitored by van der Schmidt. Jan's son, Karl, spent much of his youth driving BMWs around Holland and Germany at high speeds. He spent little time working with his father in the restaurant business. Nonetheless, Karl is smart and just received his MBA degree from a leading business school. Karl has decided to follow his father as the chief operating officer of the restaurant chain. What advice about organizational architecture for the company would you offer Karl now that he has taken over?

12–5. Discuss the positive and negative effects of a university rule that would not allow professors to change a grade once recorded.

12–6. United Airlines assigns flight attendants to routes using the following procedure: Once a month, the attendants request the routes they prefer, with conflicts resolved strictly on the

basis of seniority. Why does United use this procedure rather than simply let the supervisor of the attendants assign the flights?

12–7. Many companies have been experimenting with organizing their manufacturing around teams of employees. The employees are given decision rights on such things as how to organize the work and employee schedules. Often the employees are paid based on team output. Sometimes, this organizational arrangement has worked well. In other cases, it has not. Discuss the conditions under which you think that this type of team organization is most likely to succeed.

12–8. A leading business school currently uses study teams in the MBA program. Each team has five members. Some of the work in the first year is assigned to study teams and graded on a group basis. Discuss the trade-offs involved with enlarging student study groups in the MBA program from five to six people.

12–9. It is frequently argued that for empowerment to work, managers must "let go of control" and learn to live with decisions that are made by their subordinates. Evaluate this argument.

12–10. It is sometimes argued that empowerment can be successful only if managers learn to live with decisions made by lower-level employees. Managers are to set clear boundaries within which employees can make decisions (for example, allowing a salesperson to set prices between $15,000 and $20,000). Managers should never overturn a decision if it is within the boundaries. Rather, good decision making should be encouraged through proper incentives and training. Do you agree that for empowerment to work, managers should always set clear boundaries and live with decisions within these boundaries? Explain.

12–11. Several Fortune 100 companies have nominated members of the clergy to be members of their boards of directors. Discuss the advantages and disadvantages of such a proposal.

12–12. An organizational consultant evaluates your division. She indicates that she does not like the divisional manager's top-down management style. She recommends setting up a board that consists of the divisional manager and his top 10 department managers. The consultant suggests that all major policy decisions be made by the board by a majority-voting rule. She argues that this process will make for better use of information within the organization. She also argues that our political system is a democracy, which works well, and that the same concept could be applied beneficially within the corporation. Evaluate the recommendation.

12–13. The Colorado Symphony Orchestra (CSO) was formed after the Denver Symphony was no longer financially viable. CSO's corporate charter requires that it cannot have an operating deficit in any year. Revenues, donations, grants, and other income must equal or exceed operating expenses. CSO balances its budget each year by adjusting the musicians' salaries. For example, in 1999 the musicians were not paid for the last 2 weeks of the year.

CSO's board of directors and executive management committees are composed of one-third each of musicians, full-time CSO staff, and community supporters of the CSO.

In most organizations, it is unusual for labor to have representation on the board of directors and management committees. Explain why you would expect musicians to have seats on the CSO board and management committees.

12–14. Discuss the trade-offs involved with enlarging student study groups in the MBA program from around five people (the current number) to ten people.

12–15. Recently a number of companies have adopted what is known as *open-book management.* Under this concept lower-level employees are given training to help them understand the company's financial statements and how their individual actions affect financial performance. They are given access to information previously known only to more senior management. They are also given detailed revenue and cost data as it relates to their jobs. For instance, one company gave delivery drivers information about the maintenance costs of the company's vans, whereas a building company gave employees detailed cost information on such items as a spoiled batch of glue. Why do you think this management trend is occurring now, rather than say 20 years ago? Does this policy fit with other changes that are occurring in organizations? Explain. Do you think all companies should "open their books" to lower-level employees? Explain.

12–16. Microsoft's Encarta is a multimedia encyclopedia on CD-ROM. It has nine different editions. Examples include editions in British English, American, German, and Italian. The North American version alone has 40 million words and 45,000 articles. Microsoft has delegated major editorial decisions to teams of local experts, mostly academics and specialists "who know their stuff." For example, a team of experts primarily from Italy have been given editorial decisions for the Italian edition. Encyclopedia Britannica uses a different policy. Its central staff has decision rights to ensure a standard presentation is presented in all editions. Discuss the pluses and minuses of Microsoft's policy relative to Encylopedia Britannica's.

12–17. Blue Cross Blue Shield of Rochester is Rochester's largest health insurance provider. In exchange for the insurance premiums they pay, families insured by BCBS receive all their health care needs from a group of approximately 500 doctors approved by BCBS. (Families must choose their doctors from among these 500 doctors.)

When a patient insured by BCBS visits a doctor for a consultation, the patient pays a small copayment (usually $10). The doctor is reimbursed for the difference between the cost of the consultation and the copayment by RCIPA Corp. RCIPA Corp. is a firm owned by the 500 doctors who are BCBS-approved. At the beginning of each fiscal year, BCBS and RCIPA agree on a total dollar amount that BCBS will pay to RCIPA for medical services provided to patients covered by BCBS. BCBS further agrees that this dollar amount will not be adjusted for higher- or lower-than-expected medical care required by BCBS patients. RCIPA in turn pays member doctors, based on a fee schedule, for the medical services they provide to BCBS-insured patients. If, at the end of the year, there is any money left over, it is distributed to RCIPA members. If there is not enough money to pay for all the services provided by the member doctors, then the shortfall is allocated among the member doctors who must contribute cash to make up the shortfall.

Why do you think RCIPA serves as an intermediary between BCBS and the doctors who care for BCBS's clients? Why would BCBS risk paying "too much" for the medical care of their customers? Why would RCIPA and its members risk being "underpaid" for their services? Is one of the two parties forcing the other to agree to such an arrangement? If so, who is forcing whom? Why?

12–18. In the past several years, General Motors, a large auto manufacturer, and Levi Strauss, a major apparel manufacturer, have implemented team-based production processes. Under team-based production, each employee is assigned to a team, and each employee is evaluated and compensated based on the productivity of their team.

General Motors implemented team-based production at its new Saturn car plant. No other GM plant has implemented team-based production (at least not nearly to the same extent). The Saturn plant is a new facility (i.e., not a converted existing GM facility), and team-based production processes have been in place since the plant began production. Saturn employees were generally new hires; few, if any, came from other GM facilities.

Levi Strauss adopted team-based production processes at its existing plants. Employees who had been previously paid on a piece-rate basis were put on a team-based process.

a. In general, what are the advantages and disadvantages of team-based processes?

b. Team-based production at the General Motors Saturn division is widely regarded as a success. Saturn cars are some of the best-built cars in the GM product line. Workplace morale is high at the Saturn plant. By contrast, the Levi Strauss team-based initiative is widely regarded as a failure. Worker productivity has declined and employee morale is low.

What factors caused the Saturn experiment with team-based production to be a success and the Levi Strauss experiment to be a failure? Why?

12–19. Joan Zimmerman owns a local CPA firm. The company employs 10 CPAs and some additional staff employees. Joan sets her own pay and makes most of the major decisions facing the firm. Joan often initiates new ideas and implements them. The company has

no board of directors, and no one is responsible for monitoring Joan's actions. Does this organizational arrangement contradict the basic principle concerning the value of separating decision management and control? Explain.

12–20. Traditionally, lending decisions at financial institutions were made by people relatively high up in the organization. For instance, a senior loan officer might have to approve even a small loan. Recently, some financial institutions have decentralized this decision, sometimes to people without college degrees. Discuss why it might have historically made sense to centralize the lending decision. Discuss potential factors that might have motivated the decentralization of these rights in certain organizations.

Decision Rights: Bundling Tasks into Jobs and Subunits

CHAPTER 13

CHAPTER OUTLINE

IBM Credit Corporation is a wholly owned subsidiary of IBM. Its major business is financing installment payment agreements for IBM products. If IBM Credit were a stand-alone company, it would rank in the Fortune 100 finance companies with assets valued at over $10 billion. In 1993, IBM Credit was toured in the financial press for decreasing the time required to process a credit application from six days to four hours.[1] This decrease in cycle time was achieved through a substantial rebundling of the tasks performed by individual employees. Prior to *reengineering,* individuals performed narrowly assigned tasks. For example, one employee would check the applicant's credit and another would price the loan. Employees were grouped based on functional specialties to form the basic subunits of the firm (for example, the credit and pricing departments). After reengineering, applications were handled by "case workers" who were assigned most of the tasks involved in processing the application. The basic subunit structure of the company was altered correspondingly.

The results at IBM Credit suggest that the bundling of tasks into jobs and subunits can affect a firm's productivity dramatically. This chapter examines these important

[1]Details of this example are from M. Hammer and J. Champy (1993), "The Promise of Reengineering," *Fortune* (May 3), 94–97.

managerial decisions. We begin by analyzing the problem of how to bundle tasks into jobs. We then consider the problem of combining jobs into subunits of the firm. We conclude the chapter by discussing recent trends in the assignment of decision authority (the topic of Chapter 12) and the bundling of tasks (the topic of this chapter). We expand on this example of IBM Credit to illustrate these trends. The appendix to this chapter uses a simple game-theoretic example to illustrate some of the basic principles from this chapter.

Bundling Tasks into Jobs

In Chapter 12, we discussed how jobs have at least two important dimensions—breadth of decision authority and variety of tasks. We then analyzed the topic of decision authority in greater detail. We now focus on the second dimension, the bundling of tasks. The problem of how to bundle tasks obviously is quite complex; unfortunately, limited formal analysis of the topic exists. Nonetheless, the problem is economic in nature: Managers face a set of *economic trade-offs* when they bundle tasks. As in the case of decision authority, important insights into the nature of these trade-offs can be gained through simple examples.

Specialized versus Broad Task Assignment

FinWare Inc. is a distributor of financial software. Its customers include individual consumers and businesses. Within FinWare, there are two primary activities or *functions,* selling software and after-sales service (helping customers install the software on their systems and managing its interface with other programs). Thus, as displayed in Figure 13.1, FinWare must perform four basic tasks—sales and service for each of its two customer groups. Of course, these four basic tasks could be subdivided into a much larger number of smaller tasks. To keep the analysis tractable, we ignore this finer partitioning and assume that the firm has but four tasks. Our analysis readily extends to more general cases.

FinWare operates at multiple locations throughout the country. At its planned new Greensboro office, each of the four tasks is expected to take four hours per day to complete. Thus, the firm must hire two full-time employees in this office. In structuring the two jobs, the most obvious alternatives are to have each employee specialize in one function (either selling or service) that is performed for both customer groups or have one employee provide both sales and service to individual consumers and the other employee perform both functions for business customers. We refer to the first alternative as *specialized task assignment* and the second as *broad task assignment.* We now examine the relative benefits and costs of these two groupings.

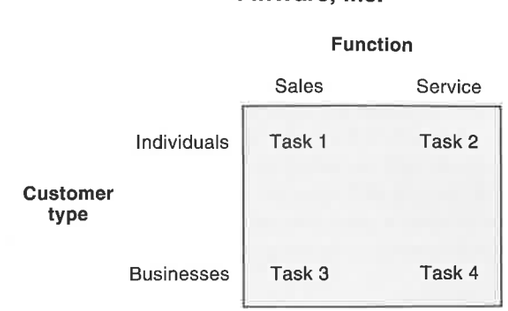
Benefits of Specialized Task Assignment

There are at least two important benefits that can arise from using specialized rather than broad task assignment:

- **Exploiting Comparative Advantage.** Specialized task assignment allows the firm to match people with jobs based on skills and training and correspondingly has employees concentrate on their particular specialties. For example, FinWare can hire salespeople to sell and technicians to provide service. The principle of comparative advantage suggests that this specialization often will produce higher output than having individuals perform a broad set of tasks—there are potential economies of scale in concentrating on a smaller number of tasks.

Figure 13.1 Tasks at FinWare

FinWare is a distributor of financial software. Its customers include individual consumers and businesses. Within FinWare, there are two primary activities or functions, selling software and after-sales service (helping customers install the software on their systems and interfacing it with other programs, for instance). As displayed in the figure, FinWare must perform four basic tasks in sales and service for each of the two customer groups.



- **Lower Cross-Training Expenses.** With specialized task assignment, each employee is trained to complete one basic function. With broad task assignment, employees are trained to complete more than one function, which can be expensive. For instance, suppose at FinWare the service function requires a skilled technician with an advanced college degree, whereas the sales function requires an individual with only a high school diploma. Specialized task assignment allows FinWare to hire one person with an advanced degree and one person without an advanced degree. With broad task assignment, the level of education required is usually the highest level across the assigned tasks. Thus, broad task assignment requires FinWare to hire two people with advanced degrees and train them to perform both functions. Because it costs more for FinWare to hire a person with an advanced degree than a person with only a high school diploma, broad task assignment is more expensive than specialized task assignment.

Costs of Specialized Task Assignment

Specialized task assignment has advantages relative to broad task assignment, but it also has drawbacks. Some of the costs of specialized task assignment include

- **Forgone Complementarities across Tasks.** Sometimes, performing one task can lower the cost of having the same person perform another task. For example, important

Adam Smith on the Economies of Specialization

With specialized task assignment, employees concentrate on performing a narrow set of tasks. Adam Smith, an important eighteenth-century economist and philosopher, was among the first to recognize the potential gains from this type of specialization. In his classic book, *The Wealth of Nations,* he argued how a number of specialized employees, each performing a single step in the manufacturing of pins, could produce far more output than the same number of generalists making whole pins. Smith presents the following description of a pin factory using specialized employees:

> One man draws the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on is a peculiar business, to whiten the pins is another; it is even a trade by itself to put them into the paper.

Smith argues that a small factory with 10 specialized employees could produce about 48,000 pins a day, while 10 employees working independently could not have produced 20 pins per day.

Source: A. Smith (1776), *The Wealth of Nations* (Modern Library: New York, 1937), 4.

information about a customer's service requirements might be gained through the sales effort. This information is less likely to be utilized if sales and service are conducted by separate people: It can be costly to transfer the information to the other individual. As another example, consider the case of two employees on an automobile assembly line. The first attaches the door to the car frame; the second attaches the latching mechanism and makes sure the door latches to the frame. If the first does not align the door properly, the second will have more difficulty getting the door to latch properly. Combining both tasks into one job increases the care with which the person attaching the door checks for proper alignment before the latch is attached.

- **Coordination Costs.** The activities of specialized employees have to be coordinated. For instance, FinWare would have to establish procedures for transferring sales orders to service technicians. Also, it might have to appoint a manager to handle exceptions to these procedures (for instance, before committing to the purchase of the software, a customer might demand authorization for specialized installation). Developing procedures and coordinating activities can be expensive.
- **Functional Myopia.** With specialized task assignment, employees tend to concentrate on their individual functions rather than on the overall process of providing good sales and service to customers. For example, a salesperson who is compensated primarily through commissions will have incentives to sell software to customers even if the sale imposes large service costs on the company, such as when the software is not well matched with the customer's existing computer system.
- **Reduced Flexibility.** Failure to cross-train employees has costs as well as benefits. For example, if only one person is trained to perform a particular function, what happens if the person is sick or on vacation? Also, having only one person trained to do a job in a firm can place the firm at a disadvantage when bargaining with the employee over salary and other benefits.[2] These problems are likely to be greatest in small companies, since large companies are more likely to have several people trained to perform any given task.

Incentive Issues

Our discussion of the costs and benefits of specialized versus broad task assignment has focused on informational and technological considerations. Incentive issues also can be important. From an incentive standpoint, sometimes it is better to have employees concentrate on a narrow set of tasks, while in other circumstances, a broad set of tasks is preferred.

With broad task assignments, the firm is concerned not only with how hard employees work but also with how they allocate effort among the tasks.[3] For instance, senior managers at FinWare would be concerned with the way employees balance their efforts between sales and service. Designing an evaluation and compensation scheme that motivates an appropriate balance of effort is complicated by the fact that the effort exerted on some tasks often is more easily measured than for other tasks. At FinWare, the sales effort might be estimated easily by sales volume, while it might be quite difficult to measure the quality of after-sales service—there are no good direct indicators of

[2]L. Stole and J. Zwiebel (1996), "Organizational Design and Technology Choice with Nonbinding Contracts," *American Economic Review* 86, 195–222.

[3]B. Holmstrom and P. Milgrom (1991), "Multitask Principal-Agent Analyses: Incentive Contract, Asset Ownership and Job Design," *Journal of Law Economics and Organization* 7, 24–52.

service quality, and poor quality might reveal itself very slowly over time (primarily as customers fail to make repeat purchases). If FinWare pays a sales commission, employees will concentrate on sales at the expense of providing good after-sales service to customers: Selling increases their incomes, whereas providing better service has a small impact (it affects income only through its effect on repeat purchases). FinWare can reduce this incentive to misallocate effort by not paying a sales commission. But this provides employees with relatively low incentives to exert effort on either task. One potential response to this problem is to use specialized task assignments. The salesperson could be provided high-powered incentives to concentrate on sales. The service person would not be evaluated on quantifiable output measures, but on more subjective measures, such as customer-satisfaction surveys. We discuss these issues in greater detail in Chapters 15 and 16.

In some cases, producing output requires the coordinated execution of several separate tasks that individually are difficult to assess. Here, it can make sense to assign all the tasks to one individual who is accountable for the final product. For instance, in the example of attaching doors and latches to automobiles, assigning both tasks to one employee makes it easy to identify who is to blame if the door does not latch properly. Similarly, at FinWare the failure of a customer to make a repeat purchase might be due to either poor sales effort or service. Having one employee conduct both sales and service facilitates identification of the employee responsible for the unhappy customer.

Costs and Benefits of Specialized Task Assignment*

Benefits	Costs
Comparative advantage/economies of scale	Forgone complementarities across tasks
Lower cross-training expenses	Coordination costs
	Functional myopia
	Reduced flexibility

*Incentive issues can favor either specialized or broad task assignment, depending on the nature of the production technology and information flows.

Productive Bundling of Tasks

The choice between specialized and broad task assignments depends on the technological, informational, and incentive issues discussed above. One variable that is likely to be of particular importance in making this decision is the relative degree of complementarity among tasks within, versus across, functional areas. At FinWare, the magnitude of the benefits of specialized task assignment depends largely on how related the selling efforts are between the two customer groups. If there are only minor differences between selling to individuals and businesses, training employees to do one makes them well prepared to do the other. In contrast, if the selling tasks are quite different between individuals and businesses, little is gained by training one employee to perform the two selling tasks compared to training separate employees. As a consequence, any economies of scale that result from specializing in sales are likely to be small. Similarly, the costs of specialized task assignment at FinWare depend on the importance of complementarities across functional areas. When these complementarities are low (for instance, little valuable information is gained about service through the selling effort), little is lost by having employees concentrate on a single function. It also is relatively easy to coordinate the

individual specialists through the use of routine procedures. Ultimately, the degree of complementarity among tasks depends on how specialized knowledge is created and the costs of transferring knowledge. It also depends on the technology used in the production process.

Our FinWare example is quite simplified, and in most settings, more complicated task divisions are feasible. For instance, the selling function might have two phases—initial contact and closing the deal. The initial contact requires less specialized product and service knowledge than closing the deal but is potentially more time-consuming. Here, it might be better for a salesperson to handle the initial contact and have a joint call by both the salesperson and service person to close the deal. As another example, at some locations, more complete specialization might be feasible. For instance, an employee at an office with a larger sales volume could concentrate solely on selling to individuals or to businesses. While our basic FinWare example abstracts from these more complicated considerations, it nevertheless isolates some of the key considerations in deciding on how to divide tasks into jobs.

Bundling of Jobs into Subunits

Our discussion of specialized versus broad task assignment highlights the economic trade-offs of bundling tasks into jobs. Managers are confronted with a similar set of trade-offs when they bundle jobs into subunits (for example, departments, divisions, and subsidiaries).

Grouping people together within a subunit lowers the communication and coordination costs among the people *within the subunit.* For instance, they often report to the same manager, who facilitates information flows and coordination. Employees also are more likely to form closer working relationships if they share the same workspace—especially if they are evaluated and compensated on subunit performance. Managers, however, must devise methods of coordinating activities *across the subunits.* For instance, rules and procedures must be developed for coordinating activities among interdependent subunits, managers must be appointed and granted the authority to rule on exceptions to these procedures, and liaison staff and coordinating committees often must be appointed to address interunit issues. In summary, there is a trade-off between the benefits that come from grouping people together and the costs of coordinating their activities with those performed within other subunits. In addition, it is important to consider incentive issues: Some groupings make it easier to devise productive performance-evaluation and reward systems than other groupings (we elaborate on such incentive issues in Chapter 17).

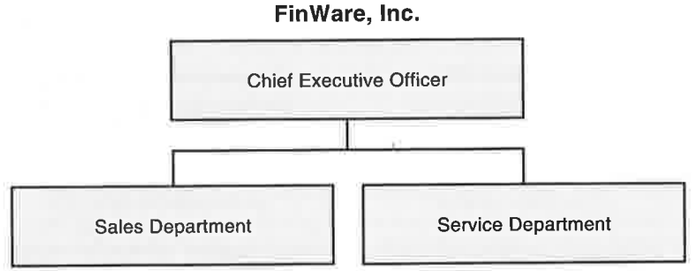
In what follows, we begin by describing two standard methods of grouping jobs into subunits—by function and by product and/or geography. We then discuss the economic trade-offs between these two subunit designs. This discussion is followed by an examination of other methods that firms use to group jobs into subunits.

Grouping Jobs by Function

One common method of grouping jobs is by functional specialty (engineering, design, sales, finance, and so on). This organizational arrangement sometimes is referred to as the *unitary form (U form)* of organization because it places each primary function in one major subunit (rather than in multiple subunits). Figure 13.2 displays an organizational chart for FinWare under this type of functional grouping. Individual jobs are characterized

Figure 13.2 FinWare as a Functional Organization

This figure displays an organizational chart for FinWare when jobs are grouped by functional specialty. These jobs are characterized by specialized task assignment. All the sales jobs in the organization are grouped together to form a sales department, and the service jobs are grouped together to form a service department. These departments are charged with managing their particular functions across the firm's entire product line. Senior management plays an important role in defining organizational architecture, coordinating activities across departments, and making key operating decisions.



by specialized task assignment. All the sales jobs in the organization are grouped together to form a sales department, and the service jobs are grouped together to form a service department. These departments are charged with managing their particular functions across the firm's entire product line. Senior management plays an important role in defining the architecture, coordinating activities across departments, making key operating decisions, and setting strategy. Rules and procedures are established for coordinating the activities across the functions. For example, detailed procedures are established to transfer sales orders to the service department. Exceptions and special cases are handled by the senior management and/or coordinating committees (which often include senior division managers and corporate staff).

Concentrating on Functions at Cadillac

Some of the coordination problems that can arise within a functional organization are highlighted by the process that Cadillac formerly used for developing new products. Under this process, engineers were grouped by narrow functional specialty and charged with completing a related set of tasks:

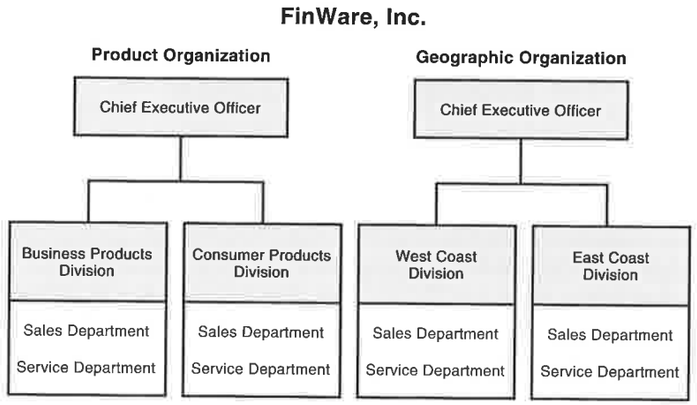
> The designer of the car's body would leave a hole for the engine, then the power-train designer would try to fit the engine into the cavity, then the manufacturing engineer would try to figure out how to build the design, and finally the service engineer would struggle to invent ways of repairing the car. The results were predictable. On one model, the exhaust manifold blocked access to the air-conditioning compressor, so seasonal maintenance meant removing the exhaust system. On another model, the connection between the spark plugs and the spark plug wires was so tight that mechanics tended to break the wires when they pulled them off to check the spark plugs.

Automobile companies have been able to reduce problems of this type by moving to a system of "concurrent engineering" where everyone affected by design participates in the process as early as possible. Often, companies use development teams that are charged with the entire process—these development teams group jobs by product rather than by function.

Source: W. Davidow and M. Malone (1993), *The Virtual Corporation* (Harper Business: New York).

Figure 13.3 FinWare as a Product and Geographic Organization

This figure shows how FinWare would look organized around product or geography. In the first case, the company is divided into a business products division and a consumer products division. Each of these divisions has its own sales and service departments that focus on the particular products of the division. (Often, jobs within the business units are grouped by functional area.) Organized geographically, the company is divided into a West Coast division and an East Coast division. In this case, the sales and service departments within each business unit serve both individual and business customers within their geographic areas.



Grouping Jobs by Product or Geography

Another prominent subunit design is the *multidivisional form (M form)* of organization, which groups jobs into a collection of business units based on product or geographic area. Operating decisions such as product offerings and pricing are decentralized to the business-unit level. Senior management of the firm is responsible for major strategic decisions, including organizational architecture and the allocation of capital among the business units. Figure 13.3 shows how FinWare would look organized around product or geography. In the first case, the company is divided into a business products division and a consumer products division. Each of these divisions has its own sales and service departments that focus on the particular products of the division (often, jobs within the business units are grouped by functional area). Organized geographically, the company is divided into a West Coast division and an East Coast division. In this case, sales and service departments within each business unit serve both individual and business customers within their geographic areas.

Trade-offs between Functional and Product or Geographic Subunits

Benefits of Functional Subunits

At least three major benefits stem from grouping jobs by function. First, this grouping helps promote effective coordination within the functional areas. For instance, a supervisor in service can assign employees to specific projects based on current workload and expertise. It also is frequently easier for functional specialists to share information if they work within the same department. For example, if a service technician develops a new solution to a problem, that employee's supervisor can help promote its use by training other technicians within the department. Second, this grouping helps promote functional expertise. Individuals focus on developing specific functional skills and are directly supervised by knowledgeable individuals who can assist and support this development. Third, there is a well-defined promotion path for employees. Employees tend to work their way up within a functional department—for example, from salesperson to local sales manager to district sales manager. Having a well-defined promotion path can reduce employee uncertainty about career paths and thus can make it less expensive to attract and retain qualified employees (recall our discussion of risk aversion in Chapter 2).

Problems with Functional Subunits

Although functional grouping has advantages, it also has disadvantages. First, there is the opportunity cost of using senior management's valuable time coordinating functions and making operating decisions. This time might be focused more productively on activities such as strategic planning—deciding in which businesses the company should compete and how to be successful in those businesses (see Chapter 8). Second, there can be significant, time-consuming coordination problems across departments. At FinWare, when a sale is made by the sales department, the order has to be communicated to the service department, which in turn must schedule the required customer service. This process can cause lengthy delays in serving the customer. Moreover, important information can be lost in these transfers between departments. Third, employees sometimes concentrate on their functional specialties rather than on the process of satisfying customers. For instance, the sales department might focus on achieving department goals, even if that focus imposes costs on other departments in the firm. A salesperson might promise rapid installation to a customer even though the workload of the service department already is high.

Benefits of Product or Geographic Subunits

An advantage of the M form of organizing large corporations—especially within dynamic environments—is that decision rights for operations are assigned to individuals lower within the organization, where in many cases the relevant specific knowledge is located. For instance, the information required for the effective coordination of

The Formation of Multidivisional Firms in the Oil Industry

In the 1950s, most of the Fortune 500 oil companies were organized into functional departments. These companies were not performing well in competition with smaller corporations. Oil companies began experimenting with their organizational architectures. The design that appeared to work best was the multidivisional form of organization. Some of the firms organized around geographic areas, whereas other firms organized around product lines. Companies that switched to the M form early outperformed other companies that switched later. By the middle 1970s, most large oil companies had switched to the multidivisional form of organization. Those which did not switch tended to be smaller companies that performed well using the old structure.

Source: H. Armour and D. Teece (1978), "Organizational Structure and Economic Performance," *Bell Journal of Economics* 9, 106–122.

functions might depend more on local information that would be expensive to transfer to senior executives at headquarters. As we discussed in Chapter 12, decentralizing these decisions to the local managers of a geographic subunit helps ensure that this local information will be used effectively. Managers of business units are compensated based on the performance of their units; this provides incentives to use this specific knowledge more productively. Decentralizing decision rights to business-unit managers also frees senior management to concentrate on other, more strategic issues. The separation of the corporate office from operations focuses senior executives' attention on the overall performance of the corporation rather than on specific aspects of the functional components. A product or geographic focus promotes coordination among the functions that must be completed to produce and market a particular product or to serve a given geographic area.

Problems with Product or Geographic Subunits

Business-unit managers tend to focus on the performance of their own units. This focus is consistent with the maximization of a firm's value so long as product demands and costs are independent across business units. In this case, firm value is simply the sum of the values of the individual units. Frequently, there are important interdependencies among units that must be taken into account if a firm's value is to be maximized. For example, there is likely to be some overlap in customers, intermediate products often are transferred between subunits, and the units share common resources. If managers focus on their own units and do not consider these interdependencies, the overall value of the firm is reduced. For example, the West and East Coast divisions of FinWare might compete against each other for a national customer and reduce overall profits by selling products at a lower price than if they coordinated their marketing. This problem can be mitigated by forming *groups* of interrelated business units and basing a component of unit managers' compensation on overall group performance. However, as we discuss in Chapters 14 and 15, developing a compensation scheme that appropriately motivates unit managers is not easy. Splitting functional personnel among business units also forgoes potential economies that might result from combining similar specialists within one subunit.

Citigroup Reorganizes to Control Conflicts

In 2002 Citibank was accused of having analysts mislead investors by distributing biased research to help land lucrative investment banking deals. Citibank was facing probes from the Securities and Exchange Commission, the New York attorney general, and Congress. Citigroup decided to reorganize, creating a new unit to separate analysts from investment bankers and thereby control potential conflicts of interest within their securities business. New York Attorney General Eliot Spitzer embraced the move as a productive initial step. "Anything that underscores the importance of insulating research from investment banking is positive," said attorney general spokesman Darren Dopp. "Actions like this could complement the broad industry reforms now being discussed."

Thus, although most decisions about how to group jobs into subunits focus on how to facilitate information flows and cooperation across employees, this case illustrates that there are special cases in which management wants to be able to convince customers and regulators that an inappropriate coordination of activities is not occurring, and the choice of job grouping can help in that process.

Sources: T. Valdmanis (2002), "Citigroup Banks on Reform Plan," *USA Today* (October 31), p. 3B; G. Stein (2002), "Citigroup Seeks to End Conflicts," *Bloomberg News* (October 31).

Benefits and Costs of Functional Organization as Opposed to Product or Geographic Organization

Benefits	Costs
Improved coordination among functional specialists	Less effective use of local product or geographic information
Promotes functional expertise	Opportunity cost of senior management time
Provides a well-defined promotion path	Coordination problems among subunits
	Functional focus: It is difficult to design compensation plans that promote a focus on profits and customers

Where Functional Subunits Work Best

Functional grouping works best in small firms with homogeneous products and markets. In these firms, it is easier for senior managers to coordinate operating decisions across departments. For large firms with more diverse product offerings, senior executives are less likely to possess the relevant specific knowledge for making operational decisions for the company. In addition, the opportunity cost of having senior management concentrate on operating and coordination issues rather than on major strategic issues for the firm can be enormous.[4] In such cases, grouping by product or geography often will be the preferred alternative.

Another variable that is likely to affect the desirability of functional subunits is the rate of technological change in the industry. Here, we consider technological change broadly to include new products, new production techniques, and organizational innovations. Functional subunits are more effective in environments with a more stable technology, since frequent communication across functional departments and specialists is less important and interactions can be handled through routine rules and procedures. In addition, senior management is likely to possess more of the relevant specific knowledge to coordinate functional areas.

In less stable environments, direct communication across functional areas is more important and new situations are more likely to arise that will challenge established coordination procedures. In turn, senior managers are less likely to have all the relevant specific knowledge to address these challenges. Rather, the specific knowledge is more likely to be spread across employees throughout the firm. For example, the frequent introduction of new products increases the benefits of communication among salespeople and design engineers about customer demands and preferences. Similarly, it is important for development and manufacturing personnel to share information when production techniques and technologies are changing more frequently.

Finally, in a rapidly changing environment, there is likely to be more uncertainty about the appropriate organizational architecture. With divisions organized around products or geography, different divisions can experiment with different architectures. For example, when Citibank began offering swaps, it opened trading desks in New York, Toronto, London, and Tokyo. The different operations competed not only with other financial institutions for business but also with one another. By encouraging experimentation with the architecture of these businesses, Citibank exploited the benefits of economic Darwinism within the firm. As experience mounted, the best procedures were made standard across the bank. Thus, when an environment is more dynamic, the desirability of a product or geographic organization increases.

[4]O. Williamson (1975), *Markets and Hierarchies* (Free Press: New York).

Environment, Strategy, and Architecture

In Chapter 11, we discussed how appropriate organizational architecture is influenced by the firm's business environment and strategy. Our discussion of the appropriate subunit configuration highlights this influence. Both environmental factors (such as the rate of technological change) and the firm's business strategy (whether the firm produces multiple products, chooses to operate in multiple locations, and so on) affect the desirability of functional versus product or geographic organization.

An important illustration of the influence of the environment and strategy on subunit design is the experience of large United States firms at the beginning of the twentieth century. The first large firms in the United States were the railroad companies, which emerged around 1850.[5] These firms initially organized around basic functions such as finance, pricing, traffic, and maintenance. As the incidence of large firms increased in other industries in the late 1800s (such as steel, tobacco, oil, and meatpacking), most followed the lead of the railroads and organized around basic functions. As companies like Du Pont, General Motors, and General Electric continued to expand—both geographically and in the number of product lines—in the early 1900s, they began faring poorly in product markets where they faced smaller, more focused competitors. Their organizational architectures did not fit their changing environments or strategies. In response, these companies began experimenting with different organizational forms. After significant experimentation, many large companies adopted the M form of organization. Economic historian Alfred Chandler concludes[6]:

> *The inherent weakness in the centralized, functionally departmentalized operating company . . . became critical only when the administrative load of the senior executives increased to such an extent that they were unable to handle their entrepreneurial responsibilities efficiently. This situation arose when the operations of the enterprise became too complex and the problems of coordination, appraisal, and policy formulation too intricate for a small number of top officers to handle both long-run, entrepreneurial, and short-run, operational administrative activities.*

Matrix Organizations

Some firms attempt to capture the benefits of both functional and product or geographic organization by using overlapping subunit structures.[7] These *matrix organizations* have functional departments such as finance, manufacturing, and development. But employees from these functional departments also are assigned to subunits organized around product, geography, or some special project. Matrix organizations are characterized by intersecting lines of authority—the term *matrix* refers to the intersecting lines resulting from such an organizational arrangement. Individuals report to both a functional manager and a product manager. Functional departments usually serve as the primary mechanism for personnel functions and professional development. The functional managers typically have the primary responsibility for performance reviews (since they have better technical knowledge for evaluating an employee's performance).

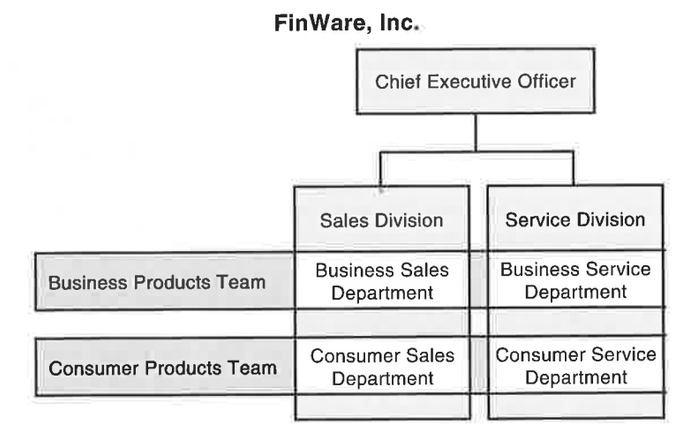
[5]A. Chandler, Jr. (1977), *The Visible Hand: The Managerial Revolution in American Business* (Belknap Press: Cambridge, MA).

[6]A. Chandler, Jr. (1966), *Strategy and Structure* (Doubleday: Garden City, NY) 382–383.

[7]For a more detailed discussion of matrix organizations, see W. Baber (1983), *Organizing for the Future* (The University of Alabama Press: Tuscaloosa, AL).

Figure 13.4 FinWare as a Matrix Organization

This figure shows how FinWare might look organized as a matrix organization. The firm maintains functional divisions of sales and service. Individuals from these divisions simultaneously are assigned to either the business-products or consumer-products subunits (teams). These teams are indicated by the shaded rectangles. The functional managers focus on managing the particular function across both products, while the product managers focus on managing particular products across functions.



Product or geographic unit managers provide input into these reviews. For example, in hospitals, nurses work with physicians and medical technicians in the delivery of health care in "product line" hospital units such as pediatrics or orthopedics. Much of the nurses' specific directions in caring for a particular patient comes from physicians. Yet in many hospitals, nurses are hired, supervised, and evaluated by other nurses who ultimately report to the director of nursing. Physicians are assigned only advisory authority in this process.

Matrix organization often is used in industries such as defense, construction, and management consulting. These industries are characterized by a sequence of new products or projects (for example, building a new airplane or a new shopping mall). Individuals are assigned to work in teams on a particular project and when that project is completed, they are reassigned to new project teams. Given the nature of the projects in these industries, it is important for individuals across functional areas to communicate and to work together closely. For example, a successful airplane design must meet the demands of the customer; thus, there are benefits from the use of product-oriented teams. However, it obviously is critical that the plane be aerodynamically sound. Thus, these projects also benefit from a high level of functional expertise, which is promoted by maintaining functional areas.

Figure 13.4 shows how FinWare might look if it were organized as a matrix organization. The firm maintains functional departments for sales and service. Employees from these departments are assigned simultaneously to either the business-product or consumer-product subunits (teams). Functional managers focus on managing their particular function across both products, whereas product managers focus on managing particular products across functions.

Intel Corporation: A Matrix Organization

Intel Corporation's organizational structure in 1992 provides an example of a matrix organization. The company organized around five major product groups, including entry-level products, Intel products, microprocessor products, multimedia and supercomputing components, and semiconductor products. Intel staffed these groups with people from the basic functional groups of corporate business development, finance and administration, marketing, sales, software technology, and technology and manufacturing. Thus, individual workers were members of both product and functional groups.

Source: A. Dhebar (1993), "Intel Corporation: Going into OverDrive," Harvard Business School Case 9-593-096.

A potential advantage of a matrix organization, as opposed to a functional organization, is that employees are more likely to focus on the overall business process rather than on their own narrow functional specialty. However, in contrast to a pure product or geographic organization, functional supervision is maintained; there is a mechanism for helping ensure functional excellence and for providing clearer opportunities for advancement and development.

While matrix organizations look good on paper, in practice they often are difficult to implement. Potential problems with the matrix form of organization arise from the intersecting lines of authority. Employees who are assigned to product teams do not automatically have strong incentives to cooperate or be concerned about the success of the team. Rather, individuals might be more concerned about how their functional supervisors view their work, since functional supervisors are responsible for their primary performance reviews. Moreover, employees often see their roles as being representatives of their functional areas. Employees might be concerned excessively about how the decisions of a product team impact their particular area. These problems sometimes can be reduced by appropriate design of the performance-evaluation and reward systems (discussed in Chapters 14 to 17). Individuals will be more concerned about the output of a product team if their compensation depends on team output. A related problem with matrix organizations is the potential for disputes between functional and product managers and the cost of resolving such disputes. Having both a functional and product manager also can increase influence costs—there are two supervisors to influence, not one. For instance, nurses might lobby with both their nursing supervisors as well as physicians to give them good performance reviews or specific assignments.

Mixed Designs

Often, firms use more than one method to organize subunits. Chase Manhattan Bank uses three types of subunits for different activities within the bank. Some are organized by product, some by geography, and some by customer. For example, Chase Delaware handles all the bank's credit card business. The business for individuals and middle-market firms is organized geographically. Large business customers are served by specific teams that generally operate out of New York City. Frequently, these teams are set up by industry. As another example, large multinational corporations often organize their international divisions around the matrix concept (with overlapping country and product managers), whereas their domestic subunits are organized around function, product, or geography.

Network Organizations

Firms (and groups of firms) have experimented with other methods of organizing subunits. One example is the network organization. *Network organizations* are divided into work groups based on function, geography, or some other dimension. The relationships among these work groups are determined by the demands of specific projects and work activities rather than by formal lines of authority. These relationships are fluid and frequently change with changes in the business environment.[8] The Japanese *keiretsu,* which is an affiliation of quasi-independent firms with ongoing, fluid relationships, is another example of a network organization. Networks can facilitate information flows and cooperative undertakings among work groups. However, their heavy reliance on implicit understandings and informal relationships also can lead to misunderstandings or opportunism.

Organizing within Subunits

We have examined the topic of partitioning the firm into major subunits. The same analysis applies to grouping jobs within subunits (for example, departments). Grouping jobs into functional departments at a business-unit level is most likely to be effective when the unit is small and has a limited range of products. In contrast, in large business units with diverse product offerings, organizing by product or geography can be a more productive alternative. Product or geographic organization also is likely to be more effective in rapidly changing business environments, since senior management is less likely to have the relevant specific knowledge to make operating and coordination decisions.

Recent Trends in Assignments of Decision Rights

Traditionally, many firms have created jobs that specify limited decision authority (the topic of Chapter 12) and narrow task assignments. In turn, these jobs have tended to be grouped by functional specialty—either at the overall firm level or at the business-unit level. During the 1990s, there was a significant shift toward granting employees broader decision authority and less specialized task assignments. Many companies also have shifted from functional subunits toward more product-oriented organizations. As we discuss below, these changes have been motivated by increased global competition and various technological changes.

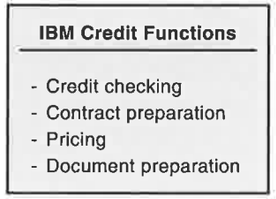
To illustrate some of the factors that have motivated such organizational changes, we examine IBM Credit Corporation in more detail. Figure 13.5 lists the basic functions that IBM Credit must perform to process a credit application.[9] The credit of the applicant has to be checked; the deal must be priced (an interest rate must be chosen); formal

[8] W. Baker (1992), "The Network Organization in Theory and Practice," in N. Nohria and R. Eccles (Eds.), *Networks and Organizations* (Harvard Business School: Boston), 397–429.

[9] Details of this example are from M. Hammer and J. Champy (1993), *Reengineering the Corporation* (Harper Business: New York). Our discussion of IBM Credit abstracts from many of the details of the actual operation of the company. For example, we do not consider the company's contract execution and administration or credit collection activities, and the organizational chart is extremely simplified. This simplification allows us to illustrate the main points of our analysis without becoming enmeshed in less relevant detail.

Figure 13.5 Functions at IBM Credit

This figure lists the four basic functions that IBM Credit must perform in order to complete the process of transforming credit applications into formal credit offers.



contracts drafted; and final documents compiled and delivered to the applicant for execution.

Prior to reengineering, IBM Credit was organized around these four basic functions; it was divided into functional departments, including credit, pricing, contracts, and documents. Figure 13.6 shows an organizational chart for IBM Credit under this functional structure. Employees typically were assigned a specialized set of tasks within their functional areas and given limited decision authority on how to complete them. For example, a clerk in the credit department might have the simple task of logging applications using prescribed procedures. Coordination across functional departments was accomplished by senior management, often through formal rules and procedures. For example, IBM Credit had procedures for transferring credit applications among the various functional departments. Department heads served together on committees to assist in this coordination process. With this architecture, customers received relatively poor service. IBM Credit took about six days to process a credit application, and it was difficult to provide timely information to the customer about the status of an application. However, each application was subject to a careful credit check and each stage of the process was conducted by functional experts.

An Executive Perspective on Increased Foreign Competition

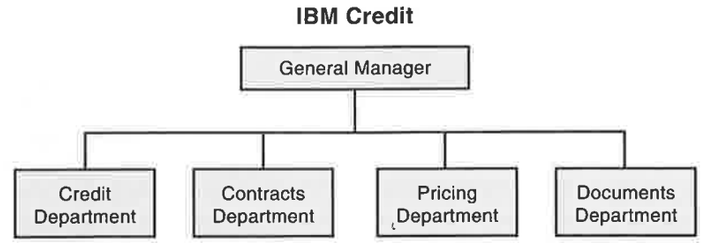
Over the past few decades, competition has increased in many industries. This increased competition has been motivated by such things as reduced transportation costs, deregulation, lost patent protection, and improved technology throughout the world. David Kearns was CEO of Xerox during the 1980s. During his tenure, Xerox faced a substantial increase in foreign competition. This increased competition motivated Xerox to improve customer service and the quality of its products. To achieve this objective, Xerox substantially reassigned decision rights by empowering workers and moving away from functional organization. In Kearns's words,

> About the only consoling factor was that I knew we weren't the only ones in the soup. Global competition had set upon this country, and everyone was vulnerable. American business was threatened not only by Japan and Korea. Europe was mobilizing into a potent force that demanded serious consideration. And yet, as I looked around me, I saw that so many great and admired companies were doing nothing but sitting on their hands. Like us, they were kissing away their businesses and laying the groundwork for their own destruction.
>
> After my string of trips to Japan and after deep introspection about Xerox's strengths and flaws, the solution began to point in one direction. Our only hope for survival was to urgently commit ourselves to vastly improving the quality of our products and service. This was something a lot of corporations talked about, but it was extraordinarily difficult to do. It meant changing the very culture of Xerox from the ground up. Everyone from the cleaning people to the chairman would have to think differently.

Source: D. Kearns (1992), *Prophets in the Dark* (Harper Business: New York), xv–xvi.

Figure 13.6 IBM Credit with Functional Organization

Under a functional organization, the firm is divided into functional departments, including credit, contracts, pricing, and documents. Employees typically are assigned a specialized set of tasks within their functional areas.



When IBM was the only major producer of mainframe computers, few customers were lost due to delays in processing finance applications. Rather, it could focus on careful and deliberate application procedures. The emergence of Japanese competitors—for example, Hitachi—increased pressure on IBM to change its strategy to focus more on customer service and to shorten the time required to process a credit application. Otherwise, it faced a substantial decrease in sales.

New information and computer technologies enabled IBM Credit to develop internal systems to support an organizational change. For instance, some of the necessary information for processing a credit application previously was stored in a manual filing system. Given this system, it made sense to assign certain tasks to individuals who had both familiarity with and proximity to this data. Computerizing this database allowed employees throughout the firm to access this information directly—a change that permitted the firm to reassign tasks more easily. Additionally, IBM Credit was able to develop computer programs to assist less skilled personnel in pricing loans. Such expert systems made functional expertise less important, thereby diminishing the importance of another of the advantages of their old organizational architecture.

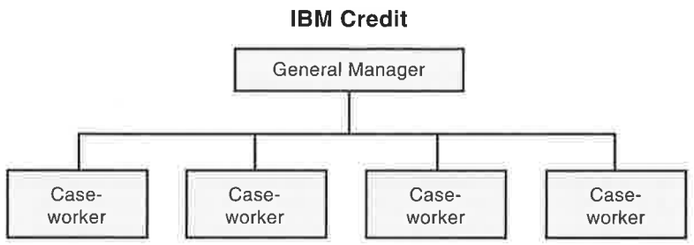
Recent Trends in Organization: GTE

During the 1990s, there was a trend toward more product-oriented organizations. An example of a firm that reorganized along these lines is the telephone company GTE. Traditionally, GTE had been organized into functional departments such as repair, billing, and marketing. This structure often frustrated customers, who had difficulty locating which person in the company was responsible for addressing particular problems. Due to increased competitive pressures, GTE decided that it had to offer dramatically better customer service to its telephone customers. Rather than make incremental improvements in each of its functional departments, GTE decided to reorganize around the basic process of providing customer service. In particular, customers wanted one-stop shopping—for example, one number to fix an erratic dial tone, question a bill, sign up for call waiting—or all three—at any time of the day. GTE began meeting this demand when it set up its first pilot "customer care center" in Garland, Texas, in 1992. GTE management stated that preliminary data from these pilot projects indicated a 20 to 30 percent increase in productivity. Customers also obtained better service.

Source: T. Stewart (1993), "Reengineering: The Hot New Management Tool," *Fortune* 128 (August 23), 40–48.

Figure 13.7 IBM Credit's Revised Organization

Under the revised structure, individual caseworkers have the primary decision rights and responsibility for completing all the steps in the credit-granting process. Each financing request is assigned to a caseworker, who checks the applicant's credit, prices the deal, completes the contracts, and so on. There are some functional specialists in the firm (not shown on the chart) who help the caseworkers when difficult or unusual circumstances arise.



Given these competitive pressures and new technologies, IBM Credit completely changed its assignment of decision rights. Under its new structure, pictured in Figure 13.7, individual *caseworkers* have the primary decision rights and responsibility for completing all the steps required in the credit-granting process. Each financing request is assigned to one caseworker, who checks the applicant's credit, prices the deal, and draws the contracts. Employees have substantial decision authority in completing these tasks, and the functional subunits of the firm largely have been abandoned.[10] Performance-evaluation and reward systems correspondingly were changed to focus more specifically on processing times and customer service. With this new organizational architecture, IBM Credit is able to process a credit application in about four hours. Customer satisfaction has increased as a result.

IBM Credit and GTE are but two examples of the many firms that undertook similar restructurings during the 1990s. The success stories from these restructurings have led some management consultants to advocate widespread change for all firms throughout

F.W. Taylor on Iron Workers

Frederick Winslow Taylor, an industrial engineer at the beginning of the twentieth century, is known as the father of scientific management. His views were quite influential in affecting the assignment of decision rights in many firms. In particular, he argued that the attributes of lower-level employees dictated that they be granted limited decision authority and a narrow set of tasks. In his words,

> Now one of the very first requirements for a man who is fit to handle pig iron as a regular occupation is that he shall be so stupid and so phlegmatic that he more nearly resembles in his mental make-up the ox than any other type. The man who is mentally alert and intelligent is for this very reason entirely unsuited to what would, for him, be the grinding monotony or work of this character. Therefore the workman who is best suited to handling pig iron is unable to understand the real science of doing this class of work. He is so stupid that the word "percentage" has no meaning to him, and he must consequently be trained by a man more intelligent than himself into the habit of working in the accordance with the laws of this science before he can be successful.

Most modern managers reject this view of lower-level employees. The workforce of today is better educated than in Taylor's time, and modern production technologies often require less brawn but increased knowledge. Correspondingly, many managers have empowered lower-level employees by giving them broader decision authority and a less specialized set of tasks.

Source: F. Taylor (1923), *The Principles of Scientific Management* (Harper & Row: New York), 59.

[10]Some functional specialists remained in the organization to help the caseworkers with difficult or unusual circumstances.

CASE STUDY: *Bagby Copy Company*

Bagby Copy Company is a worldwide producer of copy machines. It manufactures 10 different copiers, ranging from low-end desktop copiers that sell for a few hundred dollars to high-volume document machines that retail for over $200,000.

Each copy machine requires a wiring bundle. Each bundle contains several hundred wires and connectors that provide circuits connecting the paper-flow units, scanner, and photoreceptor to the internal computer logic. The wire harness is plugged into various components during the assembly process. It is possible to assign each major task in this process to different employees. For example, a given employee might focus on one of the many connectors or on testing the completed wire harness. Alternatively, one individual might be assigned the task of producing and testing a completed harness.

In either case, there is a group of employees that is assigned individual tasks to produce a wire harness for a particular copier. In total, there are 10 subgroups of wire harness makers. One alternative is to place all 10 groups in one wire harness department. Another alternative is that each of these 10 subgroups can be assigned to and report to a manager responsible for a particular copier.

Bagby operates in five European countries. Currently, it has separate subunits in each country, where a country manager handles the manufacturing and marketing of all 10 copiers. The company is considering two alternatives. One would be to organize its foreign operations around products. In this case, there would be 10 international product managers with decision rights for managing the manufacturing and sale of a particular copier throughout Europe. The company also is considering a matrix organization, organized around product and country.

Discussion Questions

1. What are the trade-offs that Bagby faces in choosing between specialized and broad task assignment?
2. What are the trade-offs between these two methods of grouping wire-harness makers into subgroups?
3. Which trade-offs does Bagby face in choosing among the country, product, and matrix forms of organizing its international operations?

The Importance of Informal Communications

A 1993 movie, *Six Degrees of Separation,* popularized the famous Harvard University experiment where randomly selected people in Kansas were handed a letter addressed to people they did not know in Massachusetts. They were asked to forward the letter to an acquaintance who might bring it closer to the "target." On average, it took only five intermediaries before the letter reached the recipient. Social scientists believe that we are all connected to each other by six people or less. Within a large global corporation, if communications require on average moving through six people (even with e-mail) before finding the right person who can respond to the query, the delay and distortion of the message could be quite costly. Two researchers at Cornell University developed a mathematical model to show that a few well-placed individuals within the organization that cut across traditional boundaries can increase the speed of communication greatly.

Source: N. Andreeva (1998), "Do the Math—It *Is* a Small World," *Business Week* (August 17), 54–55.

the world. The analysis in Chapters 12 and 13, however, indicates that a firm should not restructure without carefully considering whether a reassignment of decision rights is warranted given its particular business environment and strategy.

Although changes in technology and competition have changed the optimal assignment of decision rights within many firms, these shifts have not occurred in all industries. The benefits of narrow task assignment and functional specialization are still likely to be high for many firms in relatively stable industries. Consider, for example, a small coal-mining operation. Here, it is likely to continue to make sense to have some employees concentrate on mining the coal, while other employees sell it, and still other employees deliver it.

Summary

The bundling of tasks into jobs and subunits of the firm is an important policy choice that can affect a firm's productivity dramatically. The primary purpose of this chapter is to examine this bundling decision.

We distinguish between two types of jobs: those with *specialized task assignment* and those with *broad task assignment.* With specialized task assignment, the employee is assigned a narrow set of tasks concentrated within one functional specialty—for example, sales. With broad task assignment, the employee is assigned a broader variety of tasks. The benefits of specialized task assignment relative to broad assignment include exploiting comparative advantage and lower cross-training expenses. The costs of specialized task assignment include forgone complementarities from not performing multiple functions, coordination costs, functional myopia, and reduced flexibility. Incentive issues might favor either specialized or broad task assignment, depending on the production technology and information flows. The appropriate bundling of tasks depends on the magnitude of the costs and benefits of each alternative. One variable that is likely to be of particular importance is the relative degree of complementarity among tasks within, versus across, functional areas. Specialized task assignment is favored when the complementarity of tasks within a functional area is relatively high.

Firms can group jobs into subunits based on functional specialty, geography, product, or some combination of the three. *Functional subunits* group all jobs performing the same function within one department (for example, a sales department). Senior management plays a major role in coordinating these departments and in making operating decisions. Benefits of functional organization are the promotion of coordination and expertise within functional areas and provision of a well-defined promotion path for employees. Problems with functional organization include the high opportunity cost of employing senior management time to coordinate departments and make operating decisions, handoffs across departments that can take significant time, coordination failures across departments, and employees concentrating on their own functional specialties rather than on the customer. Functional subunits are likely to work best in smaller firms with a limited number of products operating in relatively stable environments.

Larger, more diverse firms often find it desirable to form subunits based on product or geography. In the *multidivisional (M form) firm,* operating decisions are decentralized to the business-unit level. Senior management of the firm is responsible for major strategic decisions, including finding the optimal organizational architecture and allocating capital among business units. A primary benefit of the M form corporation is that decision rights for operations are assigned to individuals lower in the organization where relevant specific knowledge often is located. Managers of business units are compensated based on the performance of their units so as to provide incentives to use this specific knowledge productively. Decentralizing decision rights to business-unit managers also

frees senior executives to concentrate on other issues. Problems with the M form of organization arise because business-unit managers often have incentives to take actions that increase the performance of their business units at the expense of other units within the firm. These problems can be controlled through careful design of business units and by basing a component of business-unit managers' compensation on *group performance*—where the group consists of profit centers with interrelated costs and demands. It is usually difficult, however, to control this problem completely. Multidivisional firms also forgo potential economies that might result from combining similar functional specialists within one unit.

Some firms maintain an overlapping structure of functional and product or geographic subunits. These *matrix organizations* have functional departments such as finance and marketing. Members of these departments are assigned to cross-functional product teams (subunits). Team members report to both a product manager and a functional supervisor. Generally, performance evaluation is conducted by the functional supervisor. Matrix organizations are common in project-oriented industries such as defense, construction, and consulting. An advantage of a matrix organization, in contrast to a pure functional organization, is that individuals are more likely to focus on the overall business process rather than just on their own narrow functional specialty. Potential advantages over a pure product organization are that the functional departments help ensure functional excellence and provide more clearly identified opportunities for advancement and development. Potential problems with the matrix organization arise from the intersecting lines of authority. An employee is likely to have loyalties divided between the goals of the project team and the goals of the functional department. This problem can be mitigated by appropriate design of the performance-evaluation and reward systems. However, as we shall see in subsequent chapters, accomplishing this objective can be difficult.

Firms often use more than one method for organizing subunits. They also use other less standard ways of organizing subunits. One example is a *network organization.*

Decisions on how to group jobs must be made at many levels in the organization. Our analysis of the costs and benefits of alternative groupings of jobs focuses on the overall firm level—how to form major subunits. This same basic analysis applies to the grouping of jobs at lower levels within the firm.

Historically, many firms have created jobs that are low in decision authority and narrow in task assignment. Recently, there has been a trend toward granting employees more decision authority and broader task assignments. Many companies also have shifted away from functional subunits toward more product-oriented organizations. These trends can be explained by specific technological changes and increases in global competition, along with accompanying changes in business strategies.

Appendix

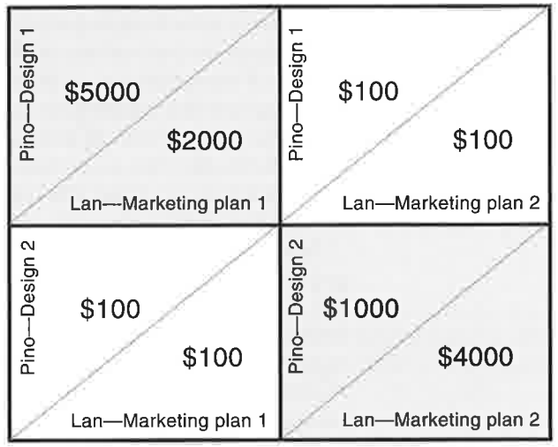
Battle of the Functional Managers[11]

This appendix uses a simple game-theoretic example to illustrate some of the trade-offs that firms face in grouping jobs into subunits. Currently, the Quick Motorcycle Company is functionally organized. Two of its main departments are design and marketing. Pino Pentecoste is the manager of the design department, while Lan Nguyen manages marketing.

[11]This example is based on the "battle of the sexes" game. For example, see R. Gibbons (1992), *Game Theory for Applied Economists* (Princeton University Press: Princeton, NJ).

Figure 13.8 Battle of the Functional Managers

Quick Motorcycle Company is functionally organized. Pino Pentecoste, the manager of the design department, selects from two designs for a new product. Lan Nguyen, the marketing manager, selects from two marketing plans. There are two Nash equilibria: Design option 1 and marketing plan 1; design option 2 and marketing plan 2. Both Pino and Lan prefer to coordinate their actions rather than not coordinate (and end up on the off diagonal). However, they disagree on the preferred equilibrium.



Pino has two options for designing a new product. One design focuses on speed, and the other design focuses on safety. Lan has two options for the corresponding marketing campaign. One option concentrates on magazine advertising and reaches older consumers, whereas the other option focuses on television and reaches younger audiences more effectively. Figure 13.8 displays the payoffs that Pino and Lan face for each combination of design and marketing programs (for example, from their respective bonus plans or personal preferences). The payoffs indicate that coordinating the design and marketing is important. If Pino chooses design option 1, and Lan undertakes marketing plan 2, both Pino and Lan receive low payoffs ($100 each). A similar outcome exists if Pino chooses design option 2 and Lan chooses marketing plan 1. In this setting, two Nash equilibria are possible. One is design option 1 and marketing plan 1; the other is design option 2 and marketing plan 2. Pino and Lan have a conflict over which equilibrium each prefers. Pino receives a higher payoff in the first case, whereas Lan receives a higher payoff in the second case. Nonetheless, both Lan and Pino prefer either equilibrium to cases where they fail to coordinate.

Suppose total firm profits are correlated with the combined payoffs for both Pino and Lan. In this case, the CEO of the firm prefers the combination of design option 1 and marketing plan 1. With complete information about the payoff structure, the CEO selects this option and then allows the design and marketing departments to focus on their specialties in implementing this program. This focus on specialization would allow each department to take advantage of its relative strengths. It also allows Pino and Lan to coordinate the new program with other design and marketing projects in their respective departments. Thus, this example illustrates that functional organization can work well if the CEO has the specific knowledge to coordinate the activities of the functional managers at low cost. This specific knowledge, in turn, is most likely to be held by the CEO in small firms within relatively stable environments.

In a rapidly changing environment it is unlikely that the CEO will know the payoffs facing the managers for each of the options (or even know all the available options). In this case, the CEO does not have the knowledge to order the profit-maximizing alternative. Both Pino and Lan prefer coordination to noncoordination. However, they do not agree on the preferred alternative. There is no guarantee that they will choose the value-maximizing equilibrium. Indeed, they might fail to reach either equilibrium. Pino and Lan have to make concurrent decisions.[12] In an attempt to achieve their preferred equilibrium, they might fail to coordinate and both will suffer. In any case, they will consume resources bargaining (battling) over which options to choose. In this environment, the CEO might want to reconfigure the subunits around products (the firm produces multiple products). The decisions on the design and marketing of each product would be made within one subunit. Profit-maximizing choices could be motivated through profit-based bonus plans. In choosing this organizational option, the CEO forgoes any efficiencies that come from combining a given functional activity (across all products) within one unit. If the benefits of functional grouping are high, rather than changing the subunit structure, the CEO might want to foster coordination through the formation of coordinating committees and changes in performance-evaluation and reward systems that promote value-maximizing choices.

Appendix Problem

In the early 1900s, General Motors had separate divisions that manufactured Buicks, Cadillacs, Chevrolets, Oaklands, and Oldsmobiles. Decision rights were highly decentralized, and there was little direction or coordination from the central corporate office. As a result, the divisions often failed to coordinate decisions on design standards, which prevented them from taking advantage of economies of scale in buying or making common components (for example, spark plugs). Discuss potential organizational changes that GM might have adopted to reduce this coordination problem.

Suggested Readings

A. Chandler, Jr. (1977), *The Visible Hand: The Managerial Revolution in American Business* (Belknap Press: Cambridge, MA).

A. Chandler, Jr. (1966), *Strategy and Structure* (Doubleday: Garden City, NY).

M. Hammer and J. Champy (1993), *Reengineering the Corporation* (Harper Business: New York).

O. Williamson (1983), *Markets and Hierarchies* (Free Press: New York).

Review Questions

13–1. Discuss the costs and benefits of specialized task assignment relative to broad task assignment. What variables are likely to be particularly important in determining the optimal choice between these two alternatives?

13–2. Define the following: functional organizations, product organization, geographic organization, matrix organization, and network organization.

13–3. Discuss the circumstances under which you think functional organizations will work best.

13–4. Discuss the pluses and minuses of matrix organizations.

13–5. Why do you think many U.S. firms have reorganized their international divisions from a country focus to matrix organizations focusing on both country and product?

13–6. In the early 1990s, Chrysler Corporation placed nearly all decisions about the development of a new vehicle in the hands of a single, cross-functional product team. In contrast, General Motors used an approach that placed a stronger emphasis on functional specialties. Small

[12]Both design and marketing require long lead times before a final product is brought to market. It obviously takes time to design and test a product. Similarly, in marketing, an advertising agency must be chosen, a marketing/advertising campaign must be developed, contracts with the media have to be negotiated, and so forth. In Lan's and Pino's case, both must commit to a specific option at about the same time.

teams were established that consisted of experts from the same functional field. Each team was charged with a particular assignment that related to its area of specialization. For example, one team might have had the primary responsibility for the design of the body of the vehicle, whereas another team might have been charged with developing the drive train. The teams worked simultaneously on their specific tasks. Some individuals on these teams also served on additional cross-functional teams that were charged with coordinating the development process across the functional areas. Discuss the relative advantages and disadvantages of these two approaches to product development.

13–7. For many years, your firm has been protected by patents. Technological change and the introduction of new products have been slow. Soon, these conditions will change. Your patent protection is expiring, and the rate of technological change and innovation has increased substantially. Discuss how these changes are likely to affect your firm's optimal bundling of tasks into jobs and subunits.

13–8. Johnson & Johnson (J&J) is one of the largest medical products companies in the world. In 1994, it had 33 major lines of business, with 168 operating companies in 53 countries. Decision rights in J&J were quite decentralized. For instance, in 1993, the baby oil manager in Italy ran his own factory and got to decide such things as package size, pricing, and advertising. Similarly, other country managers had considerable discretionary authority for similar products sold in their countries. This type of decentralized decision making has served J&J well: Its returns to shareholders have been very good. Significant changes, however, are occurring in J&J's environment. In particular, trade barriers have been significantly reduced in Europe.

- **a.** Describe the advantages of J&J's decentralized decision making that have helped to explain the success of the company.
- **b.** What organizational changes do you think J&J should consider given the change in the environment? Explain. Draw a new organizational chart for J&J's international operations (based on your suggestions).

13–9. AutoMart Repair Shop is currently organized as follows: a repair manager meets with the customer to discuss the problems with the car. A repair order is completed. The mechanics specialize in particular types of repairs (for example, air conditioning, body work, etc.). Typically, a car in the shop requires work by several specialists. The manager plans the sequence of service among the specialists. The car is then serviced by each of the necessary specialists in turn. Discuss how AutoMart Repair Shop might look if it reorganized around the process of fixing an automobile. Discuss the pluses and minuses of the current structure compared to the more product-oriented structure.

13–10. Many companies are making increased use of telecommuting, which consists of employees working out of their homes, linked to the central office by telephone, computer, and fax machine. Discuss the benefits and costs of telecommuting. What types of occupations are likely to be best suited for telecommuting? Explain why.

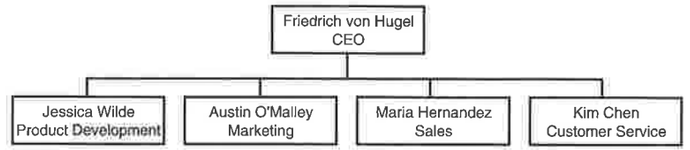
13–11. Evaluate the following statement: "It is usually best to organize as a matrix organization. Matrix organizations combine the best of both worlds, functional excellence and product focus."

13–12. Stable Inc. is in a relatively stable environment in terms of technology, competition, and regulation. Variance Inc. is in a relatively unstable environment with more frequent changes in technology, competition, and regulation. Both produce the same number of products. Which firm is more likely to be functionally organized? Explain why.

13–13. Professors Brickley and Smith are writing two chapters for a new book. Two primary tasks are involved. First, someone has to write each of the chapters. Second, someone has to copyedit the chapters. The second step involves making sure that the writing is good, that there are no typographical errors, etc. They are considering two alternative ways to organize the work. In one case, one of the professors would write both chapters, and the other professor would copyedit both chapters. In the other case, each professor would select one chapter and be

responsible for all writing and copyediting. The two professors have equal abilities and knowledge. Discuss the trade-offs between these two methods of organizing the work. What factors do you think will be most important in deciding how to organize?

13–14. Jog PCS is a wireless telephone company. It sells portable digital phones to three customer groups: (1) business users, (2) high-volume individual users, and (3) low-volume individual users. Currently, the company is functionally organized. Primary functions include product development, marketing, sales, and customer service. The organizational chart is as follows:



- **a.** The CEO, von Hugel, is considering reorganizing the company as a multidivisional firm organized around customer type. Draw the revised organizational chart.
- **b.** Discuss the pros and cons of the proposed reorganization, relative to the current structure.
- **c.** Jessica Wilde, vice president of product development, suggests that a matrix organization might be better. Draw the organization chart implied by her proposal.
- **d.** Discuss the pros and cons of the matrix proposal relative to the multidivisional proposal.

Attracting and Retaining Qualified Employees

CHAPTER 14

CHAPTER OUTLINE

Sandler O'Neill, a small investment bank with 171 employees, focused on small and medium-sized commercial banks.[1] Sandler underwrote their bank clients' stocks when they went public, made a market for these bank stocks, researched their stocks, traded their bonds, and helped them merge with and acquire other banks. Within this very small market niche, Sandler was a big fish, characterized as "hard-charging and scrappy." At the end of 2000 it had over 1,000 clients, generated $100 million in revenues, and traded some $60 billion of bonds. Sandler was a good place to work. It was profitable. It paid its people well; like most investment banks, employees received large bonuses based on their productivity and overall firm profits. And it was a close-knit firm where people worked and played together.

One hundred and forty-eight of its 177 employees worked on the 104th floor of the second World Trade Center tower hit by terrorist attacks on September 11, 2001. Of the 83 Sandler employees in the WTC at the time, only 17 got out alive. Two of the three managing partners who ran the firm were killed. Forty percent of its employees

[1]Details of this example are from K. Brooker (2002), "Starting Over," *Fortune* (January 21), 50–68.

died—all of its bond traders, 20 of the 24 people who worked on the equity desk, its entire syndication desk, and the three key people who ran its information and communications systems.

Besides losing its hardware (including its offices and the entire communications network that connected Sandler to Wall Street and made it possible to execute trades) Sandler lost much of its wetware. The attack destroyed much of the company's knowledge—their contacts, the way they did business, their institutional memory. All written records of the phone numbers of every person Sandler's traders had done business with over the years were destroyed. Amazingly, an assistant who had answered the phones on the trading desk for years was able to reconstruct the list of names and numbers from memory.

Sandler O'Neill's very existence was threatened. They faced the daunting challenge of acquiring new office space and rebuilding its physical assets such as the information technology and communications systems. But it also had to replace its human assets, including all the associated wetware—it had to attract and retain a new set of employees. First, Sandler had to take full advantage of its surviving wetware. It promoted or transferred existing employees into critical positions. The week following the attacks the surviving partners appointed two partners to replace the managing partners who died. One bond salesman became a bond trader. The head of research took charge of the syndication desk. A 23-year-old assistant with less than a year's experience was the only person who understood the workings of a new Sandler proprietary financial model used to analyze banks. And this model was critical to a pending $700 million deal. The assistant assumed the job of his boss, who had been killed. Second, it hired new employees. Sandler was helped by the massive layoffs on Wall Street that occurred following September 11. Many people who had been out of Sandler's reach before 9/11 now were looking for a job. The surviving managing partner called friends at other investment banks who were laying off people and asked, "If there's someone good getting cut, let me know, but only if they're good. I can't waste my time on duds." It hired a 51-year-old retired Goldman Sachs vice president to work on the equity desk and to help recruit others for the equity desk. By mid-November the firm had recruited two dozen new people, including four bond traders, three investment bankers, and two researchers. Yet some surviving Sandler employees were so traumatized by the attack that even after months of counseling they could not return to work and some of those that did were unable to perform their previous duties. Some were let go with separation agreements and others reassigned.

Two months after the attack, Sandler O'Neill was profitable again. Falling interest rates caused small- and medium-size banks to sell more bonds; Sandler underwrote many of these deals. Sandler managed to finish every deal that was in the works before September 11. It paid its deceased employees' estates more compensation for 2001 than they had earned in their best year. More than 30 percent of Sandler's beginning 2001 capital was paid out to the victims' families.

Sandler O'Neill's survival following the catastrophic events of 9/11 represents an extraordinary example of a management problem faced by all firms—how to attract and retain qualified employees and how to motivate these employees to be more productive. All firms must offer a level of compensation that not only allows it to attract and retain employees but also is structured to provide incentives to these employees to increase the value of the firm.

This chapter concentrates on the first of these objectives—attraction and retention. We postpone a detailed discussion of incentive compensation until Chapter 15. Since the two topics are interrelated, we also discuss some incentive-related issues in this chapter. In particular, we examine how the level of pay can be used not only to attract and retain employees but also to motivate them.

We begin by providing a more detailed discussion of the objectives of compensation contracting. We then present a benchmark economic model of employment and wages. Subsequently, we extend the basic model and examine the implications of investments in human capital, compensating differentials, costly information about market wage rates, internal labor markets, and the choice between salary and fringe benefits.

Contracting Objectives

In Chapter 10, we emphasized that it is in the joint interests of contracting parties to maximize the value created by their relationships. By exploiting fully the business opportunities the firm faces and maximizing value, the size of the overall "pie" is maximized; this permits all parties to be made better off. This general principle holds for labor contracts. By designing compensation contracts that maximize the value of employees' output net of costs, the firm's value is maximized and hence both the owners of the firm and their employees can be made better off.

Individuals will not participate in an employment relationship unless they expect to receive at least their opportunity cost. If they do not receive their *reservation utilities*—the utility they could obtain in their next best alternative—they will quit and go to work for another firm (or withdraw from the labor force). Since individuals benefit from compensation, the level of compensation is a key factor in attracting and retaining qualified employees. Owners also must receive an adequate return on their investment, or they will close the business and reinvest elsewhere. In a competitive market, paying employees more than the competitive rate results in a cost disadvantage that in the long run could drive the company out of business. Owners thus have incentives to design compensation packages that allow them to attract and retain employees with the required skills at the lowest possible cost.

The Level of Pay

The Basic Competitive Model

In this section, we present a benchmark model of employment and compensation; it is patterned after the standard competitive model that we discussed in Chapter 6. This model is a useful starting point for analyzing issues related to the level of pay. Subsequently, we extend the analysis to consider other important issues.

Suppose the labor market is characterized by the following conditions:

- The labor market is *competitive.* Firms have no discretion over the wages they pay to employees; rather, wages are determined by supply and demand in the marketplace.
- Market wage rates are costlessly observable.
- Individuals are identical in their training and skills.
- All jobs are identical. They do not vary in their risk, location, level of intellectual challenge, travel opportunities, and so on.
- There are no long-term contracts. Rather, all labor is hired in the "spot" market for a single period.
- All compensation comes from monetary compensation. The firm does not provide any fringe benefits such as vacation pay or health insurance.

Figure 14.1 How Firms Choose Employment and Wages: The Basic Competitive Model

In our basic model, firms have no discretion over the wages they pay to employees; rather, the wages are determined by supply and demand in the marketplace. As shown in the figure, individual firms continue to hire employees up to the point E^*, where the marginal revenue product equals the market-determined wage rate. Until this point, hiring additional employees produces more revenue for the firm than it costs to hire the employee. Past this point, the costs of hiring additional individuals are greater than the benefits.

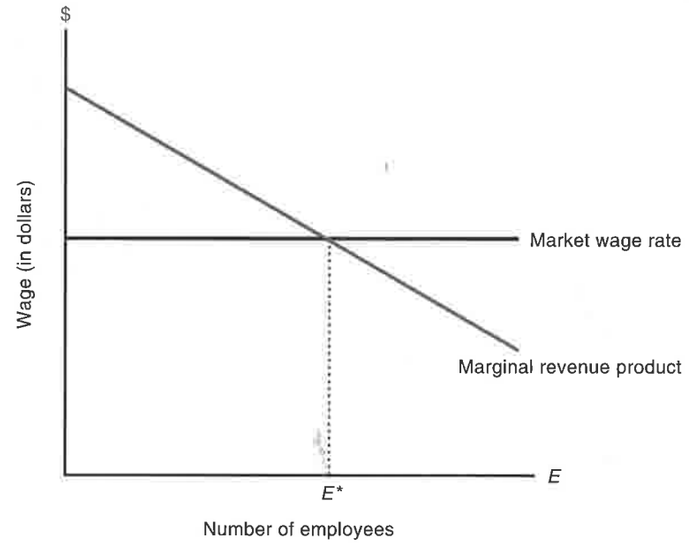


Figure 14.1 depicts the hiring decisions of individual firms within this simple market setting. Each firm continues to hire employees to the point where the marginal revenue product equals the market-determined wage rate. Until this point, hiring additional employees produces more revenue than it costs to hire the individuals. Past this point, the costs of hiring additional individuals are larger than their benefits. The hiring decisions of all firms in the market determine the demand curve for labor. The supply curve is determined by the decisions of individuals on whether to accept the given wage rate or stay out of the labor force. The market wage rate equates supply and demand.

The implications of this analysis are that if a firm pays too little (below the market wage rate), it will be unable to attract qualified employees or it will have high turnover. This principle motivated RKO to raise its level of pay. On the other hand, a firm that pays too much will have long queues for job openings and low turnover. However, the firm will incur higher costs and thus will report lower profits than firms that do not overpay. Given a competitive market for its products, it eventually will go out of business.

Human Capital[2]

In our benchmark model, all individuals are alike. Yet employees often vary in their abilities, skills, and training. *Human capital* is a term that characterizes individuals as having

[2]This section draws on G. Becker (1983), *Human Capital* (University of Chicago Press: Chicago).

Setting the Wrong Level of Pay at Salomon Brothers

In the first year out of the training program, 1983, Howie Rubin made $25 million for Salomon Brothers in the new activity of mortgage-backed securities. The several-hundred-million-dollar question was first raised by Howie Rubin: Who really made the money—Howie Rubin or Salomon Brothers? Salomon Brothers decided it was the company and refused to pay Rubin more than the normal pay scale. In his first year, Rubin was paid $90,000, the most permitted a first-year trader. In 1984, his second year, Rubin made $30 million trading. He then was paid $175,000, the most permitted a second-year trader. In the beginning of 1985 he quit Salomon Brothers and moved to Merrill Lynch for a 3-year guarantee: a minimum of $1 million a year, plus a percentage of his trading profits.

After 1985, Salomon Brothers lost much of its market share in mortgage-backed securities to other firms such as Merrill Lynch.

Source: M. Lewis (1989), *Liar's Poker* (Norton Press: New York), 126.

a set of skills that can be "rented" to employers. The value of human capital is determined by supply and demand in the marketplace. Individuals invest in their human capital through education and training, migration, and search for new jobs. The return on this investment consists of higher wage rates that come from having more valuable human capital—hence college graduates typically earn more than high school graduates.

It is useful to distinguish between *general* and *specific* human capital. General human capital consists of training and education that is valued equivalently by a broad array of different firms. Investments in general human capital include obtaining an MBA degree, mastering general principles of engineering, or learning popular word-processing programs. Specific human capital, on the other hand, is more valuable to the current employer than to alternative employers. Investments in specific capital include such things as learning the details of a particular firm's accounting system or product information.

In our benchmark model extended to allow for differences in training, firms would not invest in general training. The gains from general training go to the employees, not firms: If a firm does not pay the employee the market price for the new skills, the individual moves to another firm that is willing to pay. Thus, employees pay for their own general training. Correspondingly, employees are reluctant to invest in specific training, since it does not increase their market values. Thus, in our benchmark model, firms must pay for specific training.

U.S. Lags in Worker Human Capital Skills

A 2000 study of workforce skills ranked the United States 10th out of 17 industrialized countries. The survey judged three aspects of functional literacy: understanding books and newspaper articles, using maps and bus schedules, and making simple math calculations to balance a checkbook or compute a tip. These skills constitute the basic components of general human capital required for the workforce. And the problem is likely to get worse. Among adults aged 56 to 65, the United States was ranked 5th; but among adults 16 to 25, Americans ranked 14 out of 17. Almost 45 percent of Americans cannot read or write as well as a high school graduate. Most of the low test scores are among immigrants and minorities. Immigrants account for more than 40 percent of the U.S. labor force growth since 1990. The head of the U.S. National Association of Manufacturers says, "Our school system has failed minorities and immigrants, which is big problem for companies because that's who's out there to hire."

Source: A. Bernstein (2002), "The Time Bomb in the Workforce: Illiteracy," *Business Week* (February 15), 122.

Investments in General Human Capital

Livingston County deputy sheriff Ray DiPasquale received a $10,000 raise to bring his salary to $45,000 by moving to the larger Greece town police force. Rural and small departments generally pay no more than $34,000 annually, whereas larger departments pay about $46,000 and offer better benefits. By offering a more attractive compensation package, they get to hire better qualified, more experienced police officers. In fact, 80 percent of Greece police have been transfers. Small, usually rural police departments hire untrained officers and train them. Training a cadet with no experience costs nearly $25,000 and ties up personnel for up to 35 weeks. This example illustrates that general human capital (policing) is captured by the employee, not the firm making the investment.

Source: M. Daneman and K. Breen (1999), "Big Bucks Lure Cops to Bigger Towns," *Democrat and Chronicle* (September 20), A1.

Compensating Differentials[3]

Our benchmark model does not consider differences in working conditions across jobs. In reality, jobs vary in many dimensions, including quality of the work environment, geographic location, length of commute, exposure to danger, characteristics of coworkers, and the degree of monotony associated with the tasks. Facing equal salary levels across job offers, an individual will choose the job with the most desirable characteristics (such as low risk of injury and attractive location). To attract employees to less desirable jobs, firms must increase the level of pay.[4]

The *extra* wage that is paid to attract an individual to a less desirable job is called a *compensating wage differential.* For instance, RKO probably has to pay more to attract a manager to work at night at a more dangerous location than it does to attract a manager to work during the day at a safer location.

The prediction that unpleasant jobs pay more than pleasant jobs *holds other factors constant.* Variation in job requirements for education, skills, and training also accounts for differences in pay. For example, an office job in a pleasant work environment might pay more than the relatively unpleasant job of garbage collector because the skills required for the office job are higher. However, garbage collectors will be paid more than similar unskilled labor engaged in more pleasant tasks.

Some of the most compelling evidence of the existence of compensating wage differentials is provided by studies that relate wages to the risk of fatal injury on the job.[5] Using data from around the world, wages were found to be positively associated with the risk of being killed on the job, holding other factors constant. The estimates of the magnitude of the compensating differential are relatively imprecise and vary across studies,

[3]In this section, we discuss the key points of the theory of compensating differentials as they relate to managerial decision making. For an expanded discussion of compensating differentials, see R. Ehrenberg and R. Smith (1988), *Modern Labor Economics,* third edition (Scott, Foresman: Glenview, IL), Chapter 8.

[4]This prediction assumes that employees can obtain reasonably good information about important characteristics of the job either before or shortly after employment. This assumption is likely to be quite reasonable in many cases. For instance, applicants for a firefighter position in an arid location are likely to know that the job is hazardous. They also can observe the quality of the fire station and equipment. Applicants can collect additional information about the work environment from current or past employees. Some argue that the level of scientific knowledge required to understand certain hazards is beyond that held by most employees or job applicants. Yet the recognition of basic correlations sometimes is sufficient. For instance, the expression "mad as a hatter" goes back to the nineteenth century—long before scientists understood the details of how the chemicals used to treat the pelts in hat making adversely affected brain function.

[5]For a more detailed summary of this empirical work, see Ehrenberg and Smith (1988), 266–270.

Compensating Differentials on the "Slime Line"

At Taku Smokeries in Juneau, Alaska, gutting fish is cold, wet, smelly work done by humans, not machines, on the "slime line." Taku produces as much as 50,000 pounds of fish a day. The line consists of a dozen workers in orange rain gear, splattered with blood and fish guts. Using knives, spoons, and hoses they clean a flood of fish amidst constant noise and overpowering smell. But one of the workers, Bill Razpotnik, asserts he doesn't care. The $12 per hour salary plus time and a half for overtime allows him to feed his family of four. Razpotnik says, "What smell? It doesn't bother me, I've slimed several million fish and one fish is just another fish. Another day, another dead fish."

Source: E. Arnold (2002), "Dirty Work: Fish Processing," www.npr.org/programs/morning/features/2002/aug/dirtywork/slimeline/index.html (August 22).

but they indicate that employees receive between $20 and $300 more per year for every 1 in 10,000 increase in the risk of being killed on the job. These estimates imply that a firm with 1,000 employees could reduce wage costs between $20,000 and $300,000 per year by increasing the level of safety enough to save one life every 10 years.

Compensating wage differentials have two important effects. First, all societies have unpleasant tasks that must be completed—for instance, most require morticians and garbage collectors. Compensating differentials attract people to these jobs and reward them for their efforts. Individuals who accept unpleasant tasks tend to be the ones who bear the lowest cost for performing them. For example, if a wage premium is offered for working in a noisy factory, the people most likely to apply are those least bothered by noise. Individuals who are particularly noise-averse would choose to work in a quiet environment at a lower wage. Second, compensating differentials cause employers who offer unpleasant work environments to have higher labor costs. Employers thus can

Labor Secretary's Bid for Plant Safety Runs into Skepticism

In the summer of 1994, Labor Secretary Robert Reich charged a Bridgestone Tire subsidiary with 107 safety violations. He also levied a fine of $7.5 million. The labor secretary ostensibly took this action on behalf of the employees at the tire plant. To quote the secretary, "American workers are not going to be sacrificed at the altar of profits." The secretary, however, was "amazed" when the employees and local community did not support his action. Indeed, employees were generally skeptical and nonsupportive of his claims. For example, one employee indicated that the secretary "didn't know what the hell he was doing."

The lack of employee support for this action might reflect two considerations. First, employees might worry about layoffs if it is too expensive to comply with the regulations. Second, the theory of compensating differentials implies that dangerous jobs offer a premium over jobs in safer environments. Employees who accept dangerous jobs generally consider themselves better off than if they were working at lower wages in safer environments. Thus, regulations that force firms to provide safer work environments and lower wages (wages have to be reduced to remain competitive) can make employees worse off. Thus employees potentially are harmed by this type of regulatory action.

Nonetheless, there are at least two arguments that might justify government intervention. First, the employees might not have good information about the level of danger. For example, they might think that a plant is safer than it really is. (Yet, why the government would be better informed about the level of safety at a plant than the employees is not obvious.) Second, there are other parties that have to be considered. For example, employees who get injured on the job can impose costs on society through subsidized medical care and disability payments. Although the overall costs and benefits of this type of regulation are hard to estimate, it is clear that employees do not always believe that they benefit.

Source: A. Nomani (1994), "Muffed Mission: Labor Secretary's Bid to Push Safety Runs into Skepticism," *The Wall Street Journal* (August 19), 1.

Tight Labor Markets Increase Competition

With intense competition for skilled employees, especially managers, companies are resorting to a variety of tactics other than raising the level of pay. Key employees receive retention bonuses of 15 to 50 percent of 1 year's pay spread over 3 years if they stick around. After NYNEX and Bell Atlantic merged, top managers received retention bonuses above $1 million if they stayed at least 3 years. No one left.

Often under the guise of "increasing corporate loyalty" firms seek ways to attract and retain managers. To reduce turnover rates that can run as high as 1.1 percent a month, employers are revamping rigid pay systems to make it easier for employees to move laterally to enhance their skills. New career-development programs help employees plan their next moves up the corporate ladder. Citibank's program for 10,000 managers reviews each manager twice a year to see what their next career step should be. International Paper requires managers to discuss career desires with employees annually, separate from their annual performance review. Booz Allen has a rotation program for its consultants. By creating more flexible workdays, this program allows employees to balance work and family life better. One consultant whose parents developed health problems was assigned a stint as a college recruiter. This flexibility gave him the time to help his parents. When headhunters now call him he says, "I made a commitment to the firm, and they made a commitment to me." Many of these programs are nonpecuniary forms of compensation that particular employees value enormously.

Sources: A. Bernstein (1998), "We Want You to Stay. Really," *Business Week* (June 22), 67–72; B. Wysocki (1997), "Retaining Employees Turns into a Hot Topic," *The Wall Street Journal* (September 8), A1.

reduce their labor costs by enhancing their work environments. This possibility implies that the firms providing better work environments will be those firms which can do so at low cost (since the marginal cost of providing a pleasant environment is low relative to the marginal benefit of reducing the penalty).

This discussion suggests that there is a job-matching process in labor markets where firms offer and individuals accept jobs in a manner that makes the most of their strengths and preferences. Organizations have incentives to reduce the risk of injury in order to reduce wage premiums. In turn, the people who take risky jobs are likely to be the most tolerant toward risk—individuals *self-select* based on their risk preferences. For example, fishing companies often find it too expensive to reduce the risk of injury beyond some level, and thus they must offer wage premiums to crews of fishing boats. Individuals applying to work on these boats are likely to be among those most willing to place their lives at risk on the job. Because of this self-selection, the compensating differential is lower than if the firm attempted to hire a randomly selected person from

Compensating Differentials

A number of professionals, lawyers, dentists, accountants, and managers are forgoing six-figure incomes to earn a third that much as personal trainers. Fitness trainers advise clients on exercise techniques and diet. In the gym, trainers are celebrities—everyone knows them and they usually look great. Their clients like them. One trainer said, "You wouldn't believe the warm and fuzzies I get helping a gal into a pair of jeans she never thought she could fit into." A former software programmer became the official trainer for the Indianapolis Colts Cheerleaders. Trainer Bob says, "Every morning I wake up, I think: It's good to be me." Most trainers typically earn between $20,000 and $40,000 a year with no benefits. But they do it because they make their own hours, they wear shorts and T-shirts all day, and they work out. A big part of their pay, maybe 80 percent in some cases, is the compensating differential they receive from the lifestyle.

Source: K. Helliker (1999), "They Left Professions for a True Calling as Personal Trainers," *The Wall Street Journal* (February 25), A1.

Paying Too Much at Nucor?

When Nucor's mill in Darlington, South Carolina, advertised to fill eight openings last fall, over 1,300 applicants showed up, creating such a traffic jam that state police had to be called out. Unfortunately, the force was a bit thin—three officers were already at Nucor applying for jobs.

It is possible that the number of applications at Nucor included many unqualified candidates. But the size of the applicant pool certainly prompts the questions of whether Nucor is paying too much and whether it wants to pay more than the market wage rate for particular jobs.

Source: N. Perry (1988), "Here Come Richer, Riskier Pay Plans," *Fortune* (December 19), 58.

the population. A firm that can provide a safe environment at a low cost will offer low-risk jobs and lower wages; these positions will be filled by more risk-averse employees.

Costly Information about Market Wage Rates

In contrast to our benchmark model, compensation in many labor markets is not readily observable. Individuals vary in characteristics and generally are not perfect substitutes. Thus, observing the wage for one individual does not provide full information on what it would require to hire another. In addition, firms do not share complete information about their levels of compensation. The difficulty in observing the market price for labor means that it is not always easy to tell if a firm is underpaying or overpaying its employees.

Two important indicators of whether a firm is paying the market wage rate are the number of applications it receives for job openings and the quit rate among existing employees. If a firm is inundated by *qualified applicants* when it advertises a job opening and its quit rate is low, the firm probably is paying above the market wage rate.[6] In contrast, if the applicant rate is low and turnover is high, the firm probably is paying below the market.

In choosing the rate of pay, it is important to consider the trade-offs between incremental compensation and turnover costs. Turnover costs include the costs of recruiting employees, training expenses, and reduced productivity from employing inexperienced employees. In addition, if employees expect that they will work for the firm for only a short time, they are less likely to be concerned about how their actions affect the long-run cash flows of the firm. For instance, a salesperson might push to make a sale to collect a commission, knowing that the customer will be unhappy with the product and will reduce future purchases. Sometimes, employees who leave a firm take customers and trade secrets to competing firms. Nonetheless, turnover also has beneficial effects on the firm—for example, it adds "new blood" and fresh ideas to the organization.

Outside job offers made to existing employees also are indicative of market rates. Although these offers provide important information about the market value of existing employees, firms must be careful in deciding whether to match these offers. Failure to match can result in losing valued employees. But a policy of matching all outside offers can encourage employees to invest in generating such offers. This activity might take time away from work and also might increase the likelihood that employees will receive offers that entice them to leave the firm.

[6]Paying above the market wage rate typically will place the firm at a competitive disadvantage. As we discuss below, however, there are several reasons why some value-maximizing firms might want to pay above the market wage rate.

Internal Labor Markets

While our benchmark model provides a reasonably good description of some labor markets, such as the market for unskilled agricultural workers, it does a poor job describing employment and wages in many other cases. In contrast to the model, many firms rarely reduce employee compensation and frequently invest in general training—such as paying tuition for an employee to obtain an MBA. Also, employees often invest their time and effort in developing firm-specific skills.

Many firms are better characterized as having *internal labor markets,* wherein outside hiring focuses primarily on filling entry-level jobs and most other jobs are filled from within the firm. Firms with internal labor markets establish *long-term relationships* with employees. It has been estimated that in 1991, the typical employee between 45 and 54 had been with his or her current employer for 10 years. Another study found that over half of all men and one-fourth of all women in the United States work for the same employer for at least 20 years.[7]

Established career paths and the prospect for promotions play important roles in firms with internal labor markets. These firms interact with outside labor markets only on a limited basis. Rather than simply reflecting outside market conditions, the rates of pay (discussed in more detail below) and job assignments in internal labor markets often are determined by administrative rules and implicit understandings. Firms can have more than one internal labor market. For example, the internal market for white-collar employees might have little interaction with the internal market for blue-collar employees. In addition, firms with internal labor markets typically offer some jobs that are well described by our basic model—for instance, certain low-skilled positions.

Agreements between employers and employees concerning compensation and responsibilities are contracts. Firms generally do not enter into formal written agreements (*explicit contracts*) with nonunion employees. Rather, most employees work under *implicit contracts*—a set of shared, informal understandings about how firms and employees will respond to contingencies.[8] Implicit contracts differ from explicit contracts in that they normally are unwritten and more difficult to enforce in a court of law. Firms and employees, however, often have strong economic incentives to honor implicit contracts to protect their reputations (see Chapter 10). A primary reason for the frequent use of implicit contracts is that it would be quite costly to detail all possible contingencies and associated responses in formal documents.

Reasons for Long-Term Employment Relationships

In Chapter 3, we discussed how all methods of organizing economic activity involve contracting costs. Firms have incentives to consider these costs and to organize economic exchanges in an efficient manner.[9] Spot-market exchange is not always the most efficient way to organize firm–employee relationships. There are at least three factors that help promote the widespread use of the long-term employment relationships found in internal labor markets. These factors include specific human capital, employee motivation, and information about employee attributes.

[7]J. Aley (1994), "The Myth of the Job Hopper," *Fortune* (September 19), 32; and R. Hall (1982), "The Importance of Lifetime Jobs in the US Economy," *American Economic Review* 72, 716–724.

[8]S. Rosen (1985), "Implicit Contracts," *Journal of Economic Literature* 23, 1144–1175.

[9]R. Coase (1988), *The Firm, the Market, and the Law* (University of Chicago Press: Chicago).

Internal Labor Markets in Japan

Large companies in Japan make extensive use of internal labor markets. Many Japanese executives spend their entire careers with the same firm. Senior executives virtually never move from one major firm to another. Firms rarely go outside to hire for any position other than entry-level jobs. Turnover is extremely low. Pay is tied largely to seniority, and the differences in pay among employees are small relative to the differences in American companies.

Small pay differentials would be difficult to maintain if there were an active outside labor market in Japan. Market pressures would tend to bid up the salaries of the strong performers. Recently, poor performance has placed pressures on Japanese firms to reconsider their policies of lifetime employment guarantees. If many firms abandon this policy, the outside labor market is likely to become more active.

Source: M. Aoki and R. Dore (Eds.), (1994), *The Japanese Firm* (Oxford University Press: Oxford, UK).

Firm-Specific Human Capital

Long-term relationships provide stronger incentives for employers and employees to invest in specific training. If employers and employees expect that their relationships will be of short duration, limited incentives exist to make these investments. In contrast, long-term relationships allow firms and employees to capture the benefits of accumulated specific human capital.

Employee Motivation

The prospect of a long-term relationship with a firm provides powerful incentives for employees to work on behalf of their employers. Employees who consider shirking, stealing, or other dysfunctional activities must weigh their potential benefits of these actions against the costs of losing future benefits should they be caught and dismissed. Since there is more to lose in long-term relationships than in short-term relationships, the incentives both to engage in productive activities and to avoid dysfunctional activities are higher within long-term relationships.[10] Also, as we discuss below, long-term relationships increase the flexibility that a firm retains in designing compensation packages to motivate employee effort.

Learning Employee Attributes

Over time, managers receive much information about the skills, work habits, interests, and intelligence of individual employees. Employers then can use this information in matching employees and jobs within the firm. For example, firms with internal labor markets have fewer surprises in filling higher-level jobs than firms that rely on outside labor markets.

Costs of Internal Labor Markets

Not all firms have internal labor markets. Some firms rely heavily on outside markets to fill positions at all levels. The observation that some firms do not operate internal labor markets suggests that the costs of these markets can be larger than their benefits.

[10]This statement assumes that an employee cannot costlessly replicate the same stream of benefits by changing to a new employer. For example, the new job might pay lower compensation, the individual might incur moving costs, there might be a period of unemployment, and so on.

Hiring an Outside CEO at Kodak

Eastman Kodak had a long history of filling senior positions exclusively with longtime employees. An advantage of this policy is that senior executives have significant experience with the firm and detailed specific knowledge of the company. The prospect of promotion and long-term employment also provides important motivational effects. A disadvantage, however, is that sometimes the best people for senior jobs are outsiders.

During the late 1980s and early 1990s, shareholders placed intense pressure on Kodak's board to appoint outsiders to senior positions. Many shareholders thought that hiring outsiders was necessary to bring new skills and vision into the firm. In late October 1993, Kodak announced that it had hired George Fisher, CEO of Motorola, as the new CEO. The stock market greeted this announcement with an 8 percent increase in Kodak's stock price (from the close of the market on October 26th to the close on the 28th). This reaction represented a $1.6 billion increase in the overall value of the company. After serving as CEO for 6 years, Fisher announced his retirement effective January 1, 2000. This time Kodak decided to fill the position with an internal candidate—longtime employee Daniel Carp.

One potentially important problem with internal labor markets is the restricted competition for higher-level jobs within the organization. If a firm considers only internal candidates for higher-level jobs, it will not always hire the most qualified person—who may be from outside the firm. The likelihood of finding a desirable candidate in the outside labor market is highest when the job does not require specific training (since experience with the firm does not create an advantage in the job). Thus, firms are more likely to use internal labor markets where specific training is important. Indeed, firms in the steel, petroleum, and chemical industries, where complicated production technologies take significant time to learn, tend to rely on internal labor markets, whereas firms in the shoe and garment industries do not.[11] Firm-specific skills arguably are less important in garment and shoe manufacturing than in steel, petroleum, or chemicals.

Pay in Internal Labor Markets

Careers and Lifetime Pay

Employees who take jobs at firms with internal labor markets often expect that they will spend much of their *careers* at the same firm. Thus, in considering an entry-level job, prospective employees generally will focus on the entire stream of earnings over their anticipated career path. For example, an individual might accept a job at Firm A that pays less than another job offered at Firm B because the individual anticipates faster compensation growth at Firm A.

The fact that individuals tend to base employment decisions on career earnings gives firms with internal labor markets more flexibility over choosing the level and time profile of pay. In contrast to our basic model, firms do not need to pay the market wage rate (or equivalently, in equilibrium, the marginal revenue product) at each point in time. Rather, firms can vary compensation over a career path, as long as the overall value of the remaining stream is competitive at each point in time (valued as highly by employees as streams offered by competing firms in the labor market).

[11]P. Doeringer and M. Piore (1971), *Internal Labor Markets and Manpower Analysis* (D. C. Heath: Lexington, MA).

Competition for the Top Job

In April 1999, the stock price of Black & Decker Corp., the $4.5 billion power-tool maker, fell 8 percent on the announcement that Joseph Galli had quit. Galli, age 41, ran 65 percent of the business and was responsible for the new products that had turned B&D around. He was viewed as the heir apparent to the CEO. Galli had pressed B&D's CEO, 13-year B&D veteran Nolan Archibald, 55, to step down before 65 so that Galli could fill the position. Archibald was afraid Galli would quit, and so Archibald found a replacement and announced that Galli had quit. When pressed on the matter, Archibald disclosed, "I chose the timing." This vignette is not unusual. It illustrates the importance of succession planning and the often large nonpecuniary income some managers receive from the power of the top job.

Source: A. Barrett (1999), "How to Keep Rising Stars from Straying," *Business Week* (June 7), 80.

Economists have identified at least three ways that firms can use their flexibility in setting the level and time profile of pay to enhance employee motivation. These methods include the payment of efficiency wages, upward-sloping earnings profiles, and tying major pay increases to promotions. As we discuss below, however, influence costs can limit the extent to which firms exploit this potential flexibility.

Efficiency Wages

In many jobs, it is difficult to monitor employee actions. It also is difficult to devise incentive compensation schemes that motivate desired behavior. For example, manufacturing companies want production employees to work hard. In most cases, it is difficult to measure employee effort with much precision. In addition, the payment of piece rates or other output-based compensation can discourage employees from paying enough attention to quality.

One potential way of motivating employees in such cases is to pay compensation *above* the market rate. Paying a premium for employees obviously increases labor costs. However, it can have the desirable effect of motivating them not to shirk. Individuals who are paid a wage premium are likely to reduce their shirking because they understand that if they are caught and fired, they will have difficulty finding another job that offers such a premium. This effect will be greater for employees who have longer time horizons with the firm, since they have more to lose. Economists refer to wage premiums of this type as *efficiency wages*. Efficiency wages also provide incentives for employees to stay with the firm. These incentives can be particularly important when the employee has specific human capital (the firm does not want to replace the employee with a person with less training and experience).[12]

Lifetime Employment Collapses at Mitsubishi

During its peak, Mitsubishi employees were like lords of the universe. Hired from the top universities and treated as the elite, they had good jobs, security, and lifetime employment. But then the bubble burst. Using huge capital gains from real estate to make numerous bad investments in the 1980s created huge losses in the 1990s. Mitsubishi is actually a group of associated companies called a *keiretsu*. The main Mitsubishi companies (autos, banks, heavy industries) had a return on equity of 4 percent in contrast to the United States where anything less than 15 percent is considered poor. Now, recent hires quit and look for new jobs. There is no longer the same sense of security as before.

Source: B. Bremner and E. Thornton (1999), "Mitsubishi: Fall of a Keiretsu," *Business Week* (March 15), 86–92.

Motivating Honesty in the Local Police Force

Economists Gary Becker and George Stigler were asked to consider ways of reducing corruption within the Chicago police force. The recommendation of these Nobel laureates was to pay the police more than the market wage rate. With sufficiently high premiums, the police would have incentives not to take bribes from criminals. For this condition to hold, the immediate gains from taking bribes must be offset by the expected loss in wage premiums given the possibility of being caught and fired. Thus, the required premium to prevent cheating depends on the size of the bribes and the likelihood of getting caught. Higher bribes and lower likelihood of getting caught translate into higher required premiums.

Paying wage premiums will entice a large number of people to apply for job openings. To reduce the surplus of applicants, Becker and Stigler suggested that the jobs be sold to officers. The price of jobs would reflect the expected premiums. Under this plan, the payment for a job can be considered as a bond posted by an officer not to cheat. If the officer is honest, the officer gets the bond back in the form of the premium wage. If the officer cheats and gets caught, the bond is lost.

The concept of buying jobs may seem unusual. However, this originally was the practice among yeoman warders—the beefeaters who guard the tower of London. And today many people essentially do this when they purchase the right to manage an outlet of a franchise company.

Source: G. Becker and G. Stigler (1974), "Law Enforcement, Malfeasance, and Compensation," *Journal of Legal Studies* 3, 1–18.

Economists debate whether the use of efficiency wages is widespread. Although the empirical evidence is inconclusive, some studies suggest that firms in particular industries use efficiency wages with reasonably high frequency. The authors of one study find systematic wage differences across industries after controlling for many job and employee characteristics. In addition, they find a negative correlation between turnover and industry wage differentials, suggesting that employees in high-wage industries receive wage premiums. The authors interpret this evidence as consistent with the use of efficiency wages in certain industries.[13]

Job Seniority and Pay[14]

Compensation typically increases with seniority within the firm. Part of this increase is explained by increases in productivity that come from experience. In many firms, however, compensation increases faster than productivity as the employee ages. Firms

[12]For a more detailed analysis of efficiency wages, see G. Akerlof (1984), "Gift Exchange and Efficiency Wages: Four Views," *American Economic Review* 74, 78–83; C. Shapiro and J. Stiglitz (1984), "Equilibrium Unemployment as a Worker Discipline Device," *American Economic Review* 74, 433–444; and J. Yellen (1984), "Efficiency Wages Models and Unemployment," *American Economic Review* 74, 200–208. If all firms in an industry pay efficiency wages, there will be unemployment. (The supply of labor will exceed demand.) The threat of unemployment can provide incentives for employees not to shirk. Note that in our basic model, marginal revenue product and the wage rate are independent. The efficiency-wage concept, however, suggests that they can be related: Employees' marginal products can be affected by their wage rates due to incentive effects from potential dismissal for cause.

[13]A. Krueger and L. Summers (1988), "Efficiency Wages and the Inter-Industry Wage Structure," *Econometrica* 56, 259–293. Another empirical paper that supports the notion of efficiency wages is P. Osterman (1994), "Supervision, Discretion, and Work Organization," *American Economic Review* 84, 380–384.

[14]This section draws on E. Lazear (1979), "Why Is There Mandatory Retirement?" *Journal of Political Economy* 87, 1261–1284.

The Costs of Wage Compression

In tight labor markets it is not uncommon for new hires to be paid more than people recruited a few years earlier. At Price Waterhouse (now PriceWaterhouseCoopers) in 1998, Scott Sanster, a strategy consultant said, "This year, M.B.A.s are being offered salaries and sign on bonuses nearly 30 percent higher than what I got. It can be a real morale buster." A company spokesman contends, "We are keeping pay increases at a level roughly equal to the increase in starting salary." Employees often feel frustrated that new hires earn more than experienced workers. Some managers believe they can pay current employees slightly below their market wage because it is costly for employees to search and investigate employment opportunities. Someone who has been at the firm for around a year is unlikely to move to a new company for a 5 to 10 percent pay increase. To keep their best and brightest, some companies with high turnover are bumping up those employees' pay semiannually or even quarterly.

Source: T. Schellhardt (1998), "Rookie Gains in Pay Wars Rile Veterans," *The Wall Street Journal* (June 4), B1.

frequently offer attractive retirement packages to encourage older employees to retire and (unless precluded by law) often have mandatory retirement. For example, the employee must retire at age 65.[15]

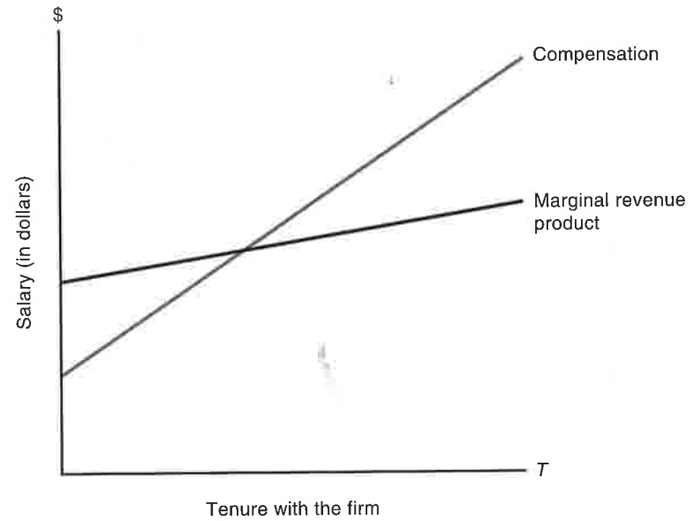
One explanation for these age-related policies is that they establish stronger incentives to employees to work in the interests of the firm. To see how, consider the example depicted in Figure 14.2. This figure displays the growth patterns of the marginal revenue product and compensation for a representative employee within a particular firm. Both the marginal revenue product and compensation increase as the employee becomes more experienced. (The analysis does not change if we allow for declines in productivity in later years.) Compensation, however, increases at a faster rate. In the early years, the employee is paid below the marginal revenue product, whereas in later years the employee is paid more. The employee is underpaid in early years but is willing to work for the firm because of the expectation of being overpaid in subsequent years. Under this compensation plan, younger employees have incentives to make firm-specific human capital investments and to work hard to avoid being fired and losing future wage premiums. Older employees do not want to get fired because they are being paid more than they could earn at other firms.

Firms that employ this type of compensation policy have short-run incentives to fire older employees, since older employees are paid more than they are worth. Unjustified dismissals of older employees, however, are not in the long-run interests of these firms because they reduce the incentive effects of the compensation plan: Younger employees will not believe that hard work will lead to wage premiums when they get older. Firms cannot pay premiums to all older employees for an indefinite period and stay in business. Thus, these firms will adopt policies that help ensure that older employees will retire when they reach a specified age. For example, if legally allowed a mandatory retirement age might be established where the present value of the underpayments in the early years offsets the overpayments in the later years. Thus, over their entire careers, employees are still paid their marginal revenue products (as in our basic model). Such a condition helps the firm survive in a competitive marketplace.

[15]Amendments made to the Age Discrimination Employment Act in 1978 and 1986 have precluded mandatory retirement for most workers in the United States.

Figure 14.2 An Example of an Upward Sloping Earnings Profile

This figure displays both the marginal revenue product and compensation for a representative employee in a given firm. Within this particular firm, both marginal revenue product and compensation increase as the employee becomes more experienced. Compensation, however, increases at a faster rate. In the early years, the employee is paid below the marginal revenue product, whereas in later years the employee is paid more. The employee is underpaid in early years yet still is willing to work for the firm because of the expectation of being overpaid in subsequent years. Under this compensation plan, young employees have incentives to work hard to avoid both being fired and losing future wage premiums. Older employees, in turn, do not want to be dismissed because they receive more than they could earn at other firms.



Promotions[16]

Firms are typically partitioned into hierarchical levels, where the jobs at a given level pay more than positions at lower levels. Employees move up this hierarchy through promotions. Since employees compete for promotions, promotions can be viewed as contests or tournaments among employees. Employees' productivity is higher as they try to win these contests.

Promotions obviously play an important role in providing incentives within many organizations.[17] One benefit of using a promotion-based incentive scheme is that it commits the firm to serious performance reviews of its employees. Promoting the wrong person to a job can impose material costs. Employers have incentives to conduct in-depth performance reviews to reduce the likelihood of making such mistakes. Another primary benefit is that promotion contests help filter out random shocks in evaluating

[16]This section draws on E. Lazear and S. Rosen (1981), "Rank Order Tournaments as Optimal Labor Contracts," *Journal of Political Economy* 89, 841–864.

[17]Promotions also play an important role in matching people with jobs based on skills and ability.

A Horse Race at General Electric

Sometimes, firms "run horse races" among internal candidates. Under this procedure, the candidates are notified that they are competing for a job with higher pay and prestige. The contest provides significant incentives for the candidates to perform since the prize for winning can be very large. General Electric ran such a horse race to fill the CEO position when Reginald Jones retired in 1981. The winner was Jack Welch. In 1999, Welch was paid $13.3 million in salary and bonuses. The next highest paid person in the firm received $4.2 million.

Sources: R. Vancil (1987), *Passing the Baton* (Harvard Business School: Boston); and GE Proxy (2000).

performance. Typically, the employee with the best *relative performance* is chosen for promotion. As we discuss in Chapter 16, potential risk-sharing benefits come from using relative performance measures rather than absolute performance measures.[18] In particular, employees are less likely to be rewarded or penalized for factors beyond their control—common shocks that affect all the contestants in the promotion contest are filtered out of the decision.

Promotion-based systems can have several significant drawbacks.[19] First, judging people on relative performance can undermine employee cooperation, and employees might even sabotage the work of others. Second, promotions can be a rather crude tool for providing incentives. Promotions occur only at discrete intervals, and the employee is either promoted or not. Moreover, within smaller firms as well as for employees with specialized skills, promotion opportunities can be quite limited. Monetary incentives, such as bonus payments, are more flexible. Third, there can be serious conflicts between matching people for jobs and providing incentives. The so-called Peter principle argues that employees keep getting promoted until they reach jobs that they cannot handle. Fourth, employees do not always value promotions. For example, research scientists and professors often do not want administrative positions. Fifth, promotion contests can subject decision makers to significant influencing activities.[20]

Despite these drawbacks, promotions are a widely employed method for motivating employees throughout the world. Lately the prospect for promotion in many firms has fallen due to an overall reduction in middle-management positions and a slowing in growth rates. This development reduced the incentives for many employees, who think that the chances for promotion are low even if they do a good job. In response, many firms have tried to restore employee incentives by adopting more explicit pay-for-performance plans. The American Productivity and Quality Center reports that 75 percent of employers in the United States have an incentive plan (such as a profit- or gain-sharing plan) for rank-and-file employees and that roughly 80 percent of these plans have been adopted since 1983.[21]

[18]Relative performance measures are based on how an employee performs compared to a peer group. Absolute performance measures compare the employee's performance to some predetermined standard.

[19]G. Baker, K. Murphy, and M. Jensen (1988), "Compensation and Incentives: Practice and Theory," *Journal of Finance* 43, 593–616.

[20]Promotions are typically based on the subjective judgments of people rather than on objective output measures (such as pieces produced). As we discuss in more detail in Chapter 16, subjective performance evaluation can motivate nonproductive actions to influence the supervisor's rating.

[21]N. Perry (1988), "Here Come Richer, Riskier Pay Plans," *Fortune* (December 19), 50–58.

Influence Costs and Pay in Universities

The potential for influence activity is especially high in firms where employees have common knowledge about one another's pay. Our discussion suggests that these firms might limit the differences in pay to reduce influence costs. One study provides empirical evidence on this issue by examining compensation levels in academic departments at about 2,000 colleges. Common knowledge about pay is more likely in small departments, in departments where the members frequently interact on a social basis, and in public institutions (where public disclosure of pay often is required). Consistent with the influence-cost arguments, this study found that all three factors were associated with reductions in the dispersion of pay.

Source: J. Pfeffer and N. Langton (1988), "Wage Inequality and the Organization of Work: The Case of Academic Departments," *Administrative Sciences Quarterly* 33, 588–606.

Influence Costs

Teammates frequently compare compensation levels. Differences in pay among co-workers regularly prompt employees to seek explanations for compensation decisions. Employees also use information about the pay of other employees to lobby for pay increases. It frequently is conjectured that firms limit the differentials in pay to reduce this type of influence activity. Such a policy, however, comes at a cost; underperforming employees are likely to be paid too much, whereas more productive employees are likely to be undercompensated and leave the firm. Influence costs also help explain why many firms try to keep their compensation decisions confidential. In many cases, however, it is difficult to prevent teammates from sharing information on compensation.

Firms often expend substantial resources on evaluating and comparing jobs within the organization. One popular method is the Hay System.[22] Under this system, each job within the organization is evaluated on factors such as required knowhow, problem-solving skills, the number of people supervised, and accountability. Based on this evaluation, each job is assigned a total number of points and placed in a position within the firm's hierarchy. Jobs at a given level in the hierarchy have similar ranges in compensation. For example, jobs included in the same level might pay from $20,000 to $25,000, depending on experience and qualifications. Although salaries reflect external market rates to some extent, a major emphasis is placed on internal consistency among jobs (equal pay for equal work). Internal consistency appears to reduce employee complaints about compensation policies and helps protect the firm against liability in discrimination suits. However, if pay is related to the number of employees supervised, such a plan can lead to empire building by managers.

The Salary–Fringe Benefit Mix[23]

In our benchmark model, individuals receive their compensation in the form of cash payments. Most employees, however, receive a substantial amount of their compensation in the form of *fringe benefits*—compensation that is either in kind or deferred.

[22]For a more detailed discussion, see G. Milkovich and J. Newman (1993), *Compensation* (Richard D. Irwin: Burr Ridge, IL), Chapter 4.

[23]This section draws on Ehrenberg and Smith (1988), Chapter 11.

Employment Market Niches

WRQ in Seattle develops connectivity software. To attract scarce engineers and programmers, WRQ, with 700 employees, must make its recruiting appeal heard over the "giant sucking sound" of crosstown rival Microsoft (with over 12,000 employees). Microsoft offers an alluring stock plan that has transformed employees into millionaires. WRQ offers a work environment with employee-friendly policies: team management, reasonable and flexible hours, time off for volunteer work, natural light from a 10-story atrium, massage, napping and breast feeding rooms, and balconies overlooking the lake. Such policies have allowed WRQ to recruit more experienced people, especially more women, and to experience only half the turnover of other software companies. A former Microsoft employee, age 31 with a wife and new baby, used to enjoy his work at Microsoft, but now with WRQ, he does not miss the 13-hour days and being on call around the clock. By taking advantage of certain employee preferences for a less stressful job environment, WRQ is able to compete effectively for talent.

Source: S. Shellenbarger (1997), "Rooms with a View and Flexible Hours Draw Talent to WRQ," *The Wall Street Journal* (August 13), B1.

Examples of in-kind payments are health insurance and membership in a company recreation center, where the employee receives an insurance policy or a service rather than cash. Payments to pension plans and Social Security are examples of deferred compensation. For the typical American employee, about 75 percent of the total compensation package is pay for time worked, while about 25 percent is fringe benefits. Based on the cost to the employer, the most important fringe benefits are pensions and insurance, paid leave time (vacations and sick or other leave), and mandated contributions to Social Security and Workers' Compensation. Many employees also receive benefits such as company-paid education, dental care, discounted meals, and subsidized recreation programs. A 1998 survey of 2,120 college grads found the following ranking as the most important job benefit: medical insurance, pension benefits, annual salary raises, and dental and life insurance.[24]

Employee Preferences

Salary and fringe benefits typically are not perfect substitutes from an employee's viewpoint. One reason is taxes: Certain fringe benefits (such as health insurance) are not

Employee Preferences

Silicon Valley has more than its share of programmers—those who do much of the heavy lifting in this information age. Given to marathon sessions in front of their computer screens, programmers tend to be an eccentric bunch. One programmer reasoned with his supervisors that he preferred to work in the buff. He noted that he worked alone, was most productive late at night, and that the building was locked after 11 P.M. Well, good programmers are difficult to find, so after some discussion, he was given permission to strip after 11 P.M.

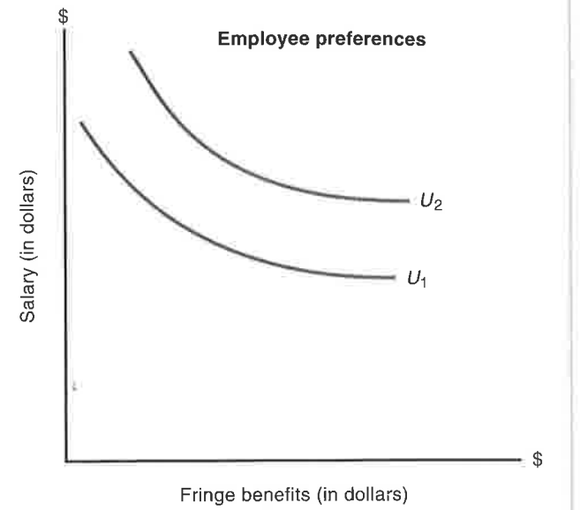
Of course there is more to the story—apparently things went well until one evening when this programmer misread the clock in his cubicle. He was not the only one surprised when he wandered into what he had assumed would be a deserted workroom.

Source: P. Bronson (1999), *The Nudist on the Late Shift* (Random House: New York).

[24]A. Karr (1998), "Special News Report about Life on the Job—and Trends Taking Shape There," *The Wall Street Journal* (May 5), A1.

Figure 14.3 Employee Preferences for Salary and Fringe Benefits

This figure displays an employee's preferences for salary and fringe benefits using indifference curves. The convexity of the curves implies that this employee is willing to substitute a relatively large amount of salary for additional fringe benefits when the employee receives few fringe benefits (possibly due to tax considerations). However, this willingness to substitute declines as the employee receives more fringe benefits (the employee wants cash for other purposes).



subject to income taxes when received by the employees. For example, an employee who wants to purchase an insurance policy that costs $5,000 would prefer that the firm provide the policy rather than $5,000 in cash. Since insurance premiums are not counted as taxable income, an employee in a 33.33 percent tax bracket would have to receive $7,500 in salary to purchase the policy. The employee also might want the firm to purchase fringe benefits because the benefits can be purchased by the firm at lower prices. For example, a firm might be able to provide group insurance at a lower cost per employee than if employees individually purchased the insurance. The potential cost advantage of employee group health and life insurance has two main components: It reduces the adverse selection problems and lowers administrative and selling expenses. On the other hand, employees often prefer $5,000 in cash to $5,000 in fringe benefits, since the cash gives them more flexibility in selecting their purchases.[25]

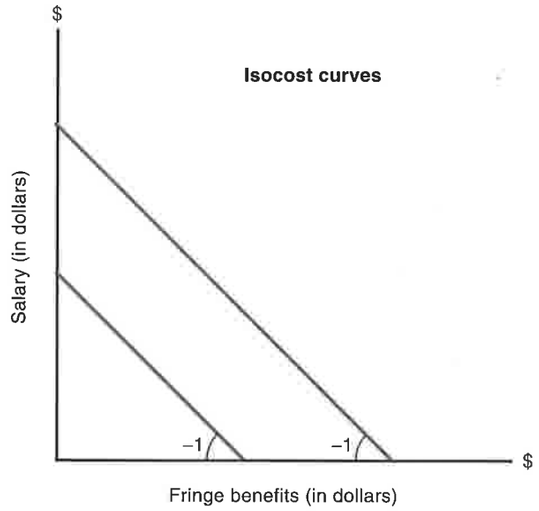
In our initial discussion, we do not break fringe benefits into finer categories. Rather, we consider the choice between salary and overall fringe benefits. Later, we discuss the mix of fringe benefits. Figure 14.3 displays an employee's preferences for salary and fringe benefits using indifference curves. The convexity of the curves implies that this employee is willing to substitute a relatively large amount of salary for additional expenditures on fringe benefits when the employee is paid primarily cash (possibly due to tax considerations). However, this willingness to substitute declines as the employee receives more fringe benefits (the employee prefers cash for other purposes).

The employee, of course, would like to be on as high an indifference curve as possible. A firm, however, will be able to hire the individual so long as the compensation package meets the individual's reservation level of utility. If the compensation package provides this level of utility (or more), this person is at least as well off working at the

[25]D. Mayers and C. Smith (1981), "Contractual Provisions, Organizational Structure, and Conflict Control in Insurance Markets," *Journal of Business* 54, 407–434.

Figure 14.4 Employe Preferences for Paying Salary or Fringe Benefits

This figure displays isocost curves for a representative firm, under the assumption that the firm's value is unaffected by whether it pays the employee cash or uses the same amount of cash to provide fringe benefits. Each curve is a straight line with a slope of −1; firm value is unaffected by the split between paying a dollar for salary or a dollar for fringe benefits. Along any isocost curve, the labor expenses for the firm are the same. The firm's value is highest on the lowest isocost curve possible (since lower isocost curves mean lower labor expenses and higher profits).



firm as working for alternative employers or not working at all. For example, the reservation utility of the individual in Figure 14.3 might be depicted by the indifference curve labeled U_2. (Note that the reservation utility of the individual would increase if the compensation packages offered by other employers were increased so that other alternatives become more attractive.)

Employer Considerations

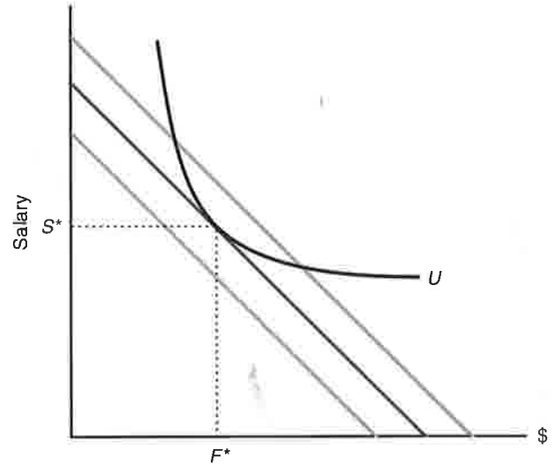
Initially, suppose that the firm's managers do not care whether they pay an employee cash or use the same amount of cash to provide fringe benefits. For instance, both expenditures might be deductible for corporate tax purposes, and so it costs the firm the same amount in either case. Figure 14.4 displays isocost curves for a representative firm under this assumption. Each curve is a straight line with a slope of −1; firm value is unaffected by the split between salary and fringe benefits. Along any isocost curve, expenditures to attract and retain employees are the same. The firm's value would be highest with the lowest isocost curve possible (since lower isocost curves imply lower employee expenses and higher profits).

The Salary–Fringe Benefit Choice

Suppose that all individuals the firm might hire have similar preferences for wages and fringe benefits. Figure 14.5 depicts an indifference curve for the reservation utility of a typical employee. The firm can hire this individual using any compensation package along this curve. The figure also shows selected isocost curves for the firm. Management's objective is to choose the compensation package that meets the reservation utility of the employee at the lowest cost. The optimal choice is S^*, F^*, where the indifference curve is tangent to the isocost curve. Management could choose other combinations along

Figure 14.5 The Optimal Mix between Salary and Fringe Benefits

The figure pictures an indifference curve U for the reservation utility of a representative individual whom the firm is trying to hire. The firm can hire the individual using any compensation package along this curve. The figure also shows selected isocost curves for the firm. To maximize the firm's value, choose the compensation package that meets the reservation utility of the individual at the lowest cost. This optimal choice is S^*, F^*, where the indifference curve is tangent to the isocost curve. Management could choose other combinations along the indifference curve. However, these combinations are more expensive. Although the firm could offer combinations that are less expensive than S^*, F^*, these combinations would not meet the individual's reservation utility.



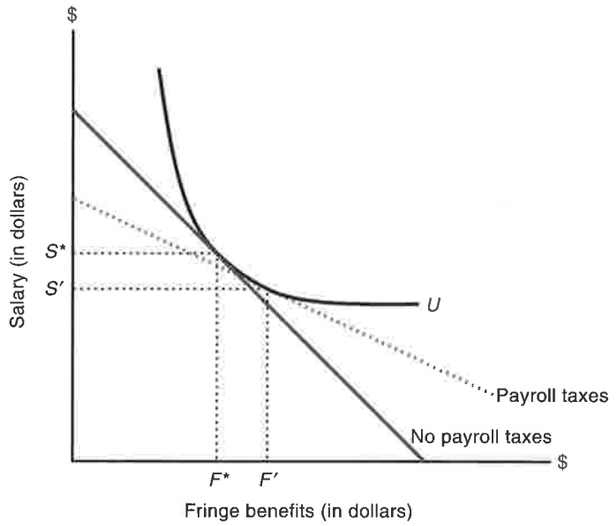
the indifference curve. However, these combinations are more expensive. Although management could offer combinations that are less expensive than S^*, F^*, these combinations would not meet the individual's reservation utility.

This analysis suggests that it is in management's interest to heed employee preferences about fringe benefits. If employees prefer that the company buy a dental policy rather than pay them the same amount in cash, the firm should offer the dental policy. Offering the dental policy makes the employees better off and the value of the firm no lower. Indeed, if the change would result in paying employees more than their reservation utilities, the firm can lower cash compensation further and share in these gains. (The firm might do this by giving lower raises in the subsequent years.) Designing more efficient contracts allows the firm to attract and retain employees at a lower cost.

We have assumed that the firm's value is unaffected by the split between paying a given amount of cash to employees and spending the same amount on fringe benefits. This assumption is likely to be valid in many cases, but there are at least two complicating factors. First, taxes at the firm level can be important. For example, the firm generally has to pay Social Security taxes on wages but not fringe benefits. This tax changes the slope of the firm's isocost curves. For example, assuming a Social Security tax rate of 6 percent, managers would be indifferent between paying $1.00 for salary or $1.06 for

Figure 14.6 Optimal Choice of Salary and Fringe Benefits with Payroll Taxes

This figure illustrates how payroll taxes can affect the optimal choice of salary and fringe benefits. In the first case, the firm does not pay payroll taxes (such as Social Security) on wages or fringe benefits. The optimal choice is S^*, F^*. In the second case, the firm pays payroll taxes on wages, but not fringe benefits. This tax flattens the isocost curves for the firm, and the optimal choice is S', F'. In the second case, the firm pays lower salaries and higher fringe benefits.



fringe benefits. The slope of the isocost curve is −0.943. As depicted in Figure 14.6, it is better to offer higher fringe benefits and lower salary than without the tax. Note that personal taxes are incorporated in the shape of employees' indifference curves, whereas the firm's taxes are incorporated in the slope of the firm's isocost curves. Thus, our analysis suggests that in designing compensation packages, management should consider the *total* tax bill for the employee and the firm.[26] Reducing the joint tax liabilities imposed on both the firm and its employees means that there is more money to split between the firm and its employees. It is generally inappropriate to focus only on the taxes of one party (for example, the firm's taxes).

The second complication is that fringe benefits can affect employee behavior in ways that affect the firm's profits. For example, sick leave can motivate absenteeism. Similarly, liberal insurance coverage can reduce employee incentives to worry about prices for medical care. These types of incentive effects can affect the appropriate compensation package. For example, some firms have reduced insurance coverage to employees for the

Paying for Fringe Benefits at Lincoln Electric

The willingness of firms to listen to the preferences of employees suggests that employees pay for their own fringe benefits. For instance, most companies would be willing to pay higher salaries if employees did not want health insurance. Employees, therefore, face an opportunity cost of lost salary when they receive fringe benefits. Lincoln Electric, a manufacturing company in Cleveland, makes this trade-off quite clear to employees. Employees at Lincoln receive about half their compensation in the form of annual bonus payments. Fringe benefit costs are taken out of this bonus payment and are shown on the employees' pay stubs. On several occasions, Lincoln employees have voted against dental plans because the majority of employees prefer cash.

[26]M. Scholes and M. Wolfson (1992), *Taxes and Business Strategy* (Prentice Hall: Englewood Cliffs, NJ).

Ford and Volvo Perk Parity

When Ford purchased Volvo AB's car division in 1999, they had to decide what to do about the differences in the fringe benefits received by the employees. Although Ford plants have fitness centers, these centers do not have the amenities offered at the Volvo plants such as Olympic-size pools, badminton and tennis courts, tanning beds, and saunas. One reason for the high level of fringe benefits at Volvo is the extremely high tax rates in Sweden. Company-supplied services such as plush health facilities are not taxed by the government. However, Ford employees in the United States might be tempted to argue for "perk parity" especially during union contract negotiations.

Source: A. Latour (1999), "Detroit Meets a 'Worker Paradise,'" *The Wall Street Journal* (March 3), B1.

express purpose of providing employees with stronger incentives to negotiate with doctors over price. Presumably, employees do not like to bargain with doctors and must be offered higher wages both to offset this increased cost as well as to offset the reduced insurance coverage in the fringe benefit package. However, the cost to the firm will be reduced if the increase in wages is less than the reduction in insurance costs. These considerations can shift the slope of the isocost curves in either direction and thus can either increase or decrease the optimal amount of fringe benefits.

Using Fringe Benefits to Attract Particular Types of Employees

Employers often care about the personal characteristics of the individuals they hire. For example, firms facing higher costs of turnover might favor hiring people with families since they might be less likely to quit. Alternatively, firms with intense work environments, such as investment banks in New York City, might favor hiring single people because they are more likely to be willing to work longer hours. Firms are constrained in using salary offers to attract a particular type of labor force. For example, firms are likely to violate discrimination laws if they offer people with families more money than they offer single people. Firms, however, sometimes can use the mix between fringe benefits and salary to attract particular types of employees.[27] Figure 14.7 depicts an example.

Trend Toward Temporary and Part-Time Workers

Part-time workers make up a growing portion of the workforce at United Parcel Service (UPS). If UPS has a peak load in the morning and another in the afternoon, hiring part-time employees offers UPS more flexibility than taking on more full-time employees. Many part-time employees like working a part-time schedule.

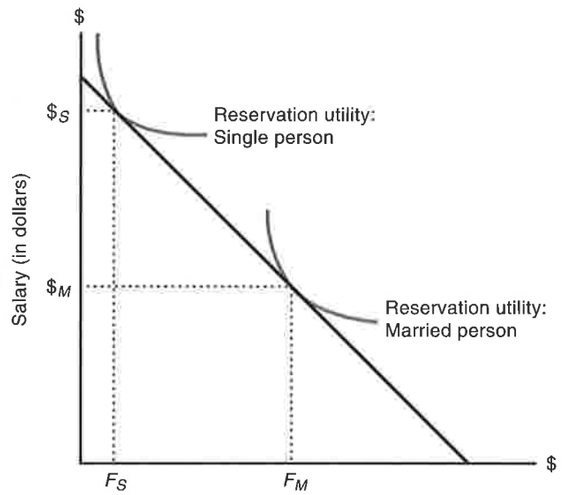
In contrast to part-time jobs, temporary jobs are full-time (40 hours per week) jobs, but not necessarily permanent. Many companies hire temps through employment agencies to fill in when permanent employees are on extended leave or if the job is temporary. These positions usually provide fewer fringe benefits. Microsoft and Time Warner have been in court over whether temps who have been in the position for several years are entitled to the same benefits as permanent employees. Who is the real employer—the employment agency or the company employing the "permatemps"? If it is the company, it owes the temp pension benefits. An IRS complaint against Microsoft claims that many of Microsoft's 6,000 temps are really common-law employees and entitled to company pension benefits.

Sources: M. Phillips (1997), "Part-Time Work Issue Is Greatly Overworked," *The Wall Street Journal* (August 11), A1; A. Bernstein (1998), "When Is a Temp Not a Temp?" *Business Week* (December 72), 67–72.

[27]Our objective in this section is to describe how firms use the salary and fringe benefit mix to attract particular types of individuals. We are not arguing that such a policy is ethical, just, or legal in all cases.

Figure 14.7 Using the Mix between Salary and Fringe Benefits to Attract Particular Types of Employees

The figure displays an isocost curve for the firm and indifference curves representing the reservation utilities of a person who is single and a person who has a family. In this example, people with families have a higher preference for fringe benefits (for example, health insurance) than single people who prefer cash. If management wants to attract individuals with families, it will offer high fringe benefits and low wages, ($\$_M$, F_M). In this case, only people with families will apply for the job. Single individuals will not apply because the package does not meet their reservation utilities. If, instead, management wants to hire single people, it will offer high salary and low fringe benefits, ($\$_S$, F_S).



The figure displays an isocost curve for the firm and indifference curves representing the reservation utilities of people who are single and people who have families. In this example, people with families have a higher preference for fringe benefits (for example, health insurance) than single people. If management wants to attract individuals with families, it will offer higher fringe benefits and lower wages ($\$_M$, F_M). In this case, people with families are more likely to apply for the job. Single individuals are less likely to apply because the package does not meet their reservation utilities. If, instead, management wants to hire single people, it will offer higher salary and lower fringe benefits ($\$_S$, F_S).

The Mix of Fringe Benefits

Our basic analysis of the choice between fringe benefits and salary also applies to the choice of the mix of fringe benefits. For example, it will make sense to provide employees with disability insurance rather than dental insurance whenever the employees prefer the disability insurance—assuming the same cost to the company. In this spirit, some companies have adopted menu or *cafeteria-style* benefit plans, where individual employees allocate a fixed fringe benefit allowance among a variety of choices. The potential benefit of these plans is that not all employees value specific benefits equally. By allowing them to choose, they will be more willing to work for the firm at a lower overall cost. Note that a cafeteria plan is more likely to be valued by two-career families since, for example, one spouse can acquire dental insurance while the other obtains health insurance.

Cafeteria plans entail costs that can limit their desirability. First, they are more expensive to administer. For example, employees must be informed of all their options and an administrative system has to be established to record choices, make the appropriate payments to suppliers, allow for changes in choices, and complete the appropriate tax forms.

Second, cafeteria plans can generate adverse-selection problems that increase the cost of the benefits. Adverse selection is likely to be a particular problem with health, life, and disability insurance. As discussed in Chapter 10, individuals know more about their likelihood of getting sick than an insurance company. This asymmetric information is less a problem if the insurance company provides the benefits to all employees as a group. When free to choose, the people who are most likely to buy insurance are those who find it a good deal at the quoted price. Thus, at any given price, the insurance company is likely to attract a clientele that causes it to lose money. To reduce the likelihood of losing money, the insurance company can do things like demand physical examinations and investigate past medical records before agreeing to insure an applicant. However, these actions increase the costs of supplying the coverage. To reduce the adverse-selection problem, companies often allow employees to opt out of health insurance only if they can document that their spouse has coverage at another firm. This policy limits the amount of discretion that employees have on whether to buy health insurance and helps ensure that the insurance company will have a reasonable cross section of health risks in the pool.

Summary

Chapters 12 and 13 discussed how firms assign decision rights. A second important component of organizational architecture is the reward system: Productive firms design compensation plans that *attract and retain* qualified employees and *motivate* them to exert effort and make decisions that exploit the business opportunities faced by the firm. This chapter examines how firms attract and retain qualified employees and how the level of pay can be used to motivate employees. The next chapter focuses on incentive compensation.

In our benchmark model of wages and employment—patterned after the standard competitive model—firms have no discretion over the wages paid to employees; rather, wages are determined by supply and demand in the marketplace. If a firm pays too little, it will have difficulty attracting employees to job openings and will experience high turnover. A firm that pays too much will have numerous job applicants and low turnover. In addition, the firm will have high costs and will compete poorly in the product market.

Human capital is a term that characterizes individuals as having a set of skills that can be "rented" to employers. We distinguish between *general* and *specific* human capital: General human capital consists of training and education that is equally useful to many different firms; specific human capital is more valuable to the current employer than to alternative employers. In our benchmark model, employees would be expected to pay for their own general training, and employers would pay for specific training.

Our benchmark model does not consider differences in working conditions across jobs. Yet actual jobs vary in many dimensions, such as geographic location and the level of danger. Holding other factors constant, unpleasant jobs must pay a *compensating differential* to attract employees. Compensating differentials attract employees to unpleasant tasks; they also provide employers with direct financial incentives to enhance the work environment whenever it is cost-effective.

In some settings, it can be difficult to tell whether a firm is paying the market wage rate to employees. Important indicators are the application and quit rates and the nature of outside job offers made to existing employees.

Our benchmark model provides a good description of some labor markets, such as the market for unskilled agricultural workers. It is less useful in describing employment and wages in many other cases. Many firms are better characterized as establishing *internal labor markets,* where outside hiring is done primarily for entry-level jobs; most other jobs are filled from within the firm. Internal labor markets are characterized by *long-term relationships* between the employee and the firm. Long-term relationships can be beneficial because they provide both employers and employees incentives to invest in specific training, offer incentives for employees to work to exploit the business opportunities facing the firm, and allow firms to take greater advantage of information about employee attributes. One cost of using internal labor markets is that it sometimes is undesirable to limit the search to the firm's current employees, especially when filling higher-level positions.

Employees accepting jobs with firms that employ internal labor markets evaluate *career earnings.* Thus, firms with internal labor markets have more flexibility in setting the level and career profile of pay. Firms can vary compensation over the career path, so long as the overall remaining stream of earnings is competitive at each point in time relative to the streams offered by other firms within the same labor market. Economists have identified at least three ways in which firms can use their flexibility in setting the level and sequencing of pay to enhance employee motivation. These methods include the payment of *efficiency wages, upward-sloping earnings profiles,* and the tying of major pay increases to *promotions.* However, influence costs can affect the desirability of exploiting this potential flexibility. Firms might reduce the dispersion of pay among coworkers to limit influence costs.

The typical American employee receives about 25 percent of total compensation in the form of *fringe benefits* such as vacation time, insurance coverage, and contributions to retirement plans. Salary and fringe benefits are not perfect substitutes for most employees. Tax benefits and the fact that the company often can purchase fringe benefits more cheaply favor fringe benefits. The desire for flexibility in making purchases can favor cash payments. Employers have incentives to heed the preferences of employees when it comes to the choice between salary and fringe benefits. By responding to their preferences, firms can design compensation packages that attract and retain qualified employees at the lowest cost. Firms sometimes can use the salary–fringe benefit mix to attract particular types of employees. For example, offering liberal insurance coverage is more likely to attract people with families than single individuals, who are more likely to prefer cash payments. Firms also have incentives to heed employee preferences when it comes to choosing the mix of fringe benefits. This incentive has motivated many firms to consider *cafeteria-style* benefits. Use of these plans is limited due to administrative costs and *adverse-selection problems.*

Suggested Readings

M. Aoki (1988), *Information, Incentives, and Bargaining in the Japanese Economy* (Cambridge University Press: Cambridge).

G. Becker (1983), *Human Capital* (University of Chicago Press: Chicago).

P. Doeringer and M. Piore (1971), *Internal Labor Markets and Manpower Analysis* (D. C. Heath: Lexington, MA).

R. Ehrenberg and R. Smith (1999), *Modern Labor Economics: Theory and Public Policy,* seventh edition (Addison-Wesley: Reading, MA), Chapters 8, 9, and 11.

Review Questions

14–1. Explain the following quotation: "My employer doesn't determine my salary; he determines where I work."

14–2. In the basic competitive model, why do employees pay for general training and firms pay for specific training?

14–3. Why do firms form internal labor markets?

14–4. Evaluate the following statement: "Firms are free to set salaries in any manner they want in an internal labor market."

14–5. Present an economic argument to explain why firms often have mandatory retirement (where allowed by law).

14–6. How do influence costs affect pay within internal labor markets?

14–7. The United States Congress has considered proposals that would limit the level of top executive pay to some multiple of the lowest-paid employee in the company (for example, executive pay must be less than 10 times that of the lowest-paid employee). Do you think this type of proposal is a good idea? Explain what effect the proposal would have on the involved companies.

14–8. President Clinton proposed eliminating the tax deduction for all compensation over $1 million for CEOs unless the pay is tied to company performance. Proponents argue that this proposal will benefit shareholders. "Everyone knows that CEOs are overpaid and that their pay is not appropriately tied to performance. This legislation helps solve both problems." Present an argument against this proposal.

14–9. The Brown Tool Company is a multidivisional firm with offices throughout the country. The company sets the salaries of most of its positions at the central level. For example, secretaries are paid $8 per hour throughout the company. Discuss two important reasons why the firm might adopt such a policy. Discuss two important problems that the policy might cause.

14–10. A recent study concluded that many employees fake sickness to avoid going to work. The authors argue that through unwarranted sick leave, employees "steal" about $150 billion a year from firms. This amount is three times larger than the estimated loss from shoplifting. One proposal is for Congress to outlaw the granting of sick leave to employees. The argument is that companies would be much better off because they would not incur the giant losses associated with sick leave. Further, the costs of taking sick leave would be internalized with the employees. Comment on this proposal.

14–11. The University of Rochester used to pay all faculty a 10 percent bonus as a substitute for a retirement plan. Individuals could either place this money in a retirement fund or keep the cash. Placing money in the fund deferred taxes on the income until the point of withdrawal. Changes in the United States tax code forced the university to change this policy. In particular, employees cannot be given options of this type but must either be covered or not covered as a group. The university now has the following policy: All new faculty members without prior service at another university are given a 10 percent bonus in cash. This payment is treated as ordinary income for tax purposes. Most new faculty are young people fresh out of graduate school. All faculty members with more than 2 years of service must place the bonus in a retirement account. Taxes are deferred until withdrawal from the account. Explain why it might make economic sense for the university to have such a two-group plan, rather than treat all employees (old and new) the same.

14–12. The University of Medford pays the full tuition for the children of faculty members at any university in the world. Recently, this policy has received bad publicity. The argument has been made that people in other occupations have to pay the tuition costs for their children and so should college professors. According to this argument, it is not fair to have these relatively well paid people get subsidized in this manner. The board of trustees of the University of Medford has been asked to reconsider this policy. Provide an economic argument to explain why the board of trustees might want to continue this policy.

14–13. Payments under some retirement plans are based on the average earnings in the last few years of employment. Discuss the potential incentive effects of this policy.

14–14. Suppose UAW negotiations argue for upgraded perquisites for Ford's U.S. employees to match those available in the Swedish plants Ford acquired from Volvo.
- **a.** Ford might achieve perk parity by upgrading U.S. facilities or by reducing Swedish facilities. What would be the implications of each policy?
- **b.** Ford might live with different levels of perks. What would be the implications?
- **c.** Suppose the difference in perks between U.S. and Swedish employees is reduced following the merger. What are the efficiency implications for the merger?

14–15. Companies can often gain if they listen to employees about what they prefer in the way of a fringe benefit package—a more preferred package serves to attract and retain employees at a lower cost. Nevertheless, many firms have shunned "menu plans" where each employee would be completely free to choose their own fringe benefit package. (For instance, those wanting health insurance could buy it through the company, whereas those who want some other benefit or cash would make different choices.) Why do you think many firms have avoided this type of menu plan?

14–16. The Good Beer Brewing Company currently purchases health insurance for its 10,000 employees. The company is considering a flexible plan where employees can have either $2,000 in cash or insurance coverage (the insurance costs $2,000). The company figures it will expend the same amount of money either way. However, employees will be better off because they can choose the option that is most preferred. Do you see any potential problems with this idea? Explain.

14–17. Public accounting firms have traditionally paid low starting salaries to new employees. Nevertheless, these firms have been able to hire and retain qualified employees (even though these employees could obtain higher salaries elsewhere). Is this observation inconsistent with economic theory? Explain.

14–18. Parkleigh Pharmacy is a small department store in Rochester, NY, specializing in upscale, expensive personal accessories (e.g., sunglasses, beauty aids, leather goods) and home decorations (e.g., crystal, china, table lamps). Kaufmann's is a large department store chain, based in Pennsylvania, with several stores in the Rochester area. Kaufmann's carries a broader range of products and caters more to middle-income consumers.

Salespeople at Parkleigh are paid a straight hourly wage (i.e., no sales commissions). In addition, they are entitled to a 30 percent discount on anything they buy at the store. By contrast, salespeople at Kaufmann's are paid an hourly wage (lower than the hourly wage paid at Parkleigh) plus a commission of 5 percent on sales they make. They receive no discount on products they buy at Kaufmann's.
- **a.** Why do you think the compensation plans differ at the two firms? In particular, why do you think Kaufmann's pays commissions to salespeople, while Parkleigh does not? Why does Parkleigh offer employees discounts on purchases, while Kaufmann's does not?
- **b.** Assume, for the moment, that neither store pays sales commissions. Parkleigh offers an hourly wage plus the employee discount. Kaufmann's offers only an hourly wage. Do you expect Kaufmann's hourly wage to be higher or lower than Parkleigh's? Why?

14–19. Critically evaluate the following statement:

> *At Lincoln Electric, workers must pay for their own fringe benefits (for example, health insurance). The payment for these benefits is taken out of the annual bonus checks. At other firms, the firm pays for fringe benefits. Therefore, the workers at Lincoln are worse off than at other firms.*

14–20. People buying disability insurance on an individual basis are often required to take physical exams. Physical exams are typically not required when employees acquire disability insurance through a company-sponsored plan (which covers all employees in the firm). Provide an economic rationale for the different policies relating to physical exams.

14–21. Marks & Spencer is a large, established British retailer of apparel, housewares, and food products. The company has a large workforce. As part of the company's benefits package, employees receive a discount of 30 percent off all purchases of apparel.

- **a.** What are the advantages and disadvantages of offering a 30 percent discount off company merchandise?
- **b.** What are the advantages and disadvantages of offering a 30 percent discount off apparel, but not housewares and food products? Why do you think the company differentiates between apparel and other products?

14–22. Consultants often spend much of their time away from home. Deloitte and Touche recently implemented a policy that curbs its consultants' travel time. Instead of spending five days a week at a client's office, consultants spend three nights and four days, fly home, and work a fifth day at their home cities. One observer argued that Deloitte and Touche is putting employee concerns ahead of good business. Deloitte and Touche should focus on company profits, not employee comfort. Do you agree that the firm is necessarily wasting company profits? Explain using concepts from class. In answering this question assume that employees would be more productive if they stayed at the client's office.

14–23. A recent study found that CEOs in Europe are paid substantially less than CEOs in America, even after controlling for a firm's size and industry. Does this necessarily imply that American CEOs are overpaid? Explain.

14–24. You work in the human resource office of a major cruise line that offers cruises in various locations around the world (the Caribbean, the Mediterranean, Asia, etc.). The CEO of your company has recently proposed that all employees in the corporate office (i.e., those employees who do not actually work on a ship) be offered free passage on your firm's cruises as a fringe benefit. The CEO has asked for your thoughts on this proposal.
- **a.** If this proposal is adopted, what will happen, if anything, to employee salaries? Why?
- **b.** What are the advantages and disadvantages of this proposal? What factors should be considered when evaluating the proposal?

14–25. Consider two states that are nearly identical in terms of such factors as income, climate, and population. There are public universities in both states. One state has a law which specifies that all professors of a given rank (assistant, associate, and full professor) have to be paid the same. Thus an assistant professor, whether in history or in law, has to be paid the same. Associate professors are paid more than assistant professors. However, all associate professors have to be paid the same. The same is true for full professors. The other state does not have such a law. In this state, law professors are paid substantially more than history professors within each rank. The laws in both states allow the universities to choose their own teaching loads for faculty. These loads can vary across faculty members.
- **a.** How do you expect the teaching loads to vary across the two states (you can focus on history and law departments)? Explain the economic reasoning behind your answer.
- **b.** Are either history or law professors in the state with the law necessarily better or worse off than their counterparts in the state without the law? Explain.
- **c.** Discuss how the residents of the state might be made worse off by such a law.

14–26. Some companies base promotions solely on seniority. Discuss the negative and positive aspects of such a policy.

Incentive Compensation

CHAPTER 15

CHAPTER OUTLINE

In October 1988, Du Pont's fibers division announced "one of the most ambitious pay-incentive programs in America."[1] Its plan covered nearly all of the division's 20,000 employees, including both management and rank-and-file employees. Under the plan, a portion of employees' pay would be placed into an "at-risk pool." If the business exceeded its profit goals for the year, the employees would receive a multiple of the at-risk monies as a bonus. If not, the employees stood to lose the money in the pool. The intent was eventually to place as much as 6 percent of annual pay at risk. The plan was adopted initially for a 3-year trial period. Many companies indicated that they were watching this experiment carefully to see what they could learn about incentive pay. "The attention that the American business community has given to the Du Pont program is tremendous," said Robert C. Gore, a vice president at Towers Perrin Company—a major compensation consulting firm.

The largest of Du Pont's chemical businesses, the fibers division consisted of departments ranging from automobile seat covers to apparel. In 1990, the division had to achieve a target of 4 percent real-earnings growth for its employees to recover their at-risk pay. But profits for the first 9 months were off 26 percent, due largely to a poor economy and unexpectedly high input prices. Demand for the division's products had declined substantially due to weak housing and automobile markets, and oil prices had risen materially because of the Gulf War. By fall 1990, it was obvious that the employees were likely to lose all the monies placed in the bonus pool. Employee discontent was quite high: Employees were facing significant financial losses, largely due to factors beyond their control. In October 1990, Du Pont precipitously canceled the incentive program with more than a full year left in the trial period. In the words of the fibers division chief, "I have to conclude it was an experiment that didn't work."

[1]Details of this example are from L. Hays (1988), "All Eyes on Du Pont's Incentive Program," *The Wall Street Journal* (December 5), B1; and R. Koening (1990), "Du Pont Plan Linking Pay to Fibers Profit Unravels," *The Wall Street Journal* (October 25), B1.

Given the widespread interest in this experiment, it is important to understand why the Du Pont plan failed. Incentive pay, as some critics claim, simply might be a bad idea. If so, any firm adopting a large-scale incentive plan is making a mistake and should expect to experience a fate similar to Du Pont's. Alternatively, the failure of this plan might be traced to basic design flaws that could have been avoided through more careful planning. In this chapter, we examine the economics of incentive compensation. Our analysis suggests that Du Pont's failure was due largely to problems with the structure of the plan. Correspondingly, our analysis provides insights into how companies might design more effective compensation plans.

We begin this chapter by providing a more detailed discussion of incentive problems. We then examine how ownership can resolve some of these problems by providing strong incentives for individuals to take efficient actions. Next, we consider a critical limitation of ownership in controlling incentive problems—inefficient risk bearing. We then detail the implications of risk bearing for the design of compensation contracts. Next, we review some of the key insights about incentive compensation contained in the economics literature. We begin by discussing the standard principal-agent model. We then extend this basic analysis by considering the informativeness principle, group incentive pay, multitask principal-agent problems, alternative forms of incentive pay, and the role of incentive pay in the process of matching individuals with jobs. Toward the end of the chapter, we discuss the debate on whether incentive pay works, and we provide a case study on CEO compensation to allow the reader to apply some of the concepts we develop on compensation policy. In the appendix we examine multitask principal-agent problems in greater detail.

The Basic Incentive Problem

As described in Chapter 10, incentive problems exist within firms because owners and employees have fundamentally different objectives. For example, the owners of an insurance company want its salespeople to sell insurance policies to customers, but salespeople might prefer to play golf. Similarly, stockholders of a research company want its scientists to develop marketable products, whereas scientists might prefer to work on more intellectually challenging but less marketable ideas. Presumably, employees at Du Pont's fibers division have other interests than simply making and selling fibers products.

Consider the example of AssemCo, a small company that assembles components for several large electronics firms. As in most companies, there is a basic conflict between the aims of the owners and the aims of the employees. The owners would like employees to work diligently, but the employees would prefer longer coffee breaks and working at a more leisurely pace.

To add concreteness to our discussion, we focus on the problem of motivating a particular employee at AssemCo, Ian MacLeod. For simplicity, we focus on a given time

period (for example, motivating Ian over a single week). Ian's preferences with respect to income and work are portrayed by the following utility function[2]:

$$U = I - e^2 \tag{15.1}$$

where I is his income for the period and e is the number of units of effort exerted (for example, hours spent actually assembling components). This utility function, which measures utility in dollar equivalents, indicates that he is better off as his total income increases, but becomes worse off as he exerts more effort on component assembly. As Ian exerts effort, he suffers decreased utility because he would rather engage in other activities. His reservation utility is equivalent to $1,000. AssemCo must meet this level of utility or Ian will not work for the firm.

The firm benefits from Ian's effort, since more components are assembled. The benefits to AssemCo from his effort are

$$B = \$100e \tag{15.2}$$

To begin with a simple case, suppose that his effort is costlessly observable and verifiable—hence, effort is contractible. In this case, the firm offers Ian a compensation contract that would pay him a sum of money if, and only if, he provides a specified level of effort, $\hat{e}$. He will accept this contract, so long as he is paid his reservation utility. To meet this condition, the firm must pay him a wage of $\$1{,}000 + \hat{e}^2$. If he delivers that level of effort and is paid $\$1{,}000 + \hat{e}^2$, then his utility is $U = (\$1{,}000 + \hat{e}^2) - \hat{e}^2 = \$1{,}000$ and he receives his reservation utility. The profits to the firm P from his efforts are

$$P = \$100\hat{e} - (\$1{,}000 + \hat{e}^2) \tag{15.3}$$

The firm then chooses the $\hat{e}$ that maximizes the firm's value.

Figure 15.1 provides a graphical illustration of this problem. The figure displays both the benefits to the firm ($\$100e$) and the costs ($\$1{,}000 + e^2$). Profits are the difference between the two. As the figure indicates, maximum profits occur at $e^* = 50$. At this effort level, Ian is paid $3,500 and the profits for AssemCo are $1,500. This outcome is the efficient bargaining solution. Ian is indifferent among the feasible effort choices—he is paid his reservation wage in all cases—and the firm's profits are maximized at 50. The firm could induce him to provide additional effort by paying him more. However, the additional costs to the firm would exceed the incremental benefits. At the optimal effort level of $e^* = 50$, the marginal costs of effort are equal to the marginal benefits; hence relevant benefits and costs to both parties are considered.[3]

Thus far, we have assumed that Ian's effort is costlessly observable. But this is rarely the case. Effort normally is observable neither by the firm nor by a court of law—effort is not contractible. In addition, the firm is unlikely to be able to tell whether Ian worked hard simply by observing his output. Often, output is difficult to measure and is affected by factors beyond the employee's control.[4] In this case, there is a standard incentive

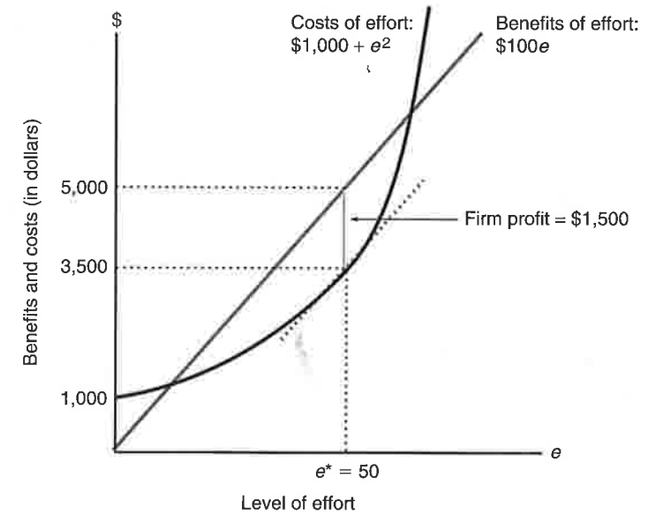
[2]We chose this particular utility function (as well as the firm's benefit function, discussed below) to simplify the calculations. Our basic results, however, are quite general and are not specialized to this particular example.

[3]Technical note: Recall that the marginal benefit at a point is equal to the slope of the total benefit at that point. The same relation holds between marginal cost and total cost. Using elementary calculus, the slope of the total cost curve is $2e$, whereas the slope of the total benefit curve is 100. The optimal effort level is where they are equal or $2e = 100$; thus $e^* = 50$.

[4]In our simplified example, the firm can infer e from observing Q, Ian's output. More generally, Q would be affected by factors that are beyond the control of the employee. For example, the following relation might hold: $Q = \$100e + \mu$, where μ is a random error. Random factors that might affect his output include the quality of raw materials and equipment failures. With the random error term, the firm cannot infer e simply from observing Q.

Figure 15.1 The Optimal Effort Choice at AssemCo

This figure pictures both the benefits and the costs to the AssemCo from the efforts of a given employee, Ian MacLeod. Profits are the difference between the two. Maximum profits occur at $e^* = 50$. This example assumes that Ian will exert the agreed-upon effort as long as he is paid his reservation utility. To meet this constraint, the firm must pay a wage of $\$1{,}000 + e^2$. This payment meets Ian's reservation wage of $1,000 and reimburses him for his disutility of effort. Benefits to the firm are $\$100e$. At the optimal effort level, $e^* = 50$, $5,000 in gross benefits are generated. Ian is paid $3,500 and the firm's profits are $1,500. The firm could induce Ian to exert more effort by paying him more. However, the costs are larger than the benefits. The effort choice of 50 is efficient. Ian is indifferent among the possible choices (since he is paid his reservation utility in each case), and the profits for the firm are maximized at this level.



problem. If Ian promises to provide 50 units of effort and is paid a fixed salary of $3,500, he has the incentive to renege on his promise and provide less effort. He gets paid anyway and benefits from exerting less effort. The firm might suspect that Ian did not work hard. However, it would not know for sure. In this case, a straight salary of $3,500 fails to provide Ian with appropriate incentives. Rather, AssemCo must devise some other type of contract that motivates him to provide additional effort.

This simple example illustrates three important points about incentive problems:

- Incentive problems exist basically because of conflicts of interest between employers and employees. If the interests of employees and employers were aligned perfectly, there would be no reason to worry about incentives.
- Incentive conflicts do not cause problems when actions are contractible. Firms can identify the most efficient actions and pay employees only if those actions are taken. For instance, if the actions of employees at Du Pont were costlessly observable, there would be no reason for the firm to adopt a profit-based plan for employees. Rather, the employees could be motivated appropriately by contracts based directly on their actions.

- In a competitive labor market, employees must be compensated for undertaking undesirable actions—there are compensating differentials. It normally is not sensible to have employees work as hard as physically possible. In choosing the optimal action, there is a trade-off between the benefits of the action for the firm and the personal costs borne by the employees.

Incentives from Ownership

In some cases, there is a simple way to resolve incentive problems, even when the actions of employees are unobservable. This solution is to sell each employee the rights to his or her total output. The incentive problem is caused by the fact that most of the costs of exerting effort are borne by employees, while much of the gains go to the owners. By selling employees their output, both the benefits and costs of exerting effort are internalized by employees and thus employees will make more productive choices. For instance, in our AssemCo example, the firm could sell Ian the rights to the value of his output ($\$100e$) for a price of $1,500. AssemCo makes the same profits as when effort was costlessly observable. Ian's objective, in turn, is to maximize his personal utility given by

$$U = (\$100e - \$1{,}500) - e^2 \qquad (15.4)$$

where the first term represents the income from exerting effort (the value of the output minus the $1,500 payment to the company) and the second term represents the disutility of effort. Given this problem, Ian will choose to exert 50 units of effort and will have utility of $1,000.[5] This outcome is the same as in the perfect information case. It is achieved even though the employer cannot observe Ian's effort.

This discussion highlights the strong incentive effects that come from ownership. In practice, ownership often is used as an incentive mechanism. For example, a majority of the businesses in the United States are private. Moreover, the 1980s witnessed a large number of managerial buyouts of public firms and divisions of public firms, where the managers went from the status of employees to owners. Although some aspects of these buyouts might be controversial, the evidence indicates that the managers operated the units more efficiently when they became owners.[6] Furthermore, about one-third of all retail sales in the United States are made through franchised outlets (including car dealers and gas stations). In franchising, the future profits of each unit are sold to franchisees, who as owners have strong incentives to maximize value.[7]

At least three important factors limit the use of ownership in resolving incentive problems:

- **Wealth Constraints.** Limited wealth can make the ownership solution infeasible. For instance, although senior managers at Du Pont might have stronger incentives if they owned the company, few management groups have access to sufficient capital to finance this purchase.

[5]Technical note: This solution can be found using elementary calculus (see footnote 3) or a graphical analysis, as in Figure 15.1. We present a more detailed analysis of the employee's effort choice later in this chapter.

[6]S. Kaplan (1989), "The Effects of Management Buyouts on Operating Performance and Value," *Journal of Financial Economics* 24, 217–254.

[7]P. Rubin (1978), "The Theory of the Firm and Structure of the Franchise Contract," *Journal of Law & Economics* 28, 223–233; J. Brickley and F. Dark (1987), "The Choice of Organizational Form: The Case of Franchising," *Journal of Financial Economics* 18, 401–420. In many franchise agreements, the central company receives an ongoing sales royalty from the franchisee. This royalty provides incentives to the central company to honor commitments on training and promoting the brand name. The franchisee's claim on future profits is typically limited to some time period—for example, 20 years. The contract often is renewable.

- **Risk Aversion.** Typically, employees do not have full control over their outputs. Rather, output depends on random outside events in addition to employee efforts. For example, Du Pont's profits are affected by changes in the oil, housing, and automobile markets. In making employees fully accountable for their actions, ownership also exposes them to random events that affect their output, but are beyond their control. Given that employees do not like to bear risk, employee ownership entails a risk-bearing cost (see Chapter 2). As we discuss below, this cost must be considered in designing incentive contracts.
- **Team Production.** In most firms, there are production synergies; total output is greater than the sum of what each employee could produce individually. Identifying the separate contributions when there is this type of team production is problematic. Even if the firm were owned jointly by the employees, it would not solve this incentive problem—there still would be the standard free-rider problem discussed in Chapter 10.

Optimal Risk Sharing

To illustrate some of the basic principles of efficient risk sharing, consider the example of Abby Ross and Jess Rodgers. Abby receives a monthly income from a trust fund. Depending on the performance of the fund, this income can be either $0 or $10,000, each with a probability of .5. Abby's expected income is $5,000.[8] However, the income stream is risky—half the time, Abby gets $0. Jess also has a trust fund with the same income possibilities. Half the time he gets $0; the other half, $10,000. The income flows for Abby and Jess are *independent.* (That is, regardless of the outcome for Abby, the probability is still .5 that Jess will get $0.)[9] The left column of Table 15.1 displays the joint distribution of outcomes for Abby and Jess.[10] The probability of each outcome is given in the middle column.

Assuming that Abby and Jess are *risk-averse* (holding expected income constant, the person prefers less dispersion in outcomes), they both can be made better off by agreeing to split their combined incomes. The possible payoffs for each individual are given in the right column of Table 15.1. The expected income per individual is still $5,000. By sharing the risks, however, the variability of their individual incomes has been reduced. The variability is reduced because the likelihood that both Jess and Abby will be lucky or unlucky is less than the likelihood that only one of them is lucky or unlucky. For example, by sharing the risks, the probability of getting nothing is only .25, compared to .5 with no risk sharing. Being risk-averse, they prefer the less volatile income stream. (Ideally, they would like income streams that are certain.) It is this reduction in

[8]The expected income is the *average* amount that Abby will receive in a month. It is calculated by adding together each possible income multiplied by the respective probability: ($10,000 × .5) + ($0 × .5) = $5,000.

[9]We assume that the flows are independent to simplify the calculations in the example. The basic insights of this analysis hold as long as the two flows are not perfectly positively correlated.

[10]A joint outcome ($X, $Y) refers to Abby receiving $X dollars while Jess receives $Y dollars. Since the events are independent, the probability of any joint outcome is the probability of the first event (that Abby receives $X) multiplied by the probability of the second event (that Jess receives $Y). For example, the probability that both will receive $0 is .5 × .5 = .25.

Joint Outcomes	Probability	Individual Payoffs from Splitting
($0;$0)	.25	$ 0
($0;$10,000)	.25	5,000
($10,000;$0)	.25	5,000
($10,000;$10,000)	.25	10,000
		E(Income) = $ 5,000

Table 15.1 Example of Risk Sharing

In this example, two people receive incomes from different trust funds. Each fund pays either $0 or $10,000, each with a probability of .5. The two funds have independent payoffs. The left column displays the possible joint payoff outcomes, and the middle column shows the probability of each outcome occurring. For instance, ($0;$0) is the outcome where both funds pay $0 for the period. The probability of this outcome is .25. The right column shows the individual incomes if the two people agree to split the payoffs from the two funds. Splitting the payoffs makes both better off, compared to relying solely on the payoffs from their individual funds. The expected income in either case is $5,000. However, risk is reduced by the pooling of the funds. For instance, each person has a .5 chance of receiving no income when keeping all the income from his or her own fund. The two people only have a .25 chance of receiving no income when they pool the funds.

volatility from pooling risks that drives individuals to purchase insurance, as well as to invest in diversified portfolios—for example, mutual funds.

People often differ in their attitudes toward risk. Some people are more willing to tolerate large financial risks, whereas others are not. An efficient allocation of risk takes these differences in preference into account. For example, suppose that Jess is *risk-neutral,* whereas Abby is risk-averse. (A risk-neutral person cares only about the expected payoff and does not care about the dispersion in potential values around that expected value.) Jess will value each of the two random income flows at $5,000 (the expected value), whereas Abby will not. For example, Abby might be willing to accept a certain payment of $4,000 for her risky income flow. Here, there are gains from trade by having Jess buy Abby's income. A payment of $4,500 would split the potential gains of trade between the two parties. Each party would be better off by $500.

The common stock of large corporations typically is owned by many investors, each holding well-diversified portfolios. Because of this diversification, investors are less concerned about the fortunes of any one company. (Things that are specific to individual firms tend to average out over their entire portfolios; that is, one firm is lucky, whereas another firm is unlucky.)[11] Employees, in contrast, receive large fractions of their incomes from their individual employers (each generally has but one job), and thus they care greatly about the fortunes of individual firms. This difference in outlook simply reflects the fact that employees of a firm have less effective methods to manage firm-specific risk than the firm's shareholders. (Note that we are not saying that employees have different preferences than owners; rather, it is their ability to manage risk through well-diversified portfolios that makes shareholders in large corporations more willing to bear such risk.)

[11]For example, H. Markowitz (1959), *Portfolio Selection* (John Wiley & Sons: New York); and W. Sharpe (1964), "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance* 19, 179–211.

Assuming that the shareholders of the firm can manage firm-specific risks more effectively than employees, they will be willing to bear these risks at a lower price. Thus, it is better from a risk-sharing standpoint to pay employees fixed salaries and let the total risk of random income flows be borne by the shareholders. By paying fixed salaries, the firm avoids having to pay a compensating differential for risk bearing to attract and retain the desired workforce.

Effective Incentive Contracts

Basic Principle
Trade-offs between incentives and risk sharing.

Our discussion to this point suggests that compensation contracts serve at least two important functions. First, they are used to motivate employees. Second, they are used to share risk more efficiently. Unfortunately, there is a trade-off between these two objectives. Efficient risk sharing suggests that it is better to pay employees fixed salaries, while incentive considerations suggest that it is better to tie pay to performance. A compensation contract strikes an appropriate balance between these two considerations.

- When the owners of a firm have a comparative advantage in bearing firm-specific risks, it is better from a *risk-sharing standpoint* to offer employees more fixed salaries and let more of the risk of random income flows be borne by owners (for example, shareholders in large corporations).
- Fixed salaries do not provide strong incentives. Incentives are provided by basing pay on performance.
- The previous two points indicate that there is a trade-off between paying incentive compensation to increase effort and the associated costs of inefficient risk bearing. Often, an effective contract consists of a fixed salary and one or more variable components based on performance.

Economists have devoted substantial effort to studying how to design effective compensation contracts. In this section, we summarize some of the more important findings from this research. We begin with the most basic model in the economics literature, the standard principal-agent model. This model considers a contracting situation that closely resembles our example of Ian MacLeod of the AssemCo. However, the model generalizes this example and focuses on choosing the optimal contract when the employer cannot observe the employee's effort. Following the introduction of the basic model, we extend the analysis by considering the informativeness principle, group incentive pay, multitask principal-agent problems, types of incentive pay, and the role of incentive pay in self-selection.

Principal-Agent Model

The Basic Model

Economic analysis of incentive compensation begins with the basic principal-agent model.[12] This model presents a relatively simple characterization of the contracting process, illustrates the trade-offs between risk sharing and incentives, and provides a number of useful insights for designing more effective compensation plans. In this single-period model, there is an employer (the principal) who wants the employee (the

[12]One of the first presentations of this model is B. Holmstrom (1979), "Moral Hazard and Observability," *Bell Journal of Economics* 10, 74–91.

agent) to work on the employer's behalf. The employer is risk-neutral, while the employee is risk-averse. The most basic analysis focuses on an individual employee. Concerns about teamwork do not arise within the basic model.

Consider the example of Erica Olsson of a biotech firm, DNAcorp. Erica's output Q is a function of her effort, plus some random effect, μ (with expected value 0 and variance, σ^2):

$$Q = \alpha e + \mu \tag{15.5}$$

where output is defined as the market value of her production. The model does not consider the possibility that Erica might manipulate the observed output level (for example, by "cooking the books"). Both Erica and her supervisor, Jon Chang, can observe her output.

If Erica increases effort by one unit, output goes up by α dollars. Thus, α is Erica's marginal productivity—the higher the α, the higher her marginal productivity. The random effect μ reflects factors that can affect output but are beyond Erica's control (for example, equipment failures). The higher σ^2, the more likely it is that the output will experience larger random shocks.

Optimal risk sharing suggests that there are benefits from having the owners of the DNAcorp bear the output risk and pay Erica a fixed salary. For example, Erica might agree to put forth effort level $\hat{e}$ and be paid a fixed salary W for this effort. The owners of DNAcorp receive the difference between the value of the output and W.

$$\text{Owners' profits} = (\alpha \hat{e} + \mu) - W \tag{15.6}$$

There is, however, an incentive problem with this arrangement if Erica's supervisor can observe neither her effort level nor μ, the random shock. Erica has the incentive to agree to $\hat{e}$ as an effort level but then to exert less effort. Jon will tend to observe lower output when she shirks. However, Erica always can claim that her low output was due to bad luck—that is, μ was negative.

Employee's Effort Problem

Incentives can be provided to Erica by basing part of her compensation on realized output. For example, consider Erica's incentives under the following contract:

$$\text{Compensation} = W_0 + \beta Q \tag{15.7}$$

where $0 \leq \beta \leq 1$. This contract pays Erica a fixed wage W_0, plus a proportion β of the output Q.[13] To illustrate Erica's effort choice, suppose $W_0 = \$1{,}000$, $\beta = .2$, $Q = \$100e + \mu$, and $C(e) = e^2$, where $C(e)$ is Erica's cost of effort in dollar equivalents. Given these values, the compensation contract is

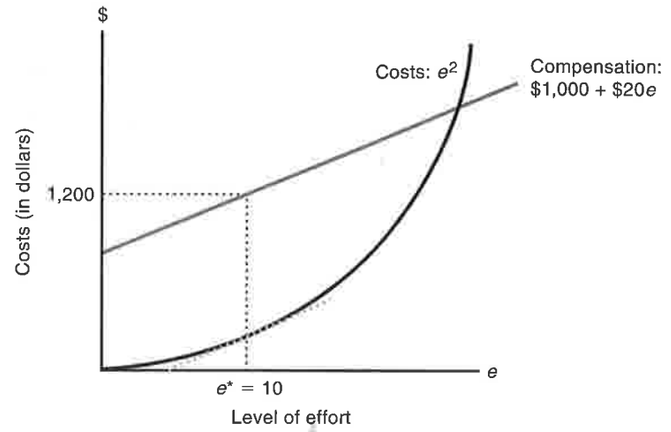
$$\text{Compensation} = \$1{,}000 + .2(\$100e + \mu) \tag{15.8}$$

The benefit to Erica from exerting effort is that it increases compensation—each unit of effort increases her compensation by \$20 (.2 × \$100). Random shocks μ affect total compensation but do not affect the benefits of exerting effort. For any realization of μ, compensation is always \$20 higher for every extra unit of effort provided. Thus, in

[13]For simplicity, we restrict our attention to linear compensation contracts. One justification for focusing on linear contracts is that in practice they are observed commonly. For instance, salespeople and real estate agents often are paid commissions, while factory employees frequently are paid piece rates. Linear contracts have the advantage of providing consistent incentives to the employee that do not depend on past output (the marginal payoff for increasing output by one unit is constant). In contrast, lump-sum bonuses that are paid once some threshold is reached lose their incentive effects once the target is met. For a technical justification for linear contracts, see B. Holmstrom and P. Milgrom (1987), "Aggregation and Linearity in the Provision of Intertemporal Incentives," *Econometrica* 55, 303–328.

Figure 15.2 The Employee's Effort Choice

This figure shows how the compensation and personal costs increase as the employee exerts more effort. The compensation function is \$1,000 + \$20*e*. The employee's cost function is e^2. The objective of the employee is to choose the effort level that maximizes the net benefits. This maximization occurs at $e^* = 10$. At this point, the marginal benefits of effort (\$20) are equal to the marginal costs. The employee's expected compensation is \$1,200.



choosing the optimal effort level, Erica can ignore μ. (It does not affect the costs or benefits of her effort.)[14] Erica's cost from exerting effort is e^2. Her objective is to choose the effort level that maximizes her net benefits.

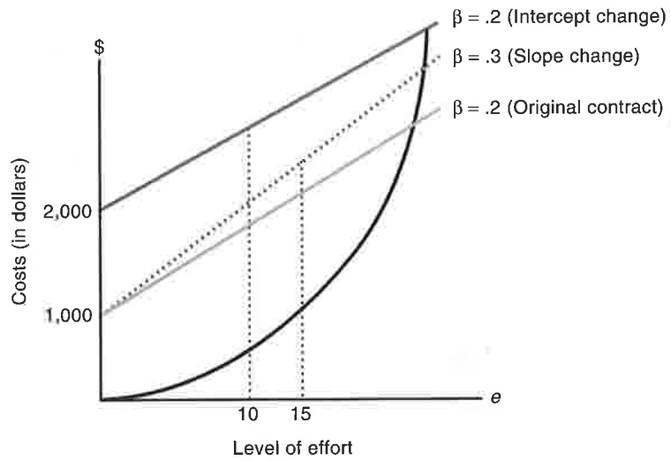
Figure 15.2 depicts how Erica's compensation and personal costs increase as she exerts more effort. As shown in the figure, the optimal effort choice is 10. Note that this figure displays total costs and benefits. The marginal benefits and marginal costs at any effort level are equal to the slopes of the total curves at that point. The difference between total costs and benefits is greatest when the slopes of the total curves are equal. Thus, at the optimal choice ($e^* = 10$), the marginal costs of effort are equal to the marginal benefits, and net benefits are maximized. If Erica exerts more than 10 units of effort, the extra income is insufficient to compensate her for the extra disutility she experiences from exerting more effort. When e is less than 10, Erica is made better off by exerting more effort, since the additional compensation is more than sufficient to cover the added costs of her additional effort.

Figure 15.3 depicts how Erica's effort choice changes with changes in the fixed wage W_0 and the incentive coefficient β. Changing the fixed wage from \$1,000 to \$2,000 results in a parallel shift in compensation, but Erica still chooses $e^* = 10$. The higher fixed wage *provides no incentives* for her to work harder since it does not affect the *marginal*

[14]Technical note: Throughout our analysis, we assume that Erica's attitude toward risk does not change with her level of wealth. Relaxing this assumption means that she will consider an additional effect in choosing the effort level. In particular, the effort choice will affect her utility by altering the costs imposed on her from bearing risk. We ignore this potential effect because it complicates the analysis without providing substantially more insights.

Figure 15.3 How the Employee's Effort Choice Changes with Changes in the Fixed Wage and Incentive Coefficient

The initial contract is Compensation = \$1,000 + .2(\$100e). The picture shows that increasing the fixed wage from \$1,000 to \$2,000 causes a parallel shift in the compensation function but does not alter the optimal effort choice (it stays at 10). Changing the incentive coefficient β from .2 to .3 changes the slope of the line and increases the optimal amount of effort to 15.



benefits of effort. Marginal benefits are \$20, regardless of the fixed wage. In contrast, when the incentive coefficient is increased, Erica selects a higher effort level. For instance, with $\beta = .3$, Erica selects 15 units of effort. In this case, marginal benefits increase to \$30 and she exerts more effort.

The implications of this analysis should be contrasted with the common argument that well-paid employees work harder because they are happier on the job. In our analysis, higher pay does not provide incentives unless it is tied to good performance. It is important to note that our analysis focuses on a single time period. In a multiperiod setting, a high level of pay can motivate employees if the *likelihood of being fired is contingent on performance.* (See the discussion in Chapter 14 on efficiency wages—in this case, the threat of dismissal effectively ties pay to performance.) But high pay and guaranteed tenure with the firm would provide no incentive effects.

Motivating Employees at Allen-Edmonds Shoe Company

Theory argues that tying pay to performance motivates employees more than fixed salaries. Allen-Edmonds Shoe Company learned this principle the hard way. Allen-Edmonds is a manufacturer of high-priced shoes. For years, it paid its factory employees based on individual output through a piece-rate system. In 1990, following the advice of quality gurus, the company abandoned the piece-rate system and started paying employees fixed hourly wages. The intent was to encourage employees to focus on quality and teamwork. But productivity plummeted as employees were observed taking more breaks and "fooling around." After the company lost \$1 million in 1990, it reinstated piecework payments. Productivity and profits immediately "shot back up." An executive of the company stated, "Our people needed the discipline that the piecework system gives to them."

Source: B. Marsh (1993), "Allen-Edmonds Shoe Tries 'Just-In-Time' Production," *The Wall Street Journal* (March 4), B2.

The Optimal Contract

We have shown how Erica will choose effort under different compensation contracts. The firm's problem is to choose the specific compensation contract that maximizes expected profits, given Erica's anticipated effort choice. The primary choice variable is the incentive coefficient, β. Given this choice, W_0 can be adjusted up or down to meet Erica's reservation utility. Selecting a contract with a high β benefits the owners of the firm because it increases Erica's effort. However, choosing a high β also imposes costs on the firm. The expected compensation that the firm must pay to Erica increases with β for two reasons. First, as discussed above, Erica must be compensated for exerting more effort. Second, increasing β imposes additional risk on her—the variable portion of her compensation increases. As risk increases, so does the compensating differential that must be paid to induce Erica to remain with the firm. The optimal contract involves an appropriate balancing of these costs and benefits.

Implications

Employees normally are offered an incentive contract that implies less effort than would be required if the employer could costlessly observe the effort choices. When effort is contractible, the effort level $\hat{e}$ that would maximize the firm's value could be elicited without imposing risk on the employee. When effort is unobservable, the employer could elicit $\hat{e}$ by paying sufficiently high incentive pay. Yet costs of inefficient risk bearing normally make this an undesirable choice.[15]

Our analysis suggests five factors that are likely to be important in selecting how strongly pay should be tied to performance. These factors are summarized in Table 15.2. The first factor is the sensitivity of the value of the output to additional effort from the employee. In our example, this factor is captured by α—Erica's marginal productivity. A high α implies that incentive pay (holding other factors constant) is effective because the benefits of motivating effort are high. A second factor is the risk aversion of the employee. Higher risk aversion implies a higher cost from inefficient risk bearing and thus lowers the use of incentive pay. The third factor is the level of risk that is beyond the employee's control (σ^2). When the level of risk is low, output is determined primarily by the employee's effort and it makes sense to pay higher levels of incentive compensation. But when this risk is high, incentive compensation imposes high costs for inefficient risk bearing. The fourth factor is how much additional effort the employee exerts as incentives are increased. If the employee is unresponsive to increased incentives, high incentive compensation imposes more risk on the employee while inducing little additional effort. Thus, there is less reason to provide high incentive pay. The responsiveness to incentive pay depends on the personal costs to the employee for exerting additional effort. For instance, changing the cost function in Figure 15.3 from e^2 to e^3 would make Erica less responsive to changes in incentives. With the original cost function, Erica increases effort by 5 units as β is increased from .2 to .3. But the increase is only

[15]The basic model assumes that the employer has the relevant knowledge to solve this problem, including knowledge of the production function, the employee's utility function, and the variance of the random error term. For a mathematical derivation of the results in this section, see Chapter 7 of P. Milgrom and J. Roberts (1992), *Economics, Organization, and Management* (Prentice Hall: Englewood Cliffs, NJ).

Factors That Favor High Incentive Pay
1. The value of output is sensitive to the employee's effort.
2. The employee is not very risk-averse.
3. The level of risk that is beyond the employee's control is low.
4. The employee's response to increased incentives is high (the employee exerts substantially more effort).
5. The employee's output can be measured at low cost.

Table 15.2 Implications of the Principal-Agent Model

The model suggests that the five factors listed are likely to be particularly important in determining how strongly to base pay on performance.

.58 under the second cost function.[16] Finally, our analysis presumes that Erica's output can be observed costlessly. This is not always the case. The more expensive it is to measure her output, the less likely that she will be offered incentive pay. We discuss these measurement cost issues further in Chapter 16.

Du Pont Revisited

The principal-agent model suggests at least two problems with the Du Pont plan. Both problems stem from using divisional profits as an output measure. First, under the plan, individuals bear the full costs of their own effort but realize only a small fraction of the output of their effort—it is shared with 19,999 other employees (β is quite small for individual employees). The limited incentives are due to the basic *free-rider problem* discussed in Chapter 10. We discuss this issue in greater detail below under the topic of group incentives. The second problem is that divisional profits are affected by many random factors (σ^2 is high) as well as the effects of other employees throughout the division. Thus the compensation plan imposes substantial uncontrollable risk on the employees. Du Pont would have provided more effective incentives if it had paid the employees based on disaggregated output measures over which they had greater control—in the limit, their own output.

Incentive Pay and Expected Compensation

A study of earnings of employees in 500 U.S. firms in the footwear and clothing industries found that piece-rate employees on average were paid 14 percent more than employees paid straight salaries. This premium was found after controlling for union status, sex, and other variables that might affect compensation. Economic theory suggests at least three reasons for this wage premium. First, people work harder under piece rates than under fixed salaries and must be compensated for the extra effort. Second, piece rates impose risk on employees; output is affected by random factors such as equipment failures. Thus firms using piece rates must pay a compensating differential for risk. A third reason—which we have not discussed in this chapter—is that piece rates are likely to attract more highly skilled and productive employees, since they will earn more under piece rates than under fixed salaries. Firms have to pay more for more talented employees.

Source: E. Seiler (1984), "Piece Rate vs Time Rate: The Effect of Incentives on Earnings," *Review of Economics and Statistics* 66, 363–376.

[16]Technical note: It is the second derivative of the cost function that is important in determining the response rate: Larger second derivatives (or equivalently steeper marginal cost curves) translate into lower response rates.

Informativeness Principle[17]

Basic Principle: Informativeness Principle

In designing compensation contracts, theory suggests that it is productive to include all performance indicators that provide additional information about the employee's effort (assuming the measures are available at low cost). Measuring the employee's effort with more precision reduces the costs of inefficient risk bearing and leads to a more efficient effort choice.

As we have seen, incentive problems exist because of imperfect information. If the actions of employees were observable at zero cost, it would be easy to write contracts to motivate appropriate behavior. It follows that the inefficiencies that result from incentive problems can be reduced by improvements in information. The standard principal-agent model assumes that there is only one indicator of an employee's effort, the employee's output. In many cases there are other sources of information that can be used to determine whether or not the employee worked hard. For instance, Du Pont was able to tell that the decline in profits in 1990 was not due entirely to a lack of effort on the part of divisional employees by observing the increase in the price of oil and the performance of other companies as well as by gathering information such as government reports on general business conditions. Appropriate use of this type of information increases the precision by which employee effort is measured and, when included in the compensation contract (with the appropriate weights), reduces the costs of inefficient risk bearing. In theory, it is optimal to include all indicators that provide additional information about the employee's effort in the compensation contract—assuming the measures are available at low cost. This basic idea is called the *informativeness principle.*

One important source of information about an employee's effort level is the output of coworkers performing similar tasks. For instance, if a salesperson's performance is poor in a given year, was the person unlucky or lazy? If average sales in the company declined substantially over the same time period, it is more likely that the employee was simply unlucky. If other salespeople had great years, the salesperson is more likely to have been lazy. The informativeness principle implies that information about other employees' sales should be included in the compensation contract as a benchmark—that is, the firm should employ a *relative performance contract.* Chapter 16 provides an extended discussion of relative performance evaluation and highlights several potential problems that can make relative performance evaluation undesirable.

The informativeness principle indicates that it typically is beneficial to include low-cost indicators in the compensation contract that improve the employee's performance measure. It also can be desirable for the firm to expend additional resources on developing even more precise measures of performance. Here, there is a trade-off between the costs of developing as well as implementing better performance measures and the benefits of improved effort motivation and more effective risk sharing.

The informativeness principle suggests that Du Pont could have reduced the risk imposed on the employees by including other indicators in the contract. For instance, rather than use an absolute performance standard (such as 4 percent real earnings growth), the target could have been set relative to the growth of other firms in the same industry. This type of contract might have avoided some of the problems that the company faced in 1990, when employees were likely to lose money under the plan due to circumstances beyond their control.

The informativeness principle also suggests that Du Pont could have reduced the uncontrollable risk imposed on its employees by adjusting earnings to reflect external

[17]Material in this section draws on B. Holmstrom (1982), "Moral Hazard in Teams," *Bell Journal of Economics* 13, 324–340.

changes in market conditions. For example, the company could have adjusted division profits for the change in oil prices from the Gulf War. In fact, the firm might want to enter financial contracts (for example, futures, forwards, swaps, or options) to transfer this risk from the fibers division to external markets to reduce the risk imposed on the division's employees and hence the required compensating differentials in their compensation packages.[18]

Group Incentive Pay

In the basic principal-agent model, employees are motivated by being paid based on their *own output*. Many firms, however, base incentive pay on *group performance*—Du Pont is an example. For instance, of 735 publicly traded companies responding to a 1998 survey by the American Compensation Association, 73 percent offered performance-related variable pay in addition to base salary for nonexecutive employees. In addition, 46 percent offered company stock options to nonexecutive employees.[19] This group pay can take a variety of forms: payoffs can be linked to the performance of the team, business unit, or the firm as a whole; and performance can be measured by stock prices, accounting earnings, or other more focused measures. (See Chapter 17 for a more extensive discussion of group performance measures.)

There are at least three reasons why firms might favor group incentive plans over individual plans:

- Individual performance generally is difficult to measure, while the performance of a group of employees often can be measured at reasonably low cost. For example, most firms' cost accounting systems measure the performance of business units for control purposes. Hence, at little additional cost these measures also can be used in administering compensation plans. However, further disaggregation—in the limit, providing a personalized measure of the performance of each employee—would be much more difficult and expensive.
- Group pay encourages cooperation and teamwork, whereas some individual incentive plans (depending on design) motivate more self-centered actions.
- Group plans can motivate employees to monitor each other for bad performance. Mutual monitoring is beneficial because the specific knowledge about individual performance often is held by teammates.
- Group pay often is structured to help retain valued workers. It normally must be forfeited if the employee quits. Although employees must be compensated for this loss of flexibility, there can be important benefits of increased expected tenure; for example, it raises the expected payoffs of making certain firm-specific investments.
- Finally, if the demand for employees' labor services by competitors is positively correlated with their group's success, then using group incentive pay can help adjust compensation automatically to reflect changes in employees' opportunity costs. This can reduce contracting costs.[20]

[18]C. Smith (1995), "Corporate Risk Management: Theory and Practice," *Journal of Derivatives* 2, 21–30.

[19]We thank Kevin J. Murphy for providing these estimates based on his analysis of the ACA data.

[20]P. Oyer (2001), "Why Do Firms Use Incentives That Give No Incentive Effects," Stanford University working paper.

Nonetheless, standard free-rider arguments provide a strong reason to question whether group plans provide effective incentives, particularly when the group is quite large. In Du Pont's fibers division, with its 20,000 employees, contributions of individual employees have little discernible effect on the overall bottom line (profits are an incredibly noisy measure of each employee's output). Also individual employees receive only a small fraction of the value each creates (it is shared with 19,999 other divisional employees and the owners of the firm). Thus, profit-sharing plans would appear to produce limited incentive effects. Yet this is not surprising. Should one really expect that paying a janitor on overall company performance would motivate that person to push the broom harder or to complain when other janitors shirk on their jobs?[21] These arguments suggest that large-group incentive plans (like Du Pont's) impose risk on employees but produce limited benefits.

Although many economists find the free-rider arguments to be quite compelling, there are some offsetting considerations that potentially help explain the widespread popularity of group plans—despite the fact that free-riding is a problem. First, it might be beneficial to increase the awareness of employees about the stock-price performance and profitability of the company. By focusing on these measures, employees learn how managerial and employee actions affect the bottom line. For instance, employees might be less likely to complain about a corporate restructuring when they see that it increases the firm's stock price. Indeed, it probably takes little stock ownership to motivate most employees to monitor the stock price on a frequent basis. Hence, these benefits can be obtained while shifting little risk to the employees. Second, employees might be less likely to take actions that harm other members of a group with whom they identify closely. Thus, when the group receives incentive pay, employees might not want to harm teammates by shirking on the job. In this case, attempting to avoid feelings like guilt or shame might motivate employees, even if they face limited direct financial consequences from shirking.[22] Third, paying employees on stock-price performance and profits sends signals to employees about what is valued within the company. These signals serve to reinforce a performance-based corporate culture (see Chapter 11). To be most effective, however, they must be complemented by other features of organizational architecture that provide more direct incentives.

Multitask Principal-Agent Problems[23]

In the standard principal-agent model, effort is one-dimensional—the firm cares only about how hard the employee works. But most jobs involve a variety of tasks. For instance, employees on an assembly line can spend time increasing output, improving quality, performing preventative maintenance, or helping teammates. Similarly, professors at universities allocate their time among teaching, research, consulting, and administrative duties. Thus, managers usually have to be concerned not only with how hard employees work but also with how they allocate their time among assigned tasks; university officials are not indifferent to how professors allocate their time.

[21]This example was suggested by K. J. Murphy.

[22]E. Kandel and E. Lazear (1992), "Peer Pressure and Partnership," *Journal of Political Economy* 100, 801–817.

[23]This section draws on B. Holmstrom and P. Milgrom (1991), "Multitask Principal-Agent Analysis: Incentive Contracts, Asset Ownership, and Job Design," *Journal of Law, Economics and Organization* 7, 24–52.

Incentive Compensation Means Pay Cuts for Poor Performance

Imposing risk on employees means that poor performance gets penalized. Take the case of Stephen Wiggins, former CEO of Oxford Health Plans. Oxford, the once high-flying managed-care company, suffered large losses of $291 million in 1997. The stock price fell 80 percent from its high a year earlier. Wiggins, who founded the company and still owned about 5 percent of the stock in the firm, took a 61 percent pay cut. All but one of the other six highest-paid executives took pay cuts and only two of the seven executives at Oxford in 1997 were there in 1998. And Wiggins, although still chairman of the board, was replaced as CEO. In 1998, he resigned as chairman.

Source: R. Winslow (1998), "Wiggins, Ex-CEO of Oxford Health, Took 61% Cut in Total Pay Last Year," *The Wall Street Journal* (May 4), B8.

Motivating an employee to strike the appropriate balance among tasks is not easy. A complicating factor is that in some tasks, effort is more easily monitored and output more easily measured than in others. For instance, university officials can observe teaching ratings, whereas the quality of administrative service is harder to measure. Compensating employees based on what is measurable encourages them to exert effort on the compensated tasks but to shirk on the others. For example, paying professors based solely on teaching ratings would encourage effort on teaching at the expense of administrative service and research. Similarly, paying an assembler based on output would encourage the employee to produce more units but to ignore quality or helping teammates. These multitask considerations suggest that firms often might want to avoid paying employees based solely on measurable outputs. The appendix to this chapter provides a more detailed analysis of these considerations.

Given enough time, managers are likely to obtain information about the overall performance of employees. For example, deans have the opportunity to observe the service of professors on committees; they hear comments on faculty research from colleagues; they talk to students about teaching quality. Incentives can be provided to employees by basing promotions, terminations, and periodic pay adjustments on this type of information. Indeed, universities rely heavily on these mechanisms to motivate faculty. Evaluating this information usually requires *subjective judgments* on the part of managers. To provide proper incentives to employees, managers must develop reputations of being impartial and objective. To be most effective, firms must establish performance measures and rewards that motivate managers to develop these reputations. Chapter 16 provides an expanded discussion of subjective performance evaluation.

Forms of Incentive Pay

The term *incentive pay* frequently evokes images of piece rates, commissions, and cash bonus plans, where employees are paid based on measurable output. This image is not surprising given that more than a quarter of the employees in the U.S. manufacturing sector receive at least part of their income through such incentive plans.[24] Our discussion in this chapter suggests that mechanisms like tying promotions and salary adjustments to performance also are forms of incentive pay. Broadly speaking, any compensation contract (explicit or implicit) that rewards employees for good performance or punishes employees for poor performance can be considered incentive pay. (Recall the Mary Kay Cosmetic Company's innovative use of incentives

[24]J. McMillan (1992), *Games, Strategies, and Managers* (Oxford University Press: New York), 93.

Red Envelopes, Gold Stars, and Mugs

Many companies have formal recognition programs to praise employees who do an outstanding job on a special project or just to say thank you. Cheryl Quinn at Xerox received a red envelope with a $100 dinner certificate for providing some data for a senior manager's special project that was outside of Quinn's job description. Everyone in her department saw the red envelope being delivered to Quinn and knew it signified that she was being recognized for her performance. In fact there is a "recognition industry" that sells companies certificates, lapel pins, plaques, medallions, mugs, candles, key chains, and feel-good toys like the "Squeezable Praise" (a pocket-sized foam toy that says "way to glow"). Clearly, employees like praise and recognition. However, compensation consultants offer several warnings about such recognition programs. Don't hand out mugs to employees who have landed million-dollar contracts. It's demeaning. Don't pit employees against each other to see who can get the most recognition mugs. And most important, a plaque or certificate does not substitute for a good salary or benefits.

Source: R. Flanigan (2002), "Will Work for Praise," *Rochester Democrat and Chronicle* (November 4), E1.

discussed in Chapter 11.) Under this definition, all the following are forms of incentive compensation[25]:

- Piece rates and commissions
- Bonuses for good performance
- Prizes for winning contests (for example, vacations)
- Salary revisions based on performance
- Promotions and titles for good performance
- Preferred office assignments for good performance
- Stock ownership and profit-sharing plans
- Firings and other penalties for poor performance
- Deferred compensation and unvested pensions that are forfeited on dismissal

It is important to emphasize that rewards *do not have to be monetary.* Rewards can consist of anything that employees value. For example, managers in some organizations have little flexibility in what they pay employees. Nonetheless, incentives can be provided by rewarding more productive employees with desirable job assignments, better offices, preferred parking spaces, special honors, and trips to training sessions in attractive locations.

Incentive Compensation and Information Revelation

The basic principal-agent model assumes that the employer and employee have the same information at the time of initial contract negotiations. In some contracting situations, precontractual information is asymmetric.[26] For example, prospective employees

[25]G. Baker, M. Jensen, and K. Murphy (1988), "Compensation and Incentives: Practice versus Theory," *Journal of Finance* 43, 593–616.

[26]In Chapter 10, we divided asymmetric information into two categories—precontractual and postcontractual. Thus far, in this chapter, we have focused on postcontractual information problems (also called *moral-hazard* or agency problems). In this section, we discuss precontractual information problems (also called *adverse-selection* problems).

generally know more about their likelihood of quitting over the next year than the prospective employer. Similarly, sales representatives are more likely to know about the sales potential of their territories than are higher-level managers.

Sometimes it is possible for the firm to induce employees to reveal their private information by clever design of the compensation contract. Consider the example of Onex Copy Company. This company uses sales representatives throughout the country to sell copy machines to customers. Each salesperson is assigned a specific territory. Some territories have greater sales potential than others. For simplicity, suppose that there are only two types of territories, good and bad. Good territories have the potential to generate $2 million in sales, while bad territories have the potential to generate only $1 million in sales. The sales representatives know the quality of their own territories. Central managers have insufficient information to distinguish between good and bad territories.

The firm would like to use information about whether specific territories are good or bad to evaluate the performance of the sales representatives. The company also wants accurate forecasts to plan production cycles. The company simply could ask the sales representatives to state the quality of their territories. But the sales representatives with good territories are likely to be less than completely truthful: If the firm thinks that a good territory is bad, the representative will look good when sales are high. (Alternatively, the salesperson can generate the expected poor sales with only limited effort.)

In this example, the firm can induce the salesperson to tell the truth by offering the following menu of contracts. Sales representatives who state that their territories are good receive compensation contracts that pay 2.6 percent of sales. Sales representatives who state that their territories are bad receive a flat wage of $50,000. Given this choice, it is in the interests of all salespeople to tell the truth: Those with bad territories would prefer the $50,000 wage contract (2.6 percent of $1 million = $26,000), whereas those with good territories would prefer the contract that pays 2.6 percent of sales (for them, a $52,000 payout). The key to making the plan work is that the compensation for each type of employee is higher when the information is correctly reported than when it is not.

Providing Incentives to Work and Tell the Truth at IBM Brazil

There is no systematic evidence on how frequently firms design compensation contracts to provide incentives for truthful information revelation and hard work. We are aware of one example, IBM Brazil. During the 1970s, this company experimented with a compensation plan that rewarded its salespeople for accurate sales forecasts and actual sales performance. At the start of each period, headquarters would provide salespeople with forecasts of future sales in their territories. Then they would indicate what proportion of this forecast each salesperson thought could be met. For instance, a value of 1 would indicate that this salesperson thought the forecast could be better by 50 percent. The bonus payments under the plan rewarded salespeople for actual sales, relative to the company forecasts, and sales relative to their own forecasts. The payments were set in a manner that encouraged both hard work and accurate forecasts.

According to IBM's management, the plan seemed to work relatively well. The company did encounter some unanticipated problems in implementation. For instance, salespeople quickly learned how the plan could be "gamed" by shifting sales between sales periods. For example, a salesperson might delay a sale in one period in order to promote higher sales and improve personal sales forecasts in the future. IBM, however, implemented penalties that discouraged this type of behavior. The difficulties that IBM encountered in implementation might help explain why these types of plans are not used more frequently by other companies.

Source: G. Jacob (1978), "Tie Salesmen's Bonuses to Their Forecasts," *Harvard Business Review* 56 (May–June), 116–123.

In this example, there are many potential compensation plans that would induce truth telling. The problem for the firm is to choose the most profitable contract. Onex is likely to want the compensation contract to provide strong performance incentives, as well as to induce truth telling. Thus, it might choose to pay commissions to both types of employees but structure different commission rates to induce truth telling.

Does Incentive Pay Work?

Throughout this chapter, we have argued that compensation plans motivate employees. Although this argument is readily accepted by many people, it is not without controversy. Quality guru W. Edwards Deming has gone so far as to assert that "pay is not a motivator." In the same spirit, psychologist Alfie Kohn, in a controversial article on the merits of incentive pay, states, "Bribes in the workplace simply can't work."[27]

Critics of incentive pay generally rely on two basic arguments. The first is that money does not motivate employees. As support for this view, it is pointed out that employees usually rank money relatively low when it comes to factors that make a job attractive. Factors such as the nature of work and quality of colleagues appear more important. The second, more prominent criticism is that it is difficult (if not impossible) to design an effective incentive compensation plan. Support for this argument is provided by the many examples of flawed compensation plans that have produced unwanted behavior (for example, the case of Merrill Lynch discussed in Chapter 2). Interestingly, these two lines of criticism are somewhat at odds with one another. If money did not motivate people, incentives plans would not produce the dysfunctional behavior that proponents of the second argument cite. In making a similar point, economist George Baker notes, "The problem is not that incentives can't work but that they work all too well."[28]

Certainly, it is easy to identify examples of compensation plans that have caused dysfunctional behavior among employees. We have done so throughout this book.

The Power of Incentives: Evidence from Chinese Agriculture

One especially interesting piece of evidence on the effectiveness of incentive pay comes from one of the largest economic experiments in history—reforms in Chinese agriculture in the early 1980s. Between 1952 and 1978, the Maoist period, Chinese agriculture revolved around the commune system. Under this system, employees were divided into production teams. There were some attempts to tie pay to performance. However, these incentives were relatively weak, and there was a tendency to base pay on family size, independent of effort. From 1980 to 1984, under the rule of Deng Xiaoping, the commune system was gradually replaced by the "household-responsibility system." Under this system, each peasant family was given a long-term lease on a plot of land. The family had to deliver a quota of agricultural products to the government each year, but it could keep any production in excess of the quota. This additional output could be consumed by the family or sold to others.

Economic theory argues that the ownership of residual claims on output provides strong incentives. Thus, this theory predicts higher productivity under the household-responsibility system than the commune system. Empirical studies support this prediction. For instance, one study estimated that productivity in Chinese agriculture increased by nearly 50 percent over the period of the Dengist reforms.

Source: J. McMillan (1992), *Games, Strategies, and Managers* (Oxford University Press: New York), 96–98.

[27]A. Kohn (1993), "Why Incentive Plans Cannot Work," *Harvard Business Review* (September–October), 54–63.

[28]G. Baker (1993), "Rethinking Rewards," *Harvard Business Review* (November–December), 44–45.

CASE STUDY: *The Debate over CEO Compensation*

The most visible and highly paid person in most corporations is the chief executive officer (CEO). CEO compensation is particularly important to firms for three reasons. First, the compensation package is likely to be important in attracting and retaining good CEOs. Second, the form of the pay contract is likely to help determine whether the CEO focuses on value maximization or some other objective. Third, employees throughout the organization carefully follow their CEO's pay. Important morale problems can occur when employees think that the CEO is overpaid. For instance, employees complain bitterly when they are asked to take pay cuts because the company is in trouble, yet at the same time the CEO gets a big raise.

Controversy over CEO pay has increased substantially in recent years. One charge is that the *level* of CEO pay is too high. CEO pay is so huge that people don't believe they deserve it. It is easy to point to many CEOs who report compensation in the millions of dollars (reported compensation figures typically include salary and bonus payments, as well as gains from the exercise of stock options). Consider the following two examples. Investors were outraged when E*Trade Group Inc. disclosed it had paid out a $77 million compensation package for CEO Christos M. Cotsakos in 2001—a year in which the financial-services company lost $242 million. When Cotsakos pledged later to return $21 million, the complaints hardly subsided. In 2001 Qwest Communications posted a $4 billion loss and employees were laid off. However, Qwest's CEO, Joseph Nacchio, received a $1.5 million bonus, $24 million in cash, $74 million in exercised options, and was granted 7.25 million new options. In 1980, CEO compensation was 42 times that of the average worker. In 2000, it was 531 times.

The second major criticism of CEO pay concerns how CEOs are paid. Critics argue that CEOs are agents of stockholders and that CEO pay should be based heavily on stock-price performance. In some celebrated cases CEO pay appears disconnected to CEO performance. For example, Ford Motor Co. reported a $5.45 billion loss in 2001. Workers were laid off, and salaries for nearly everyone left suffered. Even though former Ford CEO Jacques Nasser was fired, he still received about $20 million in compensation for the year. Since 1980, the increasing use of stock options has boosted the sensitivity of the average CEO's wealth to firm performance. However, the absolute sensitivity of CEO wealth to performance remains small. Research indicates that for a $1,000 change in firm value, the wealth of the average CEO of a large public corporation changes by only about $10.57. Some argue this relation (which is equivalent to the CEO owning 1.057 percent of the common stock) is too small and that most companies would be better off if they increased incentive pay for CEOs. Some support for this view seems to come from studies that document an increase in stock price when companies announce that they are increasing incentive pay for CEOs.

Discussion Questions

1. Do you think the fact that most American CEOs are paid so much more than rank-and-file employees suggests CEOs are overpaid? Explain.
2. Japanese CEOs generally receive much lower levels of compensation than CEOs in the United States. Does this imply that U.S. CEOs are overpaid?
3. Is it obvious that $3.25 per thousand is too low incentive pay for CEOs? Explain.
4. Does the observation that the stock price increases when firms increase incentive pay for CEOs suggest that most CEOs do not receive enough incentive compensation? Explain.

SOURCES: J. Byrne (1991), "The Flap over Executive Pay," *Business Week* (May 6), 90–112; M. Jensen and K. Murphy (1990), "CEO Incentives—It's Not How Much You Pay, But How," *Harvard Business Review* (May–June), 138–153; J. Haubrich (1994), "Risk Aversion, Performance Pay, and the Principal-Agent Problem," *Journal of Political Economy* 102, 258–276; J. Brickley, S. Bhagat, and R. Lease (1985), "The Impact of Long-Range Compensation Plans on Shareholder Wealth," *Journal of Accounting and Economics* 7, 115–129; P. Elgin (2002), "E*Trade: CEO Pay Isn't the Only Problem," *BusinessWeek Online* (May 17); L. Bebchuk, J. Fried, and D. Walker (2002), "Managerial Power and Rent Extraction in the Design of Executive Compensation," *University of Chicago Law Review* 69, 751–846; and "CEOs: Why They're So Unloved," Editorials, *Business Week* (April 22, 2002).

Teachers Gaming Student Test Scores

To improve public education, a number of school districts reward teachers with cash bonuses if their school's test scores rise. However, such systems have spawned cheating among teachers to boost their ratings. Kentucky, for example, created an annual test, heavy on essay questions. Schools were rated on how well their students did along with attendance and dropout rates. The essays were graded by the students' own teachers. If a school's rating dropped, sanctions were imposed—consultants were hired, and in extreme cases a new principal was brought in with the power to dismiss teachers. Schools performing well received rewards that, at the discretion of teachers, were used to buy supplies or pay teachers bonuses. In 98 percent of the time, the teachers paid themselves a bonus, as much as $2,602 in extra cash or 7 percent of the average salary.

Problems surfaced quickly. In 96 percent of the schools surveyed, auditors found that grades assigned to the writing portion of the exam—which counted for 14 percent of each school's total score—were too generous by an average of 35 points on a 140-point scale. Teachers were found typing students' essays. Students received advance copies of the test and tip sheets. Teachers explained questions to students during the exam. Students admitted to being coached by teachers during the test.

The tests are distributed to schools three weeks before the exam so that school officials can prepare for the exam. Ed Reidy, state deputy commissioner for assessment, states, "I operate under the assumption most people are ethical and what we need are procedures in place to catch folks when they're not." This example demonstrates that poorly designed incentive plans can induce dysfunctional behavior.

Source: B. Stecklow (1997), "Kentucky's Teachers Get Bonuses, but Some Are Caught Cheating," *The Wall Street Journal* (September 2), A1.

Incentive plans also involve administrative costs, such as tracking output and explaining the system to employees. The important question is not whether incentive plans entail costs—they certainly do. Rather, is it possible to design incentive plans where the benefits exceed the costs? Examples like the Lincoln Electric Company (discussed in Chapter 16) suggest that the answer is yes. Also, the fact that incentive plans—commissions, piece rates, bonus plans, and stock options—have survived so long in a competitive marketplace suggests that the net benefits of incentive pay often are positive.

Unfortunately, the scientific evidence on this debate is limited.[29] Numerous studies indicate that tying pay to performance has a positive impact on employee performance. Other studies reach the opposite conclusion. Since many of these studies have serious flaws, it is difficult to draw strong conclusions from the evidence. Our overall reading of this literature indicates that incentive compensation is value-enhancing if properly designed and implemented. Thus we have focused on providing insights into how managers might accomplish this task.

Summary

Incentive problems exist because of conflicts of interest between employers and employees. These problems are easily resolved when actions are costlessly observable. Firms can identify the most efficient actions by employees and pay employees only if these actions are taken. In most situations employee actions are not observable at low cost. Here, firms can motivate employees through incentive compensation.

In a competitive labor market, employees must be compensated for undertaking actions they find undesirable—there are compensating differentials. Thus, it is not sensible to have employees work as hard as possible. In eliciting particular actions, there is a trade-off between the benefits of the action for the firm and the personal costs to the employees.

[29]G. Milkovich and J. Newman (1993), *Compensation* (Richard D. Irwin: Burr Ridge, IL), Chapter 8.

Incentive problems arise because most of the costs of exerting effort are borne by employees, whereas most of the gains go to their employers. Sometimes, there is a simple way to resolve this incentive problem even when the actions of employees are unobservable. The solution is to sell each employee the rights to his or her total output. By selling employees their output, both the benefits and costs of exerting effort are internalized by employees and thus employees will make more productive choices. We observe this solution being approximated in private firms as well as in franchising. There are at least three important factors that limit the use of ownership in solving incentive problems: wealth constraints, team production, and costs of inefficient risk bearing.

Risk-averse individuals do not like to bear financial risks; they prefer income flows with less volatility. Risk-averse individuals can benefit from sharing risks because it lowers the volatility of the individual cash flows. People often vary in their attitudes toward risk. For instance, some people are more willing to tolerate financial risks than others. An efficient allocation of risk takes these differences in preferences into account. If one party is risk-neutral whereas another party is risk-averse, it is better to have the risk-neutral party bear all the risk and the other party to receive a fixed payment.

Stockholders of firms often hold diversified portfolios; this is a powerful method for managing firm-specific risks. Employees, in contrast, have much of their human capital invested in a single firm and hence have fewer opportunities to manage risk through diversification. Thus, from a risk-sharing standpoint, it is better to pay employees more through fixed salaries and to let the risk of random income flows be borne more by the shareholders. Yet fixed salaries provide limited incentives for employees to exert effort: *Therefore, there is a trade-off between optimal risk sharing and optimal incentives.*

Economic analysis of incentive compensation begins with the basic principal-agent model. This model presents a relatively simple characterization of the contracting process. However, it illustrates the trade-offs between risk sharing and incentives and provides a number of useful insights for designing better compensation plans. In particular, the model suggests that firms should pay more performance-based pay when (1) the sensitivity of the value of output to additional effort by the employee is higher, (2) the employee is less risk-averse, (3) the level of risk that is beyond the employee's control is lower, (4) the employee response to increased incentives in terms of exerting additional effort is more pronounced, and (5) employee output is more easily measured.

According to the *informativeness principle,* it is useful to include all indicators that provide additional information about employee effort into the compensation contract—provided that these indicators are available at low cost. Including these indicators in the contract reduces the randomness of payouts and thus the costs of inefficient risk bearing. One important source of information about an employee's effort is the output of coworkers performing similar tasks. The informativeness principle suggests that it is useful to employ *relative performance evaluation.* In Chapter 16, however, we discuss several factors that can limit the desirability of relative performance evaluations.

In the basic principal-agent model, employees are motivated by basing compensation on their own output. But many firms base incentive pay on *group performance.* Common reasons offered for group incentive pay are that group performance can be less expensive to monitor than individual performance, group performance emphasizes teamwork, and group plans motivate employees to monitor one another's performance. Standard free-rider arguments provide a strong reason to question whether group plans provide effective incentives—particularly when the group is large. At least three factors might help explain the widespread popularity of these plans, even though free-riding is a potential problem. First, it can be beneficial to increase employee awareness of stock-price performance and profitability (assuming employees can be motivated to monitor these measures by relatively modest plans that do not impose much risk on employees). Second, employees might feel guilty from shirking and imposing costs on teammates who are compensated on group performance. These feelings might motivate employees, even if the direct financial consequences are small. Third, paying employees on firm performance sends a strong signal to employees about what is valued within the company. To be most effective, however, these signals must be reinforced by other parts of the organizational architecture that provide more direct incentives.

Most jobs involve a variety of tasks. Motivating an employee to strike the appropriate balance among tasks is not easy. A complicating factor is that some tasks are more easily measured than others. Compensating the employee based on what is measurable will encourage the employee to exert more effort on the compensated tasks but shirk on other tasks. These *multitask considerations* suggest that firms often want to avoid paying employees based solely on measurable outputs. Given enough time, managers are likely to obtain information about the overall performance of employees. Incentives can be provided by basing promotions, terminations, and periodic pay adjustments on this information. Often, this information is not easily quantifiable but is based on the subjective opinions of supervisors.

The term *incentive pay* conjures up images of piece rates, commissions, and cash bonus plans, where the employee is paid based on measurable output. Broadly speaking, however, any compensation contract (explicit or implicit) that rewards employees for good performance or punishes employees for poor performance can be considered incentive pay. *Rewards do not have to be monetary.* Rather, rewards consist of anything that employees value.

The basic principal-agent model assumes employers and employees have the same information at the time of initial contract negotiations. In many contracting situations precontractual information is asymmetric. Sometimes it is possible for the firm to induce employees to reveal their private information by clever design of the compensation contract. For such a plan to work, the payoffs to employees must be higher when they are honest than when they misrepresent information.

Throughout this chapter, we have argued that compensation plans motivate employees. Although this argument is accepted by many, it is not without controversy. Critics of incentive pay rely on two basic arguments. The first is that money does not motivate people. The second, more prominent criticism is that it is difficult (if not impossible) to design an effective incentive compensation plan. The first argument seems inconsistent with the many examples where monetary incentives have dramatically affected employee behavior. The second argument is correct: Developing an appropriate incentive plan rarely is easy. The important question is whether plans can be designed where the benefits exceed the costs. Examples such as Lincoln Electric suggest it can be done. Our intent is to provide insights into how managers might design value-maximizing contracts.

Appendix

Multitask Principal-Agent Theory[30]

This appendix provides a more detailed example of the multitask principal-agent model. It also uses this framework to analyze the corporate practice of *telecommuting*—employees working out of their homes and communicating with the central office via fax, computer, or telephone. This application illustrates how principal-agent theory can provide insights into specific managerial policy decisions.

[30]This appendix requires elementary knowledge of calculus. This appendix draws on Milgrom and Holmstrom (1991).

Multitask Model

Adel el Gazzar is a production employee at the Bijar Dye Company. He works 10 hours per day. His job consists of two tasks, assembling parts and checking the quality of his output. He is paid a piece rate for each part that he assembles. He also receives a bonus that is based on the quality of his output. Denote t_1 and t_2 as the hours per day he devotes to producing output and checking quality, respectively. Adel's incentives are high enough so that he will not shirk: He works the full 10 hours. Therefore, $t_2 = (10 - t_1)$.

Suppose that Adel's compensation translates into the following relation between compensation and the time allocated to each activity:

$$\begin{aligned} \text{Compensation} &= \alpha_1\left(6t_1^{1/2}\right) + \alpha_2 t_2 \\ &= \alpha_1\left(6t_1^{1/2}\right) + \alpha_2(10 - t_1) \end{aligned} \tag{15.9}$$

where the α's are the weights that the compensation plan places on quantity and quality (the *incentive coefficients*).[31] Adel's objective is to maximize his compensation. He chooses t_1 to meet the following first-order condition:

$$\alpha_1\left(3t_1^{-1/2}\right) = \alpha_2 \tag{15.10}$$

This condition has a straightforward interpretation. The left-hand term is the marginal benefit for allocating time to producing higher quantity, whereas the right-hand term is the marginal benefit for allocating time to producing higher quality. At an interior solution, these marginal returns must be equal. If the marginal benefits are not equal, Adel is better off devoting more time to the activity with the higher value and less time to the activity with the lower value. Figure 15.4 provides an illustration. When t_1 is small, the returns for devoting extra time to quantity are high relative to the returns from allocating time to quality. Here, it makes sense to increase the time devoted to quantity and correspondingly reduce the time spent on quality. As Adel continues to increase the amount of time he spends on quantity, the marginal benefit declines.[32] At the optimum t_1^*, the marginal returns are equal. Beyond t_1^*, the marginal returns from allocating time to quantity are less than for allocating time to quality.

If Adel's supervisor chooses α_1 and α_2 so that the marginal return for one of the activities is always higher over the relevant range, $0 \le t_1 \le 10$, Adel will devote all 10 hours to the activity with the higher marginal return (there is a corner solution).

Solving Equation (15.10) for t_1 yields

$$t_1 = 9(\alpha_1/\alpha_2)^2 \tag{15.11}$$

This equation shows that when $\alpha_1 = \alpha_2$, Adel will spend 9 hours producing output and 1 hour checking its quality. Observing how t_1 and t_2 change with changes in the α's provides two important insights:

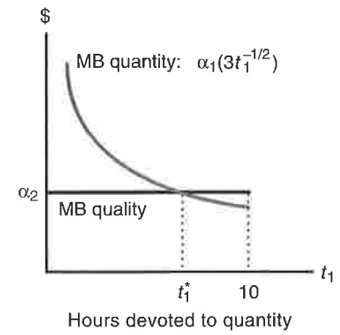
- A manager can motivate an employee to devote more time to a task in two ways: First, the manager can increase the incentive coefficient for that task. Second, the manager can reduce the incentive coefficient for the alternative task. In our example, Adel will devote more time to quantity if either α_1 is increased or α_2 is decreased. Increasing α_1 increases the direct return from investing in quantity, while decreasing α_2 reduces the opportunity cost (the compensation that is lost from not investing in quality).
- If an incentive coefficient for a given task is sufficiently small, relative to the other incentive coefficient, an employee will devote no time to the task. In our example, if $(\alpha_1/\alpha_2)^2 > 1.12$, Adel will devote no time to quality ($1.12 \times 9 > 10$ hours). This result indicates that if a manager wants an employee to devote time to multiple tasks, the manager must be careful to provide balanced incentives. Setting too strong an incentive for one task can undermine effort on other tasks.

[31] The terms in this equation are chosen to simplify the calculations and yield reasonable values for the time allocated to the two activities. Our basic results, however, are quite general and are not specialized to this particular example.

[32] Technical note: For simplicity, we assume that time devoted to producing quantity is more strenuous than that devoted to quality. Thus, with more time devoted to quantity, he becomes tired and less productive. We have assumed that the marginal benefit from allocating time to quality is constant. This assumption is not necessary.

Figure 15.4 Optimal Allocation of Effort

In this example, Adel must allocate his time between two activities, producing quantity and checking its quality. The number of hours devoted to quantity is t_1. Since he puts in 10-hour workdays, he devotes $t_2 = (10 - t_1^*)$ hours to quality. This figure illustrates the case where there is an interior optimum. At this optimum, the marginal benefit MB from allocating additional time to either activity is the same. Adel spends t_1^* hours on quantity and $(10 - t_1^*)$ hours on quality. But if the marginal benefits for quantity are higher than the marginal benefits from quality over the relevant range ($0 \le t_1 \le 10$), Adel allocates all his time to producing output—there is a corner solution.



An Application: Telecommuting

Recently, there has been an increase in the use of telecommuting by large firms—working out of an office in the employee's own home. The asserted benefits of this practice are (1) companies can reduce office expense—it can be less expensive to reimburse an employee for a home office than to provide office space in an urban center, (2) employees avoid wasteful commutes to work, (3) firms can hire higher-quality employees at lower wages by offering them the flexibility to work out of their homes (for instance, employees can balance child care and career demands more easily), and (4) employees can be closer to customers (for example, salespeople frequently have homes in their sales territories).

One potential drawback with telecommuting is the lost synergy that results from having employees work at separate locations. For instance, there is likely to be less information sharing, team production, and so on. While computer technologies (such as e-mail) reduce these concerns, they frequently are still important and limit the viability of telecommuting in many occupations. For instance, it would simply be infeasible for a dental assistant to telecommute. Another is the reduced ability to share specific equipment when individuals work from different locations. Our focus is on a third potential concern with telecommuting—the problem of motivating employees to exert effort on their jobs.

In analyzing telecommuting, it is useful to envision the employee being at home and choosing how to allocate time between two activities, home and work. The incentive coefficient for home activities (α_1) is the personal benefit the employee obtains from spending extra time playing with children, watching television, working in the garden, and so on. The incentive coefficient for working on company activities (α_2) depends on the compensation plan.

Some Costs and Benefits of Telecommuting

Cisco Systems, the computer-networking company, claims that telecommuters improve their productivity 25 percent and save the company $1 million of overhead. Another company reported annual savings of $7,400 per telecommuting employee. A 1999 Department of Labor study reported that 28 percent of companies used telecommuting and estimated that by 2004 nearly 25 percent could be doing so. However, not all employers enthusiastically endorse telecommuting. One consultant estimates that 20 percent of the programs fail—causes include resistant managers, isolated employees, and insufficient opportunities for teamwork. Telecommuters have fewer opportunities to talk shop. Informal communications are reduced. Companies schedule meetings, informal lunches, and other social interactions that used to happen automatically. Other companies require telecommuters to spend at least a day or two at the office.

Sources: A. Tergesen (1998), "Making Stay-at-Homes Feel Welcome," *Business Week* (October 12), 155–156; and J. Greer, T. Buttross, G. Schmelzle (2002), "Using Telecommuting to Improve the Bottom Line," *Strategic Finance* (April), 46–50.

Viewed in this context, the multitask model has at least two important points relating to telecommuting. First, it usually is important to provide incentive compensation to telecommuters.[33] Without sufficient incentives, employees tend to shirk and devote too much of their time to home activities rather than work. Second, the most viable jobs for telecommuting are those where output is easily measured, and thus incentive compensation can be used most readily. For instance, sales jobs often are good candidates for telecommuting, since incentives can be provided by sales commissions. (Synergies from having salespeople work out of a central location also are likely to be relatively low.) If it is difficult to measure employee output, it can be better to *require the employee to come to work* at a central location. This requirement has two effects. First, it is easier to monitor the employee's efforts. Second, it is equivalent to reducing the incentive coefficient on home activities to zero (the employee is unable to devote time to home activities and thus cannot gain from these activities). Since there are fewer activities that compete for their time, employees spend more time on work-related activities.

Appendix Problems

Life insurance agents focus on selling policies. The company expects little follow-up in terms of providing ongoing customer service. In contrast, auto insurance agents often are expected to provide ongoing customer assistance after a policy is sold (answering questions about the policy, providing assistance in filing claims, and so on).

Some insurance companies use independent agents to sell their policies. These agents are paid solely on commission and are often allowed to sell the products of other companies (the agent presents the customer with a choice of plans across multiple companies). Other insurance companies hire their own agents. These employees are restricted from selling other companies' products and are sometimes paid a salary in addition to any commission they might receive.

1. Which type of insurance company, life or auto, is more likely to use the in-house agent? Explain. (Be sure to discuss why the in-house agent faces product restrictions and is not always paid on a pure commission basis.)
2. Some auto insurance companies separate the tasks of selling and customer service and assign them to different people. Why do you think they do this?

[33] As discussed in the text, this incentive pay need not take the form of a commission or a piece rate. Rather, it can be a bonus plan, a promotion based on performance, and so on.

Suggested Readings

G. Baker, M. Jensen, and K. Murphy (1988), "Compensation and Incentives: Practice versus Theory," *Journal of Finance* 43, 593–616.

J. McMillan (1992), *Games, Strategies, and Managers* (Oxford University Press: New York), 91–129.

P. Milgrom and J. Roberts (1992), *Economics, Organization, and Management* (Prentice Hall: Englewood Cliffs, NJ), 206–247.

Review Questions

15–1. Evaluate the statement: "Investment banking is a demanding profession; investment banks want their employees to work as hard as possible."

15–2. Two employees are assigned to work overseas for a 2-year period. One person sells his house in the United States, whereas the other leases it for 2 years to another family. Which house do you think will be in better condition after the 2 years? Explain.

15–3. Explain why an investor is usually better off if she holds a diversified portfolio rather than investing all her resources in the stock of one company.

15–4. Discuss trade-offs between efficient risk bearing and incentives in compensation plans.

15–5. Some companies reward salespeople based on their performance relative to other salespeople in the company. Why would a company want to do this?

15–6. Evaluate the statement: "Profit-sharing plans are good; they encourage teamwork."

15–7. Some school districts have compensated teachers based on the performance of students on standardized tests. Do you think this is a good idea? Explain.

15–8. Evaluate the following statement: "John is paid a straight salary with no bonus pay. Obviously, he has no incentives to do a good job."

15–9. Mrs. Fields' Cookie Company is a very successful company out of Salt Lake City, Utah. The company sells freshly baked cookies to customers in shopping malls. The company has expanded and opened outlets in other cities such as San Francisco. Debbie Fields has been on the cover of several business magazines. The articles stress that Mrs. Fields works very long hours and is often at the stores monitoring the quality of the product and making sure the cookies are produced with "tender loving care." The Fields have earned millions of dollars from this business. In 1986, they were planning to open new outlets throughout the country. They had a policy that they would not franchise units. To quote Mrs. Fields, "We do not want to turn into just another fast-food franchise company. Our success is based on high-quality products produced with great care and love. We do not want to lose this quality by expanding through franchises. Rather, we prefer to maintain ownership of all units to ensure continued good service and quality." Evaluate the Fields' franchising policy.

15–10. The Roman Empire taxed many faraway provinces. Rome would auction the rights to tax collection to the highest bidder. The winning bidder was given the right to set the tax rate for the province and the right to collect (and keep) the taxes. In turn, the winner would pay the bid amount to the Roman government. Assume (1) that the Roman Senate is interested in maximizing the present value of all future revenues to Rome from auctioning off the tax rights, and (2) that the auction for the rights to each province is conducted annually.

- **a.** Give two reasons why Rome would auction off the rights to tax collection rather than simply send a Roman soldier to collect the taxes.
- **b.** Discuss two problems this system might generate for the Senate.

15–11. There has been an increased emphasis on compensating employees through incentive pay. High incentive pay, however, is not likely to be productive in all settings. Discuss the factors that are likely to favor paying high incentive pay to employees.

15–12. In 1995, Philip Morris Company ratified a new labor pact that gave employees stock in lieu of pay increases. The agreement covered 7,800 employees, with each employee being given 94 shares (1994 value of about $60 per share). Employees cannot sell the stock for at least a

year and forfeit the stock if they quit or are fired before the year expires. *Business Week*[34] argued that the "deal was good for Philip Morris" because the employees' base pay and fringe benefits did not rise. Also "current shareholders' shares won't be diluted, since employees probably will get less than 500,000 shares out of 850 million outstanding." Discuss the pros and cons of this policy compared to a policy of simply giving a cash bonus to employees of a similar dollar value.

15–13. Two successful firms are observed with quite different compensation plans for their salespeople. One firm pays its salespeople on a commission basis, whereas the other firm pays its salespeople fixed salaries. Do you think that one of the two companies is making a mistake? Explain.

15–14. You work for a compensation consulting firm. You are designing a pay package for the CEO of a major corporation. The board has asked you to choose the parameters a, b, and c, in the following pay contract:

$$\text{Pay} = a + b[(\text{company stock return}) - c(\text{industry stock return})]$$

Discuss the key factors that will influence your recommendation for each of these three parameters.

15–15. You are a sales manager at the XYZ Corporation. You want to hire a new sales representative. You plan to make an offer to Sally Gomez. You can pay Sally a fixed salary of $20,000 per year or a 10 percent sales commission plus α (a fixed component in the compensation formula). She has a competing offer at another company for $20,000. You anticipate you can hire her if you meet the $20,000 fixed salary offer.

Sally's sales will be either high or low depending on whether she gets a corporate account. If she gets the account, sales will be $100,000. If she does not, sales will be $10,000. The probability of getting the account is .7. This probability is beyond Sally's control. Sally's utility function can be represented by

$$u(\text{compensation}) = (\text{compensation})^{1/2} \quad (1)$$

She seeks to maximize *expected utility*. Expected utilities under the two plans are

$$\text{Fixed salary: } u = (20{,}000)^{1/2} \quad (2)$$

$$\text{10 percent plan: } u = .7(\alpha + 10{,}000)^{1/2} + .3(\alpha + \$1{,}000)^{1/2} \quad (3)$$

a. Sketch the graph of the function $u(x) = (x)^{1/2}$.
b. Is Sally's utility function convex or concave? Is she risk-loving or risk-averse?
c. What α makes Sally indifferent between the two plans?
d. As the sales manager, which plan do you select? Give an explanation that shows why this plan is optimal.

15–16. Susan Jones is a salesperson at Radex Co. Her utility function can be represented by $U = C^2$, where C is her compensation.
a. The company is considering paying her a sales commission rather than a straight salary. The sales manager, however, is concerned that he will have to pay her a compensating differential for imposing risk on her that is beyond her control (sales at Radex are heavily dependent on macroeconomic factors and central company policies). Is the sales manager's concern about paying Susan higher compensation justified? Explain.
b. Is this example representative of the typical worker in most companies? Explain.

15–17. Top executives of European firms are typically paid substantially less than the top executives of American firms. They are also paid differently. For example, stock options are much more common among American than European executives. Do these differences imply (*a*) that

[34]A. Bernstein (1995), "At Philip Morris, Blue Chips for Blue Collars," *Business Week* (March 27), 38.

American executives are overpaid, and (*b*) that the form of the compensation in either America or Europe is suboptimal? Explain.

15–18. American accounting rules do not require firms to expense stock options on their accounting statements. Thus, firms can grant executive stock options without impacting "bottom-line performance." Correspondingly, some people argue that the primary reason firms pay executives in the form of stock options is that they are free. Do you agree (1) that stock options are free and (2) that this is the primary reason for paying executives in options? Explain.

15–19. Bobby's Burgers is a large restaurant chain with nearly 10,000 units worldwide. It is experiencing incentive problems among its outlet managers. The managers are not working very hard and are letting quality deteriorate at their units. CEO, Bobby Jones, is considering a stock plan where each unit manager would be given 500 shares of stock in Bobby's Burgers. He reasons that making the managers part owners of the company will motivate better service.
a. Critically evaluate the proposed stock plan.
b. Discuss other ways that Bobby Jones might motivate increased effort at the units.

15–20. How does the concept of a *risk premium* in incentive compensation relate to the concept of a *compensating differential* in compensation policy?

15–21. Consider two successful sales companies. One company pays its salespeople a high commission, whereas the other pays its salespeople a straight salary. Assume that both companies are paying their salespeople in an optimal manner. Explain potential differences in the firms that might help to explain the difference in pay policy.

Individual Performance Evaluation

CHAPTER 16

CHAPTER OUTLINE

Lincoln Electric Company, headquartered in Cleveland, Ohio, was founded in 1895 to manufacture electric motors and generators.[1] In the early part of the twentieth century, the firm became the premier supplier of electric arc welding machines and welding disposables (electrodes). In 2002, Lincoln manufactured welding and cutting supplies and industrial electric motors in 24 plants across 18 countries. Prior to expanding manufacturing operations outside the United States in the 1980s, Lincoln Electric had an almost unbroken string of profitable years and often was cited as a model of productivity gains and cost savings.

[1]Details of this example are from N. Fast and N. Berg (1975), "The Lincoln Electric Company," Harvard Business School Case 376–028; and Lincoln Electric's financial reports.

At the heart of Lincoln Electric's success has been a strategy of building quality products at a cost lower than that of its competitors and passing these savings to customers by continuously lowering prices. Lincoln has been able to implement this strategy, in part, through an employee incentive system that fosters labor productivity increases arising from a pay-for-performance compensation plan. For production employees, wages are based entirely on piecework. In addition, they receive a year-end bonus which averages approximately 100 percent of regular compensation.

A key element of Lincoln's organizational architecture, and the topic of this chapter, is its performance-evaluation system. There are two components of Lincoln's performance evaluation: pieces produced and merit rating. The first component is an objective, readily quantifiable performance measure for each production employee—the number of good units produced. The employee's wage is equal to a piece rate times the number of good units produced. (Employees are not paid for defects.) The piece rates, set by the time study department, allow employees producing at a standard rate to earn a wage comparable to those for similar jobs in the local labor market. However, by working hard—in some cases even through meal and coffee breaks—employees can double and sometimes triple their pay. Moreover, Lincoln's policies prohibit piece-rate changes simply because an employee is making "too much" money. Finally, any employee who has been at Lincoln for at least 2 years is guaranteed employment for at least 75 percent of the standard 40-hour week.

The second component of Lincoln's evaluation system is the employee's merit rating. These ratings are used to determine the employee's share of the bonus pool. Although there is substantial annual variation, the size of the bonus pool approximately equals total wages and is about twice Lincoln's net income after taxes. Each employee's merit evaluation is based on employee dependability, quality, output, ideas, and cooperation—all of which are assessed primarily by the employee's immediate supervisor.

Two important observations emerge from Lincoln Electric. First, the reward system uses as an input the output from the performance-evaluation system—the two systems are linked. Second, Lincoln Electric uses both quite objective and explicit (units produced) as well as subjective (dependability and cooperation) performance measures.

Employee performance is evaluated for at least two reasons. First, performance evaluation provides employees with feedback on job achievement that provides important information on how they might improve performance. For example, additional training in particular areas might be indicated. Second, performance evaluation is used in determining rewards and sanctions—wages, raises, bonuses, promotions, reassignments, and dismissals. These two purposes create somewhat different incentives. For example, if evaluations were used exclusively to provide feedback, employees would have fewer

Japanese Car Makers Adopt Performance Evaluations

The large Japanese automobile companies switched to traditional Western performance-evaluation systems to link compensation and promotion more closely to individual performance. Honda and Toyota have been examples of lifetime employment in Japan's auto industry. But in 1993 and 1994, both companies announced plans to change this practice. In 1993, Honda became the first Japanese car company to adopt a merit-pay plan that ties the manager's pay to achieving performance goals. In 1994, Toyota, Mazda, and Nissan announced that they too would depart from their seniority-based pay and promotion systems.

Source: R. Johnson (1994), "Advance or Perish, Honda Tells Managers," *Automotive News* (March 18).

incentives to distort their evaluations to make themselves look better. But distortions to improve reported performance are more likely if employees are rewarded based on measured performance.

In this chapter, we focus primarily on the second reason for performance evaluation—as input for setting rewards and sanctions for employees. This chapter as well as the next describes the performance-evaluation system, the third leg of our three-legged stool that constitutes the firm's organizational architecture. Performance evaluation involves evaluating both individual employees and subunits of the firm. This chapter focuses on individual performance evaluation. Chapter 17 examines issues in evaluating subunits within the firm.

To organize our discussion of individual performance evaluation, we return to the basic principal-agent model presented in Chapter 15. In that model, the employee's output Q depends on effort e and a random component μ:

$$Q = \alpha e + \mu \tag{16.1}$$

where α is the employee's marginal productivity. For every unit of effort, α units of output are expected. In this model, e and μ are unobservable by management, but α is known by both management and the employee. If the employee is paid a fixed wage, independent of output Q, the employee has incentives to shirk because low Q can be blamed on negative μ, which is not observable. (Remember, effort is costly to the employee.) To limit such shirking, the firm bases employee compensation on output:

$$\text{Employee compensation} = W_0 + \beta Q \tag{16.2}$$

where β represents the sensitivity of pay to performance. Such compensation contracts create incentives for employees to reduce their shirking on effort. But these contracts also impose risk on employees because pay is now a function of μ, the random component in the production of output. Since the employee is risk-averse, the firm must compensate the employee for bearing this risk or else the employee will work someplace else. This additional compensation for bearing such risk is called a *compensating differential.* Thus, owners of firms must trade off the additional effort the employees will exert from more powerful incentives with the larger compensating differential to bear this risk.

In this basic principal-agent model, output is assumed contractible; Q is an *objective performance measure.* The employee and the firm can execute compensation contracts based on Q at relatively low cost. Hence, compensation and performance evaluation (two legs of the stool) are explicitly linked.

The basic model leading to Equation (16.2)—and Equation (16.3), which follows—implicitly includes the following assumptions:

- The principal knows the employee's production function ($Q = \alpha e + \mu$), but not the actual values for e and μ.
- Output can be observed at zero cost.
- There is a only one quantitative measure of performance—output.
- The employee produces a single output.
- The employee cannot game the performance measure.
- The employee works independently; there is no team production.
- Any mutually beneficial contract is feasible; labor markets are unregulated.

Clearly in practice, managers must implement performance-evaluation systems in situations that do not conform to some or all of these assumptions. The remaining sections of this chapter describe various issues that arise when these assumptions are relaxed.

Setting Performance Benchmarks

Solving for the optimal β in Equation (16.2) requires management to know α in Equation (16.1). Since the employee's marginal productivity is not readily observable, management must estimate it. To illustrate the issues involved in estimating the employee's marginal productivity, consider the following simplified example. Conrad Mueller can assemble a particular model of welder at the following daily rate:

$$\text{Units assembled} = 5e_c + \mu_c \tag{16.3}$$

where e_c is the number of hours of normal effort worked, and μ_c is a random error term. If Conrad worked 8 hours at a normal effort level, $e_c = 8$, then on average he would assemble 40 welders (5×8). On average, the error μ_c is zero. If Conrad worked 8 hours but at a faster, more strenuous pace ($e_c > 8$)—the equivalent of, say, 12 hours at a normal effort level ($e_c = 12$)—then 60 units per day would be assembled on average. If he slacked off and took numerous short breaks, e_c might only be 5, and 25 units on average would be assembled.

While the average error μ_c is zero, the number of units assembled is subject to potentially large shocks; this means that the variance of μ_c is not zero. For example, if Conrad were to receive low-quality parts or subassemblies, the number of units assembled would be down even if Conrad were to expend normal amounts of effort ($e_c = 8$) because more time would be required to fit together each slightly out-of-specification part. Or perhaps Conrad might be idled for a few minutes each hour waiting for parts delivery. In these cases, μ_c would be negative. Alternatively, he might get lucky and assemble more than $5e_c$ units because of an unusually well produced set of parts, ample parts inventory, productive tools, or few distractions.

The assembly department in the preceding example might establish a benchmark of 40 welders assembled per employee per day. Production above 40 then would be considered good performance and less than 40 considered poor performance. The standard of 40 is absolute in the sense that it is fixed and known before the employee exerts effort. Management, however, might know neither the exact relation between effort and production (welders assembled $= 5e + \mu$) nor that the average employee exerted 8 units of effort a day. Thus, the output of the average assembler must be estimated. There are at least two ways to do this: time and motion studies and historical production data analysis.

Time and Motion Studies

In time and motion studies, industrial engineers estimate how much time a particular task requires, with the goal of determining the most effective work method. Motion studies involve the systematic analysis of work methods, considering the raw materials, the design of the product, the process, the tools, and the activity at each step. Besides focusing on how long a particular activity should take, industrial engineers often are able to redesign the product or process to reduce the time required. Time studies employ a wide variety of techniques for determining the duration a particular activity requires under certain standard conditions. Work sampling (one type of time study) involves

selecting a large number of observations taken at random intervals and observing how long employees take performing various components of the job. Time and motion studies often are expensive in terms of engineering time used in the studies. They usually must be redone whenever product design changes or new equipment is introduced. They also suffer from potential bias because of employees' incentives to establish lower quotas by underperforming during the study period.

Past Performance and the Ratchet Effect

Another common mechanism for setting performance goals uses historical data on past performance. Unfortunately, this method often leads to a perverse incentive called the *ratchet effect.*[2] The ratchet effect refers to basing next year's standard of performance on this year's actual performance. But performance targets usually are adjusted in only one direction: upward. A poor year usually causes subsequent years' targets to be reduced not at all, or to be reduced by very little. This "ratcheting up" of standards discourages employees from exceeding the quota substantially to avoid raising the standard for future periods by too much.[3] Many illustrations of dysfunctional behaviors induced by the ratchet effect exist:

- Companies often base a salesperson's bonus on meeting target sales where the target is based on last year's sales. If salespeople expect an unusually good year, they often will try to defer some sales into the next fiscal year. For instance, they might take the customer's order but delay processing it until the next fiscal year.
- In the old Soviet Union, central planners would set a plant's production quota based on past experience. Plant managers meeting their targets received various rewards, and those missing the target were punished. This created incentives for managers to exceed the quota just barely.
- In one automobile engine assembly plant, a labor productivity performance goal was mandated each year. Each department's target was based in part on last year's performance plus an increase. This created incentives for managers to defer making big productivity improvements in any one year, preferring instead to spread them over several years.[4]

Lincoln Electric avoids the dysfunctional problems of the ratchet effect by its policy that the piecework rate cannot be changed even if the employee is making too much money. Once a piecework rate is set by the time study department, it is never changed until production methods or processes are changed, or unless the employee challenges the rate and a new time study is conducted.

Another way to reduce problems caused by ratcheting up each year's performance targets is more frequent job rotation. If you know that next year someone else has to meet the sales figures you achieve this year, you will sell more now. However, job rotation can destroy job-specific human capital such as customer-specific relationships.

[2]A. Leone and S. Rock (2002), "Empirical Tests of Budget Ratcheting and Its Effect on Managers' Discretionary Accrual Choices," *Journal of Accounting & Economics* 33, 43–67.

[3]Some of the incentive not to exceed the target by a large amount is reduced if the employee's bonus is a function of the amount by which output exceeds the target. The actual dysfunctional incentives created by the ratchet effect depend on the precise form of the incentive compensation contract. For example, if past performance is used to set β in Equation (16.2), very different incentives are created than if past performance is used to set a target performance and a fixed bonus is paid so long as actual output exceeds this target.

[4]R. Kaplan and A. Sweeney (1993), "Peoria Engine Plant (A)," Harvard Business School Case 9-193-082.

Measurement Costs

When it is costly to observe the employee's output, performance evaluation becomes much more complicated—and interesting. For example, your server at the restaurant might appear to have performed well. But you only begin to suspect that you were served caffeinated instead of decaffeinated coffee at 2 A.M. when you still cannot sleep. The quality of a patent attorney's work is not known until a challenge to the patent is filed. Measuring an elementary teacher's output is complex. Relying on standardized test scores captures only a part of student learning. Or, a research scientist's output is difficult to quantify and observe. "Observability," "verifiability," and "contractibility" ultimately are questions of cost. Almost everything is observable—even effort—at some cost. For example, in jobs where physical effort is required, how hard an employee works might be measured by attaching heart-rate monitors or videotaping the person. But, such measurements frequently are quite costly.

Costs are incurred in generating performance measures. For example, accounting systems must be developed and maintained to keep track of sales, costs, quality, or divisional profits. Computer systems and software capable of producing detailed reports are more complicated. And if the measures are used for performance evaluation, additional management and clerical time must be spent ensuring the accuracy of the performance measures. High measurement costs can lower the net benefits of tying pay to performance.

In our simple principal-agent model, the employee's output is used in setting compensation. However, output depends on random factors. Even if output were costlessly observable, it still can be optimal to expend additional resources to measure the employee's effort level more precisely. To the extent the firm can reduce the employee's exposure to the variance of these random factors via more sophisticated performance measures, the lower the compensating differential the firm must pay the employee to bear this risk. As we noted in Chapter 15, the informativeness principle implies that whenever low-cost information is available that allows a more accurate assessment of the employee's effort, such information should be used in assessing performance. A value-maximizing firm will go to the point where the incremental cost of increasing the precision of its performance measurement (through more sophisticated accounting and information systems, for instance) equals the incremental benefits. These benefits include the reduction in the risk premium that must be paid to employees.

In general, the more incentive pay in the employee's compensation package, the more risk the employee bears and the more the firm should spend on measurement systems to quantify the impact of these random factors. Thus, the choice of the optimum β in Equation (16.2) and the choice of how much to spend measuring performance are jointly determined. These two legs of the stool are complements. Increasing the

Measuring What Counts

Determining the weight of an orange may be a low cost, accurate operation. Yet what is weighed is seldom what is truly valued. The skin of the orange hides its pulp, making a direct measurement of the desired attributes costly. Thus the taste and amount of juice it contains are always a bit surprising.

Source: Y. Barzel (1982), "Measurement Cost and the Organization of Markets," *Journal of Law & Economics* XXV, 27–48.

Technology to Reduce Measuring Costs of Individual Performance

Companies are turning to new technology to evaluate individual performance. British Airways uses employee performance software to track how long their customer service representatives spend resolving customer complaints or issuing tickets. The software also tracks how many customers call back complaining about errors in their tickets or complaining that their previous complaint calls were not addressed satisfactorily, so ticket agents don't slough off in issuing the original ticket. The software even monitors how long the reps spend on break, making personal calls, or surfing the Web. Firms are using these systems to provide extra incentives to those employees whose digital records merit the pay. This is an example of how a reduction in the cost of measuring individual performance leads to a more precise estimate of employees' effort, thereby reducing the risk employees bear from random events (or errors) in measuring their performance, and thus increasing the amount of incentive pay in their compensation package.

Source: M. Conlin (2002), "The Software Says You're Just Average," *Business Week* (February 25), 126.

employee's incentive compensation β should be accompanied by increasing the precision with which effort is measured.[5]

In some cases, observing and measuring the employee's output becomes so expensive that the firm begins to look for alternative proxy variables that capture employee performance. For example, managers often are evaluated on the accounting profits of their divisions, even though the firm ultimately is interested in the total value created by its managers. This value includes not only short-term divisional profits (as measured by the accounting system) but future expected profits, as well as the effects of the manager's efforts on other divisions' profits. Similarly, schoolteachers often are evaluated on their students' performance on standardized tests, even though the school ultimately is interested in broader, harder-to-measure indicators of learning. Whether or not a particular proxy variable is good for purposes of performance evaluation depends on whether the employee's actions have similar effects on both the proxy variable and the underlying output variable.[6] For example, if paying a manager on divisional profits motivates more diligent effort as well as actions that increase underlying value, then divisional profits would be a productive performance measure. Alternatively, to the extent divisional profits motivate actions that do not enhance value (for example, sacrificing substantial future profits to achieve only a modest increase in near-term profits), divisional profits are a poor performance measure. Ill-designed performance measures promote opportunism and gaming.

Opportunism

Employees often behave opportunistically in ways that affect their performance evaluation. This section describes two examples of such opportunism: gaming and the horizon problem.

Gaming

Our basic principal-agent model assumes that the employee shirks only in the amount of effort exerted this period. If measured output is not perfectly correlated with firm

[5]For a more formal treatment of this principle, see P. Milgrom and J. Roberts (1992), *Economics, Organizations, and Management* (Prentice Hall: Englewood Cliffs, NJ), 226.

[6]G. Baker (1992), "Incentive Contracts and Performance Measurement," *Journal of Political Economy* 100, 598–614.

Gaming Objective Performance-Evaluation Systems

This example illustrates how members of one local management team, who did not want to lose their jobs, successfully gamed the performance-evaluation system their company used in deciding when to close unprofitable mines.

> In this particular company, mines were shut down after the yield per ton of ore dropped below a certain level. One old marginal mine managed to stay open for several years because of the strategic behavior of its management. It happened that the mine contained one very rich pocket of ore. Instead of mining this all at once, the management used it as its reserve. Every time the yield of the ore it was mining fell below an acceptable level, it would mix in a little high-grade ore so the mine would remain open.

Source: E. Lawler and J. Rhode (1976), *Information and Control in Organizations* (Goodyear Publishing: Santa Monica, CA), 87–88.

value, employees endeavoring to increase reported output might cause the firm's value to decline. Thus, objective measures of output can motivate employees to engage in dysfunctional activities to improve their evaluations. Recall the costs Merrill Lynch incurred when its analysts inappropriately recommended securities to its customers (Chapter 2). Doing so increased the analysts' incomes but was extraordinarily damaging to Merrill. Other examples include the following: A salesperson offers customers discounts to shift sales from one evaluation period to another. An employee paid based on output reduces quality to increase output. A refuse hauler, compensated on the weight of trash delivered to the landfill, uses a fire hose to top off his load with water before weighing in at the truck scales. Finally, Lincoln Electric installed counters on typewriters to record the number of characters typed by their secretaries who were paid on this basis. But piecework for secretaries was abandoned when one secretary, who earned much more than the others, was found staying at her desk during lunch and coffee breaks depressing a repeating key on her keyboard, thus quite rapidly typing totally useless pages. Hence, seemingly objective measures of performance such as sales or output often create incentives for employees to take value-reducing actions (such as lowering product quality) if such actions increase their measured performance.

Horizon Problem

Objective output measures frequently focus on the near term because of the difficulty of objectively measuring consequences that might occur in the future. Short-run, objective performance measures can cause employees—especially those about to change jobs or

Gaming Compensation Plans

Insurance agents, sales managers, and some executives at Prudential Insurance Company were paid commissions based on sales volume. To boost sales, agents engaged in "churning." Agents would convince customers who had life insurance policies with large cash values built up to use the cash balance to buy bigger policies on the promise that it wouldn't cost them anything. Some customers weren't even told the cash value was being used this way. Once the cash values were exhausted paying the premiums on the new policies, many policyholders, some elderly, were hit with big, unexpected premium bills. Those customers who couldn't pay lost their insurance coverage. The technique kept the new policies in force long enough for the agents to collect large commissions. In 1997, Prudential agreed to pay $410 million to settle a class-action suit related to deceptive sales practices.

Source: L. Scism and S. Paltrow (1998), "Prudential's Auditors Gave Early Warnings about Sales Abuses," *The Wall Street Journal* (July 7), A1.

Relative Performance Evaluation in Banking

Research suggests that firms use relative performance evaluation. One study focuses on subsidiary bank managers in multibank holding companies. Turnover of these managers is greater when their own bank's performance is poor and when the median bank's performance in the same holding company is high. This study's findings are consistent with market and industry risk being filtered out in making compensation and retention decisions.

Source: D. Blackwell, J. Brickley, and M. Weisbach (1994), "Accounting Information and Internal Performance Evaluation: Evidence from Texas Banks," *Journal of Accounting and Economics* 17, 331–358.

leave the firm—to concentrate their efforts on producing results that will influence their appraisals favorably over their remaining horizon with the firm (see Chapter 10). For example, a 64-year-old salesperson, paid on commission and expecting to retire at age 65, has little incentive to work at developing long-term customer relationships.

Relative Performance Evaluation

Multiple employees performing similar tasks potentially can provide useful additional signals about the random errors affecting individual employees. For example, if in addition to Conrad, Dina van den Brink also assembles welders and her output is

$$\text{Units assembled by Dina} = 5e_d + \mu_d \tag{16.4}$$

where e_d is the number of hours of normal effort worked by Dina, and μ_d is her random error term. In assembling welders, both Conrad and Dina expect that if they exert average effort of $e = 8$, each expects to produce 40 units. If Conrad's and Dina's error terms, μ_c and μ_d, are positively correlated because they depend on many of the same conditions (raw material quality and working conditions), then in evaluating Conrad's performance, management can look at Dina's output for information about uncontrollable factors affecting Conrad's production. If Dina were to have unusually low output, it is likely that there was some shock that would have lowered Conrad's output, as well.

More generally, suppose that in addition to Conrad and Dina, a number of other employees also assemble the same welders. As we noted in Chapter 15, the informativeness principle implies that an important source of information about an employee's effort is the output of coworkers performing similar tasks. Thus to reduce the risk of noncontrollable factors, management uses information about the average number of welders assembled by all these employees. Forty units per employee per day is the expected number of welders, given normal quality and no unusual events. Suppose the average number of welders across all the employees on a given day was 43. Then for this day, average $\mu = 3\ (43 - 40)$. And if Conrad produced 41 welders that day, his compensation would be adjusted by some part of his two-unit shortfall (41–43). Using the output of other employees to adjust the employee's output in the compensation contract is called *relative performance evaluation.* (The appendix to this chapter discusses methods to estimate the optimal adjustment.)

Within-Firm Performance

Using other employees' output within the same firm to estimate the average error is a useful method of reducing the risk employees bear from incentive compensation contracts if they all sell or manufacture the same products and face the same competitors

Relative Performance Evaluation for CEOs

CEO compensation (salary plus bonus) and turnover likelihoods depend on relative performance evaluation. Gibbons and Murphy examine 2,214 CEOs serving in 1,295 large, publicly traded, U.S. corporations from 1974 to 1986. They find that CEOs' compensation is positively related to their own stock return performance and negatively related to the stock return in the market and industry. That is, compensation is higher when the CEO's own firm's stock return is higher and when the market or industry stock return is down. Finally, they study the likelihood that the CEO is replaced. Executive turnover is lower the larger the firm's own stock price return and the lower the industry return. If the industry is performing poorly, the CEO is more likely retained, holding everything else constant. However, CEOs also are compensated using awards of stock and options. The realized values of these awards are adjusted for overall market or industry performance only rarely. Thus, although some of the incentives of executives are based on relative performance, others are based on absolute performance.

Source: R. Gibbons and K. Murphy (1990), "Relative Performance Evaluation for Chief Executive Officers," *Industrial and Labor Relations Review* 43, 30S–51S.

and economywide factors. However, forming a reference group from employees inside the firm also can have drawbacks. Only in rare cases are employees' jobs identical. For instance, some salespeople have large established territories—others, small developing ones. Customer types can vary dramatically across sales territories.

If an internal reference group is formed and its group average is used to assess normal performance, the group has incentives to punish "rate busters"—extremely productive employees who raise the average. In a classic research study known as the Hawthorne experiments, employees were observed hitting colleagues who exceeded the commonly accepted output rate.[7] Thus, explicit employee collusion to hold down the benchmark can occur. Also, instances of sabotage are observed in relative performance evaluations. Instead of working diligently and increasing their own performance, coworkers sabotage their peers within the reference group. Alternatively, employees might try to get themselves classified into a reference group that has weak performance so they will appear above average.

Relative performance evaluation also affects recruiting incentives. Employees often are involved in interviewing and selecting potential colleagues. If paid based on relative performance, such employees have the incentive to recommend hiring less competent new employees. This improves the relative performance of the current employees.

Across-Firm Performance

The Securities and Exchange Commission requires publicly traded firms when describing their executive compensation to select a benchmark reference group of other firms and report how their firm has performed relative to that benchmark. This is an example of selecting a reference group outside the firm. Some firms also employ external benchmarking to overcome the lack of an internal reference group or to avoid the pernicious actions of sabotage and collusion. Firms exchange information directly or do so through a trade association that aggregates information across several firms to mask individual firm data. Thus, average performance in other firms is used as the reference group.

There are several disadvantages to external benchmarking. Use of this method often is precluded by a lack of data: Other firms view their performance data as proprietary

[7] H. Parsons (1974), "What Happened at Hawthorne?" *Science* 183 (March 8), 927.

Potential Costs of Relative Performance Evaluations

Individuals gaming performance-evaluation systems are not uncommon. This example illustrates the lengths to which some people will go to sabotage others when their advancement is based on relative performance evaluations:

> I was recently talking to a friend of mine who works at a big bank. When I asked him about his new promotion, he told me how he got it. He managed to crack the network messaging system so that he could monitor all the memos. He also sabotaged the work group software and set back careers of a few company-naive souls who didn't realize that someone was manipulating their appointment calendars. They would miss important meetings and be sent on wild-goose chases, only to look like complete buffoons when they showed up for appointments that were never made. By the time any of these bumpkins knew what hit them, they had a new vice president.

Source: J. Dvorak (1988), "New Age of Villainy," *PC Magazine* (September 27).

and thus are unwilling to share it. Even if firms are willing to share data, for firms in the same industry such cooperation is potentially illegal under antitrust laws. Moreover, employees in outside firms may not be subject to the same common shocks as the benchmarking firm's employees. Thus, external benchmarking might increase the risk to employees, rather than decrease it.

Subjective Performance Evaluation

Most jobs contain numerous dimensions. For example, baseball players have to field the ball, get hits (ranging from bunts to home runs), run the bases, and generally support the team. It is difficult to specify and measure all aspects of the job. If explicit measures are used only for some aspects, employees will deemphasize the unmeasured job attributes. For instance, if a veteran ballplayer is evaluated solely on his hitting, he has fewer incentives to spend time mentoring young ballplayers. Often, the firm augments its use of objective, explicit measures of output and uses more subjective yet comprehensive measures of performance.

As we noted in Chapter 12, firms decentralize decision rights to individuals in the firm, in part to encourage them to participate in the conversion of wetware into software. Firms often use subjective performance evaluation to provide employees with incentives to take their skills and insights (wetware) and systematize them into valuable methods, formulas, or recipes (software). This software then can be leveraged throughout the organization. Many firms have formalized mechanisms to accomplish these goals, such as "Suggestion Boxes" to solicit ideas for improving organizational productivity.

Subjective performance reviews are conducted primarily because it is expensive to measure accurately all the dimensions of the employee's output that are valued by the firm. In fact, most employees are not evaluated exclusively based on objective measures. Rather, their performance evaluations tend to include subjective elements. For example, most employees receive annual performance reviews from supervisors. These reviews often form the basis for setting salaries and promotions. Even when compensation is based entirely on objective measures (piece rates in agriculture), the firm reserves the right to fire employees for low-quality production, tardiness, inability to get along with coworkers, or other dysfunctional behavior. Lincoln Electric bases factory employees' wages entirely on piecework—an objective measure. But in addition to this objective measure, Lincoln also uses a subjective merit evaluation to set the employee bonus, which is approximately the same magnitude as wages.

We first describe an important reason firms use subjective performance measures—namely, assigning multiple tasks to employees. Then various subjective evaluation systems are described. Finally, problems with subjective evaluations are summarized.

Multiple Tasks and Unbalanced Effort

As discussed in Chapter 13, multiple tasks often are assigned to one employee because there are efficiency gains from bundling the tasks. For example, secretaries answer phones, word process, file, schedule appointments, and make travel plans. Or, an employee might be expected to sell products to existing customers, contact potential new customers, and fill out sales reports. These tasks all are complementary to selling the product.

Suppose Conrad Mueller performs two tasks, assembling welders and training new employees to assemble welders. Some activities are more easily measured, such as counting the number of welders Conrad assembles; others, like training new assemblers, are more difficult to assess. If Conrad's evaluation is based primarily on the easily measured tasks (welders assembled), he has incentives to concentrate his efforts on these activities. Conrad will not allocate the optimal amount of time to the other unmeasured tasks (see Chapter 15). Remember: *You get what you pay for—and frequently, that is all you get.*

Recall from Chapter 13 that this multitask problem can affect optimal job design. For example, a firm might want to have certain employees concentrate only on assembling welders when complementarities among tasks are low. These employees then could be evaluated on their output of assembled welders. Other employees would concentrate on training new assemblers and correspondingly be evaluated on their training. By separating the tasks, each employee can be given more focused incentives to perform their single task.

Subjective reviews evaluate an employee's performance on a more comprehensive basis. Aspects of the job that are measured less easily can be considered along with more easily measured activities. For example, the supervisor might consider the employee's efforts at being cooperative, being part of a team, being responsive to potential customers, or filling out reports accurately. Conrad's supervisor can observe how he instructs new hires, how patient he is, and how they ultimately perform as assemblers in assessing Conrad's performance as a trainer. Moreover, if Conrad games the performance measure—takes firm-value reducing actions that increase the objective performance measure—his supervisor (if aware of these dysfunctional actions) can penalize Conrad through his subjective performance evaluation.

Subjective Evaluation Methods

There are two widely used subjective performance-appraisal systems: standard-rating-scale systems and goal-based systems. Goal-based systems tend to be more explicit and less subjective than standard-rating-scale systems.

Standard-Rating-Scale Systems

Standard rating scales require the evaluator to rank the employee on a number of different performance factors using, for example, a five-point scale: far exceeds requirements, exceeds requirements, meets all requirements, partially meets requirements, does not meet requirements. The different performance factors judged vary across firms and positions within firms but often include the following:

- Achieves forecasts, budgets, objectives
- Organizes effective performance through oral and written communications

- Sets and attains high performance goals for self and group
- Updates knowledge of job-related skills
- Emphasizes teamwork among subordinates
- Identifies and resolves problems
- Evaluates subordinates objectively
- Ensures equal opportunities for all subordinates

After ranking the employee on each of these narrow criteria, the evaluator then assigns a rating for the overall job: excellent, better than satisfactory, satisfactory, needs further improvement, and unsatisfactory. Most subjective performance appraisals contain a section where the supervisor provides detailed comments on the employee's strengths and weaknesses and offers specific recommendations for improvement and further development.

Goal-Based Systems
In a goal-based system, each employee is given a set of goals for the year. For example, goals might be "hold training sessions for all employees in the department by November 1," or "hire four additional qualified members of minority groups." These goals tend to be more objective and easier to measure than the more vague performance factors used in the standard rating scales such as "emphasizes teamwork." Nonetheless, these goals still are more subjective than standard piecework measures. At the end of the year, the supervisor writes a memo detailing the extent to which each goal has been met. An overall evaluation of the employee is based on the extent to which the goals are achieved.

After evaluators have rated their employees using either a standard rating scale or a goal-based system, evaluators usually then review the evaluations with their supervisors. This helps ensure the accuracy of the review and promotes consistency of criteria across employees. Next, supervisors give copies of the evaluations to the employees and meet with them to review the evaluations. Employees can respond to the evaluation in writing, including the expression of formal disagreement with any of the specifics in the appraisal. Finally, the evaluators and their supervisors review the feedback provided by the evaluators and the employees' responses.

In the majority of cases, the employee's immediate supervisor does the performance evaluation. In some cases, firms have experimented with peer evaluations—especially in situations where teams are important. The benefit of peer evaluations is that peers have information about typical performance in group assignments and the actual contribution of the individual to the team. Offsetting the better specific knowledge of peers is the added

360-Degree Performance Reviews

Privately held W. L. Gore & Associates with sales of $1.4 billion in 2001 employs 6,000 employees and manufactures Gore-Tex waterproof fabric. All employees are called associates. There are no "bosses," but each employee is assigned a "sponsor" who acts as a mentor. Gore has been using 360-degree evaluation as part of its performance feedback since 1958. Under this system, annual evaluations are gathered on all associates from the individual's peers, subordinates, and superiors. The evaluations are anonymous and rate employees on their contributions to the success of the business during the past year. All ratings on each employee receive equal weight. Compensation committees composed of sponsors with specialized knowledge of the area use the rankings to award pay increases or performance warnings. Thus, such review systems are not new; much of what is new is the jargon invented to make these performance-evaluation systems appear to be a recent innovation.

Source: J. Lopez (1994), "A Better Way?" *The Wall Street Journal Supplement* (April 13), R6; www.gore.com

costs of training everyone in the team to do evaluations. Moreover, peer evaluation can increase the tensions within the team. For example, some team members might systematically lower everyone else's ratings to make themselves look better. Or, friends may be rated highly to increase their chance of being promoted to supervise their former colleagues. Finally, teammates might decide to collude to give everyone higher performance ratings.

Frequency of Evaluation
Most subjective performance evaluations are conducted yearly, primarily because most salary adjustments are made annually. The benefits of more frequent evaluations (say quarterly) unlikely offset the higher costs. However, there are some examples of more frequent review. For example, new hires typically receive more frequent evaluations; often a new employee is evaluated at the end of 3 months. During this probationary period, the firm must decide whether to keep the individual. Also during this period, frequent feedback helps the employee learn and improve performance. As another example, consultants are evaluated after each professional assignment by the partner-in-charge of the engagement. Especially where team composition changes from project to project, capturing performance-evaluation information on a timely basis is important. The person's performance is known, and there is no reason to wait until the end of the year. Moreover, the evaluation provides more timely information to base subsequent project assignments.

Problems with Subjective Performance Evaluations

There are several potential problems with subjective performance evaluation.

Shirking among Supervisors[8]
Disciplining employees and informing them of their shortcomings often are unpleasant tasks. Supervisors do not capture the full wealth effects of these actions. Hence, potential shirking among supervisors leads to the provision of inaccurate performance evaluations. For example, a supervisor might be reluctant to give adverse ratings to avoid conflict with subordinates. In other cases, supervisors compress ratings around some norm rather than distinguish good and poor performers. Or, a supervisor might rank employees based on personal likes and dislikes rather than on job performance. Bias adds noise to the performance-evaluation system; it typically reduces morale and consequently the employees' incentives to work diligently, thereby lowering overall firm performance.

Indirect empirical evidence suggests that managers tend to assign relatively uniform performance ratings to employees. In a study of 7,000 performance ratings of managers and professionals in two firms, the researchers report that 95 percent of all appraisals were in just two categories: Good and Superior (Outstanding).[9] A survey of employee attitudes at Merck & Co., a large United States pharmaceutical firm, reported the following attitudes[10]:

- Managers are afraid to give experienced people a 1, 2, or 3 rating. It's easier to give everyone a 4 and give new people a 3.

[8] C. Prendergast and R. Topel (1993), "Discretion and Bias in Performance Appraisals," *European Economic Review*, (June), 355–365; C. Prendergast and R. Topel (1996), "Favoritism in Organizations," *Journal of Political Economy* 104 (October) 958–978.

[9] J. Medoff and K. Abraham (1980), "Experience, Performance, and Earnings," *Quarterly Journal of Economics* 95, 703–736.

[10] Quotes excerpted from a 1985 Merck report by K. Murphy (1992), "Performance Measurement and Appraisal: Motivating Managers to Identify and Reward Performance," in W. Bruns (Ed.), *Performance Measurement, Evaluation, and Incentives* (Harvard Business School: Boston), 37–62.

- Charlie's been in that job for 20 years. He hasn't done anything creative for the last 15 years. Do you think my manager would give him a 3 rating? No way! Then he'd have to spend 12 months listening to Charlie complain.
- What's the use of killing yourself? You still get the same rating as everyone else, and you still get the same 5 percent increase. It's demoralizing and demotivating.

This evidence suggests that low-rated, disgruntled employees can impose costs on supervisors. In response, supervisors bias their evaluations. Hence, performance ratings are inaccurate appraisals of the employee's true performance. Biased, inaccurate appraisals reduce the incentive of employees to improve their performance by working harder and can lead to the promotion of less qualified people. Here, the problem lies not in the evaluation system *per se,* but rather in the incentives for the evaluators.

At Lincoln Electric, supervisors have incentives to do a good job because they are evaluated and compensated on the job they do in evaluating lower-level employees. Also, employees can discuss their ratings with senior management. Problems of bias are likely to be lower if the supervisor is held accountable for the future performance of individuals that are promoted based on the supervisor's recommendation.

Forced Distributions

To overcome the tendency to rate all employees "above average," some firms impose a forced distribution where a fixed fraction of employees are assigned to each category (that is, the supervisor must rank a certain percentage of the employees as poor). However, forced distributions may not reflect the true distribution of performance accurately in each work group. Forced ranking systems can cause problems, especially when the size of the group to be evaluated is small. For example, having to rank one of four employees as poor might force the supervisor to rate a good-performing employee as poor; inaccuracies from the forced distribution might be larger than those from a biased supervisor. Moreover, forced distributions do not necessarily reduce the costs imposed on the supervisor. Under a forced distribution, supervisors might assign ratings based on the potential costs employees will impose on them—not based on the employees' true performances.

Tips on Subjective Performance Reviews

Here are some tips for improving your next performance evaluation:

- Prepare a list of creative ways you are solving problems with limited resources. For example, to reduce travel costs you have been holding fewer, but more comprehensive, meetings.
- Show how your work bolsters the bottom line. For example, instead of requesting new computers because they are state-of-the-art, frame the request as the new computers will save 10 percent of operators' time.
- Focus on the future. Instead of dwelling on past failings, emphasize specific future plans, such as training programs to attend.

When appraising others:

- Give honest feedback. Don't rate problem employees as above average because of fear of confrontation. This merely prolongs and exacerbates the inevitable confrontation.
- Ask employees if they understand their current assignments, if they have any problems, or stresses.
- Focus on the future, upcoming goals, potential training opportunities, instead of dwelling on the past.
- Communicate the company's goals and shifting priorities via the performance review.

PPG Industries illustrates how one company implements many of the above suggestions. PPG uses "SMART goals" for employee objectives. SMART is an acronym for Specific, Measurable, Agreed-upon by employee and manager, Realistic, and Timebound. Instead of simply telling a sales manager to boost sales next year, a SMART goal would be: "Develop, by May 1, three new customers in the Eastern region with annual sales potential of $50,000."

Source: S. Scherreik (2001), "Your Performance Review: Make It Perform," *Business Week* (December 17), 139–140.

Influence Costs

Influence costs (discussed in Chapter 12) include those nonproductive activities employees engage in to influence outcomes—in this case, politicking for higher ratings by their supervisor. One potential method of reducing these costs is to rotate supervisors or employees more frequently (getting on the good side of one supervisor is of limited benefit). Rotation of employees, however, can limit potential synergies and cost reductions that arise with repeated interaction between a given manager and employee. New supervisors have limited knowledge of employees' specialized skills. Also, more frequent rotation potentially increases total influence costs, since the employee has more lobbying opportunities.

Reneging

There is the potential that the firm will renege on promises to employees to reward good performance.[11] For example, management might promise to give raises to those who perform well. Afterward, management might unjustifiably say that work was poor to avoid higher payments. It is less likely that an employee will be successful in a lawsuit involving subjective performance measurement than when the employee can document that a firm reneged on an explicit contract involving objective performance measures.

As discussed in Chapter 10, managers in healthy firms generally have incentives to maintain good reputations for honoring implicit contracts. However, reneging on implicit contracts will appear most attractive to firms in financial difficulty (near bankruptcy). Reneging also can occur when a supervisor has a short horizon with the firm and is compensated on business-unit profits. (Unit profits might be increased in the short run by not granting raises to employees.) We discuss these issues further in Chapter 22.

Combining Objective and Subjective Performance Measures

Performance-evaluation systems generally fall on a continuum between the two extremes—objective and subjective evaluation systems. Objective measures consist of items like output and sales that can be quantified easily and thus explicitly measured. Objective measures can be used in formal contracts between the employee and the firm. Subjective measures consist of noncontractible judgments about employee performance (the year-end evaluation from a supervisor). Subjective measures are used in implicit contracts. Few job-performance measures are purely objective or purely subjective; most measures involve mixtures of both. In most cases, organizations that use objective measures also use subjective measures to evaluate the same employee (as does Lincoln Electric, for example). Investment bankers pay bonuses based on fees generated by the employee but also use subjective measures such as the "quality of the deals."[12]

[11] G. Baker, R. Gibbons, and K. Murphy (1994), "Subjective Performance Measures in Optimal Incentive Contracts," *Quarterly Journal of Economics* CIX, 1125–1156.

[12] Baker, Gibbons, and Murphy (1994).

Both objective and subjective performance measures can be inaccurate measures of the employee's contribution to the firm's value. As the accuracy of either measure decreases, more weight will be placed on the other in determining performance (holding its accuracy constant). As the accuracy of each measure decreases, the risk the employee bears increases, as does the compensating differential the employee must be paid.[13]

Besides being inaccurate, both objective and subjective measures can induce various dysfunctional behaviors. We indicated earlier that objective measures can create incentives for gaming, which reduces the firm's value, as in the case of the policy "churning" by Prudential Insurance Company agents. If supervisors shirk when writing subjective performance reviews, employees' incentives to work diligently are reduced. Also, employees will generate influence costs lobbying for higher subjective ratings. Finally, implicit contracts using subjective measures are more easily abrogated by the firm than formal contracts based on objective measures. Employees must trust that the firm will not renege on implicit contracts. An important constraint on the firm from reneging is its reputation. Thus, firms facing a greater likelihood of financial distress will find subjective evaluations more costly to use.

Because the costs and benefits of objective and subjective measures vary across jobs, in some situations only objective measures are observed, others are mixtures of both, and in other cases, only subjective performance measures are observed. Each firm will face specific costs and benefits of objective and subjective measures and will tailor its performance measures to its circumstances. Moreover, the costs and benefits are likely to vary over various divisions of the firm and jobs. However, employees performing similar tasks in similar industries tend to have similar performance-evaluation systems because the costs and benefits of alternative evaluation methods will be similar.

Both objective and subjective performance measures are costly. The larger these costs, the less firms tend to rely on performance evaluations for setting rewards and punishments. Paying employees straight salary and giving simple cost-of-living raises to all employees will lead to predictable shirking and other incentive problems. Yet these costs still might be lower than the costs of implementing a performance-based incentive plan.

Team Performance

As we discussed in Chapter 12, teams frequently are used at all levels of the organization. Teams are formed because they are more successful at assembling specialized knowledge for decision making than are alternative methods that might be used to pass the knowledge through the traditional hierarchy. As discussed below, teams also can prove useful particularly when one employee's productivity affects the productivity of other employees. For instance, one complaint by employees at Lincoln Electric is that their pay suffers when employees ahead of them on an assembly line are unable to keep them supplied with work.

Team Production

To illustrate the performance measurement problems of teams, again consider welder assemblers Conrad Mueller and Dina van den Brink. To simplify the notation, assume

[13]See C. Prendergast (1999), "The Provision of Incentives in Firms," *Journal of Economic Literature* 37 (March), 7–63, for a survey of the relevant papers.

Objective and Subjective Performance Evaluation at Fiat

This example illustrates how one very large company combines both objective and subjective performance reviews into a single, integrated system.

The Italian firm Fiat is one of the world's largest corporations, with over 220,000 employees in 10 operating sectors. Although automobiles are its largest product, Fiat also has operating units in railway systems, aviation, publishing and communications, and financial and real estate services. Fiat uses a formal management by objectives (MBO) evaluation program for its 500 highest-level managers. Under the MBO program, annual bonuses of up to about 30 percent of base salary were awarded for meeting objectives. Managers had a set of objectives tailored to the specific situations. Managers in charge of profit centers had profit and debt objectives. Profit targets were defined in terms of net profit before taxes. Because Fiat had an extremely high level of debt in the 1980s, profit center managers also were given objectives to lower their group's borrowings. Besides these specific financial objectives, managers had other performance indicators such as increasing sales in particular markets, completing an acquisition, improving quality or customer service, and introducing new products or processes.

Even though managers might meet their particular objectives, unless the larger group also achieved its goals, no bonus would be paid. For example, the Fiat Group has 16 sectors headed by a manager. If the entire Fiat Group failed to meet its objectives, none of the 16 sector managers would receive their bonuses, even though some of them achieved their goals. Each manager had a set of weightings attached to each objective. Unless the manager achieved a minimum level of profits before taxes, no bonus would be paid. Once this threshold profit level was achieved, the weights attached were 20 to 40 percent profits, 10 to 20 percent reducing debt, and 10 to 15 percent for each of three or four other performance targets. Each objective was scored on a 5-point scale, with 3 being the minimum acceptable score. Superiors would set the targets for each objective. In setting the performance targets, the following probabilities of achieving each target were supposed to be used:

Performance Level	Ideal Probability of Achievement
3 (threshold)	90–99%
4 (good)	50–60%
5 (excellent)	10–20%

For example, suppose "install new production-control system" was an objective that had a weighting of 20 percent. If the system was installed by November, it is judged as a 3 threshold. To achieve a 4, installation must be completed by October. And a 5 is earned if completed by September. If actual completion is October, a 4 is earned with a weighting of 20 percent and 0.80 (4 × 20%) was added to the manager's other performance objectives to compute an overall grade—say, 3.69. A performance rating of 3 would receive a bonus of 12 percent of salary. Ratings below 3 would receive no bonus. A rating of 4 would receive an 18 percent bonus, and a 5 would receive a 30 percent bonus. Fractional ratings are scaled (e.g., a 3.69 receives 12% + 0.69 × [18% − 12%] or 16.14%). The median manager's rating was between 4.1 and 4.4. In any given year about 10 percent of the managers were rated below 3.0 and about 15 percent were rated 4.9 or better.

This performance-evaluation system at Fiat is similar to those used by many large United States corporations.

Source: K. Merchant and A. Riccaboni (1992), "Evolution of Performance-Based Management Incentives at the Fiat Group," in W. Bruns (Ed.), *Performance Measurement, Evaluation, and Incentives* (Harvard Business School: Boston), 63–96; www.fiatgroup.com

they exert a common effort level e, whether in a team or not. If they work independently, their individual output is

$$\text{Individual output} = 5e + \mu \tag{16.5}$$

where e represents the individual effort of either Conrad or Dina and μ is a random error term with zero mean and positive variance. If Conrad and Dina work as a team, they produce

$$\text{Team output} = 4e^2 + \mu \tag{16.6}$$

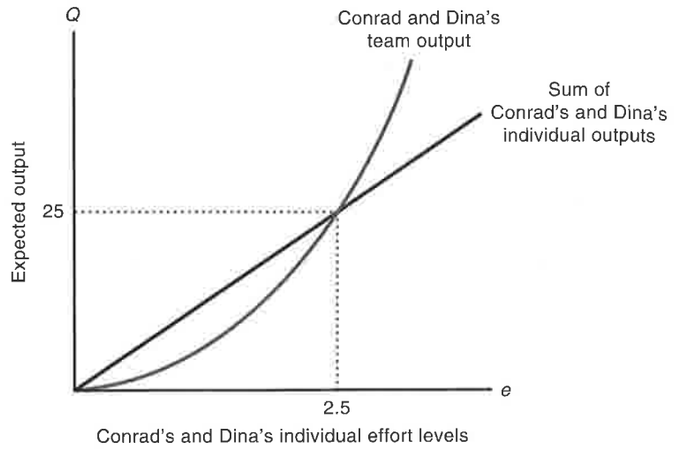


Figure 16.1 Comparing Individual and Team Outputs

When Conrad and Dina each exert at least 2.5 units of effort, their team output is greater than their outputs working independently.

For $e > 2.5$, the expected output working as a team is higher than the output of working independently:

$$\text{Expected team output} = 4e^2 > \text{Expected individual output} = 5e + 5e \qquad (16.7)$$

As displayed in Figure 16.1, Conrad and Dina's team output always is larger than the sum of their individual outputs whenever they each exert 2.5 units of effort (they jointly exert 5 units of effort).

In this example, there are team-production effects: Output is potentially higher when Dina and Conrad work as a team. Team output can be larger because Dina and Conrad help each other. Large, awkward pieces can be attached in less than half the time by two people assisting each other than if they worked independently. In other cases, team output is larger than individuals working separately because the team makes better use of the knowledge of its members.

Evaluating Teams

Teams are formed because of their joint production effects.[14] These team production effects make evaluating the performance of individual team members quite complicated. Although often there is no measure of individual output—only team output is observed—it normally is optimal to evaluate team members, at least in part, on team output. Using team output focuses team members on a common objective and helps promote cooperation. However, paying team members on group output provides individuals with incentives to free-ride. These incentives are less pronounced in smaller teams. But as team size grows, these free-rider problems can become enormous.

Free-rider problems can be controlled by evaluating team members not only on team output but on other measures as well. For instance, the following factors might be used to assess performance by Conrad and Dina: the number of hours worked, a supervisor's

[14]A. Alchian and H. Demsetz (1972), "Production, Information Costs and Economic Organization," *American Economic Review* 62, 777–795.

Peer Review Performance Ratings of Teams

This example describes the specific areas and skills evaluated for individuals working on teams. One small company is organized around nine management teams. Using a five-point scale, each team member rates all other team members on each of the following ten topics:

- Expresses opinions freely
- Comes to meetings prepared
- Takes initiative
- Accepts criticism
- Listens to others
- Delegates authority
- Shares information freely
- Bases decisions on sound data
- Values all customers
- Recognizes others' contributions

These individual peer ratings then are averaged across the ten topics and team members to arrive at an overall peer evaluation for each team member. Pay and promotion decisions as well as future team assignments are based on these evaluations, along with the team's overall performance.

Peer Pressure within Teams

Levi Strauss, maker of Levi jeans, installed multitask teams in its U.S. plants, replacing the old piecework system. Each team had 20 to 30 employees responsible for completing individual orders by assembling full pairs of pants, instead of each employee specializing as a zipper sewer or a belt-loop attacher. In essence, jobs were redesigned from being functional to being more multitask and process-oriented (recall Chapter 13's discussion). The much touted move was designed to empower workers, cut down on monotony, reduce stress, and increase productivity.

Employee incentive compensation was based on team output, which created free-rider problems, which in turn led to absenteeism and shirking, which caused tempers to flare. Supervisors on the plant floor spent more time intervening to prevent "big fights." One plant manager reported, "Peer pressure can be vicious and brutal." Before installing the multitask teams, each employee received 2 weeks of training in group dynamics and an additional 1-day seminar in "let's-get-along sessions" with private consultants. These training sessions did not resolve the conflicts. In fact, productivity dropped and costs rose. The quantity of pants produced per hour worked fell in 1993 to 77 percent of preteam levels. At one plant the cost of stitching a pair of Dockers went from $5 before teams to $7.50 with teams.

Then, Levi's share of the domestic men's denim-jeans market fell from 48 percent in 1990 to 26 percent in 1997. In 1997, Levi closed 11 U.S. plants and laid off 6,400 employees. While vowing to preserve the team strategy at its remaining U.S. plants, many of them unofficially went back to individual piecework. Robert Haas, Levi's CEO, admits, "Teams created pressures and tensions and a lot of unhappiness, and some people would rather go back. Ours is a culture of experimentation and novelty, and we're not always successful."

Sources: R. Mitchell (1994), "Managing by Values," *Business Week* (August 1), 50; R. King (1998), "Levi's Factory Workers Are Assigned to Teams and Morale Takes a Hit," *The Wall Street Journal* (May 20), A1.

subjective evaluation as to how hard they are working, the condition of their tools, and peer evaluations. Peer evaluations consist of Dina's evaluation of Conrad's work and Conrad's evaluation of Dina's work. Peer reviews often are important in evaluating the individual performance of team members because it is teammates who have the specific information about how each team member has performed.

Sometimes the costs of controlling free-rider problems within teams exceed the benefits that come from team production. In this case, it is better to work individually rather than as a team. For instance, if evaluating Dina and Conrad on team output provides low incentives to exert effort and the costs of monitoring individual performance of teammates (for example, through supervisor or peer reviews) are high, the net value of their combined output might be higher with individual production and performance evaluation.

One of the key tasks for new teams is to develop the internal architecture for the team. Decision rights (task assignments) must be partitioned among the team members. Accordingly, members must decide how to evaluate the work efforts of team members. Finally, members must decide on the rewards and punishments for members of the group. Sometimes the rewards and punishments are social; for example, a shirking member may be ostracized.

As another example of evaluating team output, consider the case of student project teams in business school courses. Such projects build leadership skills and teach students how to work more effectively in teams. These projects also enhance learning by allowing students to share their understanding and by helping all students on the team to learn more than if they each did the project individually. Instructors assigning projects to study teams frequently give the same grade to all members of the team. Thus, the team is evaluated based on the team's joint output.

Rather than assign all the members of the team the same project grade, some instructors apportion the total project grade among the team members based on peer reviews where unequal team grades are possible. Thus, although the overall project's grade might be a B+, some team members might receive an A− and others a B so long as the average across the team is a B+. Providing the team with the decision rights to evaluate one another reduces the free-rider problem and increases team production. But it can also reduce morale and lead to increased influence costs as team members lobby one another for better evaluations. Or, some team members might downgrade a team member unfairly to raise their own grades. These dysfunctional incentives are likely to be greater if the team is formed for a single project. As described in Chapter 10, free-rider problems are smaller if the team spans several courses and students have more incentives to invest in their reputations.

Why Teams Fail

Along with Mom and apple pie, teamwork has become a sacred cow to American businesses. Yet, one survey by Mercer Management found that only 13 percent of 179 teams received high ratings. "Somehow, we have to get past this idea that all we have to do is join hands and sing *Kum Ba Yah* and say, 'We've moved to teamwork.'" Many companies are narrowing the focus and time horizon of teams. A team manger at Texas Instruments counsels that not everyone has to be on a team and that only 5 percent of its workforce are on self-directed teams.

Teams fail for several reasons including:

- The mental opt-out. Busy managers feel compelled to sit through endless team meetings and frequently "surrender by withholding any real effort." Thus half the decisions reached by teams never get implemented.
- Dueling advice. "Teams start out with everyone very polite. Then they start to storm." Several months can pass before things settle down.
- Old-fashioned pay scales. Often when companies move to teams, they keep individual performance measures and pay systems. Team-based pay systems are not used to reward the entire team for meeting goals. This is an example where two legs of the three-legged stool do not match and the stool thus is not balanced.

Source: E. Neuborne (1997), "Companies Save, But Workers Pay," *USA Today* (February 25), 1B.

Government Regulation of Labor Markets

The basic principal-agent model assumes that both parties are free to arrive at any mutually agreeable contract and that labor markets are unregulated. However, government regulates labor markets and hence constrains the agreements employees and firms might otherwise reach. Since the 1960s, federal laws in the United States dealing with affirmative action and equal employment opportunity (EEO) have had a profound effect on both performance-evaluation systems and reward systems. Federal and state legislation and court actions have forced companies to document their compensation and promotion decisions to demonstrate that their actions are related to performance and are not influenced by the employee's race, religion, sex, age, or national origin.

Labor laws and court decisions have had a material impact on the performance-appraisal systems. In deciding cases involving alleged discriminatory employment practices, courts look more favorably at companies with the following characteristics[15]:

- The firm's job descriptions are clearly written and well defined.
- The appraisal system has clear criteria for evaluating performance such as written objective scales and dimensions.
- There are specific written instructions on how to complete the performance appraisal.
- Employees are provided feedback about their performance appraisal.
- Higher-level supervisors' evaluations are incorporated into the appraisal system.
- Individuals who receive similar evaluations in the firm are treated equally and consistently.

Although these characteristics appear sensible, even worthwhile for many firms, government regulation has negative side effects. The law does not permit companies and employees to "opt out" of these regulations. Even if these characteristics were appropriate and would be adopted voluntarily by the majority of firms, they are imposed on all firms and hence impose costs on that minority that would not have chosen them voluntarily.

The presence of potential legal scrutiny of the firm's performance-evaluation systems pushes these systems to become more formal, more objective, with less reliance on subjective appraisal. Every personnel action and appraisal must be documented. The firm's human resources department typically assumes the role of ensuring that the firm is complying with the labor laws.

[15]Major federal legislation includes the Equal Pay Act of 1963, Title VII, and the Civil Rights Act of 1964. A. Barnes, T. Dworkin, and E. Richards (1994), *Law for Business* (Richard D. Irwin: Burr Ridge, IL), Chapter 23; G. Milkovich and J. Newman (1993), *Compensation* (Richard D. Irwin: Burr Ridge, IL), 316–318.

The performance-appraisal system that meets these regulatory criteria would not necessarily maximize the firm's value absent the regulation. For example, many Japanese managers try "to make everybody feel that he is slated for the top position in the firm"[16] by delaying differentiating among cohorts and performance appraisals for 12 to 15 years after joining the firm. Such limitations on annual feedback to employees potentially would run afoul of affirmative-action laws in the United States and thus would be opposed strenuously by human resources departments at most large corporations. Hence, U.S. firms find it more difficult to use less formal, more subjective performance-evaluation systems than their foreign competitors, even though such systems might be value-enhancing for some firms if they could operate in a less regulated setting.

Government regulations cause U.S. firms to spend more money than they would otherwise on appraisal systems that, to a court's satisfaction, document the firm's compliance with affirmative-action regulations. Thus, regulations likely cause some U.S. firms to adopt different performance-appraisal systems. This is another example of how regulation affects the firm's optimal choice of organizational architecture. (Chapter 21 describes government regulation more generally and provides additional organizational architecture examples.)

Summary

In the previous four chapters, we have examined the first two components of organizational architecture: the assignment of decision rights and the reward systems. In this chapter, we began to examine the third component: the performance-evaluation system.

Performance evaluation is conducted for both individuals within the firm and subunits of the firm: How did Taylor perform? How did Morgan's team perform? Such questions require individual and team performance evaluations. Also, Morgan and Taylor are in the automotive products division. How did this division perform? Answering this last question requires divisional performance measures. This chapter focuses on individual performance-evaluation systems; divisional performance evaluation is discussed in Chapter 17.

The simple principal-agent model in Chapter 15 suggests that part of the employee's compensation should be based on performance (output). But basing pay on output requires that output is observable at low cost and is difficult to manipulate by the firm or the employee. Among the costs of performance measures are the *compensating differentials* employees must be paid for bearing the additional risks of incentive pay. Moreover, the model assumes that the firm and employee are free to contract in an unregulated labor market. This chapter explores how individual performance evaluation is affected when these conditions are violated.

To set the optimum compensation package, management must know the employee's marginal productivity of effort. One way managers estimate these marginal productivities is to use time and motion studies or data on past performance. If past performance is used, dysfunctional incentives due to the *ratchet effect* can result; employees will limit output if they anticipate that the next period's target benchmark will be raised. To reduce the dysfunctional consequences of the ratchet effect, some firms set performance estimates at the beginning of the period and do not adjust them simply because employees are making high earnings.

[16]N. Hatvany and V. Pucik (1981), "Japanese Managerial Practices and Productivity," *Organizational Dynamics* 13, 4. Also, M. Aoki (1988), *Information, Incentives and Bargaining in the Japanese Economy* (Cambridge University Press: Cambridge).

In some cases, measuring output can be extremely costly. For example, accurately measuring the output of a teacher is likely to be quite costly. Firms will select performance evaluations based on the direct cost of the measure, the cost of employee opportunism induced by the performance measure, and the indirect cost incurred by imposing more risk on the employee.

Another assumption of the model is that the employee shirks only on effort. If output is not correlated perfectly with the firm's value, employees attempting to increase output might cause the value of the firm to decline. Such dysfunctional results can occur when employees game the system—as in the Prudential Insurance Company agents case of "churning" policies.

Often a manager has multiple signals available regarding the employee's output. The informativeness principle from Chapter 15 suggests that the manager should use all these signals (so long as they are available at low cost) because they allow the firm to reduce the risk the employee bears and hence lower the compensating differential the employee must be paid. The informativeness principle suggests that when several employees are performing similar tasks, their combined output provides information about common random shocks affecting all their outputs. Thus, the employee's compensation should be adjusted relative to peers. This is called *relative performance evaluation.* Relative performance evaluation requires the firm to establish a reference group of employees to use as a benchmark. But relative performance evaluations can lead employees to collude or sabotage coworkers to improve their evaluations. Moreover, establishing the appropriate reference group and measuring its performance is costly.

In some cases, the measurement costs or the costs from employees' dysfunctional attempts to maximize explicit performance measures become so great that alternative measures of performance are sought. *Subjective performance evaluations* are periodic reviews by supervisors that usually incorporate a comprehensive examination of all the employee's outputs. Subjective evaluations can be based on either standard rating scales for a number of different areas or goal-based systems. Standard rating scales have the appearance of objectivity but entail subjective judgments by the evaluator. Goal-based systems set performance targets at the beginning of the period that the evaluator uses at the end of the period to determine an overall, subjective evaluation.

Subjective performance measures also involve costs. It becomes easier for a manager or the firm to renege on the promise to reward good performance because it is harder to define "good." There is more latitude to exercise favoritism and introduce bias in subjective measures. Finally, subjective systems often generate greater influence costs as employees try to lobby for better ratings.

Subjective and objective performance evaluations usually complement each other. Subjective evaluations often are used to reduce the incentives of employees to engage in opportunistic behaviors that increase the costs of objective measures. For example, the Lincoln Electric secretary who typed meaningless characters during lunch could be penalized using a subjective system: The supervisor could dismiss the secretary or give the secretary a poor subjective evaluation.

When employees work in teams, each individual's marginal contribution to the team's output depends on others' efforts. There are synergies or interdependencies among employees. Measuring individual output is difficult, and it is costly to disentangle individual shirking from others' effort. Evaluating teams of employees usually requires a measure of team performance while still recognizing individual contributions to the team. Individual performance (possibly measured using peer reviews) is rewarded to overcome free-rider problems. In some cases, each team member's bonus

is based on individual performance, but the bonus is paid only if the entire team reaches its goals.

The principal-agent model assumes that the parties are free to contract, yet labor laws constrain their choices. The equal employment opportunity laws in the United States have had a pronounced effect on performance-evaluation systems. For example, defending against affirmative-action lawsuits has encouraged firms to adopt more explicit, objective appraisal systems than they otherwise might have chosen voluntarily.

Appendix

Optimal Weights in a Relative Performance Contract[17]

In this chapter, we argued that it can be optimal to base an employee's pay on performance *relative* to some benchmark group such as employees within the same organization who perform similar tasks. The advantage of this type of system is that it filters out common shocks in the evaluation of employees and thus reduces the costs of inefficient risk bearing. In this appendix, we consider how a risk-neutral firm might optimally weight the performance of such a benchmark group in a compensation contract.

For simplicity, we restrict our attention to simple linear compensation contracts of the following form:

$$\text{Compensation} = W_0 + \beta(Q - \lambda\overline{Q}) \tag{16.8}$$

where W_0 and β are fixed parameters, Q is the employee's own output, and $\overline{Q}$ is the average output of the benchmark group (for example, similar employees within the firm). W_0 is the employee's fixed wage under a relative performance contract. We are interested in how to choose the optimal λ. Note that if $\lambda = 0$, average output receives no weight and thus is left out of the contract. In contrast, if $\lambda = 1$, then compensation is based on a simple difference between own output and average output.

In the discussion that follows, we show that expected compensation can be held the same by simply adjusting W_0. Second, under certain assumptions, the employee's effort choice is independent of λ. Third, we show how to choose λ to minimize the risk the employee bears. Since expected compensation can be the same for any λ and if the effort choice isn't affected by λ, then the efficient contract is the one that minimizes the risk borne by the employee.

Expected Compensation

Rewriting Equation (16.8) yields

$$\text{Compensation} = W_0 + \beta Q - \beta\lambda Q \tag{16.9}$$

Expected compensation in Equation (16.9) is $W_0 + \beta E(Q) - \beta\lambda E(\overline{Q})$ where $E(\bullet)$ denotes the expectation operator. Expected compensation can be held constant at any level of λ by adjusting W_0 by $+\beta\lambda E(Q)$.

Effort Choice

Under certain assumptions, the employee's effort choice is independent of λ. In this case, the firm can choose λ without being concerned about how it might affect employee productivity. In particular, suppose that the employee's cost of exerting effort is

[17]Technical note: This appendix requires elementary knowledge of statistics, decision theory, and calculus. Material in this appendix draws on the analysis in Milgrom and Roberts (1992), Chapter 10.

given by the function $C(e)$, which expresses the disutility of effort in dollar equivalents. The employee's certainty equivalent can be approximated by the following formula:[18]

$$\text{Certainty equivalent} = E[W_0 + \beta E(Q - \lambda\overline{Q})] - 0.5rs^2 - C(e) \tag{16.10}$$

where r is the coefficient of absolute risk aversion, and s^2 is the variance of compensation. In this expression, the first term on the right-hand side represents expected compensation, the second term is the risk premium (employees discount the expected value because they are risk-averse), and the last term is the cost of effort. We make two additional assumptions: (1) the effort of the employee does not affect the average output of other employees of the benchmark group, and (2) r is a constant. Employees want to maximize their certainty equivalent with respect to the effort choice e—which is equivalent to maximizing their utility. Conceptually, the maximizing effort level is found by taking the partial derivative of the certainty equivalent with respect to effort e and setting it equal to zero. The first-order condition is therefore

$$\beta Q' = C'(e) \tag{16.11}$$

where Q' and $C'(e)$ are partial derivatives with respect to e. This expression indicates that the employee chooses the effort level that equates marginal benefits and marginal costs. The marginal benefit is the extra compensation that the employee receives from exerting more effort, and the marginal cost is the extra disutility that he experiences from working harder. Note that λ does not enter into this equation, since the average output of other employees does not depend on this employee's effort. Thus, in this case, the firm can choose any value for λ without affecting the employee's effort level.

Minimizing Employee Risk

Note from Equation (16.10) that the employee is made better off by reducing the variance of compensation (it lowers the discount for risk). The firm, on the other hand, is not harmed by this choice because the employee exerts the same effort level under any λ and W_0 can be adjusted to keep expected compensation the same. Indeed, the firm potentially can share in the gains from the risk reduction to the employee by paying a lower expected level of compensation—since the firm can meet the employee's reservation wage with a lower expected level of payout.

Basic statistics allows us to express the variance of compensation [Equation (16.8)] as

$$\text{Var}(\text{Compensation}) = \beta^2[\text{Var}(Q) + \lambda^2\,\text{Var}(\overline{Q}) - 2\lambda\text{Cov}(Q, \overline{Q})] \tag{16.12}$$

Figure 16.2 shows a picture of this quadratic function. The optimal weight is λ^* at the bottom of the parabola. Using basic calculus, we can show that

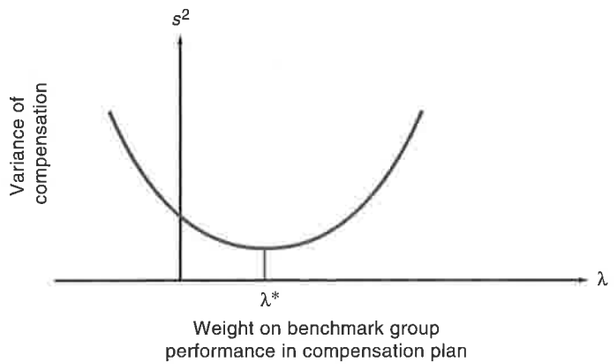
$$\lambda^* = \text{Cov}(Q, \overline{Q})/\text{Var}(\overline{Q}) \tag{16.13}$$

Equation (16.13) has a quite intuitive interpretation. The numerator of the expression $\text{Cov}(Q, \overline{Q})$ is a measure of the association between this employee's own output and the average output of other employees. The higher this association, the more information average output contains about random shocks that affect the employee's output (the

[18]Technical note: A certainty equivalent is the amount of cash that employees would require with certainty to make them indifferent between this certain sum and the uncertain income stream. The approximation of the certainty equivalent in Equation (16.10) is a basic result from decision theory. It holds when the risk is small and the utility function is sufficiently smooth. J. Ingersoll (1987), *Theory of Financial Decision Making* (Rowman & Littlefield: Totowa, NJ), 38.

Figure 16.2 Choosing the Optimal Weight in a Relative Performance Contract

This figure reflects a simple linear contract of the form Compensation $= W_0 + \beta(Q - \lambda\overline{Q})$, where W_0 and β are fixed parameters, Q is the employee's own output, and $\overline{Q}$ is the average output of the benchmark group (for example, similar employees in the firm). Pictured is the variance of compensation as a function of λ. Given the assumptions in the analysis, the optimal weight, $\lambda^* = \text{Cov}(Q, \overline{Q})/\text{Var}(\overline{Q})$. This is the value that minimizes the variance of compensation.



better is the "signal"). For example, if this covariance is zero, average output contains no information about these shocks and should not be included in the compensation contract. The denominator of the expression is the variance of average output. The higher this variance, the more noise there is in average output and the less information it contains about the employee's effort. The optimal weight λ^* can be estimated using a time series of observations on own output and average output.[19]

Firms sometimes base compensation on the simple difference between the employee's output and average output. This measure is equivalent to choosing $\lambda = 1$. Our analysis indicates that this choice is not always optimal and in some cases can be worse than excluding average output in the contract (for example, when the covariance between the two variables is small). Indeed, the optimal weight could be negative if the two variables were negatively correlated.

Appendix Problem

Assume that a salesperson, Edwynn Phillips, has the following annual compensation package:

$$C = \$15{,}000 + 0.2(\text{own sales})$$

This compensation plan induces Ed to exert a given level of effort in selling. Given this effort level, expected sales are $30,000 per year.

Below are 10 years' worth of data for Ed's sales and the average sales for other employees in the company (Ed's own sales are excluded in calculating this average). The

[19]Technical note: Readers familiar with linear regression analysis should note that the right-hand side of Equation (16.13) is the formula for the slope coefficient in a simple linear regression, where the employee's output is the dependent variable and average output of other employees is the explanatory variable. Thus, this formula can be estimated through a simple regression.

expected value of average sales is also $30,000. However, in any given year, average sales might rise or fall, depending on general economic conditions, and so on. Some of these same conditions affect Ed's sales. Ed has no impact on the average sales for other employees.

Year	Ed's Sales	Average Sales
1	30,000	30,000
2	24,000	27,000
3	36,000	28,500
4	27,000	27,000
5	33,000	36,000
6	30,000	33,000
7	25,500	27,000
8	24,000	24,000
9	34,500	30,000
10	36,000	36,000

1. Based on the 10 years of data, calculate Ed's average annual pay and standard deviation under the existing compensation plan.
2. Calculate Ed's average pay and standard deviation under the alternative plan:

   $$\$21{,}000 + 0.2(\text{own sales} - \text{average sales})$$

   Note: We adjust the intercept of the pay plan by $6,000 to reflect Ed's average loss imposed on the employee by subtracting 0.2 (average sales) from the compensation. This adjustment keeps the expected pay the same as before. Also, the sample mean of average sales over a 10-year period need not equal the expected value of $30,000.
3. Does including the average sales in the pay package alter Ed's incentives to work hard? Explain. (Assume that Ed cannot affect the average by collusion, sabotage, etc.)
4. Is this pay plan superior to the original plan from a risk-sharing standpoint?
5. Devise an even better plan using the more general form:

   $$C = a + 0.2(\text{own sales} - \lambda \text{ average sales})$$

   (Remember to adjust the intercept to keep expected compensation the same.)
6. Calculate the average pay and standard deviation for this plan.

Suggested Readings

A. Alchian and H. Demsetz (1972), "Production, Information Costs and Economic Organization," *American Economic Review* 62, 777–795.

G. Baker, R. Gibbons, and K. Murphy (1994), "Subjective Performance Measures in Optimal Incentive Contracts," *Quarterly Journal of Economics* CIX, 1125–1156.

Y. Barzel (1982), "Measurement Cost and the Organization of Markets," *Journal of Law & Economics* XXV, 27–48.

E. Lazear and S. Rosen (1981), "Rank Order Tournaments as Optimal Labor Contracts," *Journal of Political Economy,* 89, 841–864.

G. Milkovich, J. Newman, and C. Milkovich (1999), *Compensation* (Irwin/McGraw-Hill: Burr Ridge, IL).

G. Milkovich and A. Wigdor (1991), *Pay for Performance* (National Academy Press: Washington, DC).

C. Prendergast (1999), "The Provision of Incentives in Firms," *Journal of Economic Literature* 37 (March), 7–63.

Review Questions

16–1. Discuss some of the costs and benefits of 360-degree evaluation systems.

16–2. Semco S.A. in São Paulo, Brazil, has 500 employees and manufactures capital goods. The employees elect their managers and evaluate them every 6 months. Managers rated poorly are transferred or fired. There are 100 nonunion employees who set their own performance standards and arrange their own work schedules. Twice a year, the nonunion employees receive a market salary survey and are asked to set their own pay for the next 6 months. Employees setting their pay too low receive that amount, as do employees requesting too high a salary. If management decides after 1 year that the employees' salaries were above what they were worth to the company, these employees are fired. The 400 unionized employees' pay is set by union contract. Critically evaluate Semco's performance-evaluation system.[20]

16–3. In 360-degree performance review programs, personnel evaluations are collected anonymously from employees knowing the manager being evaluated (superiors, subordinates, and coworkers). These are tabulated and a consensus summary is provided to the manager. Each manager being evaluated also does a self-evaluation, and this is used to benchmark how closely the manager and the coworkers' assessments match. About one-third of the managers match their coworkers, one-third have an inflated view, and one-third rate themselves lower. Those who overrate themselves tend to be judged "least effective" as perceived by their coemployees. However, these overraters are more common higher up in the organization.[21]

a. What does the breakdown of three one-thirds indicate?

b. Offer some plausible explanation of why overraters are higher up in the organization.

16–4. The following quote is based on statements made by quality expert W. Edwards Deming:

> *If by bad management the components of a company become competitive, the system is destroyed. . . . A common example lies in the practice of ranking people, divisions, teams, comparing them, with reward at the top and punishment at the bottom. Jobs and salaries are based on comparisons. Teams naturally become competitive; divisions become competitive. Each tries to outdo the other in some competitive measure. The result is higher costs, battle of market share. Everybody loses.*[22]

Do you agree with Deming that performance evaluations based on comparative rankings always reduce company value? Explain.

16–5. The United States Navy recently revamped its officer fitness report system.[23] Under the old system, officers were ranked into one of four categories, where 4.0 was the highest grade. This old system had been used for 20 years and grade inflation had become rampant. Eighty percent of all sailors routinely were ranked a perfect 4.0. One officer remarked, "Let's face it, 85 percent of the people are 4.0 and 80 percent [of those] have every mark in 4.0." A retired admiral commented, "The old system wasn't entirely broke, it was just deteriorating over time and became less and less useful."

The Navy decided to change the evaluation system because of the natural tendency for senior officers to promote their own subordinates over unknown sailors. Not everyone deserved a 4.0, but to get their own people promoted, senior officers had to play along because that's what everyone else was doing.

The new system requires each officer to be rated on a 1–5 scale in seven areas: professional expertise, leadership, support for equal opportunity programs, military bearing and appearance, teamwork, mission accomplishment, and interpersonal skills. The total points out of 35 possible are then used to provide an overall promotion recommendation:

- Clearly promote
- Must promote

[20]J. Lopez (1994), "A Better Way?" *The Wall Street Journal Supplement* (April 13), R6.

[21]B. O'Reilly (1994), "360 Feedback Can Change Your Life," *Fortune* (October 17), 93–100.

[22]R. Aguayo (1990), *Dr. Deming: The American Who Taught the Japanese about Quality* (Fireside Simon & Schuster: New York), vii–viii.

[23]E. Blazar (1995), "The New Standard of Excellence," *Navy Times* (March 20), 12–14.

- Promotable
- Progressing
- Don't promote

The number of ratings in the top two categories—"clearly promote" and "must promote"—will be severely restricted to at most 20 percent of the evaluations. If an officer is evaluating 10 junior officers, at the most only 2 can receive the top two ratings.

What are the expected consequences of this new system? What are the likely outcomes? What are the pros and cons of the new system?

16–6. Evaluate the following statement:

> *The overarching purpose of a measurement system should be to help a team, rather than senior managers, gauge its progress. A team's measurement system should primarily be a tool for telling the team when it must take corrective action.*[24]

16–7. The Green Shoe Company is considering going to a piece rate system, where manufacturing employees are paid based on their level of output. Discuss what factors the firm should consider in deciding whether this idea should be implemented. How should the initial piece rate be set? Under what circumstances should the company alter the piece rate once it is adopted?

16–8. Your company currently has a bonus plan for its sales managers. If annual sales for a manager's unit exceed $1 million, the manager receives a $10,000 bonus. In a typical year, about 5 of the 10 managers in the firm meet the target and receive the bonus. However, the number receiving the bonus varies from year to year due to the state of the economy, which in turn has an effect on sales. The company is considering replacing the bonus plan with a plan that rewards the top-five selling managers each year with a $10,000 bonus. Discuss the potential benefits and costs of the new plan relative to the old plan.

16–9. Communities are frequently concerned about whether police are vigilant in carrying out their responsibilities. Several communities have experimented with incentive compensation for police. In particular, some cities have paid members of the police force based on the number of arrests that they personally make. Discuss the likely effects of this compensation policy.

16–10. A consultant does not like the fact that you use subjective performance measures in your firm. He argues that they are arbitrary and should be replaced with objective measures. He stresses that objective measures provide a clear target for employees, but mentions none of the potential costs. What are the potential problems associated with using objective performance measures?

16–11. Some firms have recently adopted 360-degree performance evaluations. Under this evaluation system, the employee is evaluated not only by supervisors and peers but also by employees who report to the employee being evaluated. Discuss why a firm might want to adopt 360-degree reviews. What are the likely problems with this type of performance evaluation?

16–12. Evaluate the following quote:

> *Teams do not spring up by magic. Nor does personal chemistry matter as much as most people believe. Rather, we believe that . . . most people can significantly enhance team performance. And focusing on performance—not chemistry or togetherness or good communications or good feelings—shapes teams more than anything else.*[25]

16–13. A basic principle in accounting is that of "responsibility accounting." Under this principle, it is inappropriate to base performance evaluation on measures that are beyond the control of the employee. Do you think that you should ever include variables in a workers' compensation plan that are not under at least partial control of the employee? Explain.

16–14. Once again, the Eastman Kodak Company has altered the determinants of pay raises for U.S. employees. Whereas in the past pay increases for managers, professionals, and hourly workers

[24]C. Meyer (1994), "How the Right Measures Help Teams Excel," *Harvard Business Review* (May–June), 96.

[25]J. Katzenbach, and D. Smith (1993), *The Wisdom of Teams* (Harvard Business School: Boston), 61.

had been automatic, starting in 1996 the company began determining the size of an annual bonus pool and then allocated lump-sum bonuses to employees on the basis of performance. Hourly workers were to be evaluated within their annual performance appraisals; professional-level employees would work with their supervisors to establish personal goals against which they would be measured.

a. What problems do you foresee with the implementation of this arrangement? Be specific about who will be affected by the problems you've identified.

b. What recommendations would you offer to top management at Kodak to preempt or minimize problems with the new reward system?

16–15. Agricultural workers are often paid piece rates. For example, pear pickers are paid a fixed amount for each box of pears they pick. Pear companies, however, pay tree thinners on an hourly basis. These thinners remove excess fruit from trees so that the remaining fruit can grow larger. (Each piece of fruit must be at least 6 inches apart on the tree.) Why do you think these companies pay thinners by the hour? Presumably, they would work harder if they were paid by the tree.

16–16. Evaluate the following statement:

I am a manager at a governmental agency. I have no control over compensation policy. All workers are paid the same salary, and I cannot fire them. Therefore, an understanding of the basic principles of organizational architecture will not help me be more effective in my job.

16–17. The JAB Gold Mining Company observes that some firms pay their CEOs based on performance *relative* to the S&P 500. Most firms, however, have stock prices that are positively correlated with the S&P 500. JAB has a *negative beta*! (Its stock returns are negatively correlated with the index.) Does this mean that JAB would be wrong in paying its CEO based on performance relative to the S&P 500? Explain.

16–18. Martina Genser sells copiers for Xerox. Her sales are a function of her effort e and can be expressed in the following manner:

$$\text{Sales} = 100e + \mu$$

where μ is a random error term with expected value of zero. Martina's personal cost of exerting effort is

$$C(e) = e^2$$

She is paid a straight salary plus a commission:

$$\text{Compensation} = \$1{,}000 + 0.10 \text{ sales}$$

Her personal objective is to maximize

$$U = E(\text{Compensation}) - C(e)$$

the difference between the expected value of her compensation and her cost of effort.

a. Find Martina's optimal effort level.

b. Now assume that Xerox compensates Martina based on her sales relative to the average sales for salespeople in the company. Assume that Martina's sales are not included in the calculation of this average and that she cannot affect the average sales through her effort. The expected value of average sales is 500. Her compensation is now

$$\text{Compensation} = \$1{,}000 + 0.10(\text{sales} - \text{average sales})$$

Calculate Martina's optimal effort level under this compensation plan.

c. Including average sales in the contract affects expected compensation. What adjustment must be made in the salary to keep expected compensation the same as before?

d. Does including average sales in the compensation contract affect the variance of Martina's compensation? Assume that her sales and average sales are positively correlated. Give a brief verbal explanation to support your answer.

16–19. The Quantum Division of Nextel Corp., based in San Jose, California, manufactures semiconductors that convert analog signals to digital signals. Lynn Kraft is the division manager. Her compensation consists of a base wage of $50,000 plus a bonus of 2 percent of division profits above $10 million. Last year's division profits were $12 million, and so Kraft received a bonus of $40,000.

This year two things happened that adversely affected division profits. First, the price of gold, a key ingredient in Quantum's chips, increased dramatically, causing the division's costs to be higher than expected. Second, an earthquake in the San Jose area caused Quantum's plant to be closed for 6 weeks and to require $1 million in repairs. Division profits for this year were $9 million.

Kraft believes her compensation plan should be adjusted for these events. She believes that, but for these events, division profits would have been $13 million for the year.

What issues should the CEO of Nextel consider when deciding whether to adjust Kraft's bonus plan? Do you think the plan should be adjusted? Why?

Divisional Performance Evaluation

CHAPTER 17

CHAPTER OUTLINE

Briggs & Stratton with 2002 sales of $1.5 billion is the world's largest producer of air-cooled gasoline engines for outdoor power equipment.[1] B&S engines, primarily 3 to 25 horsepower, are purchased by original equipment manufacturers and incorporated into lawn and garden equipment such as mowers and garden tillers. In the 1980s, most of their manufacturing plants were unionized. Union work rules reduced B&S's labor productivity, causing B&S's labor costs to exceed those of their competitors. To reduce their labor costs, B&S invested heavily in automation during the 1980s. While automation was consuming B&S's capital, competition (primarily from Japan) was reducing their profits. Moreover, a shift from independent dealers to mass merchandisers, such as Wal-Mart, Kmart, and Home Depot, who insisted on price concessions from their suppliers, put further pressure on B&S's profit margins. In 1989, B&S reported a $20 million loss.

Their deteriorating financial situation coupled with a changing competitive landscape prompted B&S to reexamine their corporate strategy, to reorganize the firm, and to adopt new performance measurement and compensation schemes. B&S's traditional

[1]Details of this example are from J. Stern and J. Shiely with I. Ross (2001), *The EVA Challenge: Implementing Value-Added Change is an Organization* (John Wiley & Sons, Inc, New York), 28–33. EVA is a registered trademark of Stern Stewart.

market had been high-volume basic small engines. But the firm had ventured into the high-end market, only to lose money. Briggs & Stratton refocused its strategy back to its core business to become the low-cost high-volume producer. To implement this strategy and to boost sales to the mass merchandisers, B&S had to economize on both capital and labor costs. This required a reassignment of decision rights. B&S had been functionally organized. This worked well when the engines were relatively simple and its environment was reasonably stable. But engines were becoming more complex and its operating environment more volatile. B&S reorganized around major products (the small-engine division for walk-behind mowers, large-engine division for ride-on mowers, aluminum castings division, and iron castings division). Decision rights were decentralized to product managers, who were held responsible for operating decisions and capital expenditures. Furthermore, to focus managers' attention on both operating and capital costs, the performance evaluation and reward systems were altered.

Briggs & Stratton changed the way performance was evaluated when it adopted Economic Value Added (EVA) in 1990. EVA is the after-tax operating profit of the division minus the total annual opportunity cost of the capital invested in the division. The total annual cost of capital is the product of the division's cost of capital times the amount of capital invested in the division. Managers in the newly organized divisions now became responsible for how much capital they were using. Moreover, they were given incentives to increase EVA (by increasing sales or by decreasing operating or capital costs) because 40 percent of their bonuses were based on corporate EVA, 40 percent on divisional EVA, and 10 percent on appraisal of personal performance by their superior.

The new strategic focus, decentralization, and tying bonuses to Economic Value Added had a dramatic effect. In 1989, before adopting EVA, B&S's negative EVA was $62 million. This means that its operating earnings fell short of covering its cost of capital by $62 million. By 1993, Briggs & Stratton finally showed a positive EVA, and it generated positive EVA from 1993 through 2000, including a record EVA of $50.9 million in 1999. The stock market recognized this performance and B&S's stock price rose from $10.25 per share in the fall of 1990 to about $70 in 2000. Most of B&S's stock price increase occurred in the first three or four years after changing its strategy and organizational architecture. Since about 1995, B&S's stock price has tracked the broader market indexes. It is interesting to note that consistent with Figure 11.1, Briggs & Stratton adopted an integrated approach to organizational change, which involved matching a new strategy with a revised organizational architecture: decentralization of decision rights, EVA performance measure, and tying pay to EVA.

In Chapter 16, we described individual performance-evaluation systems. Our discussion is extended in this chapter to evaluating the performance of business units within the firm. As described in Chapter 13, firms are organized in a variety of ways: by function, by product line, or by geography. Most organizations partition decision rights among subunits within the firm. This chapter describes different ways organizations measure the performance of their various businesses. The next section describes commonly used arrangements—cost centers, expense centers, revenue centers, profit centers, and investment centers. These subunits are assigned different sets of decision rights and accordingly use different performance-evaluation metrics—for instance, costs, revenues, profits, or EVA. Because business units within the organization interact with one another and often exchange goods or services among themselves, reported performance of each center involved in an exchange depends on the rules used to value the exchange. Performance evaluation of business units exchanging goods or services requires establishing an internal transfer price for these exchanges. The following section discusses these transfer-pricing issues. Finally, because most firms rely on their accounting systems to measure the

performance of their business units, we discuss general issues involving use of the accounting system in measuring performance.

Measuring Divisional Performance[2]

All but the smallest organizations invariably are divided into subunits, each granted particular decision rights and then evaluated based on performance objectives for that subunit. Rewards typically are based on these performance evaluations. In effective organizations, performance-evaluation and reward systems are consistent with the decision rights granted the unit manager—the three legs of the stool are balanced. Chapter 13 described alternative organizational structures: U form, M form, and matrix organizations. In the U form, one unit might be responsible for manufacturing, another for R&D, another for marketing, and so forth. These basic building blocks of the organization are the work groups that define what each part of the firm does. Senior management attempts to evaluate the performance of these various subunits both for setting rewards for lower-level managers as well as for making business decisions—for instance, which businesses to expand.

Chapter 12 pointed out that teams often are more productive than individuals working independently. The business units of the organization are, in effect, production teams. For example, the maintenance department maintains facilities; the marketing group structures and implements marketing plans; research and development explores potential new products; support groups provide products and services to customers. Each unit generally can be characterized into one of five categories based on the decision rights it has been granted and the way its performance is evaluated: cost centers, expense centers, revenue centers, profit centers, and investment centers. For instance, Briggs & Stratton changed from evaluating some of its divisions as cost or profit centers to evaluating them as investment centers.

Cost Centers

Cost centers are assigned the decision rights to produce a stipulated level of output; in achieving this objective, the unit's efficiency is measured and rewarded. Cost center managers are granted decision rights for determining the mix of inputs—labor, materials, and outside services—used to produce the output. Managers of cost centers are evaluated on their efficiency in applying these inputs to produce output. Since they are not responsible for selling their output, they are not judged on revenues or profits.

To evaluate the performance of a cost center, its output must be measurable. Moreover, because it retains the decision rights to specify the department's output or budget, central management must possess the requisite specialized knowledge. Manufacturing departments like the welder assembly department at Lincoln Electric normally are cost centers. The output of the welder assembly department is measured by counting the number of welders completed. Besides manufacturing settings, cost centers also are used in service organizations such as a railroad's railcar maintenance department (where output is measured as the number of railcars serviced), check processing by a bank (number of checks processed), or food services in a hospital (number of meals served). In addition to measuring the quantity of output, its quality must be monitored effectively. If not, unit managers evaluated on costs have incentives to meet their targets by cutting

[2]This section draws on M. Jensen and W. Meckling (1998), "Divisional Performance Measurement," in M. Jensen (1998), *Foundations of Organizational Strategy* (Harvard University Press: Cambridge MA), 345–361.

quality. Thus, Lincoln Electric must have mechanisms to ensure that assembled welders meet quality standards, which requires that quality must be reasonably observable.

Various objectives are used for evaluating cost center performance. Two of the more widely used are

- Minimize costs for a given output.
- Maximize output for a given budget.

In Chapter 5, we indicated that to maximize value, managers must select the optimal output Q^* and produce this output at minimum cost. Cost center managers focus primarily on the second of these activities—cost minimization. Their task is to choose the efficient input mix. For example, if Anthony Mancuso, the manager of the railcar maintenance department, is told to service 100 railcars per day, he is evaluated on meeting this production schedule and controlling the cost of servicing the 100 railcars. The quantity decision tends to be made by central management. The first potential evaluation criterion focuses directly on cost minimization. Minimizing costs given a prespecified quantity (and quality) is consistent with value maximization, so long as Q^* is selected as the target output.

The second potential evaluation criterion, maximizing output for a specified budget, provides incentives equivalent to the first criterion, given that the specified budget is the minimal budget necessary for producing Q^*. For example, Tony might be given a fixed budget ($27,500 per week) and evaluated based on the number of railcars serviced that meet quality specifications within his fixed budget. In either case, Tony has incentives to select the cost-minimizing input mix for producing Q^*.

For both objectives, the manager is constrained either by total output or by the budget. Effective implementation requires that central management choose either the value-maximizing output level or the appropriate budget for efficient production of this output level. Nonetheless under either cost center arrangement, Tony has incentives to reduce costs (or increase output) by lowering quality—again, the quality of production in cost centers must be monitored.

Cost center managers sometimes are evaluated based on minimizing average cost. In this case, the manager has the incentive to choose the output at which average costs are minimized and to produce this output efficiently. It is important to understand that value maximization need not occur at the point where average costs are minimized. In general, minimizing average unit cost is not the same as maximizing value. For example, in Table 17.1, profits are maximized by selling 6 units; yet, average cost is minimized by producing 9 units. Maximum profits occur where marginal costs and marginal revenues are equal—this need not be where average unit costs are lowest. As another example, suppose a cost center has fixed costs in addition to constant marginal costs. Then average unit costs fall with increases in output. To illustrate, assume that total costs are

$$TC = \$6Q + \$300{,}000 \tag{17.1}$$

Fixed costs are $300,000, and marginal costs are a constant $6 per unit. Given the equation for total costs, average costs are derived by dividing both sides of the equation by Q to get

$$AC = \frac{TC}{Q} = \$6 + \frac{\$300{,}000}{Q} \tag{17.2}$$

With constant marginal cost, as quantity produced increases, AC falls. In this situation, a cost center manager who is evaluated based on minimizing average unit costs has

Quantity	Price	Revenue	Total Cost	Total Profits	Average Cost
1	$35	$ 35	$ 78	$–43	$78.0
2	33	66	83	–17	41.5
3	31	93	90	3	30.0
4	29	116	99	17	24.8
5	27	135	110	25	22.0
6	25	150	123	27	20.5
7	23	161	138	23	19.7
8	21	168	155	13	19.4
9	19	171	174	–3	19.3
10	17	170	195	–25	19.5

Table 17.1 Example Demonstrating That Minimizing Average Cost Does Not Yield the Profit-Maximizing Level of Sales

Minimizing average unit cost is not the same as maximizing profits. Maximum profits occur where marginal costs and marginal revenues are equal, which need not be where average unit costs are lowest. This simple example shows that profits are maximized by selling 6 units. However, minimum average cost occurs by producing 9 units.

incentives to increase output, even as inventories mount. Focusing on average costs can provide incentives for cost center managers to either overproduce or underproduce; it will depend on how the value-maximizing output level compares to the quantity where average costs are minimized.

Cost centers work most effectively when central managers have a good understanding of the business unit's cost structure, can determine the value-maximizing output level, can monitor quantity as well as quality, and can establish appropriate rewards; in addition, the cost center manager has specific knowledge of the optimal input mix. Table 17.2 summarizes the measures used to evaluate performance for the different types of centers, the decision rights the various centers are granted, and circumstances under which particular centers are used most effectively.

Expense Centers

Cost centers are a common way of organizing manufacturing units. However, activities such as personnel, accounting, patenting, public relations, and research and development often are organized as expense centers. As in cost centers, expense center managers are given fixed budgets and asked to maximize service/output. The fundamental difference between expense centers and traditional cost centers is that output in expense centers is measured more subjectively than objectively. Thus, an expense center is basically a cost center that does not produce an easily measurable output.

The difficulty in observing the output of an expense center has several implications. As director of personnel, Salman Abassi is given a total budget and told to provide as much service as possible. Because the cost per unit of output is difficult to measure, the users of this expense center typically are not charged directly for the center's services.[3] Hence, his

[3]In some cases, firms indirectly charge for these services through a cost allocation system. For example, human resources does not charge for services provided; rather, other business units are charged based on head count.

Unit Type	Performance Measures	Decision Rights	Typically Used When
Cost center	Minimize total cost for a fixed output Maximize output for a fixed budget	Input mix (labor, material, supplies)	Central manager can measure output, knows the cost functions, and can set the optimal quantity and appropriate rewards. Central manager can observe the quality of the cost center's output. Cost center manager has knowledge of the optimal input mix.
Expense center	Minimize total cost for a fixed level of services Maximize service for a fixed budget	Input mix (labor, material, supplies)	Output is difficult to observe and measure.
Revenue center	Maximize revenues for a given price (or quantity) and operating budget	Input mix (labor, material, supplies)	Central manager has the knowledge to select the optimal product mix. Central manager has the knowledge to select the correct price or quantity. Revenue center managers have knowledge of the demand curves of the customers in their sales districts.
Profit center	Actual profits Actual profits compared to budgeted profits	Input mix Product mix Selling prices (or output quantities)	Profit center manager has the knowledge to select the correct price/quantity. Profit center manager has the knowledge to select the optimal product mix.
Investment center	Return on investment Residual income EVA	Input mix Product mix Selling prices (or output quantities) Capital invested in center	Investment center manager has the knowledge to select the correct price/quantity. Investment center manager has the knowledge to select the optimal product mix. Investment center manager has knowledge about investment opportunities.

Table 17.2 Summary of Cost, Expense, Revenue, Profit, and Investment Centers

Performance measures and decision rights are balanced across the various subunits of the organization. Their use depends on the distribution of specific knowledge.

users tend to overconsume the services, and Sal regularly requests larger budgets. The central corporate budget-setting organization has difficulty determining the budget that maximizes the firm's value, again because output is not easily observed. Expense center managers frequently derive additional benefits from managing larger staffs (empire building), which reinforces the tendency of these centers to grow faster than the firm as a whole. If the central budget office tries to cut the personnel department's budget, Sal might threaten to reduce those services that are most highly valued by users to enlist their help lobbying against the proposed budget cuts. This behavior is yet another example of influence costs (see Chapter 12).

A number of devices are employed to control expense centers. One is to benchmark their budgets against those of comparable centers in similar-sized firms. Another is to reorganize the firm and place the expense center under the control of their largest user, who then has not only more specialized knowledge of the expense center's value but also the decision rights to set the expense center's budget. Yet, this reorganized structure frequently supplies too little of the service to other units. If these other users are charged more than marginal cost, they demand too little of the services. Alternatively, without a charge-back system for the expense center's services, the controlling user might ration resources provided to other business units and again other users would receive too little of its services.

Revenue Centers

To organize the marketing activities of selling, distributing, and sometimes servicing finished products received from manufacturing, revenue centers are used. The idea behind a revenue center is to compensate the manager for selling a set of products. For example, a regional sales office might be evaluated as a revenue center. The regional sales manager, Eva Szabo, is given a budget for personnel and expenses and has decision rights as to how to deploy the budget to maximize revenue. Eva has limited discretion in setting the selling price; typically, she must keep the price within a prescribed range.

As with a cost center, various objectives can be used to evaluate revenue centers. One objective is to maximize revenue for a given price (or quantity) and budget for personnel and expenses. That is, the revenue center is told the price of each product it sells and is given a fixed operating budget. This objective is consistent with value maximization so long as central management chooses the correct price-budget combination for each product sold by the revenue center.

Giving Eva decision rights over product pricing or quantity and then evaluating her based on maximizing total revenue usually is inconsistent with value maximization. To maximize revenue, Eva goes to the point where marginal revenue equals zero—not to where it equals marginal cost. Since marginal cost usually is greater than zero, Eva's firm loses money on units sold at prices below marginal cost.

Revenue centers work best if sales managers have specialized knowledge of the demand curves of the customers within their sales district and understand how to sell products effectively while central managers understand aggregate market conditions—for instance, they need to be able to select the correct price-quantity combination as well as the optimal product mix (otherwise, salespeople might shift effort toward selling higher revenue-generating products rather than selling products that generate greater value).

Profit Centers

Profit centers often are composed of several cost, and possibly expense and revenue, centers. Profit center managers are given a fixed capital budget and allocated decision rights for

input mix, product mix, and selling prices (or output quantities). Profit centers are most appropriate when the knowledge required to make the product mix, quantity, pricing, and quality decisions is specific to the division and this information is costly to transfer.

Central managers rely on their internal accounting systems to provide performance measures for profit centers. Profit centers usually are evaluated on the difference between actual and budgeted accounting profits for their division. Although measuring the profits of profit centers is seemingly straightforward, two complications often consume managers' attention: how to price transfers of goods and services between business units (transfer pricing) and which corporate overhead costs to allocate to specific business units. In every large firm, managers constantly debate these two issues. (We examine the transfer-pricing problem in the next section.)

When there are interdependencies among business units, motivating managers of individual profit centers to maximize the profits of their business units normally fails to maximize the value of the firm as a whole. For instance, individual units focusing on their own profits frequently ignore how their actions affect sales or costs of other units.[4] One division might free-ride on another division's quality reputation, thereby reaping short-run gains at the expense of the other division and the whole firm. For example, Chevrolet and Buick are two profit centers within General Motors. Suppose Chevrolet, in pursuit of higher profits, decides to raise its car quality. This might affect consumers' perceptions of the average quality of all General Motor cars—including Buick's perceived quality. An enhanced reputation for all General Motors cars helps Buick. But if Chevrolet receives no credit for additional Buick profits, it is likely to ignore this positive externality that it generates for Buick and will tend to underinvest in quality enhancements. To help managers internalize both positive and negative externalities that their actions impose on other profit centers, firms often base incentive compensation not just on the profits of the manager's own business unit but also on a group of related profit centers' profits and/or firmwide profits. Unless the group and/or the entire firm makes a certain profit target, no individual profit center manager receives a bonus.

Investment Centers

Investment centers are similar to profit centers. However, they have additional decision rights for capital expenditures and are evaluated on measures such as return on investment. Investment centers are most appropriate where the manager of the unit has specific knowledge about investment opportunities as well as information relevant for making the unit's operating decisions.

Investment centers often comprise several profit centers. They have all the decision rights of cost and profit centers, as well as decision rights over the amount of capital to be invested. For example, suppose Lars Erikssen manages the consumer electronics group of an electronics firm that comprises three profit centers: the television division, the DVD division, and the stereo division. Lars has decision rights over the amount of capital invested in consumer electronics and is evaluated based on the return on the capital invested. There are two commonly used measures of performance for investment centers: accounting return on investment and residual income (EVA).

Accounting ROA

The most commonly used investment center performance measure is *return on assets.* ROA is the ratio of accounting net income generated by the investment center divided

[4]Conceptually, other units could offer side payments to take these effects into account. However, in the presence of transaction costs, these offers are likely to be limited.

by total assets invested in the investment center. It has intuitive appeal because ROA can be compared to external market-based yields to provide a benchmark for a division's performance.[5] However, using ROA creates potential problems. ROA is not a measure of the division's economic rate of return because accounting income (the numerator) is not a measure of economic profit and assets (the denominator) is not the market value of the division's assets. Economic profit is the change in value over the period. Accounting rules tend to be conservative: They dictate that accounting net income excludes some value increases and includes some value declines. For example, accounting net income excludes any appreciation in land value until the land is sold but recognizes permanent declines in market value even though the land has not been sold. Also, accounting depreciation, which is deducted from accounting profits, does not necessarily reflect the change in the economic value of the depreciable assets.

Lars has an incentive to reject profitable projects with ROAs below the mean ROA for the consumer electronics group because accepting these projects lowers the group's ROA. For example, suppose the group has an average ROA of 19 percent, 4 percent above its 15 percent cost of capital.[6] A new investment project that is 10 percent the size of the existing group investment is available. Its ROA is 16 percent, which also is above its cost of capital of 15 percent; thus, taking this project would increase firm value. But if this project is accepted, the group's ROA falls to 18.7 percent ($.90 \times 19\% + .10 \times 16\%$). If his group is evaluated based on increasing ROA, Lars will reject the project, even though its returns exceed the opportunity cost of capital.

Riskier projects require a higher cost of capital to compensate investors for bearing additional risk. If managers are rewarded solely for increasing their ROA without being charged for any additional risk imposed on the firm, they have incentives to plunge the firm into risky projects. Finally, a manager near retirement who is evaluated based on ROA might take projects that boost ROA immediately, even if they were expected to be unprofitable projects—this is just a specific case of the horizon problem (see Chapter 16).

Accounting Residual Income

To overcome some of the incentive deficiencies of ROA, such as divesting projects with ROAs above their cost of capital but below the division's average ROA, some firms use *residual income* to evaluate performance.[7] Residual income measures business-unit performance by subtracting the opportunity cost of capital employed from the profits of the business unit. For example, suppose Amita Singal manages a division that has profits of $20 million (after tax but before interest expense) and investment (total assets) of $100 million. Furthermore, her division has a required cost of capital of 15 percent. Its ROA is 20 percent, which is in excess of its opportunity cost of capital (15 percent). Residual income is $5 million ($20M − 15% × $100M). Under the residual income approach, divesting a project with an ROA of less than 20 percent but above 15 percent lowers residual income, although it raises average ROA.

Nonetheless, residual income has its own problems. Residual income is an absolute number; thus, larger divisions typically have larger residual incomes than smaller

[5]For levered firms, it is important to add back interest expense to accounting income before comparing ROA to the firm's external market-based yields.

[6]Cost of capital is the rate of return the firm must pay the market to raise capital. If the firm can raise money at 15 percent and invest in projects earning 16 percent, the value of the firm increases.

[7]For a more detailed discussion of residual income, see D. Solomons (1968), *Divisional Performance: Measurement and Control* (Richard D. Irwin: Burr Ridge, IL).

divisions. This makes relative performance-evaluation comparisons across investment centers of different sizes more difficult. To implement residual income requires that senior managers estimate the opportunity cost of capital for each division. In principle, each division will have a different required cost of capital to allow more precise performance evaluations by controlling for risk differences. However, these risk adjustments also potentially lead to greater influence costs as divisional managers lobby to lower their required capital costs.

Like ROA, residual income measures performance over a single year. It does not measure the impact of actions taken today on a firm's value in the future. For example, by

EVA Often Is Linked to a Change in the Compensation Plan

At the beginning of this chapter, Briggs & Stratton's use of economic value added was described as a performance measurement plan that is being widely heralded and adopted by such companies as AT&T, CSX, Coca-Cola, Equifax, and Quaker Oats. EVA is a variant of residual income. The formula for EVA is

$$\text{EVA} = \text{adjusted accounting earnings} - (\text{weighted average cost of capital} \times \text{total capital})$$

This is the same formula as residual income, but variables used in computing EVA are measured more carefully than historically has been done. Instead of using the same accounting procedures that are used in reporting to shareholders, different accounting procedures often are used to arrive at "adjusted accounting earnings." For example, standard United States accounting rules require that the entire amount spent on research and development each year be deducted from earnings. This creates incentives for managers with a short time horizon to cut R&D spending. One adjustment to accounting earnings some EVA adopters make is to add back R&D spending and treat it as an asset to be amortized, usually over 5 years. Total capital, in the above formula, consists of all the firm's assets, including the amount invested in R&D and other adjustments made to earnings.

EVA uses a weighted average cost of capital, which reflects the cost of equity and debt. The cost of equity is the price appreciation and dividends the shareholders could have earned in a portfolio of companies of similar risk. This is the opportunity cost the shareholders bear by buying the company's stock. The cost of debt is the current market yield on debt of similar risk. The costs of debt and equity are weighted by the relative amounts of debt and equity. Suppose the cost of equity is 18 percent, the cost of debt is 10 percent, and the firm's capital structure is 40 percent debt and 60 percent equity. Then, the weighted average cost of capital is 14.8 percent ($0.60 \times 18\% + 0.40 \times 10\%$).*

EVA, like residual income, measures the total return after deducting the cost of all capital employed by the firm. It estimates the economic profits of the firm in the period (usually a year). Many of the firms adopting EVA to measure divisional performance did so as part of a corporate reorganization. AT&T was organized as a huge corporate monolith providing balance sheets only for a few large groups such as long-distance services. In 1992, AT&T reorganized into investment centers, each resembling an independent company. The long-distance service function now has 40 units selling products like 800 service, telemarketing, and public telephones. Each is measured using EVA. Besides decentralizing decision rights and adopting EVA as the performance measure, firms also change the third leg of the three-legged stool, the reward system. Manager bonuses are based on EVA.

*EVA is calculated on an after-tax basis using adjusted accounting earnings before interest but net of income taxes. The weighted average cost of capital is computed as follows. The after-tax cost of debt is computed using 1 minus the marginal corporate tax rate times the market yield on debt of similar risk. For example, suppose the market yield on equivalent debt is 15 percent and the marginal corporate tax rate is 38 percent. The after-tax cost of debt is 9.3 percent [$15\% \times (1 - 0.38)$]. If the cost of equity is 20 percent and the proportions of debt and equity are the same, the after-tax weighted average cost of capital is 14.65 percent ($0.50 \times 9.3\% + 0.50 \times 20\%$).

Sources: B. Stewart (1991), *The Quest for Value* (Harper Business: New York); and S. Tully (1993), "The Real Key to Creating Wealth," *Fortune* (September 20), 38–50.

cutting maintenance, current period residual income (and ROA) is increased, but future cash flow and hence the value of the firm might be jeopardized. Managers with short-term horizons will have incentives to avoid projects that have negative EVAs in early years even if they are quite profitable in the long run. Thus, the use of EVA is not sufficient for making investment decisions.

Table 17.2 summarizes our discussion of the various types of subunits of the firm. Notice that performance-evaluation measures and decision-right assignments are balanced: Decision rights assigned to the center and performance measures are matched. Note also the linkage between decision rights assigned to each center and the location of the specific knowledge. For example, if a center does not have knowledge of customer demand curves, it does not have decision rights for pricing and hence is evaluated as a cost center.

Although not explicit in Table 17.2, to ensure that our three-legged stool remains balanced, performance rewards must be tied to the performance evaluations. For example, besides introducing EVA in 1990, Briggs & Stratton also changed its management compensation plan. B&S managers were compensated based on both their division's EVA and firm EVA. Therefore, besides linking pay to the performance measure, EVA, B&S also changed the performance reward system.

Transfer Pricing[8]

As discussed above, firms organize into business units. Whenever business units transfer goods or services among themselves, measuring their performance requires that a *transfer price* be established for the goods and services exchanged. For example, recall that Briggs & Stratton reorganized and created several investment centers including the aluminum castings and small-engines divisions. Besides producing for and selling to outside customers, the aluminum castings division also sells intermediate products to other investment centers within B&S. In order to measure the performance of these investment centers, each of these internal transactions requires a transfer price. The purchasing division pays the transfer price; the producing division receives the transfer price.

Some executives do not view the transfer-pricing problem as important from the overall firm's perspective. They think that changing transfer-pricing methods merely shifts income among divisions and that, except for relative performance evaluation, little else is affected. But this is a mistake: *The choice of transfer-pricing method does not merely reallocate total company profits among business units, it affects the firm's total profits.* Think of the firm's total profit as a pie. Choice among transfer-pricing methods not only changes how the pie is divided among the business units, but also changes the size of the pie to be divided.

Managers make investment, purchasing, and production decisions based on the transfer prices they face. If from the firm's perspective these transfer prices do not reflect resource values accurately, managers will make inappropriate decisions and the value of the firm will be reduced. For example, if the opportunity cost to B&S of producing an aluminum casting is $20 but the transfer price is $30, the small-engines division will buy too few castings and firm value will be reduced. Purchasing division managers will have the incentive to shift away from the aluminum castings, perhaps outsourcing that

[8]This section draws on J. Brickley, C. Smith, and J. Zimmerman (1995), "Transfer Pricing and the Control of Internal Corporate Transactions," *Journal of Applied Corporate Finance* 8, 60–67.

Transfer Pricing and Taxes

DHL, the package delivery and courier service, lost a transfer-pricing dispute with the Internal Revenue Service and had to pay $32 million more in U.S. taxes. In fact, 30 percent of all U.S. corporate tax adjustments made each year involve transfer-pricing disputes. Beginning in the late 1980s, the United States began imposing penalties of between 20 and 40 percent of the tax underpayment caused by transfer-pricing issues and strict record-keeping requirements. As a result, corporate tax departments quickly realized that if they underpaid their U.S. taxes, they could be exposed to huge penalties; if they underpaid other countries, they would face less severe penalties. But other countries quickly followed suit. Canada doubled the size of their staff of transfer-pricing examiners. Australia, Brazil, Japan, and France put new penalties in place.

To attempt to streamline the transfer-pricing dispute-resolution process, the IRS instituted an Advanced Pricing Agreement (APA) Program. A taxpayer team and IRS team work together prospectively to develop the transfer-pricing method the taxpayer will use. As long as the taxpayer complies with the agreement, the IRS will not challenge subsequent years' transfer prices. The IRS had negotiated about 350 APAs by the end of 2001.

Source: S. Wrappe, K. Milani, and J. Joy (1999), "The Transfer Price Is Right," *Strategic Finance* (July), 39–43; "Announcement and Report Concerning Advance Pricing Agreements," Internal Revenue Service (March 29, 2002).

purchase even though, in reality, it is more expensive. Also, because transfer prices affect managers' performance evaluations, incorrect transfer prices can result in inappropriate promotion and retention decisions.

Transfer prices are more prevalent in organizations than many managers realize. Firms often have extensive charge-back systems for internal service departments. Consider the charges that the advertising department receives from the maintenance department for janitorial service, as well as charges for telephones, security services, data processing, legal, or human resource services. Most firms charge inside users for these internally provided services. Such charge-back systems also exist in hospitals, universities, and other nonprofit organizations. These charge-back systems are internal transfer prices.

Because the use of transfer prices (including charge-back systems) is widespread and because transfer pricing affects performance evaluation and hence the rewards managers receive, fighting over the transfer price between divisions is virtually inevitable. Transfer pricing is a continuing source of tension within firms. Many managers in multidivisional firms are involved in a parade of transfer-pricing disputes over the course of their careers.

A potentially important factor in determining an optimal transfer price is taxes. If the producing and purchasing divisions are in different countries and subject to different tax rates, then taxes affect the opportunity cost of the product and thus the optimal transfer price. The producing division pays income taxes on the difference between its costs and what it receives for each unit, which is determined by the transfer price. In general, to minimize the sum of the two taxes, the firm should set the transfer price so as to allocate as much of the profit as possible to the division in the country with the lower tax rate.[9] To simplify the analysis, this section focuses on the organizational economics of transfer pricing and ignores these important tax issues.

[9]International tax treaties and local regulation constrain the transfer-pricing methods firms can use for tax purposes. See M. Scholes, M. Wolfson, M. Erickson, E. Maydew, and T. Shevlin (2002), *Taxes and Business Strategy: A Planning Approach* (Prentice Hall: Englewood Cliffs, NJ).

Economics of Transfer Pricing

The transfer-pricing rule is quite simple to state: The optimal transfer price for a product or service is its opportunity cost—it is the value forgone by not using the product transferred in its next best alternative use. Unfortunately, as we will see, this rule, although simple to state, often is difficult to implement in practice.

Transfer Pricing with Costless Information

To illustrate the concept of opportunity cost, we focus on two of a multinational firm's profit centers—U.S. manufacturing and European distribution. Senior management is considering making a product in the U.S. division and transferring it to its European division. Assume also that marginal cost of production is $3 per unit, and that the U.S. division has excess capacity. If the product is transferred to Europe, they can sell it and receive $5 for each unit, net of their own marginal cost. Also, everyone knows each division's cost and revenue data.

If the unit is not manufactured, the firm saves $3 in U.S. manufacturing costs but forgoes $5 in European revenue, hence reducing profit by $2. If the unit is manufactured and transferred, the firm forgoes $3 (marginal cost to produce) and receives $5, for a net receipt of $2. The better alternative is to manufacture and transfer the unit. The resources forgone by transferring it from the United States to Europe—and hence the opportunity cost of such a transfer—are $3 per unit, the same as U.S. manufacturing's marginal cost of production.

As this example is meant to suggest, the marginal cost of producing the unit often is its opportunity cost. But this is not always the case. Sometimes, the opportunity cost is the marginal revenue of selling the intermediate good externally. For example, suppose the U.S. division can produce one unit for $3, and can either transfer that unit to Europe or sell it for $6 in the United States, but, because of limited capacity, it cannot do both. In this case, by having the U.S. division transfer the unit to Europe, the firm forgoes selling the intermediate good in the U.S. market. And even though the marginal cost of producing the unit still is $3, the opportunity cost of making the transfer now is $6. Thus, it now is optimal to sell it externally rather than to transfer it to Europe.

Dual Transfer Pricing Systems?

Some consultants advocate using two separate transfer pricing systems, one aimed at satisfying tax reporting and another directed at internal decision making. Jay Tredwell, director of CEO Solutions for Answer*Think* Consulting Group, says, "Having a separate system can give senior managers a better view of . . . real profitability [as opposed to] their 'tax profitability.'" However, Michael Patton, a partner at Ernst and Young, counters,

> An essential problem with separated reporting is that transfer prices already reflect the profitability of a division or project. If you are trying to make decisions about new activities or facilities, and trying to judge their returns on invested capital, you need good benchmarks to judge these by, and good transfer prices provide part of that. Basically, then the question is whether your current transfer prices reflect economic reality or not. If they do, there's little need for a new system. If not, the tax authorities may have a question or two for you on audit in a few years' time.

Case Corp., a $6 billion farm and construction equipment maker, opposes separate transfer pricing systems for statutory and internal reporting. They argue dual systems are costly. Case keeps all accounts around the world based on U.S. accounting practice and bases management results and compensation on actual transfer prices used by divisions for tax purposes.

Source: I. Springsteel (1999), "Separate but Unequal," *CFO* (August), 89–91.

More generally, the U.S. division will produce to the point where the marginal cost of the last unit equals the transfer price. Likewise, the European division will buy units from the U.S. division so long as their net receipts just cover the transfer price. When opportunity cost is used to set the transfer price and both divisions are maximizing their respective profits, total firm profits are maximized, assuming no other interdependencies between the divisions (we consider the case of dependencies among units later). Thus, in this simple example, the transfer price represents the marginal cost to the European division. If the transfer price is too high or too low relative to opportunity cost, Europe purchases too few or too many units and the firm's profits are not maximized.

Transfer Pricing with Asymmetric Information

The preceding discussion assumes that everyone knows that the U.S. division's marginal production cost is $3, that the intermediate product has an external price of $6, that Europe's marginal revenue is $5, and whether the U.S. division has excess capacity. Yet if all this knowledge were readily available, there would be no reason to decentralize decision making within the organization. Central management would have the knowledge to make the decision and could retain the decision rights or, if the decision rights were delegated, closely monitor the process at low cost. In reality, much of this information is not readily available to central management. Especially in large, multidivisional firms, such knowledge generally resides at lower levels within the firm where it is private knowledge, costly to either transfer or verify by senior management. In some circumstances, lower-level managers have incentives to distort the information they pass to senior managers. To illustrate these incentives, we consider a firm with market power (see Chapter 6).

Consider the situation where Hiroshi Komada, the manager of manufacturing, is the only person with detailed knowledge of his division's marginal costs, and assume that Hiroshi seeks to maximize the profits of his division. Even if distribution is allowed to purchase the product on the outside, if manufacturing has market power in setting the transfer price, it will attempt to set the price above marginal cost to increase its *measured* profits. When this happens, the firm manufactures and sells too few units of the product. This is another example of unexploited gains from trade from monopoly that we described in Chapter 6. The manufacturing division possesses what amounts to monopoly rights in information and hence behaves like a monopolist. Just as monopolists earn "monopoly profits" by raising prices and restricting output, manufacturing's higher profits lead to lower-than-optimal production levels and reduced total firm value.

As a simple illustration of this, consider a firm that produces one product and faces the following demand:

$$P = 110 - 5Q \tag{17.3}$$

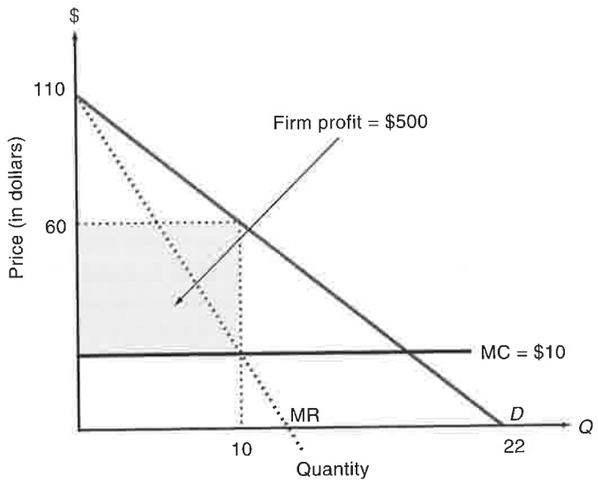
Assume that the product is produced at a constant marginal cost of $10. Profit maximization occurs by setting marginal revenue equal to marginal cost. At this condition, $Q^* = 10$ and $P^* = 60$. Firm profits are $500 ($60 \times 10 - 10×10). Figure 17.1 depicts this situation.

Assume that manufacturing produces the good at $MC = 10$ and transfers it to distribution at a transfer price, P_t. Suppose the only cost to the distribution division is the transfer price. (For simplicity, additional distribution costs equal zero.)

Distribution sells the product externally and thus the demand curve for its product is the firm's demand curve. How many units of the good will the manager of this unit want to buy at each possible transfer price? Note that distribution's marginal cost is the transfer price $MC_d = P_t$. Distribution maximizes division profit by setting $MC_d = MR_d$. Hence, in this case, the firm's marginal revenue curve represents distribution's demand for

Figure 17.1 Profit-Maximizing Price

A firm faces the following demand curve: $P = 110 - 5Q$. The product is produced at a constant marginal cost of \$10. Profit maximization occurs by setting marginal revenue equal to marginal cost. At this condition, $Q^* = 10$ and $P^* = 60$. Firm profits are \$500 (\$60 × 10 − \$10 × 10).



The Successive Monopoly Case

A basic principle in economics says that to maximize the value of the firm, a monopoly price should be charged only once whereas all other transfers are charged marginal cost. To illustrate, suppose a paper box company has both a patented technology for making boxes and a patented box design. The production technology belongs to the manufacturing division and the unique box design is sold by the distribution division. Distribution buys the boxes from manufacturing, and both divisions are run as profit centers. Further assume that manufacturing has enough capacity to sell both internally and externally. Thus, the opportunity cost of manufacturing's transfer is its marginal production cost.

Transfer-pricing theory implies that the profit-maximizing solution in this case is to set the price to external customers at the price where the firm's marginal revenue is equal to the combined marginal costs of manufacturing and distribution. This result obtains if distribution buys the boxes from manufacturing at marginal cost. In this case, to maximize its own profits, distribution will set the external price at the point where the marginal revenue from customers equals the sum of distribution's own marginal cost and the transfer price, which is manufacturing's marginal cost.

However, if the transfer price is marginal cost (and assuming marginal cost is less than or equal to average cost), manufacturing reports no profit. If manufacturing tries to report a profit by charging distribution a transfer price above marginal cost, the firm's profits are lower than in the original case. For, if manufacturing is able to set the transfer price above marginal cost, then when distribution sets the final price to the customer, it will equate marginal revenue to a now-higher marginal cost—that is, its own marginal cost plus the transfer price. To maximize its own profits, distribution will thus set the price "too high," buy fewer units from manufacturing, and hence fewer units will be sold than under the profit-maximizing case above.

The transfer-pricing rule thus holds that when two divisions inside the same firm have market power (that is, when they are able to charge prices above long-run marginal cost), both divisions should not be allowed to charge prices above their own costs. When there are such successive monopolies within firms, only one division should be permitted to charge a price above cost. If monopoly prices are charged at both stages of the production process, a firm's profits will not be maximized.

the good and thus is the derived demand curve facing manufacturing: $P_t = 110 - 10Q$ (the marginal revenue curve in Figure 17.1).

Next, assume that manufacturing sets the transfer price. It has monopoly power, and because of costly information, senior management cannot monitor the decision. What price will manufacturing set and what quantity of the good will be produced? Hiroshi has one customer, the distribution division. To maximize his profits in manufacturing Hiroshi sets $MC_m = MR_m$. His marginal cost is \$10. What is Hiroshi's marginal revenue? To answer that question we must look at his customer, the distribution division. Distribution has market power and faces the demand curve: $P = 110 - 5Q$. The distribution division's marginal cost is the transfer price: MC_d = transfer price. Distribution will take the transfer price and set it equal to its marginal revenue, in this case $MR_d = 110 - 10Q$. This marginal revenue curve for distribution displays how Hiroshi's customer (the distribution division) alters demand as Hiroshi varies the transfer price and hence his customer's marginal cost. For example, if Hiroshi sets the transfer price at \$50, distribution will maximize its profits by setting $MC_d = MR_d$. Or, $\$50 = 110 - 10Q$. Solving for $Q^* = 6$ units. If Hiroshi sets the transfer price at \$50, distribution will buy 6 units. The important point to understand is that the demand curve Hiroshi faces is distribution's marginal revenue curve. The demand curve facing Hiroshi is not the firm's (or distribution's) demand curve but rather it is the firm's marginal revenue curve. Thus, manufacturing faces a *derived demand curve* equal to the marginal revenue curve for the firm: $P = 110 - 10Q$. Using this as his demand curve, Hiroshi's marginal revenue curve is $MR_m = 110 - 20Q$. To maximize his division's profits Hiroshi sets $MR_m = MC_m$. Or, $110 - 20Q = \$10$ and sells 5 units to distribution at a transfer price of \$60 (transfer price = $P = 110 - 10 \times 5$). (See the left panel in Figure 17.2.) Facing a transfer price of \$60, distribution in turn will sell the 5 units to the external market at a price of \$85 (right panel in Figure 17.2). Total firm profits are \$375 ($5 \times \$85 - 5 \times \$10$), which are lower than at the firm's profit-maximizing output of 10 units—\$500. Manufacturing reports profits of \$250, and distribution books profits of \$125. Both divisions are reporting profits, but total firm profits are lower in Figure 17.2 than in Figure 17.1.

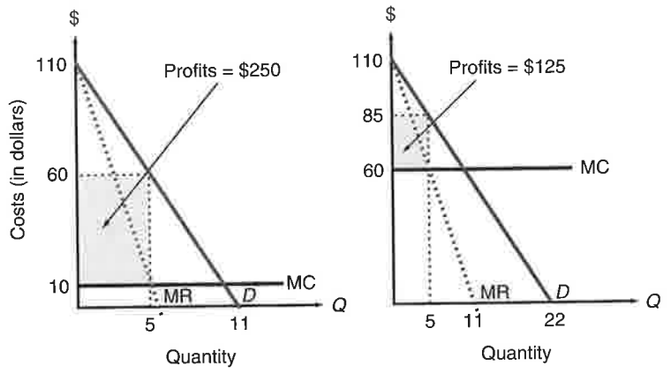
The basic problem is that distribution, facing a transfer price of \$60, is overestimating the *opportunity* cost to the firm of producing extra units of the good (\$10). Hence, from the firm's standpoint, distribution stops short of the optimal quantity to be sold to the external market. The transfer price that ensures firm profit maximization in this example is the marginal production cost of the unit. Note, however, that Hiroshi does not want to set \$10 as the transfer price because manufacturing would report a lower profit—in this example, \$0.

The above discussion thus illustrates the basic incentive problems associated with internal transfers when information is held privately by divisional managers. Opportunity cost is the transfer price that maximizes a firm's value. But because business-unit managers tend to have better knowledge of opportunity costs than senior management and because transfer prices frequently affect performance evaluation and managerial rewards, divisional managers have incentives to distort information to influence the transfer price.

Complicating matters further, getting the information necessary to calculate opportunity costs is especially difficult for senior management because opportunity costs depend on the firm's next best alternative use of the good or service. Central management is likely to know less about the next best use of a product, and about the resources used to make the product, than the manager of the division that produces it. Moreover, the next best alternative will change as the firm's business opportunities change. For example, sometimes the division has excess capacity and manufacturing can sell the good both internally and externally. At other times, manufacturing has only enough current capacity to

Figure 17.2 Decentralized Firm

In the decentralized firm, manufacturing produces the good at MC = 10 and transfers it to distribution at a transfer price, P_t. Distribution's demand curve for the product is the firm's demand curve. Distribution's marginal cost is the transfer price $MC_d = P_t$. Distribution maximizes profit (for the unit) by setting $MC_d = MR_d$. The firm's marginal revenue curve represents distribution's demand for the good and is, therefore, the demand curve facing manufacturing: $P_t = 110 - 10Q$. The manager of manufacturing sets marginal cost equal to marginal revenue: $MC_m = MR_m$. The marginal cost = 10. The marginal revenue for the manufacturing division is $P_t = 110 - 20Q$. Profit maximization for manufacturing will involve setting the transfer price at $60 and selling 5 units of the good (see the left panel). Facing a transfer price of $60, distribution will in turn sell the 5 units to the external market at a price of $85 (right panel). Total firm profits are $375 (5 × $85 − 5 × $10), which are lower than at the firm profit-maximizing output of 10 units ($500). Manufacturing has profits of $250, and distribution has profits of $125.



produce for either the inside or outside user. This specialized knowledge of the alternatives is held primarily by the division managers.

Problems arise whether distribution or manufacturing has the decision rights to set the price of the goods or services transferred and the other division cannot purchase or sell outside. Manufacturing sets a price above opportunity cost to capture some monopoly profits, and distribution purchases fewer units than if the appropriate (lower) transfer price were set. But, if given the decision rights to determine the price, distribution would set a transfer price below the opportunity cost and manufacturing would supply too few units. Again, the number of units transferred is below the profit-maximizing level. If central management knew the opportunity cost, it would not have to decentralize decision making to the profit centers and could dictate both price and quantity decisions.

The economics of transfer pricing is summarized well by the following quote:

> *The economist's first instinct is to set the transfer price equal to marginal cost. But it may be difficult to find out marginal cost. As a practical matter, marginal cost information is rarely known to anybody in the firm, because it depends on opportunity costs that vary with capacity use. And even if marginal cost information were available, there is no guarantee that it would be revealed in a truthful fashion for the purpose of determining an optimal transfer price.*[10]

[10]B. Holmstrom and J. Tirole (1991), "Transfer Pricing and Organizational Form," *Journal of Law, Economics, and Organizations* 7, 201–228.

Common Transfer-Pricing Methods

The correct transfer price, then, is opportunity cost. But as we also have noted, determining opportunity costs is expensive—in part because the information necessary to calculate such costs resides with operating managers who have incentives to distort it. To address this problem, companies sometimes commission special studies of the firm's cost structure by outside experts. Such studies, however, are not only costly, but their findings become outdated whenever the firm's business opportunities or productive capacities change. On the other hand, if senior management simply vests the right to set the transfer price with either manufacturing or distribution, prices are likely to be set too high or too low, resulting in too few units transferred and the firm's value lower than it could be.

Because determining opportunity costs is itself an expensive undertaking, managers resort to various lower-cost approximations. There are at least four different methods for setting transfer prices that firms regularly use to approximate the opportunity cost of the units transferred: market price, marginal production cost, full cost, and negotiated pricing. As discussed below, each of these four methods is better than the others in some situations, but not in others. For example, if the divisions operate in different countries with different tax rates, then the choice of method will be driven in part by tax considerations. If manufacturing faces lower tax rates than distribution, full-cost prices will allocate more of the profit to the lower-taxed division than marginal-cost prices. Our aim in the rest of this section is to describe these basic alternatives and set forth their advantages and disadvantages so that managers can select the best transfer-pricing method for their particular circumstances.

Market-Based Transfer Prices

The standard transfer-pricing rule offered by most textbooks is this: Given a competitive external market for the good, the product should be transferred at the external market price. If manufacturing cannot make a long-run profit at the external price, then the company is better off not producing internally and instead should purchase in the external market. If the purchasing division cannot make a long-run profit at the external price, then the company is better off not processing the intermediate product and instead should sell it in the external market.

In short, the use of market-based transfer prices often is assumed to produce the correct make-versus-buy decisions. In many situations, however, market prices will not provide an accurate reflection of opportunity costs. If the firm and the market both are making the intermediate good, the fundamental question arises, *Can both survive in the long run?* If one can produce the good at a lower, long-run average cost than the other, the high-cost producer should not be producing the intermediate product.

Yet it is important to keep in mind that transactions generally take place inside rather than outside firms whenever the cost of repetitive internal contracting is cheaper than outsourcing.[11] For example, production of different kinds of goods tends to take place

[11]Advantages to internal transactions include the elimination of credit risk, lower marketing costs, and learning from production. See Chapter 3 and R. Coase (1937), "The Nature of the Firm," *Economica* 4, 386–405. For a summary of the arguments for the types of costs that are lowered by firms, see R. Watts (1992), "Accounting Choice Theory and Market-Based Research in Accounting," *British Accounting Journal* 24, 242–246. These arguments include economies of scale in contracting, team production and monitoring, postcontractual opportunism, and knowledge costs. Chapter 18 discusses these topics.

Controlling Quality by Internal Production at Kodak

Eastman Gelatine buys 80 million pounds of cow bones annually. In their plant in Peabody, Massachusetts, the company turns these bones into gelatine. Trucked to Kodak's other plants, it is mixed with other chemicals to create a photosensitive emulsion on strips of film. The gel-making process is complicated and is affected by the bone used. (Male is better than female; young is better than old; longer is better than shorter; drier is better than wet.) Kodak founder George Eastman started the plant in 1930 to provide better control over the gel-making process. He nearly had been ruined after buying a batch of bones from cattle fed mustard seed, causing his gel to overexpose the film. Kodak, like many companies, has outsourced an array of activities from its cafeteria to plant security. Yet it has kept Eastman Gelatine, in part to control quality of a critical input.

Source: A. Klein (1999), "Who Knew Kodak Would Keep So Many Skeletons in Its Closet?" *The Wall Street Journal* (January 18), A1.

inside the same firm when there are important interdependencies or synergies among those products. And, of course, the more valuable such synergies, the more likely the firm will continue producing internally.[12]

At the same time—and this is what makes the issue of transfer pricing so difficult—in circumstances where the firm is most likely to produce a good internally, the external market price is least likely to provide an accurate reflection of the opportunity cost of internal production. For example, it is often the case either that an intermediate good is not being produced by other firms or that the good produced externally is not identical to the good produced internally. In one case, there is no market price; in the other, the market price often will be an unreliable guide to opportunity cost. And, even when there are virtually identical "cheaper" external products, producing internally still can make sense insofar as it provides greater quality control, more assurance of timeliness of supply, or better protection of proprietary information. When these factors are included in the analysis, the external market may no longer be "cheaper."

In such cases, use of the market price as the transfer price may understate the profitability of the product and its contribution to the value of the firm.[13] Suppose, for example, an intermediate product can be purchased (but not sold) externally for $3 per unit. Synergies such as high transaction costs of using the market make it effective to produce the item internally. Internal production avoids the costs of writing and enforcing contracts. Suppose there are $.50 worth of synergies, so that the correct transfer price is $2.50 in the sense that $2.50 is the opportunity cost to the firm. But, if the market price of $3.00 is used as the transfer price, distribution will purchase fewer units than if $2.50 were used, and the value of the firm will not be maximized.

Marginal-Cost Transfer Prices

If there is no external market for the intermediate good or if large synergies among business units cause the market price to be an inaccurate measure of opportunity cost, then

[12]Interdependencies or synergies that cause production to occur inside the firm are classic economic externalities. If interdependencies in production or demand functions exist, the market price does not capture these interdependencies. The same occurs inside the firm and causes the external price to mismeasure the opportunity cost of one more unit being transferred.

[13]This point has been recognized by others. As one notes, "observed market prices cannot directly guide the owner of the input to perform in the same manner as if every activity he performs were measured and priced." In S. Cheung (1983), "The Contractual Nature of the Firm," *Journal of Law & Economics* 26 (April), 5.

marginal production cost may be the most effective alternative transfer price. As we saw earlier, marginal cost represents the value of the resources forgone to produce the last unit.

As with other transfer-pricing methods, there are problems with marginal production cost as a measure of opportunity cost. One is that manufacturing does not necessarily recover its fixed costs. If all manufacturing's output is transferred internally and marginal cost is below its average total cost, manufacturing's fixed costs are not recovered. Thus, manufacturing appears to be losing money.[14]

One variant of marginal-cost transfer pricing is to use a two-part price—to price all transfers at marginal cost while also charging distribution a fixed fee for these services. Distribution pays marginal cost for the additional units and buys the number of units that maximize the firm's profits. Unlike straight marginal-cost pricing, this variant allows manufacturing to cover its full cost and earn a profit. The fixed fee represents the rights by distribution to acquire the product at marginal cost, and it is set to cover manufacturing's fixed cost plus a return on equity.

Another problem with marginal-cost transfer pricing occurs in situations where the marginal cost per unit is not constant as volume changes. Suppose the marginal cost per unit increases as volume expands (say, a night shift is added with higher wages per hour). If marginal cost is greater than average cost and all users are charged the higher marginal cost, the total charged to all the users is greater than the total cost incurred by the firm. Users who did not expand their volume will still see their costs increase. In such cases, conflicts are likely within the firm over the appropriate measure of marginal cost and whether all users should pay the higher marginal cost or just those users who expanded output, thereby prompting the addition of the night shift.

A similar problem arises when manufacturing approaches capacity. To illustrate the problem, let's assume that manufacturing is considering a $2.5 million outlay to add more capacity. These capacity additions costs of $2.5 million are variable in the long run but become short-run fixed costs (depreciation and higher utilities and maintenance). Thus, conflicts arise between manufacturing and distribution as to whether these additional capacity costs should be included in the transfer price or not. What makes such conflicts so difficult to resolve is that there is no indisputably objective method for calculating marginal costs. They are not reported in *The Wall Street Journal.* Instead, they have to be estimated, normally as "variable costs," from accounting records. Although most of the components of marginal cost are easily observed, such as the cost of direct labor and direct material, some components are quite difficult to estimate. For example, it is not easy to estimate the additional costs imposed on the purchasing department when additional units are manufactured.

Marginal-cost transfer pricing also creates incentives for manufacturing to distort marginal cost upward, perhaps by misstating some fixed costs as variable. For example, how much of the electricity bill is fixed and how much is variable? Since these classifications are to some extent arbitrary, resources are wasted as managers in manufacturing and distribution debate various cost terms and their applications—and as senior managers are forced to spend time arbitrating such disputes.

Moreover, under marginal-cost transfer pricing, manufacturing can have an incentive to convert a dollar of fixed costs into more than a dollar of marginal costs—for example, by using high-priced outsourcing of parts instead of cheaper internal manufacturing—even though this clearly reduces the value of the firm. For manufacturing, the use of

[14]Of course, if central management knows the magnitude of the fixed costs, it can budget for this loss. But, once again, if central management knew the magnitude of the fixed costs, then it would know marginal cost, and thus there would be little reason to have a separate business unit and transfer-pricing system in the first place.

outsourcing can remove the burden of any fixed costs while distribution, as well as the firm as a whole, bears the extra cost of such decisions.

Full-Cost Transfer Prices

Because of the information and incentive problems described above, simple, objective, hard-to-change transfer-pricing rules can lead to higher firm value than transfer-pricing rules that give one manager discretion over the transfer price. Objective transfer-pricing rules such as those based on full accounting cost often are adopted primarily to avoid wasteful disputes over measuring marginal costs. Since full cost is the sum of fixed and variable cost, full cost cannot be changed simply by reclassifying a fixed cost as a variable cost.

The problem, however, is that full-cost transfer pricing frequently overstates the opportunity cost to the firm of producing and transferring one more unit internally. And so distribution usually will buy too few units internally. Full cost also allows manufacturing to transfer any of its inefficiencies to distribution. Thus, manufacturing has less incentive to be efficient under a full-cost transfer-price rule.[15]

Despite all these problems, however, full-cost transfer pricing is quite common. In various surveys of corporate practice, full-cost transfer prices are used 40 to 50 percent of the time.[16] In most cases, moreover, the definition of *full cost* includes both direct materials and labor as well as a charge for overhead.

One reason for the popularity of full-cost transfer prices is their ability to deal with the problem of changes in capacity. As a plant begins to reach capacity, opportunity cost is likely to rise because of congestion and the cost of alternative uses of now-scarce capacity. Hence, opportunity cost is likely to be higher than direct materials and labor costs. In this case, full cost might be a closer approximation to opportunity cost than just the cost of materials and labor.

Perhaps the most important benefit of full-cost transfer pricing, however, is its simplicity and hence its low cost of implementation. Because of its simplicity and objectivity, full-cost transfer pricing reduces influence costs. That is, because operating managers have less ability to manipulate full-cost than marginal-cost calculations, senior management faces fewer calls to arbitrate disputes over calculating the transfer price. Nonetheless, managers should consider carefully whether full-cost pricing is optimal for their particular situation. If the opportunity cost differs from full cost materially, the firm's forgone profits can be substantial.

Transfer Pricing at Hewlett-Packard

Jon Flexman, CFO at Hewlett-Packard, oversees a mishmash of interdivisional transfer-pricing mechanisms based on both financial and tax-accounting regulations. "We currently reward managers based on their product margins, as they are created by our transfer-pricing system." Managers "often get caught up in negotiations with each other" to produce profits for their division and themselves personally. This produces a set of final output prices that hampers what sales representatives charge end users. Another manager at Answer*Think* Consulting Group complains, "The biggest problems are when the measured profitability of a business unit has more to do with the skill of its manager in negotiating his transfer prices within the company than [it does with] its economic profits and the factors that drive shareholder-value creation."

Source: I. Springsteel (1999), "Separate but Unequal," *CFO* (August), 89–91.

[15] J. Zimmerman (2000), *Accounting for Decision Making and Control* (McGraw-Hill/Irwin: Boston, MA), Chapter 5.

[16] Technical note: To be sure, marginal-cost transfer prices also allow the selling division to export some of its inefficiencies to the purchasing division, but the problem is not as pronounced as under full cost. Nevertheless, the problem of exporting inefficiencies to the buying division through cost-based transfer prices is reduced if the purchasing division can purchase externally as well as from the selling division. This forces the selling division to remain competitive.

Negotiated Transfer Prices

Transfer prices can be set by negotiation between manufacturing and distribution. This method can result in transfer prices that approximate opportunity cost because manufacturing will not agree to a price that is below its opportunity cost and distribution will not pay a price above what it can buy the product elsewhere.

With negotiated transfer prices, the two divisions have the incentive to set the number of units so as to maximize the combined profits of the two divisions. Once the value-maximizing number of units is established, the transfer price determines how the total profits are divided between the two divisions. In terms of Figure 17.1, if the two divisions negotiate over both price and quantity, they have the joint incentive to set $Q = 10$ because this maximizes the total profit to be split—$500. Yet if the two divisions just negotiate over price, there is no guarantee they will arrive at the transfer price that maximizes the firm's value.

While negotiation is a fairly common method, it too has drawbacks. It is time-consuming and can produce conflicts among divisions. Divisional performance measurement becomes sensitive to the relative negotiating skills of the two division managers. Moreover, if the two divisions negotiate a transfer price without at the same time agreeing on the quantity to be transferred at that price, there is no guarantee that they will arrive at the transfer price that maximizes the firm's value.

Reorganization: The Solution If All Else Fails

In some cases, transfer-pricing conflicts among profit centers can become sufficiently divisive to impose large costs on the firm. These costs take the form of both influence costs and the opportunity costs that arise when other than firm-value-maximizing transfer prices are chosen. Costly transfer-pricing disputes usually occur when the relative volume of transactions among divisions is large. In such cases, a small change in the transfer price can have a large effect on the division's reported profits. Hence, the potential for (and destructive effects of) opportunistic transfer-pricing actions by operating managers is substantial.

If transfer pricing becomes sufficiently dysfunctional, reorganize the firm. For example, senior management could combine two profit centers with a large volume of transfers into a single division. Alternatively, it might make more sense to convert manufacturing into a cost center rather than a profit center and compensate the operating head based on efficiency of production. Or, senior management might even organize both divisions as cost centers and keep the pricing and quantity decisions at the central office.

A final possibility is to give distribution the right to produce the input—that is, change the allocation of decision rights and allow both manufacturing and distribution the rights to make the transferred good. However, this alternative can be expensive due to the duplication of resources and effort.

Internal Accounting System and Performance Evaluation[17]

Accounting costs, revenues, profits, return on investment, and residual income usually are used as performance measures of cost, expense, revenue, profit, and investment centers. Accounting costs frequently are used as transfer prices. The accounting system is an

[17] This section draws on analysis in Zimmerman (2000).

important component of the firm's performance-evaluation system and thus is an integral part of the firm's control system—the performance-evaluation and reward systems. This section elaborates on accounting's role within the firm.

Uses of the Accounting System

Many people think of the firm's accounting system in terms of its external financial reports—balance sheets and income statements—to the shareholders, taxing authorities, regulators, and lenders. These external financial reports (both quarterly and annual) are an incredibly aggregated view of the enormous amount of data produced internally. Internally, managers rely on detailed operating reports of expenses, product costs, and customer account balances from the accounting system.

These internal reports are used by management for two general purposes: decision management and decision control. As discussed in Chapter 12, the decision-making process can be divided into decision management (initiation and implementation) and decision control (ratification and monitoring). Managers frequently have both decision-management and control rights, but normally not for the same decisions. More senior managers in the firm tend to hold more decision-control rights, whereas decision-management rights tend to be delegated to managers lower in the firm. To exercise either decision-management or decision-control rights, managers require information. Some of that information is provided by the accounting system. Thus, although the accounting system is used for both decision management and decision control, its primary function within most firms is decision control.

Decision management requires estimates of future costs and benefits. Initiating an investment decision to build a new plant requires the manager to forecast future alternative uses of this plant; designing a marketing campaign requires judgments of likely future sales and competitors' responses. Managers frequently use accounting-based data as inputs to these decisions. Accounting numbers provide a starting point in forecasting future consequences of proposed actions. Most firms have accounting-based budget systems. Managers forecast costs and revenues for the next year in preparing their budgets. This process encourages managers to be forward-looking, to coordinate their operations with those managers most directly affected by their decisions and to share specialized knowledge of their markets and production technologies. Accounting-based budgets provide the framework for such coordination and knowledge sharing.

Although helpful for decision management, accounting systems generally are more useful for decision control (ratification and monitoring). In fact, this is the primary reason they evolved. Accounting systems are based on historical costs and historical revenues. Historical costs record what the firm paid for its current resource base and in this sense are backward-looking. Internal accounting systems protect against theft of company assets, fraud, and embezzlement. They also provide a scorecard to show how a business unit did historically by measuring costs, profits, or residual income. Monitoring is by definition a historical function, one well served by the accounting system. Since accounting systems are primarily used for decision control—to prevent malfeasance and to measure past performance—when it comes to providing managers with information for decision management, accounting systems often are found wanting.

Internal Auditing in Law Firms

Law firms, scared of adverse publicity from billing errors, are turning to internal auditors to catch problems before others do. The fear of embarrassment provides incentives for law firms to check their bills more carefully. The firm of Bartlit, Beck, Herman, Palenchar & Scott caught an error before the bills went out. In two out-of-town trials, one client was almost billed $8,000 for a hotel in which its attorneys didn't stay. Before Winston and Strawn in Chicago hired its internal auditor, its former managing partner went to jail for cheating the firm and several clients of more than $750,000. Some of these internal auditors report to the head of the finance department. Other firms, fearing a conflict of interest, have the auditor report directly to the firm's executive director or to the firm's executive committee (which would be equivalent to the board of directors in a corporation).

Source: E. White (1998), "More Law Firms Are Auditing Themselves to Catch Billing Errors," *The Wall Street Journal* (July 14), B8.

Trade-offs between Decision Management and Decision Control

Considering how the accounting system is used for both decision management and decision control leads to a number of important insights. First, accounting measures, to the extent that they are used for monitoring purposes, are not under the complete control of the people being monitored—the operating managers.

Second, managers with decision-management rights tend to be dissatisfied with financial measures for making operating decisions. The data often are at too aggregate a level and hence do not provide sufficient detail for the decision. In response, operating managers develop their own, often nonfinancial, information systems to provide more of the knowledge required for decision management. But at the same time, they rely on accounting-system output to monitor the managers who report to them.

Third, nonaccounting measures frequently are more timely than accounting measures. Not every decision requires ratification or monitoring. Decision monitoring can be based on aggregate data to average out random fluctuations. Instead of monitoring every machine setup, it usually is more effective to aggregate all setups occurring over the week or month and make sure the average setup cost is within acceptable levels.

Massive Financial Fraud at Cendant

In the vast majority of cases, there are sufficient controls such as internal and external auditors to ensure that the firm's accounting reports accurately reflect the organization's financial performance. However, in rare situations, the managers have "cooked the books." Take the case of Cendant, the result of the $14 billion merger between HFS Inc. and CUC in 1997. HFS had been a franchising powerhouse with brands such as Ramada, Howard Johnson, Coldwell Banker, and Avis. CUC had been a hodgepodge of businesses including software, advertising, publications, and an online venture. Most of CUC's revenues came from selling memberships in discount shopping, travel, and entertainment clubs.

Four months after the merger, two former CUC managers who stayed on with Cendant after the merger disclosed to Cendant's CFO that they had been instructed to record millions of dollars of phony orders. They were told to adjust revenue up or expenses down. Further investigation concluded that about $500 million of revenue reported between 1995 and 1997 was simply invented and 61 percent of 1997 reported net income was fraudulent. Investors filed numerous lawsuits. The U.S. attorney's office and the Securities and Exchange Commission are investigating. The former CEO of CUC resigned and his CFO was fired. The day Cendant announced it had uncovered extensive alleged accounting irregularities that would force it to cut 1997 earnings by about 13 percent, Cendant's stock plunged 46.5 percent. The former CEO of HFS and current CEO of Cendant lost $800 million of personal wealth because of Cendant stock's plunge.

Source: E. Nelson (1998), "How Whistle-Blowers Set Off a Fraud Probe That Crushed Cendant," *The Wall Street Journal* (August 13), A1.

One survey reports that managers rely on nonfinancial data (labor counts, units of output, units in inventory, units scrapped) to run their day-to-day operations. But when they are asked about their "most valuable report in general," they say it is the monthly income or expense statement because this is one of the measures used to judge their performance.[18]

In choosing among alternative accounting systems, managers often must make trade-offs between decision management and decision control. Consider the transfer-pricing decision. The transfer-pricing method that most accurately measures the opportunity cost to the firm of transferring one more unit inside the firm might not be the transfer-pricing method that gives internal managers the most effective incentives to maximize the firm's value. For example, if the transfer-pricing method that most accurately measures the opportunity cost of units transferred (decision management) also requires manufacturing to reveal privately held and hard-to-verify knowledge of costs, then manufacturing has substantial discretion over the transfer prices. If these prices are important in rewarding managers (decision control), manufacturing can distort the system to its benefit. Given the reward system, a transfer-pricing method that is less subject to managerial discretion might in the end be a more accurate measure of opportunity costs than one that requires managers to disclose private, hard-to-verify knowledge.

All accounting (as well as nonaccounting) performance measures are prone to managerial opportunism in the form of accounting manipulations and dysfunctional decisions. Managers can choose depreciation methods that reduce expenses and increase reported earnings (straight-line depreciation). These accounting choices artificially raise ROA. Investment center managers can increase ROA by rejecting (or divesting) profitable projects with ROAs below the average ROA of the division. Most accounting measures are short-term measures of performance. They all suffer from the horizon problem, whereby managers emphasize short-term performance at the expense of long-term returns. Therefore, any accounting-based performance-measurement system requires careful monitoring by senior managers to control dysfunctional behavior by lower-level managers.

In the United States, accounting methods are regulated and managers must choose accounting methods from *generally accepted accounting procedures* (GAAP). Yet managers still have considerable discretion. External, third-party auditors ensure the accuracy and consistency of the accounting reports. Most firms employ a single accounting system for multiple purposes: reporting to shareholders, taxes, internal decision management and control, and regulation.[19] Debt agreements, management compensation plans, and financial reports all use these accounting-based numbers. Using the same numbers for many purposes helps control the incentives to distort the numbers for any single purpose.

Finally, no performance-measurement and reward system works perfectly; no system eliminates all managerial decisions that will increase the manager's welfare at the expense of the firm's other claimholders. The key question is: Does the system outperform the next best alternative after all the costs and benefits are included? One should avoid the "nirvana fallacy," which suggests discarding a system because it fails to eliminate all managerial opportunism. The nirvana fallacy arises when one compares a real system to a hypothetical but unachievable "perfect" system.[20]

[18]S. McKinnon and W. Bruns (1992), *The Information Mosaic* (Harvard Business School: Boston).

[19]Even though the firm has "one" accounting system, the accounting numbers often are adjusted for special purposes. For example, the system may use straight-line depreciation for shareholders but adjust these numbers to accelerated depreciation for taxes.

[20]H. Demsetz (1969), "Information and Efficiency: Another Viewpoint," *Journal of Law & Economics* XII, 1–22.

CASE STUDY: *Celtex*

Celtex is a large, quite successful, decentralized specialty chemical producer organized into five independent investment centers. Each of the five investment centers is free to buy products either inside or outside the firm and is judged based on residual income. Most of each division's sales are to external customers. Celtex has the general reputation of being one of the top two or three companies in each of its markets.

Leopoldo Garcia, president of Synchem, Celtex's synthetic chemicals division, and Walid Murad, president of the consumer products division, are embroiled in a dispute. It all began 2 years ago when Wally asked Leo to modify a synthetic chemical for a new household cleaner. In return, Synchem would be reimbursed for out-of-pocket costs. After Synchem spent considerable time perfecting the chemical, Wally solicited competitive bids from Leo as well as several outside firms; he then awarded the contract to one of the outside firms, which was the low bidder. This annoyed Leo, who expected his bid to receive special consideration because he developed the new chemical at cost, yet the outside vendor took advantage of his division's R&D.

The current conflict has to do with Synchem's producing chemical Q47, a standard product, for consumer products. Because of an economic slowdown, all synthetic chemical producers have excess capacity. Synchem was asked to bid on supplying Q47 for consumer products. Consumer products is moving into a new, experimental product line and Q47 is one of the key ingredients. Although the magnitude of the order is small relative to Synchem's total business, the price of Q47 is quite important in determining the profitability of the experimental line. Leo bid $3.20 per gallon. Meas Chemicals, an outside firm, bid $3. This time, Wally is annoyed because he knows that Leo's bid contains a substantial amount of fixed overhead and profit. Synchem buys the base raw material, Q4, from the organic chemicals division of Celtex for $1 per gallon. Organic chemical's out-of-pocket costs (i.e., variable costs) are 80 percent of the selling price. Synchem then further processes Q4 into Q47 and incurs additional variable costs of $1.75 per gallon. Allocated fixed overhead adds another $.30 per gallon.

Leo argues that he has $3.05 of cost in each gallon of Q47. If he turned around and sold the product for anything less than $3.20, he would be undermining his recent attempts to get his salespeople to stop cutting their bids and start quoting full-cost prices. Leo has been trying to enhance the quality of the business he is getting, and he fears that if he is forced to make Q47 for consumer products, all of his effort the last few months would be for naught. He argues, "I already gave away the store once to consumer products and I won't do it again." He questions, "How can senior managers expect me to return a positive residual income if I am forced to put in bids that don't recover full cost?"

Wally, in a chance meeting at the airport with Diana Philapados, senior vice president of Celtex, described the situation, and asked Philapados to intervene. Wally believed Leo was trying to get even after their earlier clash. Wally argued that the success of his new product venture depended on being able to secure a stable, high-quality source of supply of Q47 at low cost.

Diana has hired you as a consultant and has asked you to do the following:

Discussion Questions

1. Prepare a statement outlining the cash flows to Celtex of the two alternative sources of supply for Q47.
2. Offer advice regarding how Diana should handle the issues raised by Wally.

Summary

Chapter 16 described individual performance-evaluation systems; this chapter extended the discussion to evaluating divisional performance.

Decision rights are allocated to cost, expense, revenue, investment, and profit centers. These centers often are evaluated and rewarded based on accounting-based performance measures. Cost centers are delegated decision rights over how to produce the output, but

not over price or quantity. Cost centers are evaluated on either minimizing total cost for a fixed output, or maximizing output for a fixed total cost. Expense centers such as the human resources department are like cost centers except that their output is not easily quantifiable. This difficulty in quantifying output means users often are not charged for the expense center's output; hence the demand for expense center services tends to grow faster than the firm's output.

Revenue centers also are similar to cost centers, with the difference that they are responsible for marketing the products. They have decision rights over how to sell or distribute the product, but not over the price-quantity decision. Revenue centers are evaluated on maximizing revenue for a given price or quantity and a fixed budget for operating expenses.

Profit centers have all the decision rights of cost centers plus product mix and pricing decisions. They do not have decision rights over the level of investment in their profit center. Profit centers are evaluated based on total profits. Finally, investment centers are like profit centers except that they also have decision rights over the amount of capital invested in their division. Evaluating performance of investment centers involves adjusting profits for the amount of capital invested. Two commonly used investment center measures are return on assets and residual income (or economic value added). Both measures create incentives for managers to eliminate assets that are not covering their opportunity cost of capital. However, ROA gives incentives to eliminate profitable projects with returns below the average ROA for the division. Residual income avoids this incentive problem, but as a performance measure it makes comparing divisions of different sizes more difficult.

Large companies, particularly those operating across multiple lines of business, typically are organized into multiple business units or divisions. Such an organizational architecture is intended to furnish senior managers with information about the profitability or efficiency of different businesses and to provide accountability and incentives for the operating managers charged with running those businesses.

Nonetheless, when there are significant interdependencies among different business units, often involving internal transfers, motivating individual profit centers to maximize their own profits generally will not maximize profits for the firm as a whole. Individual units focusing on their own profits often will ignore how their actions affect the sales and costs of other units.

One valuable role of a transfer-pricing method, then, is to lead managers to allocate resources internally in ways that take account of such interdependencies among divisions. But transfer pricing is a quite complicated undertaking. The likelihood of getting the wrong answer is high, and the consequences of so doing—primarily in the form of poor pricing and output decisions—can be substantial. Transfer prices not only change how total profits are divided among business units but affect total firm profits.

The opportunity cost of a transferred resource is the correct transfer price. But accurate information about opportunity cost usually is known only by local divisional managers. If either the buying or selling division can set the transfer price unilaterally, it has incentives to behave opportunistically. The selling division will set too high a price trying to capture monopoly profits, and too few units will be transferred. If the buying division is allowed to set the transfer price, a price below the true opportunity cost is likely to be chosen; in this case, too few units will be produced and transferred.

Because accurate information about opportunity costs is quite expensive to obtain (or at least to verify), managers generally rely on approximations such as market values, marginal costs, full costs, or negotiated prices. Each of these approximations works better than others in certain circumstances. Market-based transfer prices are most useful

when competitive external markets exist. But if an external market is employed, why is the firm producing the good or service? If there are important synergies favoring internal production, the external market price is unlikely to capture them. For example, if there are transaction costs of using the market, such as writing and enforcing contracts, then the transfer price is the market price less these transaction costs. Marginal cost is another popular transfer-pricing method. But marginal cost is expensive to estimate and can generate influence costs as managers debate whether certain expenditures are "marginal" or not. Full-cost transfer prices are objective, simple-to-compute transfer prices. They also are used widely in practice. However, full-cost transfer prices likely suffer from setting the transfer price above opportunity cost. Negotiated transfer prices, although time-consuming to establish, give both parties to the contract the incentive first to negotiate the quantity that maximizes the firm's profits and then negotiate the transfer price that determines how the total profits will be divided.

No matter what transfer-pricing method is used, it normally is important to permit both buying and selling divisions access to the external market. In this case, the external market acts as a check on opportunistic managerial behavior. But again, if the external market is employed regularly, one must examine whether the firm should be producing the intermediate product at all.

Finally, most divisional performance-evaluation systems rely on internally generated accounting-based numbers. These accounting-based performance metrics are for decision control (decision ratification and decision monitoring). Besides exercising decision-control rights, employees also exercise decision-management rights (decision initiation and implementation). Exercising decision-management rights requires information; often managers turn to their accounting systems for this information. But the accounting systems of most firms are designed for decision control—not necessarily for decision management. This leads to a trade-off between these two uses and to the general conclusion that most managers find their accounting systems wanting when it comes to providing information for decision management.

Suggested Readings

R. Eccles (1985), *The Transfer Pricing Problem: A Theory for Practice* (Lexington Books: Lexington, MA).

J. Gould (1964), "Internal Pricing in Firms When There Are Costs of Using an Outside Market," *Journal of Business* 37, 61–67.

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B. Holmstrom and J. Tirole (1991), "Transfer Pricing and Organizational Form," *Journal of Law, Economics, and Organizations* 7, 201–228.

D. Solomons (1985), *Divisional Performance: Measurement and Control,* 2nd edition (Richard D. Irwin: Burr Ridge, IL).

B. Stewart (1991), *The Quest for Value* (Harper Business: New York).

J. Zimmerman (2003), *Accounting for Decision Making and Control* (McGraw-Hill/Irwin: Boston, MA).

Review Questions

17–1. Auto-fit is a multidivisional firm that produces auto parts. It has the capacity for annual production of 100 units of a particular part. The marginal cost of producing each unit is $10. These units can be sold internally either to other divisions or to external customers. The external market price is $20. The allocated share of corporate overhead for each part produced is $5. Total corporate overhead expenditures do not vary with the production of the part.

How many units of the part should the company produce? What is the theoretically correct transfer price (should the company decide to transfer the part internally)? Explain.

17–2. High Tech, Inc., has strong patent protection on a particular type of computer chip. High Tech uses the chip for the internal production of PCs. It also sells the chip to other manufacturers on the open market. Does High Tech necessarily want to charge the same price to both external and internal customers? Explain.

17–3. A firm has a demand curve: $P = 50 - Q$. Its total costs are

$$TC = 110 + Q + 3Q^2$$

Prepare a table that computes the profit-maximizing quantity. What quantity minimizes average cost? (Hint: Prepare a table similar to Table 17.1 for $Q = 1, 2, \ldots 10$.)

17–4. Assume that a firm faces a demand curve: $P = 6{,}600 - 10Q$. The total cost of production is $TC = Q^2$ and marginal cost is $MC = 2Q$. What are the optimal output, price, and profits for the firm?

Now assume that the firm is divided into two profit centers. One division manufactures the product at a total cost of $TC = Q^2$ and then transfers it to a selling division that faces the firm's demand curve. The selling division has no costs other than the transfer price for the product. Assume that the manufacturing division has the power to set the transfer price and that the selling division can only buy internally. The selling division, however, can select the quantity to purchase. What transfer price will the manufacturing unit select? What are the resulting profits for the two units? From the firm's standpoint, what is the optimal transfer price?

17–5. Chips Computer Company assembles personal computers and sells them in the retail marketplace. The company is organized into two profit centers: the assembly division and the distribution division. The demand curve facing the company (and the distribution division) is $P = 3{,}000 - 10Q$. The marginal cost for assembly (which includes purchasing the parts) is constant at $500. The distribution division faces constant marginal distribution costs of $50 per unit. What is the profit-maximizing retail price and output for the firm as a whole? If the assembly division has monopoly power to set the transfer price, what transfer price will it select (assuming it knows all the information above)? Calculate the profits for the two divisions in this case.

17–6. The Xtrac Computer Company is organized into regional sales offices and a manufacturing division. The sales offices forecast sales for the upcoming year in their territories. These figures are then used to set the manufacturing schedules for the year. Prices of the computers are determined by corporate headquarters, and the salespeople are paid a fixed wage and a commission on sales. The regional sales offices are evaluated as revenue centers. The regional sales manager is paid a small wage (about 30 percent of total pay) and a commission on all sales in her territory (about 70 percent of total pay) that exceeds the budget.

Xtrac has a notoriously bad track record for forecasting computer sales. Its budgets always underforecast sales, and then, during the year, manufacturing scrambles to produce more units, authorizes labor overtime, and buys parts on rush orders. This drives up manufacturing costs. At first, management thought the underforecasting problem was due to high unexpected growth in the computer industry. But Xtrac even underforecasts sales when the economy is slow and the industry growth is below its long-run average.

a. What is the likely reason Xtrac persistently underforecasts sales?
b. What are some likely explanations for the reason in part (a)?
c. Propose three likely solutions, and critically evaluate each of them.

17–7. Scoff Division of World-Wide Paint is currently losing money, and senior management is considering selling or closing Scoff. Scoff's only product, an intermediate chemical called Binder, is used principally by the latex division of the firm. If Scoff is sold, the latex division can purchase ample quantities of Binder in the market at sufficiently high quality levels to meet its requirements. World-Wide requires all of its divisions to supply product to other World-Wide divisions before servicing the external market.

Scoff Division Profit/Loss Last Quarter (in thousands of dollars)

Scoff's statement of operations for the latest quarter is as follows:

Revenue:		
Inside	$200	
Outside	75	$275
Operating expenses:		
Variable costs	$260	
Fixed costs	15	
Allocated corporate overhead	40	315
Net income (loss) before taxes		$(40)

Notes:
1. World-Wide Paint has the policy of transferring all products internally at variable cost. In Scoff's case, variable cost is 80 percent of the market price.
2. All of Scoff's fixed costs are avoidable cash flows if Scoff is closed or sold.
3. Ten percent of the allocated corporate overhead is caused by the presence of Scoff and will be avoided if Scoff is closed or sold.

Calculate the annual net cash flows to World-Wide Paint of closing or selling Scoff.

17–8. Suppose a firm has two different accounting systems. For example, suppose it uses EVA to measure and reward management performance. To calculate EVA, annual spending on research and development is recorded as an asset and then depreciated in calculating earnings. In reporting earnings to shareholders, R&D spending in any given year is expensed against earnings.

Describe some of the likely consequences that can arise if the firm tries to maintain two different accounting systems.

17–9. An organizational consultant does not like the way your company compensates profit center managers (currently a large part of their pay is based on the center's profits). He argues that you should compensate the managers based on whether or not they made "reasonable decisions" and not based on the outcome of the decisions, which is partly beyond the control of the managers. The consultant argues that the managers will then have incentives to make good decisions but will not be subject to undue levels of risk. Evaluate this argument.

17–10. Below is a suggestion from a leading economics text on how to set optimal transfer prices. In this context, both the manufacturing and distribution divisions are profit centers. Do you think it would work? Explain.

The manufacturing division could be supplied data on the net marginal revenue curve for the distribution division and told to use this as its relevant marginal revenue curve in determining the quantity it should supply. By choosing the output where marginal revenue equals marginal cost, firm profits are maximized. The transfer price should be the marginal cost at this output level.

17–11. Xerdak Inc. has a corporate jet, which it uses to fly managers from Rochester to Chicago. The associated costs (monthly) of maintaining and flying the jet are as follows:

Pilot:	$10,000
Depreciation:	10,000
Overhead	10,000

In addition, each round trip to Chicago costs $10,000 in fuel. Commercial airlines (for example, United) charge $600 for a round trip to Chicago. Managers consider the commercial service and the company service to be identical. The company plane flies a maximum of 20 times each month and has 50 seats. There are always more managers wanting to fly on the plane than there are seats. The company wants to buy some more planes. Unfortunately, they

are back-ordered, and so the company will not be able to obtain additional capacity in the near future. According to economic theory, what is the optimal transfer price for a round trip to Chicago? Explain why.

17–12. Geriatrics Inc. has a patent on a new type of hospital bed. The marginal cost of producing each bed is $400. The company has significant production capacity. Geriatrics sells the beds to customers on the open market and also uses them internally throughout its nursing home chain. The external demand for the product is given by $P = 5{,}000 - Q$. Assuming that Geriatrics wants to profit-maximize, what is the optimal external market price? What is the optimal internal transfer price?

17–13. Biotech Inc. is a new company that invests in technologies relating to the use of plants in drugs. The stock market perceives that the company has the potential to generate large profits once it develops a line of products. To date, however, the company has not reported positive profits and does not anticipate doing so over the next 5 years or more. The owners of Biotech are particularly concerned about the investment choices of the managers. They are concerned that the managers do not have the right incentives to choose value-maximizing investments. They are considering adopting an EVA evaluation and compensation plan for the managers. Do you think this is a good idea? Explain.

17–14. Speed Company sells printers. It is divided into a manufacturing unit and a sales unit. The marginal cost of producing a printer is $200. External demand is given by $P = 1{,}000 - 0.01Q$. Selling and distribution costs total $150 per unit.

a. What is the profit-maximizing retail price and quantity? What are firm profits?

b. Suppose the manufacturing unit has monopoly power to set the transfer price and knows all the information in this problem. What transfer price will it charge? What are the resulting retail price, quantity, and firm profits?

17–15. Do you agree with the following statement? Explain.

Obviously the correct transfer price is the opportunity cost of the resource. Any firm that uses full cost (which includes an allocation of corporate overhead) is doing it wrong.

17–16. You are the owner and CEO of a large divisionalized firm, with operations in a number of diverse industries. Reporting to you are a number of division managers. Division managers have considerable decision-making responsibility with respect to the day-to-day operations of their divisions, but you must approve any capital investments above $100,000 before they are made.

a. As owner, what type of capital investments would you like your division managers to be proposing to you?

b. Is there a potential agency problem between you, as owner, and your division managers with respect to capital investments? What is the nature of that problem? Why is it a problem?

c. How might you attempt to solve that agency problem?

d. Do you think you can solve the problem entirely? Why or why not?

17–17. The Jameson Company has recently formed a subsidiary, Bright Ideas, to manufacture and sell household appliances.

a. What is the difference between an investment center and a profit center?

b. What factors should Jameson consider in deciding whether to evaluate Bright Ideas as a profit or investment center?

Capstone Case Study on Organizational Architecture

ARTHUR ANDERSEN LLP[1]

Introduction and Overview

It is difficult to find an example of a more spectacular business failure than the recent collapse of Arthur Andersen. Within a few years, Andersen moved from one of the largest professional service organizations in the world to almost complete collapse. The impact of the firm's failure on its employees, customers, investors, and the general public is hard to overstate. Its once proud reputation had been reduced to shambles. Even the President of the United States joked:

> *We just received a message from Saddam Hussein. The good news is that he's willing to have his nuclear, biological, and chemical weapons counted. The bad news is he wants Arthur Andersen to do it.*[2]

The dramatic demise of Andersen (along with the failures of companies such as Enron and Global Crossing) has raised concerns among managers throughout the world. They want to understand what caused the collapse of the company so that they can take actions to avoid similar fates.

Over the years, Andersen's business environment and strategy changed in material ways. Their management responded by making associated changes in their organizational architecture (decision right, performance evaluation, and reward systems). Part 3 of this book has argued that ill designed organizational architectures can result in poor performance and even company failure. An important question is whether Andersen's failure can be traced to inappropriate organizational choices. An even more critical question is whether other managers can learn from Andersen's mistakes. We believe that the answer to both questions is yes.

Our case study begins by summarizing the history and events that led to the collapse at Arthur Andersen. This discussion is followed by a series of questions that ask the reader to analyze the demise of Andersen in the context of the framework introduced in this book. Our purpose is not to present all the relevant analysis ourselves. Rather it is to provide readers with the opportunity for an integrated analysis and capstone discussion of an important business problem that relies on material drawn from across the chapters in Part 3 of this book. It also provides a forum for discussing the

[1]This case study is based on public news accounts, company documents, and press releases. Among the most important sources are Ken Brown and Ianthe Jeanne Dugan, "Sad Account: Andersen's Fall from Grace Is a Tale of Greed and Miscures," *Wall Street Journal,* June 7, 2002; and a series of articles from the *Chicago Tribune* published in September 2002.

[2]Joke made by President George W. Bush at a dinner talk in January 2002 as quoted in the *MBA Jungle,* December 2002–January 2003, 70.

root causes of the recent business scandals that have rocked the international business community.

Arthur Andersen: The Early Years

A 28-year-old Northwestern accounting professor named Arthur Andersen started his own business in 1914. Andersen's strategy was to offer high-quality accounting services to clients—promoting integrity and sound audit opinions over higher short-run profits. Soon after Andersen formed the firm, the president of a local railroad demanded that he approve a transaction that would have lowered his company's expenses and increased its reported earnings. Andersen, who was not sure he could even meet his firm's payroll, told the president that there was "not enough money in the city of Chicago" to make him do it. The president promptly severed his relationship with Andersen. However, Andersen soon was vindicated when the railroad filed for bankruptcy a few months later.

In the 1930s, the federal government adopted new laws to require public companies to submit their financial statements to an independent auditor every year. These regulatory changes, along with Andersen's reputation, helped the firm to grow. During these formative years, the organization continued to promote its "four cornerstones" of good service, quality audits, well-managed staff, and profits for the firm. Quality audits were valued more than higher short-run firm profits. Leonard Spacek, who succeeded Andersen as managing partner in 1947, produced more company folklore when he accused powerful Bethlehem Steel of overstating its profits in 1964 by more than 60 percent. He also led a crusade to motivate the Securities and Exchange Commission to crack down on companies that cooked their books. The yellowing press clippings of his bold efforts were still on display at the company's main training center near Chicago in 2002.

Between 1914 and the late 1980s, "tradition was everywhere" at Arthur Andersen. The firm installed heavy wooden doors at the entrance of all its offices. Andersen employees were known to be "one of a kind"—clean-cut, straight-laced, and dressed in pinstripes. Employees were taught to recite the partnership's motto, "Think straight, talk straight." Auditors were rewarded and promoted for making sound audit decisions. Top management assigned significant decision rights to the central office's Professional Standards Group. This group, which consisted of internal experts, monitored audits and issued opinions on how specific types of transactions should be handled. The objective was to promote consistent and well-reasoned opinions throughout the firm.

Andersen's insistence on quality and high standards enhanced its reputation and promoted consistent growth. Auditors in the firm did not become wealthy in these formative years. However, Andersen partners were well respected within their local communities and earned enough to purchase comfortable houses, nice cars, and memberships at local country clubs. In the late 1960s, a mid-level partner at Arthur Andersen made about $30,000—or $160,000 in today's dollars.

Andersen Enters the Consulting Business

In 1950, an Andersen engineer named Joseph Glickauf demonstrated that computers could be used to automate bookkeeping. This event led to monumental changes in the partnership. In addition to its basic auditing function, Andersen also could help clients automate their accounting systems. The firm launched its new computer consulting business in 1954 when it began providing services to General Electric's state-of-the-art

appliance factory near Louisville, Kentucky. Andersen soon developed the largest technology practice of any accounting firm.

During the 1950s and 1960s, the consulting business grew but remained a relatively minor activity compared to Andersen's auditing business. During the 1970s, Andersen's consulting business exploded as the demands for information technology increased. By 1979, 42 percent of Andersen's $645 million in worldwide fees came from consulting and tax work, as opposed to auditing and accounting. Consulting became the leading contributor to Andersen's revenues and bottom line in the mid-1980s.

Family Feud

As Andersen's consulting business continued to grow, tensions within the firm mounted. The consultants, who were contributing more to profits than the auditors, felt that they were subsidizing the audit partners. Consultants began to realize that they were underpaid relative to their market opportunities. Auditing partners resented the fact that the consultants wanted a higher share of the profits. The auditing partners, who controlled the managing board, made few concessions to the consulting partners. In response, a number of the top consultants left Andersen for other firms or to start their own consulting businesses.

Because of mounting tension, the firm separated its consulting and auditing businesses in 1989 by forming a new Geneva-based holding company, Andersen Worldwide (AW). Under the AW umbrella were two subsidiaries, Andersen Consulting (AC) and Arthur Andersen (AA). AC was to focus on providing consulting services to large corporations (primarily in the areas of computer systems integration and business strategy). AA, in turn, would focus primarily on audit and tax engagements. However, AA was allowed to provide consulting services to smaller companies (annual revenues of less than $175 million). The more profitable business was to share part of its profits with the other unit. Compensation no longer had to be the same across consulting and auditing partners. Each unit had significant decision rights over its own business.

Strategic and Organizational Changes at Andersen

The implications for the auditing partners were grim. The traditional accounting business was growing quite slowly due to increased competition and the large number of mergers in the 1990s; auditing quickly was becoming a low margin activity. Despite the long hours, accountants' salaries began lagging behind those of other professionals, such as lawyers and investment bankers. AA accountants particularly resented being eclipsed by their consulting counterparts at AC.

The auditors decided to "fight back." As top partner (at the time) Richard Measelle said, "It was a matter of pride." AA adopted a new strategy that focused on generating new business and cutting costs. AA began evaluating its partners on how much new business they brought to the firm. Superb auditors "who could not get a lick of business" were secure in their jobs in the 1970s, but not in the 1990s. According to Measelle, partners began to feel that "the number one thing was to make your numbers and to make money."

To reduce costs, AA began requiring partners to retire at age 56, enforcing a policy that had long been overlooked. The increased emphasis on revenue growth and expense reduction led to substantially higher revenues and profits per partner. As the twentieth century drew to a close, the average AA partner made around $600,000. However, these new policies also led to less experienced auditors and fewer partners overseeing audits.

A new breed of partner rose to the top within this new environment. One prominent example was Steve Samek, who was in charge of the Boston Chicken audit. Top partners gave Samek high praise for "turning a $50,000 audit fee at Boston Chicken into a $3 million full-service engagement." Samek, however, allowed the chain to keep details of losses at it struggling franchises off its own financial statements as it moved toward an initial public offering. The overstated financial statements helped make the IPO a "rousing success." Boston Chicken's subsequent collapse and bankruptcy led to legal actions against AA for helping to create a "facade of corporate solvency." In 2002, AA agreed to settle these suits by paying $10 million. Samek, however, had left the Boston Chicken account in 1993 to move on to bigger and more important assignments.

Robert Allgyer was known within AA as the "the Rainmaker" due to his success at cross-selling services to audit clients. One of his biggest "successes" was Waste Management, which paid $17.8 million in nonaudit fees to AA between 1991 and 1997, compared to $7.5 million in audit fees. At the same time, Allgyer was signing off on inaccurate financial statements. Among other things, the company wasn't properly writing off the value of its assets such as garbage trucks as they aged. As a result, profits were substantially overstated. In 1998, AA agreed to pay $75 million to settle shareholder suits over its auditing of Waste Management.

Boston Chicken and Waste Management were not the only problems to arise at AA over this period. In 2001, AA agreed to pay $110 million to settle shareholder suits arising from its audits of Sunbeam Corporation. These suits also arose over AA's attestation of financial statements that were alleged to be overly positive.

Continued Changes as AA Moves into the Twenty-First Century

AC partners complained that AA's consulting with large companies violated their internal agreement to separate the two businesses—indeed, AC and AA competed for some of the same consulting engagements. In 1997, AC partners voted unanimously to split off entirely and filed a formal arbitration claim with the International Chamber of Commerce. Eventually AC was allowed to separate and form a new independent company, Accenture. AA partners suffered a significant financial setback when the arbitrator ruled that AA would not receive a $14 billion payment it had expected from AC upon separation.

In 1998, Samek became the managing partner at Arthur Andersen. Among his initial moves was to formulate a new strategy that included advice on how partners should *empathize* with clients. Samek surprised many of the auditing partners when he announced his new "2X" performance evaluation system. Partners were expected to bring in two times their revenues in work outside their area of practice. If an auditor brought the firm $2 million a year in auditing fees, he was expected to bring in an additional $4 million in fees from nonaudit services, such as tax advice and technology services. Partners who achieved this standard were rewarded, while others were penalized and in some cases dismissed from the company.

In addition to changing Andersen's organizational architecture, Samek tried to change the softer elements of the firm's corporate culture. For example, the dress code was relaxed, the wooden doors at Andersen's office entrances were removed, and the firm adopted a new corporate logo, the rising sun.

Soon Andersen partners began offering a new service to clients. Rather than just handling the once-a-year audit of the public books, the firm offered to take over the entire internal bookkeeping function for their clients and provide internal audit services.

Critics, such as Arthur Levitt (chairman of the SEC at the time), voiced concerns that this practice at least would impair the perceived quality of audits. Accounting firms engaged in this practice would essentially be checking their own work. In 2000, the SEC proposed new regulations that would limit the consulting work at accounting firms. In testimony before the Senate Banking Committee in July 2000, Samek called the SEC proposal "fatally flawed." He argued that the proposal was being made "just as we need to take an even more active role in making needed changes in the measurement and reporting system in support of better information for decision-making by corporations, investors, and government." Intense lobbying by the "Big Five" accounting firms defeated the SEC proposal.

Enron

Arthur Andersen began auditing Enron's books in 1986. By early 2001, Enron had grown into what was widely considered the "premier energy company" involved in wholesale energy trading and marketing, gas transmission, and electric utilities. Its market value of its equity in early 2001 was approximately $75 billion.

In the mid-1990s, Andersen hired Enron's entire team of 40 internal auditors. It added its own people and opened an office in Enron's Houston headquarters. With more than 150 people on site, Andersen staff attended Enron meetings and provided input into new businesses and other strategic issues. While the revenues from Enron represented a small fraction of Andersen's overall revenues, they were a large fraction of the Houston office's revenue and much of the livelihood of the firm's lead auditor in Houston, David Duncan.

In an attempt to speed up decision making and give local offices more power, Andersen's once-powerful Professional Standards Group was moved out of the Chicago headquarters and dispersed to local offices. Carl Bass was the PSG member at the Houston office. In 1999, he told Duncan that Enron should take a $30 million to $50 million accounting charge related to a specific transaction. Four months later, Andersen's management removed Bass from his oversight role at Enron in response to complaints by Enron's chief accounting officer, who wanted him off the audit. As one former staffer observed, "There were so many people in the Houston office with their fingers in the Enron pie. If they had somebody who said we can't sign this audit, that person would be fired."[3] This suggests that Andersen's auditors were aware of the accounting problems at Enron but chose to ignore them.

As 2001 drew to a close, Enron announced that it would take a $544 million after-tax charge against earnings related to its LJM2 Co–investment partnership. It also indicated that it would restate its financial statements for 1997–2001 because of accounting errors related to it partnerships. The company filed for bankruptcy on December 2, 2001—at that time the biggest bankruptcy filing in U.S. history. Numerous scandals relating to excessive compensation and perquisites for top executives, accounting fraud, and negligence on the part of Enron's board quickly followed. Enron's stock price fell from around $90 per share a year earlier to near zero by the end of 2001. Widespread concern among investors, regulators, and the public arose worldwide. Conflicts of interest apparently had motivated Andersen to sign off on what it knew were questionable accounting practices at Enron. The firm's reputation as an independent auditor was destroyed; other Andersen clients quickly changed auditors.

[3]"Accounting in Crisis," *Business Week,* January 28, 2002.

The Demise of a Once Great Company

Arthur Andersen was subsequently charged with obstructing justice due to the shredding of documents and other evidence related to the case. Many outside observers concluded that Andersen staffers had shredded the documents to hide their own roles in producing fraudulent accounting statements. On January 24, 2002, Andersen issued the following press release:

> *While Andersen acknowledges the serious nature of actions and errors made by several of its Enron engagement employees, it also asks that all concerned be mindful that Andersen is 85,000 honorable, hardworking professionals worldwide—including 28,000 individuals and their families in the United States.*

Andersen placed most of the blame on David Duncan, who they claimed had violated the firm's ethical standards. Andersen quickly fired him.

Arthur Andersen ultimately was found guilty on a felony charge that it had obstructed the SEC's investigation of Enron when it shredded important documents and was prohibited from auditing publicly traded companies. The firm discontinued its auditing practice in August 2002. To many observers, this was a sad end of an organization that had once been the largest personal services firm in the world.

Questions

1. Discuss the environmental, strategic, and organizational changes that occurred over the life of Andersen in the context of Figure 11.1.
2. Evaluate Andersen's claim that their problems on the Enron audit were due to a few "bad partners" in the organization. If you disagree with this claim, discuss what you think were the root causes of the problem.
3. Suppose you were Andersen's managing partner in the early 1990s. Would you have done anything differently than the actual management (assuming you knew only what they did at the time)? Explain.
4. Discuss the relation between what happened at Andersen and multitask principle agent theory.
5. Discuss the relation between the "hard" and "soft" elements of a firm's corporate culture in the context of this case.
6. Do you think that the problems at Andersen were unique to them or did they exist at the other big accounting firms? Suppose you were the top partner at one of the other major accounting firms at that time of Andersen's demise. What actions, if any, would you take in response? Explain.
7. In 2000, the SEC proposed new regulations that would limit consulting work by accounting firms. This proposal was not passed by Congress. Do you think that the legislators were trying to act in the public interest when they failed to pass this proposal? Explain.
8. The American Institute of Certified Public Accountants is the primary professional association for certified public accountants. It has developed a *Code of Professional Conduct* that sets the standards of conduct for CPAs. People can file complaints about the ethical conduct of a CPA with the AICPA, which can levy sanctions and other penalties against its members. Do you think that the unethical conduct at Andersen (and possibly other accounting firms) was the fault of the AICPA for not setting and enforcing higher ethical standards among its members? Explain.
9. The Sarbanes-Oxley Act of 2002 established a new five-person board to oversee financial accounting in publicly traded corporations. The board is appointed by the Securities and Exchange Commission. Prior to the creation of this board the industry relied primarily on self-regulation through the American Institute of Certified Public Accountants. Do you think the establishment of the new oversight board was a good idea or should the profession have continued to be self-regulated?

PART FOUR

Applications of Organizational Architecture

Choosing the Legal Form of Organization

CHAPTER 18

CHAPTER OUTLINE

Empire Blue Cross Blue Shield is a large health insurance company headquartered in New York City. As of 2002, it employed over 6,500 people and provided insurance coverage to over 4.5 million people. Empire was organized as a nonprofit company during its first 65-plus years of existence. In June 2002, it filed a plan with the State of New York to convert to a for-profit organization. According to management, changes in regulations and the health insurance marketplace had "eliminated the benefits of being a not-for-profit company" and placed the company

"at a significant competitive disadvantage in its marketplace." Management viewed "restructuring as a for-profit company as essential to the company's future."

While Empire changed its profit status, other companies have changed their legal forms of organization in other ways. Accenture Ltd. is the world's largest management and technology consulting organization with approximately $13.3 billion in revenues for the fiscal year ended August 31, 2001.[1] Accenture, formerly known as Andersen Consulting, was a subsidiary of Andersen Worldwide. It became an independent legal entity when it separated from Andersen Worldwide in August 2000. As such, it was largely unaffected by the subsequent problems that befell Arthur Andersen following the Enron collapse. After the separation, Accenture initially operated as a series of related partnerships and corporations under the control of its partners. In fiscal year 2001, the company converted to a corporation, where its partners exchanged their interests for Accenture Ltd. Class A common shares. These shares began trading on the New York Stock Exchange on July 19, 2001. According to Accenture's management, the conversion "reflected the organization's commitment to enhance the company's long-term growth, ability to deliver the highest-value solutions to its clients, and to continue to provide competitive rewards to motivate and attract the best people."

Empire and Accenture are but two examples of many companies that changed their legal form of organization in recent years. For example, the percentage of health maintenance organizations (HMOs) classified as nonprofit declined from 82 percent in 1981 to 29 percent in 1995. KPMG Consulting, which was formerly part of the KPMG International partnership, became a publicly traded corporation in February 2001. The largest U.S. meat producer, IBP Inc., converted from a publicly traded to a closely held corporation in October 2000 through a leveraged buyout valued at $3.7 billion. Changes in the legal form of organization also have been prevalent among hospitals converting between for-profit and nonprofit status and insurance companies converting between mutual organizations and stock companies.

An initial step in creating an organizational architecture is to choose the legal form of organization. These examples suggest this choice is an important managerial decision; moreover, it is one that can be changed over time. While changes in organizational form are rare events in certain sectors of the economy, they occur quite frequently in other sectors, such as health care. This chapter provides an analysis of the relative costs and benefits of the alternative legal forms of organization. As part of this analysis, we present an overview of the mechanisms that are used to control managerial agency problems within large corporations.

The remainder of this chapter is organized as follows. We begin by providing a descriptive overview of the organizational alternatives. Our economic analysis starts by summarizing the organizational architecture framework presented in Chapter 11. We subsequently use this framework to analyze the following managerial decisions: (1) whether to organize as a nonprofit or for-profit organization; and (2) assuming that for-profit organization is chosen, how to select among the available alternatives. We consider the trade-offs between organizing as either a closely held or publicly traded corporation. Included in this discussion is a general overview of the governance mechanisms that help to control agency conflicts in publicly traded corporations (for instance, the board of directors). The organizational implications of regulatory reactions to the Enron scandal (e.g., the passage of the Sarbanes-Oxley Act of 2002) are examined. The appendix discusses the tax implications of organizing as a C versus subchapter S corporation.

[1] 10-K filed 11/29/2001.

Overview

While large publicly traded corporations such as Microsoft and General Electric are prominent in today's business environment, other legal forms of organization play important roles in the economy. This section provides a descriptive overview of the existing alternatives.

Profit Status

Organizational forms can be divided into two major categories: *nonprofit* and *for-profit*. The defining characteristic of a nonprofit organization is that the persons who control these organizations—including the board, officers, and members—are forbidden from receiving the organizations' residual profits. Laws do not preclude nonprofit organizations from making a "profit"; indeed, some regularly receive revenues that substantially exceed their costs. Nonprofit organizations receive significant tax benefits, and regulations require that their net surplus ("profits") be used for social purposes, such as the arts, education, or charity.

Most nonprofit organizations in the United States fall into one of two major groups based on the U.S. Tax Code: 501(c) (3) charitable organizations and religious congregations and organizations; and 501(c) (4) social welfare organizations. Nonprofit organizations are private and self-governing. However, to qualify for nonprofit status, they must serve a public purpose. Nonprofit organizations are exempt from most federal, state, and local taxes; some receive tax-deductible contributions.

For-profit organizations differ from nonprofit organizations in that they have "owners" who receive the residual profits. Typically owners of the residual claims have *decision control rights*[2] in proportion to their ownership interests. For example, in most corporations shareholders have the right to elect the board of directors and to vote on key issues.

Nonprofit and for-profit organizations co-exist in certain sectors of the economy, such as hospitals, nursing homes, and education. As we have discussed, organizations sometimes change their profit status. These facts suggest that profit status is not always determined by the nature of the activity; rather it is an important decision initiated by the management of the organization.

For-Profit Alternatives

Within the United States, businesses are regulated primarily by state laws, which provide companies with a menu of organizational choices. Table 18.1 presents the primary organizational alternatives that exist at the current time for for-profit organization.[3] The table also summarizes how these organizational forms vary along four important dimensions: (1) ownership of the residual profits, (2) assignment of decision control rights, (3) taxes, and (4) legal liability of the owners.

Individual proprietorships are unincorporated businesses owned by individuals. The owner has title to the residual profits and has decision control rights for the organization. Income from the business is "passed through" to the owner's personal tax return

[2]Recall from Chapter 12 that decision control rights are the rights to ratify and monitor decisions in the organization. Ultimate authority for decision control is typically held by the parties at the top of the organization. These rights, however, can be delegated to individuals throughout the organization.

[3]We do not consider all existing legal forms of organization in this chapter. Rather we focus on the most predominant forms. For example, we do not examine mutuals, real estate investment trusts, or worker cooperatives.

	Ownership of Residual Profits	Decision Control	Taxes	Owner's Liability
Individual proprietorship	Proprietor	Proprietor	Pass through	Unlimited
General partnership	Partners	Partners	Pass through	Unlimited
Limited liability partnership	Partners	Partners	Pass through	Limited
Limited partnership	Partners	General partners	Pass through	Unlimited: general partners Limited: limited partners
S corporation	Shareholders	Shareholders and board	Pass through	Limited
C corporation	Shareholders	Shareholders and board	Both corporate and shareholder levels	Limited

NOTE: The table does not list limited liability companies (LLCs). LLCs are similar to S corporations in many dimensions.

Table 18.1 Legal Forms of Organization in the For-Profit Sector

This table summarizes the five primary forms of for-profit organization that exist under current state laws. The table describes (1) who owns title to the residual profits, (2) who has the top decision control rights (rights to ratify and monitor key decisions), (3) the organization's tax status ("pass through" means that the income of the organization is allocated to the owners and is taxed only at the personal income tax level), and (4) the legal liability of the owners (limited liability means that the owners' risk is limited to their initial capital contributions, while unlimited liability means that the owners are fully liable for all debts and obligations of the business).

(there is no separate tax at the business level). The owner faces "unlimited liability" with respect to debts and other claims against the business. Because courts view the company and the owner as the same party, the owner's personal assets are at risk in legal disputes.

General partnerships are unincorporated businesses with two or more co-owners. In the absence of a partnership agreement, profits are shared equally among the partners. A partnership agreement, however, will usually provide for the manner in which profits and losses are to be shared. In the absence of a partnership agreement, each general partner has an equal right to participate in the management and control of the business. Disagreements in the ordinary course of partnership business typically are decided by a majority of the partners. Disagreements of extraordinary matters and amendments to the partnership agreement often require the consent of all partners. The income from the business is passed through to the owners' personal tax returns. Each partner is, jointly and individually, liable for the obligations of the partnership.

Some states allow professionals, such as attorneys, doctors, and accountants, to organize as *limited liability partnerships* (LLPs). LLPs have the same basic characteristics as general partnerships except that the individual partners are shielded from certain "vicarious liabilities." For example, since Arthur Andersen was organized as an LLP, its worldwide partners were not personally liable for the actions as its Houston office during the Enron scandal.

In a *limited partnership,* one or more "general" partners manage the business while "limited" partners contribute capital and share in the profits but take no part in running the business. Income is passed through to the partners for tax purposes. General partners

are personally liable for the partnership's debts, while limited partners incur no liability with respect to partnership obligations beyond their capital contributions.

Corporations are formed by filing the appropriate paperwork and fees with officials in the state of incorporation. Corporations have the legal standing of an individual (distinct from its shareholders) and can enter contracts, participate in lawsuits, and so on. Corporations also have the right to issue stock and to exist indefinitely. State laws require that corporations have a board of directors who are assigned the primary decision control rights. Shareholders have the rights to vote on key issues and in the election of the board. In the United States, boards have a fiduciary responsibility to represent the interests of shareholders. Corporations are free to select their boards and governance procedures (for instance, voting rules) within the legal boundaries. Shareholders have limited liability (only their initial capital contribution is subject to risk).

S corporations were created in 1958 as part of a tax program to help small businesses. Limits on the number and type of shareholders were imposed to make this organizational form unattractive to large firms (that benefit from being able to raise capital from a large number of individuals).[4] In practice, the shareholder/managers and the boards in small S corporations are the same people. Similar to partnerships, the income in S corporations passes through to the individual owners' (the shareholders) tax returns. There is no tax at the corporate level. While shareholders have limited liability, lenders often demand that the owner/managers guarantee the loans to the company with their personal assets. (Thus, liability limitations have the biggest impact on claims that do not arise from a prior contractual relationship—for instance, through a lawsuit.)

The earnings of *C corporations* are taxed at the corporate level and again at the personal level when they are distributed to shareholders (e.g., through the payment of dividends).[5] Unlike S corporations, C corporations have no significant restrictions on the number or type of parties that can own stock in the firm. Therefore, most large companies that raise significant amounts of capital from outside shareholders are C corporations.

Some corporations are *closely held*, while others are *publicly traded*. Closely held corporations are characterized by stock that is not freely traded and often held by only a few shareholders (often within the same family). The boards of closely held corporations often are composed of family members. Publicly traded corporations are characterized by stock that is sold to and traded among the general public (often on organized exchanges, such as the New York Stock Exchange). Examples include Wal-Mart, General Electric, Coca-Cola, and Microsoft.

While each shareholder normlly has one vote for each share held, this is not always the case. Some firms have dual-class voting shares, where one class of stock has the primary claim to the residual profits and few voting rights, while the other class has a smaller claim to the residual profits but retains more of the voting rights. Jointly locating decision control and residual-claim rights usually is optimal since it gives those in control the incentives to maximize value and facilitates the efficient transfer of

[4]Another organizational form that is closely related to the S corporation is the limited liability company (LLC). While LLCs are similar to S corporations in many dimensions, they face less stringent ownership restrictions. Requirements of unanimous consent among owners and other regulations make this form of organization unattractive to most large companies. The internal structures of large corporations, however, are often quite complex. A large corporation might organize some of its subsidiaries as LLCs to shield the central company from legal exposure.

[5]While this *double taxation* typically results in higher taxes than would be paid if the income were passed through to the shareholders' individual tax returns, this is not always the case. The appendix presents an analysis of the relative taxes paid by C and S corporations.

Sotheby's Holdings: The Sting of the "Killer B" Stocks

Christie's International PLC and Sotheby's Holdings are the two largest fine arts auction houses in the world. In January 2000, the announcement that Christie's had agreed to cooperate with the U.S. Justice Department in its investigation of price fixing sent Sotheby's stock down $3.50 per share (or 15 percent) to $20.50. In return for amnesty, Christie's admitted that it had conspired with Sotheby's to fix auction commissions. Price fixing is illegal under American and European antitrust laws. Ultimately, lawsuits were settled for hundreds of millions of dollars and Sotheby's chairman, Alfred Taubman, was sentenced to a jail term and a $7.5 million fine.

Prior to the price-fixing scandal, Sotheby's had two classes of common stock. Each of the 42,269,201 Class A shares was entitled to one vote, while each of the 16,585,650 Class B shares was entitled to 10 votes. Taubman, who owned much of the Class B stock (known as "killer B's"), controlled the company with 62.5 percent of the voting rights, but had only 23 percent of the cash-flow rights. Baron Capital Group (headed by Ron Baron) in contrast was entitled to 40 percent of the cash flows, but had only 11 percent of the voting rights.

Prior to the scandal becoming public, Ron Baron indicated that he had significant faith in Taubman's leadership and was not concerned about Taubman's control through his ownership of the "killer B" stock. After the scandal became public and the stock price fell, significant conflict arose between Baron and Taubman. Baron wanted Taubman and his son to leave the company. Baron feared that Taubman's incentives were no longer aligned with the company and its shareholders, and that he might use company funds in an unreasonable legal settlement to protect himself from prosecution. The Taubmans refused to give up control, and Baron did not have enough votes to force them to leave. In a screaming match with Baron, son Robert Taubman announced that the Fords had no intention of giving up control of their company and neither did his family.

Ultimately the conflict was resolved. However, this example illustrates the conflicts that can arise when there is a separation of ownership and control rights. The Taubmans would have been forced to give up control of the company more quickly if, as in the typical company, their claim for 23 percent of the cash flows was associated with 23 percent of the voting rights. (Note that this conflict does not imply that it necessarily was suboptimal for Sotheby's to issue dual-class shares when they originally were sold. But it does illustrate vividly some of the costs associated with dual-class shares that can arise after the fact.)

Source: S. Tully (2000), "Sotheby's: A House Divided," *Fortune Magazine* (December 18), 264–273.

control.[6] Nonetheless it sometimes can be efficient to issue shares with limited voting rights. One example arises when the private (frequently nonpecuniary) benefits of control are sufficiently large to offset the agency costs associated with separating control and residual-claim rights. For example, a founder who values control might issue shares with limited voting rights, even if shares with full voting rights would command a higher price.[7]

Descriptive Statistics—For-Profit Sector

According to the U.S. Census Bureau, there were approximately 20.8 million for-profit firms in the United States in 1997, employing 103.4 million people and generating $18.6 trillion in revenues. Table 18.2 shows that over 70 percent of these firms were individual proprietorships; approximately 21 percent were corporations. Approximately

[6]See Sanford J. Grossman and Oliver D. Hart (1988), "One Share–One Vote and the Market for Corporate Control," *Journal of Financial Economics* 20, 175–202; and Milton Harris and Artur Raviv (1988), "Corporate Governance: Voting Rights and Majority Rules," *Journal of Financial Economics* 20, 203–235.

[7]Evidence suggests that the typical limited voting right stock sells at a discount of over 5 percent relative to its superior voting right counterpart. Thus if a founder decides to go public with a limited voting rights stock issue, he might expect to sell it at a discount relative to what he would receive for a full voting right stock issue of similar size. See Ronald C. Lease, John J. McConnell, and Wayne Mikkelson (1983), "The Market Value of Control in Publicly-Traded Corporations," *Journal of Financial Economics* 11, 439–471.

	Firms (000s)	% Total	Sales ($Billions)	% Total	Employment (000s)	% Total
All for-profit organizations	20,822	100.00	18,553	100.00	103,360	100.00
C corporations	2,390	11.48	13,892	74.88	70,982	68.67
Subchapter S corporations	1,979	9.50	2,977	16.05	21,446	20.75
Individual proprietorships	15,123	72.63	872	4.70	5,699	5.51
Partnerships	1,226	5.89	622	3.35	3,918	3.79
Other	103	0.49	190	1.02	1,315	1.27

SOURCE: U.S. Bureau of the Census, 1997 Economic Census.

Table 18.2 Distribution of Frequency, Sales, and Employment: For-Profit Organizations (Nonfarm), 1997

55 percent of the corporations were C corporations; the rest were S corporations. Just fewer than 6 percent of the firms in 1997 were classified as partnerships. While individual proprietorships are the most prevalent form of organization, they accounted for fewer than 5 percent of the total sales in 1997. C corporations, which include most large companies, accounted for almost 75 percent of the sales.

Many large publicly traded companies are listed on the New York Stock Exchange (NYSE), which provides an active and liquid market for trading shares. In 2001, there were 2,798 companies listed on the NYSE with an aggregate market value of $16 trillion. The average daily trading volume on the NYSE was 1,240 million shares or the equivalent of all shares on the market changing hands about every 275 trading days (there were 341.5 billion shares outstanding). Many other companies are traded in the "over-the-counter market" through the NASDAQ system. In 1998, 5,126 companies (including Microsoft) were listed on NASDAQ with a combined market value of $2.6 trillion. The average daily trading volume was 802 million shares.

While most large corporations are publicly traded, there are some very large closely held firms. According to *Forbes Magazine,* there were 257 private companies in the United States in 2002 with annual sales over $1 billion (some of these firms were organized as LLPs). The three largest were Cargill, Koch Industries, and Mars with annual sales of $50.8 billion, $40 billion, and $17.5 billion, respectively. Specifically, had Cargill been publicly traded, its sales would have placed it in the top 20 firms on the *Forbes 500.* Cargill, which is an international marketer, processor, and distributor of agricultural and other products, employed approximately 97,000 employees in 59 countries in 2002. Moreover, *Forbes* listed James R. Cargill and Margaret Anne Cargill among the "400 Richest Americans" in 2002.

Descriptive Statistics—Nonprofit Sector[8]

Approximately 6 percent of all organizations in the United States are nonprofit. The nonprofit sector has grown significantly over the past 35 years. In 1967, there were about 300,000 nonprofit organizations in the United States; currently there are close to 1.6 million. Nonprofit organizations also are prominent in many other countries. While some nonprofit organizations, such as Empire Blue Cross Blue Shield, are large, most are relatively small. Of those organizations that were required to file IRS Form 990 in 1998,

[8]Most of the data in this section is from Independent Sector and Urban Institute, 2001, *The New Nonprofit Almanac and Desk Reference.*

	$Billions	Percent
Health services	325.85	49.0
Education and research	119.70	18.0
Religious organizations	76.47	11.5
Social and legal services	76.47	11.5
Foundations	33.25	5.0
Civil, social, and fraternal organizations	17.96	2.7
Arts and culture	15.30	2.3
Total	665.00	100.0

SOURCE: Independent Sector and Urban Institute, 2001, *The New Nonprofit Almanac and Desk Reference.*

Table 18.3 Distribution of Total Revenue for Nonprofit Organizations by Sector, 1997

73 percent reported expenses of less than $500,000. Collectively, nonprofit organizations employed 9.3 percent of all employees in the United States in 1998 and generated total revenue of about $665 billion (equivalent to about 3.5 percent of the revenue generated by the for-profit sector). The nonprofit sector's estimated share of national income in 1998 was 6.1 percent or about $444 billion (including assigned values for volunteers).

Nonprofit organizations are found in a wide range of sectors and activities. Examples include hospitals, nursing homes, health insurers, and other health care organizations, universities, churches, day care centers, museums, private foundations, environmental groups, libraries, museums, drug rehabilitation centers, international human rights organizations, humane societies, environmental groups, community shelters, and soup kitchens.

Table 18.3 presents the distribution of revenue by nonprofit sector in 1997. Four sectors account for 90 percent of the distribution: health care with 49 percent of the revenue, educational and research institutions with 18 percent, social and legal services with 11.5 percent, and religious organizations with 11.5 percent.

In 1997, 38 percent of total nonprofit revenue came from private payments for dues and services, 31 percent from government grants and contracts, 20 percent from private donations, and 11 percent from other sources (including investments, interest, and dividends). The relative importance of these sources varies substantially among the sectors. For example, hospitals receive most of their revenue from payments for services, while religious organizations rely primarily on private donations.

In 1999, private donations to the nonprofit sector were estimated at close to $190 billion. Gifts from individuals and their bequests accounted for 85 percent of all private giving. Many nonprofit organizations also benefit from volunteer workers (donations of time). In 1998 the nonprofit sector employed about 11 million paid workers and 6 million (full-time equivalent) volunteers. The assigned dollar value of volunteer time in 1998 for the nonprofit sector reached almost $226 billion.

Framework for Analyzing Organizational Choices

According to the analysis in Chapter 11 (as summarized in Figure 11.1), optimal organizational choices are determined by the business environment and the strategy of the firm.[9] Firms facing different business environments and/or strategies will often

[9]While we acknowledge that a firm's organizational architecture can affect its strategic choices, as a first approximation, we assume that the strategy is chosen before the organizational architecture.

Andersen Consulting: Divorce Is Not Costless

Accenture is the largest management and technology consulting firm in the world. Prior to 2001 it was part of Andersen Worldwide.

Arthur Andersen established its consulting business in 1954. Andersen's consulting business grew substantially over the next three decades. Tensions arose between audit and consulting partners over decision rights and compensation. In 1989, Andersen separated Andersen Consulting (AC) from Arthur Andersen (AA) by forming two separate subsidiaries. Tensions between the audit and consulting partners remained, and in 1994 AA launched its own consulting business.

During the 1990s it became obvious to many people that it was dysfunctional to keep AC and AA within the same firm. The organizations fought with one another; they competed for the same business; there was limited cooperation and little productive mutual monitoring between the two units.

While many of the partners agreed that "divorce" was the right action, they disagreed on the terms of the divorce. For example, the AA partners indicated they would agree to a divorce if they received a large payment from AC. AA argued that such a payment was warranted because AC's value was largely built on the Andersen name. AC, however, disagreed. Ultimately, the dispute was resolved through arbitration.

The divorce of AC and AA illustrates that contracting costs can impede and limit organizational change. Similar to some marital divorces, significant resources and time were consumed at Andersen fighting over the terms of the divorce.

This example illustrates that the optimal organizational form can change through time. However, changing the organizational form can be a costly undertaking.

Source: Various public news reports and broadcasts, 2002.

have different optimal organizational architectures. The optimal organizational architecture can change through time as the business environment and/or the firm's strategy changes.

An important first step in designing an organizational architecture is to choose the basic legal form of organization. Each form has relative benefits and costs that can vary in importance depending on the organization's specific business environment and strategy. The managerial objective is to choose the organizational form that has the largest net benefit. As either the business environment or strategy changes, so can the relative costs and benefits of the alternative forms of organization. Correspondingly, the managers might be able to increase value by changing their organizational form through time. Changing the organizational form, however, is not a costless undertaking and the benefits of change have to be compared to the costs.

In the next section, we use this framework to analyze the choice between for-profit and nonprofit status. Subsequently we use the framework to examine the choice among the major forms of for-profit organization. We also consider the trade-offs facing corporations in choosing between being closely held or publicly traded and the organizational implications of regulatory responses to the Enron scandal.

Managerial Decision: Profit Status

Regulations only allow firms with a social purpose to organize as nonprofit organizations. For many of these firms (e.g., hospitals and health insurers) the choice between nonprofit and for-profit status is an important managerial decision. Nonprofit organizations have both benefits and costs relative to for-profit organizations. It is optimal to organize as a nonprofit organization when the net benefits are positive.

Benefits of Nonprofit Status

One of the obvious benefits of organizing as a nonprofit organization is lower taxes. Nonprofit organizations that qualify under sections 501(c) (3) and 501(c) (4) of the U.S. Tax Code (charitable organizations and religious congregations, and social welfare organizations, respectively) are exempt from most federal, state, and local taxes. For-profit organizations typically pay taxes at all three levels. Nonprofit organizations also have an advantage over nonprofit organizations in raising donations and obtaining volunteer labor. Donors are reluctant to make contributions to for-profit organizations because the owners (e.g., the shareholders) have incentives to expropriate the proceeds. Since nonprofit organizations are legally restricted from distributing profits to investors, the board, and managers, donors reasonably expect that there is a higher probability that their gifts will be used for the intended social purposes. Donors also receive tax deductions when they contribute to qualifying nonprofit organizations. No deduction is allowed for donations to for-profit companies.

Costs of Nonprofit Status

The most obvious disadvantage of the nonprofit form of organization is the inability to issue claims against the residual profits of the organization. This inability generates at least two primary costs. First, nonprofit organizations cannot sell common stock to raise investment capital. Rather they must finance investments through debt, internally generated funds, and donations. These restrictions on raising capital imply that nonprofit organizations with substantial investment demands will not always be able to finance their desired investments.[10] Second, nonprofit organizations cannot pay top managers equity-based compensation (such as restricted stock and stock options). Relative to for-profit organizations, nonprofit organizations have less freedom to design incentive compensation schemes that motivate managers to focus on financial performance. Strong financial

Managerial Incentives in Nonprofit Hospitals

Regulations do not allow nonprofit organizations to use profit sharing or equity-based incentives to motivate their managers. Indeed, some nonprofit organizations have lost their tax exempt status for giving their managers claims on the residual profits. But these restrictions do not imply that nonprofit organizations cannot use incentive compensation. Indeed nonprofit organizations often pay their managers bonuses for good performance.

Research indicates that both turnover and compensation of CEOs of nonprofit hospitals are significantly related to accounting measures of financial performance. The turnover/performance relation appears as strong in nonprofit hospitals as in for-profit hospitals and other for-profit corporations. Apparently the boards of nonprofit hospitals feel it is important to motivate managers to focus on financial performance in today's environment.

Nonprofit boards should not expect that their managers will ignore their self-interest simply because they work in a nonprofit setting. Incentives are an important issue in all organizations. Board monitoring and incentive compensation are tools that nonprofit boards can use to limit potential managerial agency problems.

Source: James A. Brickley and R. Lawrence Van Horn (2002), "Managerial Incentives in Nonprofit Organizations: Evidence from Hospitals," *Journal of Law and Economics* 45, 227–249.

[10]It is not always feasible to borrow to fund investment projects if the organization has insufficient equity capital.

performance is important, even for nonprofit organizations with social objectives, since it promotes survival of the organization and provides funds for investment and social purposes.

The absence of stockholders also implies that the managers of nonprofit organizations do not face the discipline imposed by an active takeover market (poorly performing managers of nonprofit organizations do not face the threat of being replaced through a hostile takeover). Restrictions on equity-based compensation and the absence of an active takeover market imply that board monitoring is particularly important for controlling managerial agency problems in nonprofit organizations. In contrast to corporate boards, the boards of nonprofit organizations typically do not contain managers. Rather they are comprised of people such as community leaders and major donors. Some observers, however, argue that since nonprofit board members do not have ownership interests, they often have only limited incentives to monitor managers (e.g., relative to large shareholders that hold seats on some corporate boards).

Factors Affecting the Choice of Profit Status

Nonprofits benefit from lower taxes and a higher propensity for donations, while for-profits have an advantage in raising equity capital and more freedom to design incentive compensation plans for managers. The importance of these factors varies across firms depending on their business environments and strategies. High tax rates and the potential for large donations (e.g., due to the organization's mission or the propensity for donations in the local community) promote nonprofit organization, while large investment requirements and the importance of paying managers equity-based compensation promote for-profit organization.

The importance of taxes is highlighted by the observed organizational patterns among private hospitals.[11] In 1998, for-profit hospitals accounted for only 3.2 percent, 2.2 percent, and 6.1 percent of the private hospitals in the Middle Atlantic, New England, and West North Central states. These regions correspondingly had high average state corporate income tax rates of 9.2 percent, 8.8 percent, and 7.6 percent, respectively. In contrast, the South Atlantic, Mountain, and West South Central states had much higher for-profit shares of 30.9 percent, 15.1 percent, and 42.5 percent, and respectively lower average tax rates of 6.3 percent, 6.0 percent, and 2.8 percent.[12] Data from the hospital industry also illustrate the comparative advantage that nonprofits have in raising donations. In 1997, the average donation per bed for private nonprofit hospitals in the United States was $1,268 compared to $234 for for-profit hospitals.

Between 1991 and 1998, the percentage of U.S. hospitals that were for-profit increased from 20.8 to 26.1 percent. Hospitals typically state that their primary motive for converting to for-profit status is to gain access to public equity markets. Increased competition from the private sector and the corresponding importance of investing in up-to-date information systems and equipment have increased the importance of raising equity capital for these organizations. Some converting hospitals also note the importance of using equity-based compensation to attract, retain, and motivate top executives. Other hospitals, however, have converted from for-profit to nonprofit status over the same time period. Increased taxes and the potential for increased donations (and government grants) are factors that motivate these conversions.

[11]The following data comes from the American Hospital Association and various governmental sources.

[12]We also find that differences in property tax rates help to explain the relative importance of for-profit hospitals across counties within a given state.

Choosing among the For-Profit Alternatives

In this section, we consider the choice among alternative forms of for-profit organization. We limit our attention to four major alternatives including individual proprietorships, general partnerships, closely held corporations, and publicly traded corporations.

Individual Proprietorships

One of the primary advantages of individual proprietorships is that there is no agency problem between the owner and top manager. Being the owner and operator, the proprietor has a strong incentive to maximize the value of the organization. There are no residual losses or out-of-pocket expenditures that arise because of owner–top manager conflicts (see Chapter 10).

Individual proprietorships have relative disadvantages in raising capital for at least three reasons. First, risk is inefficiently borne by the owner-manager (the owner-manager could obtain the same expected financial return with less risk by holding a more diversified portfolio). Second, the owner's limited wealth places a constraint on raising capital for new investment. Individual proprietorships finance investment through personal savings, retained earnings, and debt. Banks and other lenders base their loan-approval decisions and interest rates on the equity held by the owner. As investment demands expand, limited wealth can force the owner either to forgo profitable investment or to change organizational form by selling equity claims to outside investors. In this case, the owner must compare the benefits from the additional investment with the increased agency problems that arise from more diluted ownership. Third, relative to publicly traded stock, the owner's investment is illiquid.

The capital-raising disadvantages of individual proprietorships imply that individual proprietorships will not be widely observed in activities that require large investment (for instance, due to economies of scale in the production process). Rather they are expected to be most common in activities where the optimal size of the firm is small. Not surprisingly, this is what we observe in the actual economy. While individual proprietorships are the most common form of organization, they account for only a small fraction of total sales in the economy. Based on the figures in Table 18.2, average sales for individual proprietorships were only $56,660, compared to over $5.8 million for C corporations.

Another disadvantage of individual proprietorships is that owners face unlimited liability. Small business owners can obtain limited liability by incorporating, for example, as an S corporation. However, for many small businesses the benefits of incorporation are small since banks and other lenders typically demand personal guarantees from the owner regardless of the organizational choice. Filing fees and costs associated with various legal restrictions explain why many small businesses remain unincorporated. Limited liability helps to shield the owner from tort claims arising from the business (for instance, lawsuits over wrongful acts, injury, or damages not involving breach of contract). Small companies with a high propensity for these types of legal actions (for example, taxicab owners in major cities) often organize as S corporations or limited liability companies (LLCs).

General Partnerships

General partnerships have an advantage over individual proprietorships in raising capital because equity investments are made by more than one individual. Partnerships have a disadvantage in this dimension compared to most corporations.

The relative benefits of a partnership over a corporation (that has nonmanagement shareholders) arise from fewer owner-manager conflicts. The potential agency conflicts between management and outside investors motivate corporations to expend resources for external financial reporting and other control mechanisms. Partnerships do not incur these costs. Also partnerships (both large and small) pass the income through to the individual owners' tax returns, thus avoiding the "double taxation" associated with C corporations.

The shared equity interest in a partnership helps to reduce intermanager conflicts. In smaller partnerships, the partners have relatively strong incentives to engage in productive mutual monitoring and to cooperate with one another. As the size of the organization and the number of partners increase, however, partners have increased incentives to free-ride on one another's efforts. For example, mutual monitoring did not prevent the Enron-related problems at Arthur Andersen. Conflicts can also arise when partners want to sell their ownership claims. This conflict is often addressed through prenegotiated agreements containing provisions about each partner's rights when a partner exits the firm (for instance, continuing partners might have the option to purchase the claim). The costs of implementing these agreements depend on the costs of valuing each partner's share on an ongoing basis. These costs vary across businesses depending on the nature of the assets, growth opportunities, and so on.

General partnerships expose the owners to unlimited liability. However, the magnitude of the associated costs depends on the nature of the business. Partnerships among certain types of professionals, (for instance, accountants, doctors, and lawyers) often obtain some legal protection by organizing as limited liability partnerships.

Small businesses that require the teamwork of a few key people at the top of the organization often organize as general partnerships. Joint ownership provides relatively strong incentives for productive actions. Forming a partnership is relatively simple and does not involve the filing fees or added regulations associated with incorporation. If, however, the business exposes the owners to significant threat of litigation (e.g., injury claims), it can be value maximizing to organize as an S corporation. Joint ownership of the corporation continues to provide strong incentives and the tax treatment is essentially the same.

Mutual Monitoring Breaks Down at Arthur Andersen

Arthur Andersen, which was formed in 1914, was once one of the largest and most prestigious auditing firms in the world. It was organized as a limited liability partnership in recent years. In 2002, Andersen was convicted of a felony for obstructing the SEC's investigation of Enron. The conviction, along with the loss of reputation from the Enron and other scandals, led to the collapse of the company.

Some of the improper actions taken on behalf of Enron by Andersen's Houston office had been questioned by other partners and staff. However, the fear of losing Enron's consulting business appears to have motivated the Houston and central offices to ignore these warnings.

Joint ownership provides relatively strong incentives for mutual monitoring among the partners in small partnerships. The incentives for mutual monitoring fall with the size of the partnership since free-rider problems increase with the number of partners. Mutual monitoring among the partners did not prevent the problems at Andersen.

The breakdown in mutual monitoring at Andersen led to thousands of job losses and the losses of the partners' equity values. It is likely that other auditing and professional service firms will take actions to increase the effectiveness of their mutual monitoring to avoid becoming the next Arthur Andersen. Reputation is critical in professional service organizations. Once it is lost, it is difficult, if not impossible, to regain.

Source: Various public news reports and broadcasts, 2002.

Large professional service organizations (including major accounting, law, and consulting firms) often are organized as partnerships (usually as LLPs). Restrictions on the number of shareholders imply that the S corporation is not a viable alternative for large partnerships. They could organize as C corporations and gain access to public equity markets. However, organizing as a C corporation exposes the partners to double taxation and increased regulation and external reporting requirements. Since most professional service firms do not make large investments in physical assets (human capital is most important), the costs of organizing as a C corporation often are larger than the benefits. In recent years, the demands for equity capital have increased among some of the major consulting firms (for instance, to invest in information technology and to provide executives with stock-based compensation). Some of the large consulting firms, such as Accenture and KPMG Consulting, have converted to publicly traded corporations.

Closely Held Corporations

Some closely held corporations are organized as S corporations, while others are organized as C corporations. The choice is largely driven by tax and regulatory considerations (such as the restrictions on the number of shareholders in S corporations). Whether or not the firm is organized as an S or C corporation is unimportant in our subsequent discussion.

Closely held corporations have capital-raising advantages relative to individual proprietorships and partnerships, since capital can be raised from nonmanagement investors—such as family, business associates, or friends. Although investor liquidity is restricted, there is usually an option to sell shares and to bequeath them to heirs. Incorporation also provides limited liability.

Owner-manager conflicts arise within closely held corporations, for instance, family feuds. However, closely held corporations tend to have fewer owner-manager conflicts than publicly traded corporations, since top management typically has significantly greater ownership interests in closely held corporations. Closely held corporations also face fewer external reporting requirements and regulations than publicly traded corporations.

Academic studies of those corporations that convert from publicly traded to closely held suggest that closely held corporations generally have fewer owner-manager agency conflicts than publicly traded corporations. Studies document that the typical firm in these *going private transactions* experiences positive stock returns around the announcement of the reorganization.[13] Research suggests that the value gain is due in part to the

[13]Often these going private transactions are accomplished through a *leveraged buyout* (LBO). An LBO is defined as a takeover of a company, financed by borrowed funds. Often, the target company's assets are used as security for the loans acquired to finance the purchase. The acquiring company or group then repays the loans from the target company's profits or by selling its assets. Leveraged buyouts occur at both the corporate and divisional levels (sometimes only part of the firm is sold off). Through these buyouts, the companies (or divisions) are converted from publicly traded to closely held corporations. A summary of the academic literature on this topic can be found in J. Fred Weston, Juan A. Siu, and Brian A. Johnson (2001), *Takeovers, Restructuring and Corporate Governance,* 3rd ed. (Prentice Hall: Upper Saddle River, NJ), 463–490.

Family Feuds at Maritz Inc.

Maritz Inc. is a $1.35 billion a year business that specializes in selling merchandise and travel packages to employers as bonuses for their sales staff. In many ways, Maritz's history follows that of many closely held corporations. The company developed from a very small business to its current size under the leadership of William E. Maritz. Maritz passed the company on to his own children after his death from cancer in 2001.

As of 2002, William Maritz's three sons were engaged in an acrimonious battle over the company. Prior to his death, Maritz had booted two of his sons off the board and gave control to the middle brother Stephen. Subsequently, the two estranged sons owned 40 percent of the stock but took no role in the management of the business. In 2001, they filed legal actions. They wanted either a voice in the management of the company or their stake bought out at a "fair price."

Interestingly there is a long history of feuds in the Maritz family. William Maritz's own father had fought with his brother over the company that their grandfather had founded in 1894. They ended in splitting up the business and never speaking again. William Maritz and his brother also stopped speaking after a heated management battle.

Closely held corporations often are owned by family members. The managers in these companies typically own significant stock, which helps to reduce incentive conflicts. The feuds at Maritz Inc., however, illustrate that shareholder-manager conflicts can and do arise within closely held corporations.

Source: J. Bailey (2002), "A CEO's Legacy: Sons Wage Battle over Family Firm," *The Wall Street Journal* (August 12), A1.

increased concentration of ownership that follows the transaction (tax benefits in these reorganizations can also be important). Prior to going private, the stock often is held by many shareholders that are inactive in the governance process. Following the reorganization, much of the stock is held by management and/or buyout specialists (such as Kohlberg, Kravis and Roberts), who have strong incentives to make productive changes within the organization. Buyout specialists often hold board seats in the reorganized company and take an active role in corporate governance. Correspondingly, operating improvements are observed frequently following these reorganizations.

While the evidence indicates that some firms have increased their values by going private, it certainly does not imply that all publicly traded firms should become closely held. For example, closely held corporations are relatively uncommon in large industrial activities where it is important to raise significant amounts of external capital to fund investment. For these firms, the costs of maintaining concentrated, less liquid ownership are likely to outweigh the benefits.

Closely held corporations are common in medium-sized businesses. Often a founder will develop a business and form a corporation prior to transferring it to the next generation. Some of the founder's offspring might take an active part in the management after the transfer of power, while others may not. Nonmanagement stockholders maintain voting and legal rights that help to protect their interests.

Publicly Traded Corporations

Publicly traded corporations are characterized by stock that is sold to and traded among the general public. Most publicly traded companies are organized as C corporations. While publicly traded corporations have significant advantages in raising large amounts of capital, they have potentially greater owner-manager conflicts than more concentrated forms of organization.

Risk-averse individuals must be compensated for bearing risk to entice them to invest in a firm. In Chapter 15, we discussed how firms often can reduce the costs of raising

equity capital by selling stock to diversified investors in public capital markets. These investors demand compensation only for a portion of the total risk associated with the firm's cash flows, since some of the risk is eliminated by holding the investment in a diversified portfolio. Raising capital from diversified investors is particularly important for large firms that require significant funds to finance investment and is the primary reason why most large industrial firms are organized as publicly traded C corporations.

Large publicly traded companies are characterized by a separation of ownership and control. Much of the ownership is held by diversified investors who take little interest in the firm; operational control is held by managers with a limited financial interest in the firm. The separation of ownership and control has both advantages and disadvantages. One advantage is that the firm can hire professional managers rather than base the management choice on whether the person is wealthy enough to buy a large stake in the company. The primary disadvantage is higher owner-manager agency problems.

Governance Mechanisms in Publicly Traded Firms

Some past scholars argued that publicly traded corporations would not survive in the long run because of the significant agency problems that arise due to this separation of ownership and control.[14] History has proven this argument was wrong—large publicly traded corporations have accounted for most of the free world's industrial output for decades. What critics of corporations fail to recognize (or substantially discount) is that there are both internal as well as external control mechanisms that help to reduce the agency problems between managers and outside investors.

Internal Control Mechanisms

An organization's *governance system* consists of the collection of mechanisms that are used within the organization to control and influence behavior. There are at least four important mechanisms that publicly traded corporations use to limit managerial agency problems: (1) nonmanagement shareholders with significant ownership interests ("blockholders"), (2) shareholder voting, (3) boards of directors, and (4) management compensation. This section provides a brief overview of these mechanisms.[15]

Ownership Structure

Critics of the corporate form correctly argue that small shareholders have limited incentives to participate in the governance process. For these investors, the personal costs of becoming informed about the company, monitoring managers, and so on, are greater than the benefits. In contrast to the standard characterization, however, the majority of the shares of most publicly traded corporations are not directly held by small shareholders.

Institutional investors, such as mutual funds, pension funds, life insurance companies, and trusts, control over 50 percent of the shares of the typical publicly traded corporation. While many institutional investors have not taken an active role in corporate

[14]For example, see Adolf A. Berle and Gardiner Means (1932), *The Modern Corporation and Private Property* (Macmillan Press); and Michael C. Jensen (1989), "Eclipse of the Public Corporation," *Harvard Business Review.*

[15]Other mechanisms that we do not discuss include such things as internal auditors.

Agency Problems at Tyco?

Tyco Inc. was once touted as an example of a "successful, lean conglomerate." Much of the credit was given to L. Dennis Kozlowski, Tyco's CEO. Tyco shares and Kozlowski's glowing reputation fell significantly when the public became aware of the company's questionable accounting practices.

In 2002, shareholders learned that Kozlowski had received millions of dollars of benefits from the company that they knew nothing about. For example, the company contributed millions of dollars to purchase real estate on Kozlowski's behalf; it gave millions of dollars to Kozlowski's favorite charities, such as his college alma mater and his daughter's private school. It also spent millions funding Kozlowski's hobby of racing yachts and family trips to places like the Italian island of Sardinia.

Koslowski's personal spokesman vehemently argues that Koslowski did not misspend any of Tyco's funds. Nonetheless, the lavish perks and benefits that were given to a CEO who was already highly paid are consistent with the argument that the separation of ownership and control can lead to significant agency problems.

An important point to note is that Kozlowski is no longer Tyco's CEO. Investors and regulators are monitoring the company to help ensure that the accounting and other problems at the company are addressed. Agency problems exist in the modern corporation. However, there are both internal and external control devices that help to limit these problems.

Source: M. Maremont and L. P. Cohen (2002), "Executive Privilege: How Tyco's CEO Enriched Himself," *The Wall Street Journal* (August 7), A1.

governance, some have, most notably public pension funds (for instance, TIAA-CREF, Hermes, and CalPERS). Critics correctly argue that institutional investors that fear loss of other business with the company (such as insurance companies) have incentives not to challenge management actions.[16] Nonetheless, institutional ownership represents a constraint on managers that would not be present if all shares were directly owned by small shareholders. Furthermore, many institutional investors appear to be taking a greater interest in corporate governance since the Enron scandal.

While the typical large firm has thousands of shareholders, many have "blockholders" that own a nontrivial fraction of the shares. Studies document that the top five shareholders in the typical publicly traded U.S. corporation own about 25 percent of the shares, while the top 20 shareholders own over 35 percent.[17] Blockholders internalize more of the benefits than small shareholders from expending effort to increase share price and are generally more active in the governance process.

Shareholder Voting

Laws, regulations, stock exchange rules, and corporate charters grant shareholders rights to vote on various issues, such as electing the firm's board of directors, ratification of auditors, mergers, executive compensation plans, and major asset sales or reorganizations. In the United States, shareholders do not have to attend meetings to vote their shares; rather they can vote by mail (or in some firms by the Internet). Prior to shareholder meetings,

[16]See James A. Brickley, Ronald C. Lease, and Clifford W. Smith (1988), "Ownership Structure and Voting on Antitakeover Amendments, *Journal of Financial Economics* 20, 267–291, for evidence that other business interests affect the voting behavior of institutional investors.

[17]See Harold Demsetz and Kenneth Lehn (1985), "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy* 93, 1155–1177. For more recent information on ownership across countries, see Rafael La Porta, Florencio Lopez-De-Silanes, and Andrei Shleifer (1999), "Corporate Ownership around the World," *Journal of Finance* 54, 471–515.

Hermes' Focus on Corporate Governance in Japan

Hermes Pension Management Limited is a large British institutional investor. In 2000 it announced it had appointed a resident Japanese corporate governance advisor to assist with the development of its international governance programs.

The new position was staffed by Mr. Ariyosh Okumura, formerly chief executive of IBJ Asset Management. His first task was to authorize Japanese translation of Hermes' International Governance Practices and to explain these principles to the 450 Japanese public companies in which Hermes has shareholdings. Hermes also planned to hold private meetings with as many companies as possible to discuss their governance practices.

Hermes has been among the most active of European institutional investors in the corporate governance process. It has formed joint agreements with major U.S. pension funds to collaborate on governance issues both in the United States and internationally.

This example illustrates the active role that some institutional investors (especially public pension funds) play in the corporate governance process.

Source: Hermes (2000), company press release (March 28).

managers furnish shareholders with proxy statements that contain information specified by the Securities and Exchange Commission. Managers make recommendations on voting issues and ask for the shareholders' proxies to vote their shares. In most elections, management obtains enough votes to pass their proposals and elect their recommended slate of candidates for the board. On rare occasions, a dissident shareholder who is unhappy with the current management's performance will wage a "proxy contest" and solicit votes to elect board members who are not supported by management. Academic research suggests that this proxy process imposes constraints on management that help to increase share value.[18] For example, share prices increase significantly around proxy contests; subsequent to proxy fights firms often make operational changes or are taken over even if the dissidents fail to elect their proposed board members. Sometimes management will make operational changes to avoid a proxy fight.

Board of Directors

In the United States, boards of directors have a fiduciary responsibility to represent shareholder interests. There is substantial cross-sectional variation in board size and composition. The typical corporate board has about 12 members; over half of these members are "outside directors" (not active or retired employees of the firm or their immediate families). Critics argue that corporate boards are "captured" by managers and thus are an ineffective control device. This argument is based in part on the observation that top management often plays a key role in nominating and selecting new directors. There are many examples, however, of boards of poorly performing companies that have fired top executives. Prominent cases include James Robinson at American Express, Kay Whitmore at Kodak, and Paul Lego at Westinghouse. Research documents that the likelihood of removing a manager with poor stock-price performance increases with the percentage of outside directors on the board.[19]

[18]For a summary of the academic literature on this topic, see J. Fred Weston, Juan A. Siu, and Brian A. Johnson (2001), *Takeovers, Restructuring and Corporate Governance,* 3rd ed. (Prentice Hall, Upper Saddle River, NJ), Chapter 20.

[19]See Michael Weisbach and S. Weisbach (1988), "Outside Directors and CEO Turnover," *Journal of Financial Economics* 20, 431–460.

Management Compensation

As we suggested in Chapter 15, management compensation is an important mechanism to align executive and shareholder interests. In 2000, while the average CEO of an *S&P 500* company received over $6 million in pay, only about 20 percent of the total pay was straight salary. The remainder consisted of performance-based bonuses, stock options, and other types of performance-based pay. Top management and the board of directors also owned a reasonable fraction of the typical company's shares. Research has documented that the mean and median percentages of managerial equity ownership among exchange-listed firms in the United States increased from 12.9 percent and 6.5 percent, respectively, in 1935 to 21.1 percent and 14.4 percent in 1995.[20] The largest firms (those with market values in the top decile) had mean and median managerial ownership of 5.4 percent and 1.5 percent in 1995.

In contrast to the incentive alignment argument, some critics argue that equity-based compensation (most specifically, stock options) actually increases the agency conflicts between managers and shareholders. These critics assert that the fraudulent accounting at companies such as Enron appears to have been motivated in part by the top managers' desire to maintain temporarily high stock prices while they cashed in their stock options. As we discussed in Chapter 15, however, problems caused by poorly designed incentive plans do not imply that all incentive plans are bad. The incentives for fraudulent accounting would have been lower at Enron and Global Crossing had top managers not been in the position to cash in their options (i.e., if the options had longer vesting periods). The problems at these companies indicate that the design of executive compensation plans could be improved in some firms. They simply do not imply that equity-based compensation is always an inappropriate way to motivate managers.

External Control Mechanisms

Corporate managers also face important constraints imposed by external control mechanisms. In this section, we discuss three important external control mechanisms: the "market for corporate control," the managerial labor market, and product market competition. In addition to these mechanisms, managers also face constraints imposed by external auditors, financial analysts, regulators (such as the Securities and Exchange Commission), and the stock exchanges.

Market for Corporate Control

One of the most important external control mechanisms is the market for corporate control. If a management team fails to maximize the value of the firm, it can prompt a hostile takeover offer from a competing management team who thinks they can do a better job. The United States, with a relatively pro-takeover regulatory environment, has had a particularly active takeover market. For example, between 1993 and 1999 the value of corporate mergers represented 8.4 percent of the gross domestic product (GDP).[21] The market for corporate control, while important in many countries, is less active where there are greater legal restrictions on takeovers.

[20]See Clifford G. Holderness, Randall S. Kroszner, and Dennis P. Sheehan (1999), "Were the Good Old Days That Good? Changes in Managerial Stock Ownership since the Great Depression," *Journal of Finance* 54, 435–469.

[21]See J. Fred Weston, Juan A. Siu, and Brian A. Johnson (2001), *Takeovers, Restructuring and Corporate Governance,* 3rd ed. (Prentice Hall, Upper Saddle River, NJ).

Postretirement Incentives of CEOs

Career concerns potentially mitigate agency problems between managers and shareholders. Such concerns arise from both the external labor market, which provides managers with outside opportunities, and the internal labor market, which determines how quickly and on what terms a manager is promoted through the hierarchy in his or her own organization. Managers realize that if they perform poorly, these labor markets will downgrade the assessments of their abilities and demand for the managers will decline.

It regularly has been argued that career concerns became negligible during the last years of active employment. Evidence suggests, however, that CEOs face career concerns even in this late period of employment. Retired CEOs frequently hold multiple board seats that give them both pecuniary and nonpecuniary benefits. Research documents that both the likelihood of CEOs serving on their own boards two years after departure, as well as the likelihood of serving as outside directors on other boards, are positively and strongly related to the financial performance of their firms in their final years of active employment. Assuming the typical CEO values these positions, the effect of performance on postretirement opportunities provides incentives to CEOs in their final years of active employment.

Source: J. A. Brickley, J. S. Linck, and J. L. Coles (1999), "What Happens to CEOs After They Retire? New Evidence on Career Concerns, Horizon Problems, and CEO Incentives," *Journal of Financial Economics* 52, 344–377.

Managerial Labor Market

Another important external control mechanism is the managerial labor market.[22] Reputation is important in determining the professional opportunities that an individual receives. Managers who perform poorly at one company are less likely to be offered management positions or board seats at other companies.

Product Market

Inefficient firms have higher costs than more efficient firms and eventually fail in a competitive marketplace. Thus the product market is another external mechanism that limits managerial agency problems.[23] Global Crossing, WorldCom, and other companies involved in recent scandals ultimately filed bankruptcy petitions when their revenues were unable to cover their costs. Managers have both financial and reputational incentives to work to avoid bankruptcy.

International Corporate Governance

The United States traditionally has had shareholder protection laws that are among the strongest around the globe. Companies in the United States have also been the most active in adopting pro-shareholder governance systems (for instance, outside directors on corporate boards). Germany and Japan are frequently cited as having competing models for corporate governance. Both of these countries historically have had weaker shareholder protection laws, and the board composition and other governance practices focus on a broader set of *stakeholders* (for example, employees, banks, or the community).

[22]See Eugene F. Fama (1980), "Agency Problems and the Theory of the Firm," *Journal of Political Economy* 88, 288–307.

[23]See Armen A. Alchian (1950), "Uncertainty, Evolution and Economic Theory," *Journal of Political Economy* 58, 211–221; and Oliver D. Hart (1983), "The Market Mechanism as an Incentive Scheme," *Bell Journal of Economics* 14, 366–382.

The relatively strong performance of United States companies during the 1990s motivated many foreign countries and companies to adopt "investor reforms" based on the United States model. For example, Japanese regulations were changed to allow executive stock options, and Japanese companies have considered adding outside directors to company boards—a practice largely unheard of in Japan. Other examples include Brazil, India, Kirgiz Republic, Malaysia, South Africa, Thailand, and various western European countries. Many of these pro-shareholder governance changes were motivated by hopes of enticing investment from foreign institutional investors that are reluctant to invest in countries and/or companies with weak shareholder protections. A recent survey of institutional investors by McKinsey and Company indicates that institutional investors consider governance issues as important as financial analysis in deciding on whether or not to invest in a given company.

Regulatory Responses to Recent Corporate Scandals

The recent corporate scandals at companies such as Enron and Global Crossing raised worldwide concerns about the governance practices in the United States. These concerns placed significant pressure on public officials, regulators, and stock exchanges to do something to "fix the problems with corporate governance." Congress responded to this pressure by passing the *Sarbanes-Oxley Act of 2002,* while the New York Stock Exchange developed a new set of regulations relating to corporate governance of exchange listed firms. The National Association of Securities Dealers (NASDAQ) developed a similar but somewhat stringent set of regulations for NASDAQ firms. In this section, we discuss the organizational implications of these regulatory developments.

Sarbanes-Oxley Act of 2002

The Sarbanes-Oxley Act of 2002 established a new five-person board to oversee financial accounting in publicly traded corporations. The board is appointed by the Securities and Exchange Commission ("after consultation with the Chairman of the Federal Reserve Board and the Secretary of the Treasury"). The Act contains various rules and regulations that affect public accounting firms, the boards and management of public companies, and other parties such as research analysts. The Act prohibits various transactions between companies and their management (such as personal loans to executives). It requires:

> *The CEO and CFO must certify the appropriateness of the financial statements and disclosures contained in the periodic report, and that those financial statements and disclosures fairly present material respects, the operations and financial condition of the issuer.*

It establishes civil and criminal penalties for violations of the Act.

We have discussed how the relative costs and benefits of alternative organizational forms can change due to changes in the business environment and/or strategy of the firm. Sarbanes-Oxley represents a significant change in the business environment. The new demands on corporate boards and the limitations on management contracts and corporate actions appear to increase the costs of organizing as a public corporation substantially. While many large firms have no feasible alternative to organizing as publicly traded C corporations, some smaller firms are likely to find that it is value maximizing to "go private" and convert to closely held companies. While the overall merits of the Act can be debated, one potentially unanticipated consequence is its potential effect on organizational choice.

NYSE Rules on Corporate Governance

Soon after the Enron scandal became public, the New York Stock Exchange proposed new rules to regulate the composition and processes of corporate boards. Among other things, these rules require exchange-listed firms to have (1) a majority of outside directors; (2) nominating, auditing, and compensation committees composed entirely of outside directors; and (3) regularly scheduled executive sessions for outside directors.

The experience at Enron, however, suggests that these rules by themselves will not ensure good governance. Following the Enron scandal, a congressional subcommittee concluded that the Enron board had been grossly negligent in performing their duties. Nevertheless, the composition and processes of Enron's board met almost all of the NYSE standards. It was comprised primarily of outside directors with tremendous expertise and reputation. It had independent nominating, compensation, and audit committees. Former Stanford University accounting professor Robert K. Jaedicke had chaired the company's audit committee for more than 10 years. Nevertheless the board failed to respond to clear red flags or warnings raised about the company (e.g., by its auditors). They also approved what appear to have been overly generous compensation plans and perquisites for top managers. The congressional subcommittee concluded, "By failing to provide sufficient oversight and restraint to top management excess, the Enron board contributed to the company's collapse and bears a share of the responsibility for it."

Following the scandal, Enron's board had to appear before Congress; they were highly criticized by the press; in some cases they were forced to resign from other boards. To quote *Business Week:*[24]

> *Consider the fate of the board of directors that presided over the fall of Enron Corp. Few in the history of American business have ever felt such outrage and infamy. Pilloried by the press, dragged before Congress, and hounded by Enron shareholders, the members of Enron's board may have tumbled as far and as fast as the laws of physics allow.*

One factor that is likely to be as or more important than regulations for motivating firms to enhance their corporate governance is the personal incentives that boards and managers face not to be the next Enron or Global Crossing.

Summary

An initial step in creating an organizational architecture is to choose the *legal form of organization.* This choice is an important managerial decision, and one that can change through time.

The defining characteristic of a *nonprofit organization* is that the persons who control these organizations—including members, directors, and officers—are forbidden from receiving the organizations' residual profits. *For-profit organizations* differ from nonprofit organizations in that they have "owners" who have title to the residual profits. Typically owners of the residual claims also have the primary decision control rights for the organizations in proportion to their ownership interests. However, this is not always the case (for instance, in firms with dual-class shares).

[24]Louis Lavelle (2002), "Enron Directors: Unfit to Serve Anywhere?" *Business Week Online* (February 12).

Businesses are regulated primarily by state laws. Six basic forms of for-profit organizations allowed by law are *individual proprietorships, general partnerships, limited liability partnerships, limited partnerships, S corporations,* and *C corporations.* These organizational forms vary in at least four important dimensions including the ownership of the residual profits, assignment of decision control rights, taxes, and legal liability of the owners.

An important first step in designing an organizational architecture is to choose the basic legal form of organization. Each form has relative benefits and costs that can vary in importance depending on the organization's specific business environment and strategy. The managerial objective is to choose the organizational form that has the largest net benefit. The optimal choice can change through time with changes in the organization's business environment and/or strategy.

The relative benefits of nonprofit organization include favorable tax treatment and an advantage in raising donations (since there is no owner-donor conflict). Nonprofit organizations have a disadvantage relative to for-profit organizations because they cannot issue claims against the residual profits. This restriction can constrain nonprofit organizations in raising capital for investment and in paying managers equity-based compensation. Only firms with social purposes are allowed to organize as nonprofit organizations. When allowed, the optimal choice depends on the relative importance of the benefits and costs of nonprofit organization, which will vary depending on the organization's business environment and strategy.

Individual proprietorships internalize the owner–top manager conflict, but have significant disadvantages in raising capital. The capital-raising disadvantages imply that individual proprietorships will not be widely observed in activities that require large investment (for instance, due to economies of scale in the production process). Rather they are most common in activities where the optimal firm size is small. The income in these organizations is passed through to the owner's tax returns. The owner faces unlimited liability with respect to claims against the business.

Small businesses that require the teamwork of a few key people at the top of the organization often organize as general partnerships. Joint ownership provides relatively strong incentives for productive actions. Forming a partnership is relatively simple and does not involve the filing fees or added regulations associated with incorporation. Partnership income is passed through to the partners' individual tax returns. Partners are exposed both individually and jointly to unlimited liability for claims against the business.

Small business owners can obtain limited liability by incorporating. S corporations receive the same tax treatment as individual proprietorships and general partnerships (a related organizational alternative is the limited liability company). However, owners have limited liability. Small businesses in activities that expose the company to significant legal liability often choose to incorporate. For many small businesses, the benefits of obtaining limited liability are small. Lenders typically demand personal guarantees from business owners whether or not the organization is incorporated. Thus many businesses remain unincorporated to avoid extra fees and regulations.

Restrictions on the number and types of shareholders are designed to preclude large companies from organizing as S corporations. Therefore, most large companies are organized as C corporations. Shareholders of C corporations are exposed to "double taxation" (income is taxed at the corporate level and again when it is distributed to shareholders). The primary advantage of organizing as a C corporation comes from the increased ability to raise significant amounts of capital from outside shareholders. Risk-bearing costs are reduced when the stock is sold to shareholders with diversified portfolios. Shareholders in C corporations have limited liability.

Large professional service organizations (such as law and accounting firms) often organize as partnerships, rather than corporations. These organizations do not have to raise significant amounts of capital for investment. By organizing as a partnership they avoid the costs of having to control agency conflicts between outside owners and the management. They also avoid the double taxation associated with C corporations. Partners in large professional firms can gain some protection from liability by organizing as limited liability partnerships.

Some corporations are closely held, while others are publicly traded. Closely held firms have lower owner-manager conflicts. However, shareholders have less liquidity and are typically less diversified. While there are some very large closely held firms, most large firms are publicly traded.

Some past observers have argued that publicly traded corporations would not survive in the long run because of the significant agency problems that arise due to the separation of ownership and control. What critics of corporations failed to recognize (or substantially discounted) is that there are both internal as well as external control mechanisms that help to reduce the agency problems between managers and outside investors. There are at least four important mechanisms that publicly traded corporations use to limit managerial agency problems: nonmanagement shareholders with significant ownership interests ("blockholders"), shareholder voting, boards of directors, and management compensation. Prominent external control mechanisms include the takeover, managerial labor, and product markets. Internationally, there has been a trend in many countries toward more American-like governance systems.

The recent corporate scandals at companies such as Enron and Global Crossing raised worldwide concerns about the governance practices in the United States. These concerns placed significant pressure on public officials, regulators, and stock exchanges to do something to "fix the problems with corporate governance." Congress responded to this pressure by passing the *Sarbanes-Oxley Act of 2002.* This Act appears to increase the costs of being publicly traded and could motivate some firms (especially smaller ones) to convert to closely held corporations. The major stock exchanges developed new regulations on board composition and processes. These regulations by themselves will not ensure good corporate governance. Indeed the composition and processes of Enron's board met many of these new requirements. A factor that is likely to be as or more important than regulations for motivating firms to enhance their corporate governance is the personal incentive that boards and managers face not to be the next Enron or Global Crossing.

Appendix

Tax Implications: S versus C Corporations

The earnings of individual proprietorships, partnerships, and S corporations are taxed at the personal level. For example, the earnings of S corporations are "passed through" to shareholders, who report the income on individual tax returns. The corporation does not pay taxes at the corporate level. C corporations pay taxes on earnings at the corporate level. Shareholders also pay taxes when the earnings are passed on to them through dividends and other types of distributions.

Many small businesses organize as S corporations, rather than C corporations, to avoid "double taxation." Corporations with more than 75 shareholders do not have this option. Table 18.4 provides an illustration of the relative taxation of C versus S corporations *when all earnings are distributed.* In this example, both corporations earn before-tax profits of $100,000. The C corporation pays a tax of $35,000 and distributes the net profit of $65,000 to its shareholders. The shareholders pay $25,740 in personal tax,

	C Corporation	S Corporation
Profit before tax	100,000	100,000
Corporate tax (35%)	35,000	—
Net profit	65,000	100,000
Dividends	65,000	100,000
Personal tax (39.6%)	25,740	39,600
Net after tax	$39,260	$60,400

*This table illustrates the tax implications when a company distributes all its earnings through a dividend. Shareholders in S corporations pay personal taxes on corporate earnings, even if they are not distributed. Shareholders in C corporations only pay personal taxes upon distribution. Growth companies often retain their earnings for new investment. If no earnings are distributed, the taxes paid in the given year are actually higher for the S corporation since the personal rate is higher than the corporate rate. Thus a growth firm is sometimes better off from a tax standpoint to organize as a C corporation.

Table 18.4 Tax Implications of Organizing and an S versus C Corporation When All Earnings Are Distributed*

netting $39,260. In contrast, no corporate taxes are paid by the S corporation. The shareholders pay $39,600 on the $100,000 distribution, netting $60,400—52.5 percent higher than for the C corporation.

It is important to note that shareholders in subchapter S corporations must pay taxes on earnings at the personal level even if the earnings are not distributed by the firm. Shareholders of C corporations only pay personal taxes upon distribution. Growth firms that use earnings for investment, rather than dividends, often elect to organize as C corporations, rather than as S corporations. If no earnings are distributed, the taxes paid in the given year are actually higher for the S corporation since the personal rate is higher than the corporate rate.

Suggested Readings

Eugene F. Fama and Michael C. Jensen (1983), "Agency Problems and Residual Claims," *Journal of Law and Economics* 26, 327–349.

Henry Hansmann (1996), *The Ownership of Enterprise* (The Belknakp Press of Harvard University Press: Cambridge, MA).

Burton A. Weisbrod, Ed. (1998), *To Profit or Not to Profit: The Commercial Transformation of the Nonprofit Sector* (Cambridge University Press: Cambridge, UK).

Review Questions

18–1. The City Museum is a large nonprofit metropolitan art museum. Over the past five years, City Museum has made a significant profit because its admission fees exceed the museum's operating costs. Does the museum's profitability imply that it should lose its nonprofit status? Explain.

18–2. For-profit forms of organization vary in at least four important dimensions. Name them.

18–3. Some past observers argue that the separation of ownership and control in large corporations will lead to the downfall of corporations as an organizational form. Do you agree? Explain.

18–4. Leone, Van Horn, and Wasley is a law firm with over 60 partners. Its partners share equally in the annual profits of the organization. Ryall, Misra, and Marx is a law firm of about the same size. The Leone firm has encountered significantly more free-riding among partners than has the Ryall firm. For example, partners in the Ryall firm often work Saturdays and have been successful in generating new business, while shirking is a major problem at the Leone firm. Why do you think these differences might exist between the two firms?

18–5. From an efficient risk-bearing standpoint it makes sense for investors to hold diversified claims in all firms. Yet we observe partnerships and closely held corporations, which have concentrated ownership positions. Explain why.

18–6. Typically the residual-claim holders in an organization also have significant decision control rights. Provide an economic rationale for this observation.

18–7. A number of hospitals have converted from nonprofit to for-profit organizations. Provide an economic justification for these conversions. Why have some communities acted to block or regulate these conversions?

18–8. Which of the following businesses is more likely to incorporate: a small retail clothing store or a small exercise facility/health club? Explain.

18–9. Firms sometimes change their legal form of organization. Why?

18–10. Some firms have increased their values by "going private" (converting from publicly traded to closely held). What are the potential sources of these gains? Should all publicly traded firms convert to closely held? Explain.

18–11. Why is a large accounting firm more likely to organize as a partnership than a large industrial company?

18–12. Will new regulations that require firms to have independent boards solve the governance problems in corporate America? Explain.

18–13. What potential effects will the Sarbanes-Oxley Act of 2002 have on the choice of legal form of organization?

18–14. Evaluate the following claim: "Executive stock options caused many of the problems in corporate America. Firms should find other ways to motivate top executives."

Vertical Integration and Outsourcing

CHAPTER 19

CHAPTER OUTLINE

In 1989, Eastman Kodak sold its mainframe computers to IBM and contracted with IBM to do much of Kodak's data processing for the next 10 years.[1] Under the contract with Kodak, IBM was responsible for operating Kodak's data center. IBM provided the operating software and hardware and was responsible for backups and file protection. Kodak retained its own staff for developing applications software and was responsible for most data entry. For example, Kodak provided IBM with the basic data for running its sales-forecasting models and had developed much of the specific software for this application. IBM was responsible for running Kodak's programs on its operating system.

This *outsourcing* of computer services was newsworthy specifically because no company of Kodak's size or prominence had turned over its computers to outsiders before. Other large companies began considering similar moves. In 1990, U.S. businesses spent $7.2 billion on outsourced computer operations. According to Standard & Poor's, worldwide outsourcing of all types will exceed $170 billion by 2003.

In 1998, IBM developed and managed a procurement system for United Technologies (UT)—makers of Pratt & Whitney aircraft engines, Carrier air conditioners, and Otis elevators. UT expected to save $750 million of purchasing costs within 2 years. IBM assumed responsibility of some of UT's purchasing operations and created a procurement system (online purchasing and payments) involving negotiating and handling contracts with suppliers. IBM procured goods and services from office supplies to temporary help. However, IBM would not be responsible for procuring parts for manufacturing.

Outsourcing has not been limited to information and procurement systems. Among the services most often outsourced are trucking, catering, copying, and accounting. For example, in 1992, Du Pont sold its copy machines to Lanier and contracted with the company to provide copying services. Kodak used to operate its own kitchens to provide meals for the 40,000 employees at its headquarters in Rochester, New York. In 1992, Kodak sold this operation to the Marriott Corporation. Reebok, one of the leading athletic shoe companies in the world, owned no plants. Rather, it contracted out all footwear production to suppliers in various Asian countries. Moreover, Chrysler bought about 70 percent of its parts from external suppliers in 1999.

Outsourcing involves a fundamental change in organizational architecture. First, it reassigns decision rights relating to certain assets and employees from one firm to another. For instance, to staff its new data center, IBM hired about 300 people who formerly had worked for Kodak. IBM now owns the mainframes that serve Kodak and has the decision rights on the utilization, maintenance, and replacement of these machines. Second, performance-evaluation and reward systems also generally change with outsourcing. Kodak previously evaluated its data processing units as cost centers. By contrast, the senior managers at the new IBM-run data center are evaluated on business growth, operational efficiency, and satisfaction of Kodak users. Overall, the IBM unit more closely resembles a profit center than a cost center. Since Kodak pays scheduled fees for computer services, IBM benefits directly if it can improve efficiency and cut costs.

[1]Details of these examples are from W. Richmond, A. Seidmann, and A. Whinston (1992), "Incomplete Contracting Issues in Information Systems Development Outsourcing," *Decision Support Systems* 8, 459–477; D. Kirkpatrick (1991), "Why Not Farm Out Your Computing?" *Fortune* (September 23), 103–112; S. Tully (1993), "The Modular Corporation," *Fortune* (February 8), 106–114; R. Narisetti (1998), "IBM Picked to Develop, Run a System for United Technologies Procurement," *The Wall Street Journal* (June 29), B5; *Standard & Poor's Industry Surveys* (1999), "Computers: Commercial Services" (December 16), 1–5.

This discussion of outsourcing raises a number of important questions:

- What are the costs and benefits in choosing between the alternative architectures that are implied by within-firm production versus outsourcing?
- What activities make the most sense to outsource? Why are data processing, catering, copying, and trucking among the most frequently outsourced services? Why did Kodak outsource the operation of its data center to IBM but maintain the responsibility for developing applications software?
- When a company outsources, what are the determinants of the specific contract provisions? Why did Kodak and IBM negotiate a 10-year contract instead of a 1-year contract? Why do some firms grant distributors exclusive rights to particular territories?
- What has motivated the recent trend in increased outsourcing?

We begin by discussing the process of producing and marketing products. We then discuss trade-offs among alternative ways of organizing the steps in this process (market transactions, long-term contracts, and vertical integration), the appropriate length of a contract, contracting with independent distributors, and reasons for the recent increases in outsourcing. In the appendix to this chapter, we provide a more detailed example that highlights some of the trade-offs between company ownership and outsourcing.

Vertical Chain of Production

Consumer goods are produced through a series of steps described by the *vertical chain of production.*[2] Figure 19.1 depicts this vertical chain for personal computers. At the top of the chain are the raw materials such as chemicals, metals, and rubber that are used as inputs to produce PCs. These inputs are transported to processors that make the intermediate products used in the final construction of PCs (for instance, plastics manufacturers, chip makers, and operating software producers). The intermediate goods are transported to companies that assemble them into PCs. Finally, the PCs are transported to retail stores, which sell them to consumers and provide after-sales servicing. Each step of this vertical chain is supported by administrative services such as accounting, finance, and marketing. Firms can locate at different positions along the vertical chain. Intel is an intermediate-goods processor that manufactures computer chips; Dell Computers, which sells IBM-compatible PCs, concentrates on final assembly and distribution. Firms also can specialize in providing support services (for instance, shipping and accounting firms).

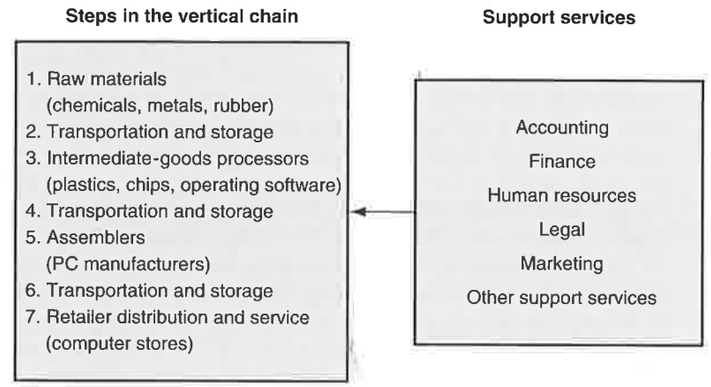
When a firm participates in more than one successive stage in the vertical chain, it is said to be *vertically integrated.* Firms vary dramatically in their degree of vertical integration. Dell Computers leases much of its manufacturing space and makes virtually none of its component parts. It does not make or even stock the many software products that it sells. IBM is much more vertically integrated, producing many of its component parts and much of its software in-house. IBM also maintains its own sales force for mainframe computers.

Firms change their degree of integration over time. An organization that begins to produce its own inputs is engaging in *backward,* or *upstream,* integration, whereas an

[2]D. Besanko, D. Dranove, and M. Shanley (1995), *The Economics of Strategy* (John Wiley & Sons: New York), 71.

Figure 19.1 The Vertical Chain of Production for Personal Computers

At the top of the chain are the raw materials, such as chemicals, metals, and rubber, that are used as inputs to produce PCs. These inputs are transported to intermediate-goods processors. These processors (for instance, plastics manufacturers, chip makers, and operating software producers) make the intermediate products used in the final construction of the PCs. These intermediate goods must be transported to the companies that assemble them into the final consumer products. Finally, these products are transported to retail stores, which sell them to consumers. Each step of the vertical chain is supported by administrative services such as accounting, finance, and marketing.

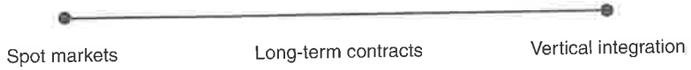


Long-Term Contracts

In this chapter, we do not differentiate among the various types of long-term contracts. Rather, we focus on how firms choose among spot markets, contracts, and vertical integration. Long-term contracts, however, can take a variety of forms. First, there are *standard supply and distribution contracts* between independent firms. For instance, IBM and Kodak have a 10-year supply contract, where IBM agrees to provide specific computer services to Kodak for a given price. The contract contains many provisions specifying the nature of the service and the duties and obligations of each of the contracting parties. Second, there are *joint ventures.* In the typical joint venture, a new firm is formed that is jointly owned by two or more independent firms. The new firm might be responsible for conducting research, supplying inputs for a subset of the firms, or downstream activities such as marketing or distributing a product. Drug companies form research joint ventures to conduct basic research on new drugs. The output of this research is shared by the partners in the venture. Similarly, an American company and a European company might form a joint venture to market the American company's products in Europe. Third are *lease contracts,* where a firm acquires an asset such as a machine or building through a lease agreement with another firm. Fourth are *franchise agreements,* which grant an independent businessperson the rights to use the parent's proven name, reputation, and business format in a given market area. Fifth are *strategic alliances.* This term is used to describe a variety of agreements between independent firms to cooperate in the development and/or marketing of products. For instance, an airline company and a car rental company might agree to promote each other's products and to participate in joint promotional activities.

Figure 19.2 Outsourcing: Choosing along a Continuum

It often is useful to think of the outsourcing decision as a choice along a continuum of possibilities. At one extreme, a product or service can be purchased from any one of a large number of potential suppliers in the spot market. At the other extreme, the company can produce the product or service internally within a division of the vertically integrated firm. Between these extremes are various long-term contracts. Contracts take a variety of forms, including standard supply and distribution contracts, joint ventures, lease contracts, franchise agreements, and strategic alliances.



organization that begins to market its own goods or to conduct additional finishing work is engaging in *forward,* or *downstream,* integration. Lincoln Electric integrated backward when it began manufacturing certain inputs for its welding machines that previously were supplied by outside companies. PepsiCo, on the other hand, integrated forward when it acquired Kentucky Fried Chicken, Pizza Hut, and Taco Bell, which sell PepsiCo's soft drinks. (Note that in 1997, PepsiCo spun off these fast-food restaurants.)

The term *outsourcing* frequently is used to describe a movement away from vertical integration—moving an activity outside the firm that formerly was done within the firm. An example of this usage is "Kodak outsourced its computer operations to IBM." The term *outsourcing* also is used to describe an ongoing arrangement whereby a firm obtains a part or service from an external firm. An example of this usage is "Reebok always has outsourced most of its footwear production to foreign companies."

Often it is useful to think of the outsourcing decision as a choice along a continuum of possibilities. As depicted in Figure 19.2, at one extreme, the part or service is purchased from any one of a large number of potential suppliers in the *spot market* (where the exchange is made immediately at the current market price with no long-term commitment between the buyer and the seller). At the other extreme, a company vertically integrates and produces the part or service internally.[3] In the middle are

Vertical Outsourcing by Taiwan Semiconductor

Taiwan Semiconductor Manufacturing Co. had 1998 sales of $1.5 billion. Most of TSMC's revenues were from chip manufacturing. For years companies like Motorola produced most of their chips to control quality and design. By 2002 Motorola had outsourced a substantial fraction of the chips it used. TSMC and Motorola also announced an expanded outsourcing program wherein TSMC would double its chip capacity by 2006. TSMC is going beyond manufacturing chips to offer semiconductor design services. TSMC will design ordinary chips and help customers design complex semiconductors. TSMC has a library of chip designs that can be "glued together" quickly to build combo chips. New semiconductors can be designed and manufactured faster and cheaper this way. Notice that TSMC plans to vertically integrate design and manufacturing within TSMC to get customers to outsource both of these functions.

Source: J. Moore (1999), "TSMC's Chip Business Booms as More Companies Outsource," *Business Week* (June 21), 128 and Motorola.com (June 26, 2002).

[3]See Chapter 17 for a discussion of how firms organize internal production into divisions. That chapter also examines the corresponding transfer-pricing issues.

Outsourcing Logistics

Deere & Co., the farm-equipment giant, uses Ryder System, the truck rental company, not only to move parts for its plants, but also to label and package tractor repair kits sent to farmers. A Deere manager says, "We don't think the farmer really cares who stores the parts, but he does want John Deere to build his tractor. You need to decide what you're really good at and focus on that." Trucking companies and shipping lines have been expanding into the often-hidden but enormous business of logistics—the planning, packaging, storing, and shipping of inventory. Logistics seeks to cut costs by slashing inventories and speeding up transportation. Today, 75 percent of big American manufacturers rely on these megashippers. One commentator remarks, "It's one-stop shopping for outsourcing." Nike outsources the running of its huge high-tech warehouse in Atlanta to another firm, Menlo. Menlo employees put air into basketballs, soccer balls, and footballs, which come only half-inflated to save space. They also place the balls in colorful packages and even attach price tags for some retailers.

Source: A Mathews (1998), "Logistics Firms Flourish Amid Trend in Outsourcing," *The Wall Street Journal* (June 2), B4.

long-term contracts between independent or quasi-independent firms. Long-term contracts take many forms, including long-term supply and distribution contracts, franchise agreements, leasing contracts, joint ventures, and strategic alliances. Many of the recent outsourcing decisions move the firm from vertical integration to long-term contracting (Kodak and IBM for computer services, Kodak and Marriott for food service, Du Pont and Lanier for copying services). We begin our analysis of outsourcing by considering some of the advantages of acquiring parts and services in spot markets. We use the term *market transactions* to refer to sales and purchases in the spot market; we use the term *nonmarket transactions* to refer either to vertical integration or to long-term contracts.

Benefits of Buying in Competitive Markets

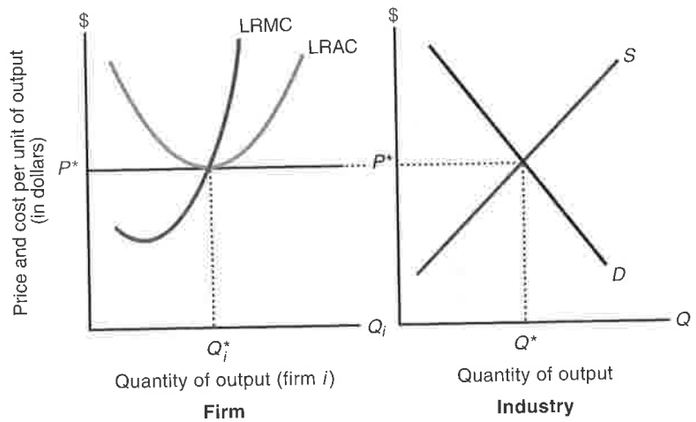
Figure 19.3 presents the standard diagram of a competitive equilibrium (as discussed in Chapter 6). The figure illustrates that competitive markets result in efficient production: Production occurs at the lowest possible average cost per unit. Price equals average cost, implying that buyers acquire the product at cost (which of course includes a normal rate of return on investment).[4] Over time, suppliers adopt technological advances that lower the costs of production and/or enhance the quality of the product. Lower costs are passed to buyers in the form of lower prices. This analysis suggests that when competitive outside markets are available to purchase goods and services, firms should use them. In most cases, a firm cannot acquire the product more cheaply through a nonmarket transaction; in many cases, it would cost more.

One common concern with internal production is generating high-enough volume to take advantage of scale economies in production. In Figure 19.3, the minimum point on the average cost curve is at a volume of Q^* units. Individual firms in the marketplace produce this volume. If a firm requires less than Q^* units and produces only that

[4]Recall that if price is above long-run average cost, firms are making economic profits and new firms enter the industry. The increase in supply drives down the price. Alternatively, if price is below long-run average cost, firms are losing money and exit occurs.

Figure 19.3 Competitive Equilibrium

This figure illustrates that competitive markets result in efficient production. The right panel displays the supply and demand curves for the industry. Their intersection determines the market price. The left panel pictures the output decision of the marginal firm in the industry. Production occurs at the lowest-possible long-run average cost (LRAC). Buyers acquire the product at cost ($P^* = \text{LRAC} = \text{LRMC}$, where LRMC = long-run marginal cost). The analysis suggests that when competitive outside markets for inputs are available, firms should use them. In most cases, the firm cannot produce more cheaply itself, and in many cases it will cost more.



amount internally, it will incur higher average costs. The firm could produce Q^* and sell the surplus in the open market. However, this choice requires the firm to enter a new market—one that is not its primary line of business. As we discussed in Chapter 8, diversifying into unrelated fields can reduce value. Empirical studies suggest that diversified firms frequently perform poorly relative to firms that are more focused.[5]

Another concern with nonmarket procurement is the cost of motivating efficient production. Divisions within large firms can be inefficient, yet continue to survive, so long as they are subsidized by more profitable units within the firm. Firms must adopt costly incentive and control systems to motivate internal managers to engage in efficient production. Similarly, parties to a long-term supply contract must be motivated to carry out their parts of the agreement. Independent firms, on the other hand, face more direct market pressures. If they are inefficient in their main line of business, they lose money and eventually are forced to liquidate.

Due to such concerns, most firms use markets to acquire many, if not most, of their inputs. Few companies produce their own automobiles, trucks, fuel, copy machines, pencils, staples, telephones, office furniture, or bathroom fixtures. Most of these products are acquired through market transactions. Also, firms generally rely

[5]P. Berger and E. Ofek (1995), "Diversification's Effect on Firm Value," *Journal of Financial Economics* 37, 39–65; R. Comment (1995), "Corporate Focus and Stock Returns," *Journal of Financial Economics* 37, 67–87; and K. John and E. Ofek (1995), "Asset Sales and Increase in Focus," *Journal of Financial Economics* 37, 105–126.

Merck and Astra—Joint Venture

United States–based Merck and Sweden's Astra formed a 50-50 American joint venture years ago called Astra Merck. Astra gave Astra Merck all of its U.S. business, and Merck helped Astra market and win regulatory approval in the United States. This joint venture has been a huge windfall for Merck and a sore point for Astra. One of Astra's drugs, Prilosec, is the best-selling prescription drug in both the United States and the world. A treatment for ulcers, Prilosec has U.S. sales of $2.4 billion and worldwide sales of $4.2 billion.

In a restructing of this joint venture, Merck will cede management control and voting rights for royalty payments. Analysts expect the restructuring to generate payments to Merck valued at between $7 and $10 billion while allowing Astra to find a merger partner.

Source: S. Lipin and R. Langreth (1998), "Merck, Astra Reach Restructuring Pact," *The Wall Street Journal* (June 19), B6.

on external markets for many of their downstream activities, such as product distribution. For instance, Procter & Gamble sells many of its products, such as soap and toothpaste, through independent grocery stores and drugstores. The key point is that well-functioning markets provide powerful incentives for efficient production and low prices. It is value-maximizing to acquire many goods and services through market transactions.

Reasons for Nonmarket Transactions

Our analysis appears to argue against nonmarket transactions: Firms should concentrate on a particular stage of the production/distribution process and acquire other inputs and services using market transactions with outside suppliers and distributors. There are, however, at least three principal reasons why firms often use nonmarket transactions to acquire inputs and downstream services: contracting costs, market power, and taxes/regulation.

Contracting Costs

In Chapter 3, we discussed the architecture of markets. We argued that markets effectively link specific knowledge and decision rights; moreover, they provide incentives for decision makers to use this information effectively. We posed the question: *Why aren't all economic transactions conducted through markets?* Ronald Coase provided the basic answer to this question by arguing that market transactions are not costless.[6] For instance, they involve the costs of searching for trading partners and negotiating relevant prices. Parties to a transaction have incentives to use other mechanisms, such as internal production, when the transaction can be accomplished at a lower cost. At least four factors can make the costs of nonmarket transactions lower than the costs of market exchanges. These factors include *firm-specific assets, costs of measuring quality, externalities,* and *coordination problems.*

[6]For a collection of Coase's work on this topic, see R. Coase (1988), *The Firm, the Market, and the Law* (University of Chicago Press: Chicago).

Made in the USA

Companies sometimes label their products "Made in the USA." This statement apparently appeals to the sentiment among some consumers that Americans should purchase only American-made products to protect domestic jobs. The claim also helps companies gain contracts from the U.S. government. The common practice of acquiring many inputs from outside suppliers, however, makes it difficult to define what really is made in the USA. In early September 1994, the FTC charged two athletic shoe companies, New Balance and Hyde Athletic Industries Inc., with deceptive advertising for saying that their products were "Made in the USA." Although the companies sew and glue the bulk of their shoes in the United States, they import many of the component parts, such as soles and uppers, from Asia. Hyde Athletic agreed to change its label to "Made in the USA from domestic and imported components." New Balance disputed the claim. This issue could affect many companies, ranging from Dell Computers to General Motors, who emphasize domestic production but rely on foreign companies for various inputs and services.

Source: M. Oneal (1994), "Does New Balance Have an American Soul?" *Business Week* (December 12), 86–90.

Firm-Specific Assets[7]

Production typically requires investment in assets. As examples, IBM requires mainframe computers to provide computer services to Kodak and suppliers require machines to make parts. Sometimes these assets can be transferred easily among alternative uses. Mainframe computers are general-purpose machines that can be used to serve a variety of other companies in addition to Kodak. Other assets are significantly more valuable in their current use than in their next best alternative. For example, the Alaska Pipeline is materially more valuable for transporting oil than for any other conceivable use. If IBM writes a specialized computer program to run Kodak's payroll, the program is more valuable for Kodak's payroll than for some other firm's payroll (which might offer different fringe benefits, for instance). Although the program could be adapted for use by other firms, changing the program is costly. Assets that are substantially more valuable in their current use than in their next best alternative use are referred to as *firm-specific assets.* Asset specificity is most likely to occur in four particular instances.[8]

- **Site Specificity.** The asset is located in a particular area that makes it useful only to a small number of buyers or suppliers, and it cannot be moved easily. An example is the Alaska Pipeline, which can be used only by oil producers in Alaska.
- **Physical-Asset Specificity.** Product design makes the asset especially useful only to a small number of buyers. An example is a specialized machine tool that is used to make parts for one particular model of automobile.
- **Human-Asset Specificity.** The transaction requires specialized knowledge on the part of the parties to the transaction. An example is the knowledge that IBM employees must acquire about Kodak's unique processes in order to provide computer services to the company.
- **Dedicated Assets.** The expansion in facilities is necessitated only by the requirements of a few buyers. An example is a chip producer who adds extra capacity to serve one particular computer company.

[7]This section draws on B. Klein, R. Crawford, and A. Alchian (1978), "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law & Economics* 24, 297–326.

[8]O. Williamson (1985), *The Economic Institutions of Capitalism* (Free Press: New York).

Kodak-IBM Outsourcing Renewal

The original outsourcing agreement between Kodak and IBM was formalized in a 10-year contract. Begun in 1989, it expired in 1999. Over this 10-year span, IBM expanded this aspect of their business substantially through its IBM Global Services unit due to its profitability. IBM routinely announces the renewal of contracts—yet, months after the original contract expired, no announcement of a Kodak renewal had been posted.

Presumably, Kodak is arguing that as technology has changed, IBM's costs have fallen by more than was expected in the original contract and thus they should receive more favorable terms. But IBM would be reluctant to cut prices, especially if Kodak is unlikely to be able to move to another vendor without incurring substantial costs. Because each company has made sunk investments in the relationship, a divorce would be an unattractive alternative. But these sunk costs are precisely the kind of relationship-specific investments that lead to holdup problems as well as contentious negotiations when such a contract must be renewed.

Sources: www.ibm.com; and A. C. Doyle (1893), "Silver Blaze," *Strand Magazine* (December).

If a supplier invests in a specific asset to serve a particular customer, that supplier places itself in a tenuous position for future negotiations. For example, consider a supplier who invests $50,000 for a machine tool (such as a metal punch-press die) to produce a particular part. The part is used only by one manufacturer, and the die has no other uses or salvage value—it is extremely firm-specific. The variable cost of production is $1 per unit and the useful life of the die is 50,000 units. The supplier must be able to sell the parts for at least $2 per unit to break even. The buyer, however, is in a strong position to argue for a price concession after the investment is made. At this point, the investment is a *sunk cost,* and the supplier will continue to operate as long as it can cover its variable costs of $1 per unit. Thus, the buyer potentially can force the supplier to accept a price as low as $1, even though the supplier loses its initial investment. Anticipating this *holdup problem,* the supplier will not invest in the machine tool in the first place unless it receives some effective guarantee that the buyer will continue to pay $2 per unit and will buy at least 50,000 units.

Buyers face potential holdup problems as well if they purchase key inputs from a single supplier that has invested in the relevant firm-specific assets. For instance, a specialized chip supplier might demand a large price increase when it knows that a computer company has a large backlog of orders and that it has no alternative sources of supply.

These potential holdup problems can be controlled by vertical integration. If the buying firm invests in the machine and produces the part internally, it does not have to worry about subsequently arguing with its supplier over prices. An alternative to integration would be for the buyer and supplier to enter into a long-term supply contract. The buyer might agree to purchase 50,000 units from the supplier over the next 5 years at a cost of $2 per unit. Contracts are not costless to write or to enforce, and so the preferred alternative depends on the relative costs of vertical integration versus contracting. This trade-off is considered in greater detail below.

Measuring Quality

It is difficult to monitor the quality of some inputs and services. The buyer might not learn that a part is defective until long after purchase. In this case, the seller can have the incentive to cheat the buying firm: Once a price is set, the supplier can increase its profits by supplying a lower-quality, lower-cost product. Buyers sometimes can avoid these problems by transacting with companies that have established reputations for quality

and/or can offer credible warranties for their products. Otherwise, buyers either should negotiate a long-term supply contract that provides appropriate incentives for quality production or should produce such products in-house. Internal production and long-term contracts are especially useful when maintaining the quality of the part is critical for the overall success of the product. (Recall from Chapter 17 Kodak's decision to own Eastman Gelatine so that it could better control the quality of the gel used in its photo emulsion.) These nonmarket forms of organization do not necessarily change the distribution of information among the parties. However, they allow the company to develop contractual incentives that motivate quality production. (We discuss this issue further in Chapter 22.)

Reducing Externalities

Firms often invest in developing reputations and customer loyalty. This investment can increase the demand for a company's products. However, firms can have problems motivating independently owned distributors to invest sufficient resources to maintain a brand name—there is a free-rider problem. Independent retailers in a distribution system have incentives to shirk on advertising and depend on the efforts of other units in the system to attract customers. These retailers also might want to cut costs by hiring less skilled, lower-priced labor. A given owner of a retail unit receives all the benefits from reducing the unit's labor costs but bears only part of the costs from providing poor service to customers: Any decline in future sales is likely to be shared with other units. The incentives to free-ride are particularly large when the retailer deals with customers who are not likely to make repeat purchases at the particular unit.

This free-rider problem can be reduced through vertical integration, where managers of stores are compensated in ways that discourage free-riding, or through long-term contracts with terms that motivate increased sales efforts. We provide a more detailed discussion of such distribution contracts later in this chapter.

Extensive Coordination

Some activities require extensive coordination. For example, railroads rely on extensive feeder traffic for their routes. In principle, it would be possible to use the price system for each link within this network. Rail companies could pay one another to use their lines, with prices adjusting to changes in supply and demand. Such a system would be complicated and expensive to operate. An alternative is for the railroad companies in the network to merge and to address the various coordination problems internally. Railroad companies were among the first large firms in the United States. These large firms were motivated, at least in part, by the benefits of using internal managers, rather than market transactions, to coordinate rail activity.[9]

A related reason for vertical integration is to coordinate pricing and service decisions among retail units. The pricing decisions of individual retailers can have effects on other units in the system—they produce a kind of externality. For instance, it might be optimal from a companywide standpoint to set prices where some units sustain losses. (When McDonald's stays open, customers are less likely to try Burger King.) Independent retailers cannot be expected to set optimal systemwide prices since they care only about the profits from their own units. In principle, the central company could set the

[9]A. Chandler (1977), *The Visible Hand—The Managerial Revolution in American Business* (Belknap Press: Cambridge, MA). Also, D. Carlton and M. Klamer (1983), "The Need for Coordination among Firms with Special Reference to Network Industries," *University of Chicago Law Review* 50, 446–465.

retail prices; but antitrust law limits this solution. The company can coordinate prices if it owns its own retail outlets.

Market Power

A firm with market power might use vertical integration to increase profits in several different ways. The following example illustrates one of these methods—using vertical integration to price-discriminate.[10] Consider a firm, DrugCo, that has a patent on a particular chemical compound used as an input in the production of two different pharmaceutical products. One of the products is a pain reliever that competes with many other pain relievers. The other helps cure a particular type of cancer and faces no close substitutes. The industry demand for the two retail products (pain reliever and cancer drug) is given by

$$\text{Pain relief:} \quad P = 100 - 5Q \tag{19.1}$$

$$\text{Cancer drug:} \quad P = 200 - 10Q \tag{19.2}$$

The marginal cost to DrugCo for producing the chemical compound is \$10 per gram. For simplicity, suppose that a drug manufacturer can take the chemical compound and transform it into 1 gram of either retail product (pain reliever or cancer drug) at zero marginal cost incurring no additional distribution or marketing costs. Many manufacturers can produce and distribute the retail drugs. Competition among these retail manufacturers will drive the retail prices of the pain reliever and cancer drug down to the retail manufacturers' marginal costs, which in this example is the wholesale price (see Chapter 7) of DrugCo's chemical compound. Thus, the demand curves facing DrugCo at the wholesale level are the same as the retail demand curves given in Equations (19.1) and (19.2).

To maximize total profits, DrugCo would like to set marginal revenue equal to marginal cost in each market. As shown in Figure 19.4, the optimal price to charge retail drug manufacturers who produce the pain reliever is \$55. The optimal price for those who produce the cancer drug is \$105.[11] Since both retail markets are competitive and there are no other costs, the price to consumers in the two markets would be \$55 and \$105. However, if DrugCo tries to sell to some manufacturers at \$55 and other manufacturers at \$105, potential *arbitrage* is available: Manufacturers who buy at \$55 can resell the chemical compound to other manufacturers at less than \$105 and make a profit. They will undercut any attempt by DrugCo to sell to manufacturers at \$105.

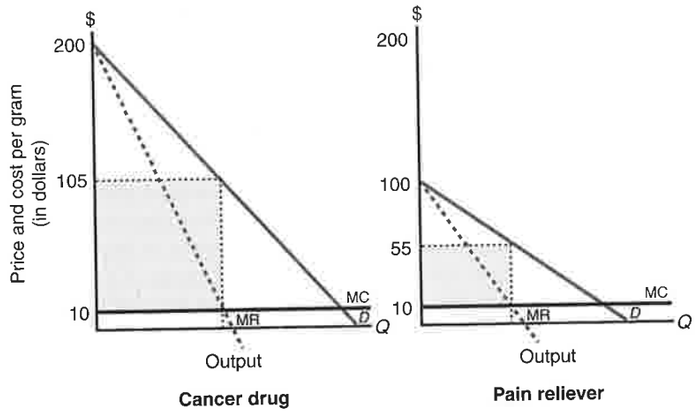
One way that DrugCo can prevent such arbitrage is to integrate forward and manufacture the pain reliever. The company would price the pain reliever at \$55 in the retail market and sell the base drug at \$105 in the wholesale market. Arbitrage is no longer possible (assuming that the pain reliever cannot be transformed back into the chemical compound at low cost). Integrating forward into the retail market for the cancer drug will not solve the problem. If DrugCo tries to price the cancer drug at \$105 and sell the chemical compound at a wholesale price of \$55, other retail manufacturers would begin to produce and market the cancer drug (after buying the chemical compound at \$55). DrugCo would not be able to maintain a price of \$105. It must integrate forward into the lower-priced (more *elastic*) pain-reliever market.

[10]For additional methods, see Carlton and Perloff (1990), Chapter 16.

[11]Recall from Chapter 7 that these prices are easily found by setting the marginal revenue in each market (implied by the two demand curves) equal to the marginal cost of \$10.

Figure 19.4 Using Vertical Integration to Price-Discriminate

DrugCo has a patent on a chemical compound used as an input in the production of two different pharmaceutical products: a pain reliever that competes with many other products and a cancer drug. The marginal cost to DrugCo for producing the chemical compound is $10 per gram. The industry-level demand curves for the two products are the same demand curves facing DrugCo for the chemical compound. The optimal price to charge manufacturers who produce the pain reliever is $55. The optimal price for those who produce the cancer drug is $105. However, if DrugCo tries to sell to some companies at $55 and others at $105, potential arbitrage is available. One way to price-discriminate effectively is for DrugCo to integrate forward into the retail market for pain relievers. It would sell the pain reliever to consumers at $55 and the chemical compound to the manufacturers of the cancer drug at $105.



Taxes and Regulation

Taxes and regulation also can motivate vertical integration. If one stage of production is heavily taxed and another is not, total taxes might be reduced by shifting profits to the low-tax activity. A firm potentially can capture these gains by integrating vertically and having the low-tax unit charge higher transfer prices to the high-tax unit. Yet as we discussed in Chapter 17, tax authorities are aware of this incentive and limit this type of activity.[12]

Similarly, a regulated company might want to integrate vertically to shift profits from a regulated segment of the business, where profits are restricted, to an unregulated segment of the business. In 1984, AT&T settled an antitrust suit with the Department of Justice by splitting into several firms. One of the concerns of the Justice Department was that it was difficult to monitor cost-shifting among AT&T's regulated businesses (for example, telephone service) and other less regulated businesses (for instance, telephone equipment). The breakup of AT&T reduced these concerns.[13]

[12]M. Scholes, M. Wolfson, M. Erickson, E. Maydew, and T. Shevlin (2002), *Taxes and Business Strategy: A Planning Approach* (Prentice Hall: Englewood Cliffs, NJ), Chapter 11.

[13]D. Carlton and J. Perloff (1990), *Modern Industrial Organization* (HarperCollins: New York).

Price Discrimination and Antitrust Law

Firms that integrate vertically to engage in price discrimination can sometimes be held accountable under antitrust law. Alcoa had market power in the production of virgin aluminum ingots, an intermediate good. It integrated into the lower-priced markets (for example, rolled sheet) and "squeezed" competitors in these markets. The judge who wrote the opinion in the antitrust case proposed a "transfer-price test" to assess whether a firm is engaged in a price squeeze. The test considers whether the integrated firm could sell the final output profitably at prevailing prices, assuming it had to pay the same price for the input as it charges downstream competitors. The court determined Alcoa could not. (Note that in our example from the previous section, DrugCo would operate at a loss if it paid $105 for the input and sold the pain reliever to consumers at $55.)

Source: *United States v. Aluminum Company of America* (1945), 148 F. 2d, 416.

Other Reasons

Another potential motive for nonmarket procurement is to ensure the supply of an important input. In contrast to the standard economic model, shortages sometimes occur in actual markets. For example, theaters do not always raise ticket prices for popular movies. Rather, tickets are allocated on a first-come, first-served basis when demand exceeds theater capacity for a performance. Similarly, companies sometimes face rationing or short supply of particular inputs. Companies might integrate vertically or enter long-term contracts to increase the reliability of receiving an input.

Firms also use nonmarket procurement to avoid sharing proprietary information with other firms. For instance, a firm might be reluctant to provide an independent supplier with detailed information about its production processes because it fears that the supplier might share the information with other firms. Normally, it is easier to control the leakage of sensitive information when dealing with internal employees or long-term suppliers.

Another common explanation for nonmarket transactions relies on technological factors. For example, some people explain the common ownership of steel milling and steel production by the close technological links of the two processes. But this argument is flawed. Although it is true that there are benefits from having these operations at one location, technology does not dictate ownership. Steel mills could buy hot steel ingots from other companies located in the same building. The reasons they do not are due not to technological factors, but rather result from contracting problems: Independent companies do not want to expose themselves to the holdup problems that arise from such firm-specific investments.

Vertical Integration versus Long-Term Contracts[14]

We have discussed reasons why a firm might acquire a good or service through a nonmarket transaction. We now consider the trade-offs between the two general types of nonmarket transactions, vertical integration and long-term contracts. We examine these

[14]This section draws on Williamson (1985). Important references on this topic include Klein, Crawford, and Alchian (1978); S. Grossman and O. Hart (1986), "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economy* 94, 691–719; and O. Hart (1995), *Firms, Contracts, and Financial Structure* (Oxford Press: Oxford, UK).

trade-offs using the example of AutoCorp, a producer of new automobiles. AutoCorp is considering whether to produce its own auto bodies or to obtain them from an independent supplier through a long-term contract. In either case, a new auto body plant must be constructed. There will be ongoing production, maintenance, and capital-replacement costs. AutoCorp wants to choose the organizational arrangement that maximizes value.

Incomplete Contracting

If contracts were costless to plan, negotiate, write, and enforce, it would not matter if AutoCorp made its own auto bodies or bought them from an outside supplier. In either case, a *complete contract* would be negotiated, one that specified exactly what was expected of each party under all possible future contingencies. Severe penalties would ensure compliance. The actions of each party would be chosen to maximize value (the level of investment, ongoing expenditures, production quantities, designs, and so on). With vertical integration, the contracts would be between the firm and employees, whereas a long-term supply contract would be between two independent firms.

Contracting, however, can be expensive. First, it is difficult to foresee and plan for all possible contingencies. AutoCorp surely will want to make future changes in the design of its auto bodies if customer tastes change or if a competitor develops a superior body design. However, AutoCorp's managers are unlikely to know the appropriate response until the new situation actually confronts them. Second, it is expensive to negotiate contracts. Self-interested parties often find it difficult to agree on contracts—consider the record of strikes by professional athletes. Third, it is costly to enforce contracts. Contracting costs necessitate *incomplete contracts:* Many contingencies will be omitted and thus left open for future negotiation. For example, the Kodak-IBM outsourcing contract stated that IBM must maintain a state-of-the-art data center. The exact technology, software, and communications system are not specified.[15] When contractual disputes arise, the contracting parties are likely to incur legal expenses and spend valuable time either preparing for court or renegotiating contracts.

The prospect of future negotiations can motivate suboptimal investment. Parties to the contract realize that part of the gains from their investments (in capital or effort) are likely to go to other parties: They are not protected by a complete contract. For example, as we discuss below, a supplier will be reluctant to invest effort or capital to reduce production costs if the buyer is likely to capture most of the gains by renegotiating a lower purchase price for the input.

Ownership and Investment Incentives

The owner has the right to determine the *residual use* of an asset—any use that does not conflict with prior contract, custom, or law. Residual rights give an individual increased ability to capture the gains from an investment and can affect investment incentives. For instance, house owners have the residual rights for their properties. As long as their actions are consistent with the law and existing contracts (for example, zoning requirements and restrictive covenants in the deed), they are free to sell or rent their houses. The ability of owners to capture the gains from investing in house repairs through

[15]Richmond, Seidmann, and Whinston (1992), 463.

Contracting Problems and Investment Incentives: Evidence from China

The early 1990s witnessed a substantial growth in American investment in China. American financial institutions loaned substantial amounts of money to Chinese businesses, and other American companies invested in a variety of Chinese business ventures. By 1995, many of these American companies experienced problems in collecting debts from Chinese businesses. One problem in enforcing contracts with Chinese businesses is that the legal system in China is "primitive." In addition, "China's corporate managers are accustomed to the old socialist system, where they could simply ignore their debts"—there is little market-based enforcement of contracts.

Leasing companies that have financed specific assets have been "particularly vulnerable because the collateral—usually heavy equipment or production lines—is difficult to seize once installed. And even if it can be repossessed, China lacks a good secondary market for equipment." The inability to write enforceable contracts has made American companies question whether it is a good idea to make specific investments in China.

Source: P. Engardio (1994), "Why Sweet Deals Are Going Sour in China," *Business Week* (December 19), 50–51.

higher selling prices makes it more likely that owners will take better care of houses than renters. Renters are reluctant to invest in repairs if much of the gains goes to owners.[16]

Vertical integration and long-term contracts differ in their assignment of ownership rights. Vertical integration keeps the ownership rights for the relevant assets within one firm, whereas long-term contracting apportions them between firms. As we discuss below, the optimal choice between vertical integration and long-term contracts depends, at least in part, on which ownership structure motivates the most productive investment decisions.

Specific Assets and Vertical Integration

Specific assets can cause substantial investment distortions among independent contractors. Consider the investment incentives of BodyWorks, a potential supplier to AutoCorp. BodyWorks would have to construct a plant next to one of AutoCorp's major production facilities. Transportation costs and special designs make this plant

Renting and Asset Abuse

Renters do not bear the total costs from abusing an asset, since it is owned by the rental company; thus, rental assets frequently are abused. "In one case, a fellow rented a sports car with 12 miles on it. He took out the high-powered engine and installed it in a 'stock car,' to run a high-speed 500-mile race. After crossing the finish line, he reinstalled the engine in the rental car and returned it. The rental company could not successfully prosecute because it failed to establish the number of miles that had been put on the engine. The rental car still showed low mileage, and the rental fee to the customer/car racer was only $24."

Source: D. McIntyre (1988), "Rent a Reck," *Financial World* (September 20), 72.

[16]C. Smith and L. Wakeman (1985), "Determinants of Corporate Leasing Policy," *Journal of Finance* 40, 896–908.

Owning versus Leasing Networks

Electric Lightwave sells services including local telephone, long-distance, Internet access, and network access to businesses. It decided to build and own a 1,300-mile fiber-optic network from Los Angeles to Portland, Oregon, and a 1,600-mile route connecting clusters of cities in the western United States. By making this firm-specific investment and owning these lines, Electric Lightwave can offer higher-quality, lower-cost services and still have higher profit margins. In addition, Electric Lightwave leases lines from other telecommunications companies to fill in gaps in its network until it can build its own lines.

Source: P. Stepankowsky (1998), "Electric Lightwave Sees Advantages in Owning Network," *The Wall Street Journal* (September 14), B11.

quite specific: It is of much less value to other car companies that are farther away and use different body designs. Asset specificity places BodyWorks in a tenuous position. Without the guarantee of a complete contract, BodyWorks will be concerned that AutoCorp will try to lower the price for auto bodies once the investment is made (recall from Chapter 5 that BodyWorks has incentives to operate as long as price is greater than *average variable cost*). AutoCorp might claim that BodyWorks is supplying low-quality products and demand a price concession. Given litigation costs, BodyWorks might be forced to accept the lower price. This concern reduces BodyWorks' incentives to invest in the plant. Similarly, AutoCorp might be reluctant to tailor-make their cars to fit BodyWorks products because it fears that BodyWorks will be opportunistic and increase the price for its auto bodies. In this example, investment incentives can be improved through vertical integration. If AutoCorp constructs its own auto body plant (or buys BodyWorks), it is in a position to capture the gains from its investment. It does not have to worry that some outside firm will try to extract part of the returns by demanding a different price for auto bodies.[17] Other contracting costs might decline as well, since the companies do not have to negotiate a complicated legal contract.

These arguments help explain why vertical integration can be preferred to long-term contracting. Why is this not always the case? What limits the entire economy from being served by one gigantic firm that produces all products? The answer lies again in investment incentives. Consider AutoCorp's purchase of lightbulbs from LightCo. Since lightbulbs are not a specialized product, the purchasing arrangement harms neither LightCo's nor AutoCorp's investment incentives. LightCo is willing to make investments that reduce the costs of making lightbulbs because it benefits from these investments. If AutoCorp tries to capture some of the benefits from LightCo's investment by offering a lower price for lightbulbs, LightCo simply will sell the bulbs to another customer. If LightCo tries to raise the price of its bulbs to extract profits from AutoCorp, it simply will buy bulbs from one of LightCo's rivals, such as Philips Electronics or General Electric. In contrast, if AutoCorp purchases LightCo and operates it as an internal division, investment incentives might be distorted. As divisional managers, LightCo's management might face reduced incentives to invest in innovative activities, since part of the credit for value-enhancing ideas will go to AutoCorp's senior management. In addition, LightCo's management might invest in unproductive activities, such

[17]With costless contracting and risk-neutral individuals, the holdup problem could be solved in the following way: The contract could specify optimal investments by BodyWorks and AutoCorp, and anticipated holdups could be compensated for in advance by appropriate side payments between BodyWorks and AutoCorp.

Figure 19.5 Asset Specificity, Uncertainty, and the Procurement Decision

When asset specificity is low, it generally is optimal to use simple market transactions for procurement. As the degree of asset specificity increases, nonmarket transactions (contracts and vertical integration) become more desirable. When uncertainty is low, relatively complete contracts can be written. Thus, contracts can be used to resolve incentive conflicts motivated by firm-specific assets. As uncertainty increases, contracting becomes more expensive. Vertical integration of firm-specific assets becomes more likely as uncertainty increases.

Asset Specificity \ Uncertainty	Low	Medium	High
Low	Market transaction	Market transaction	Market transaction
Medium	Contract	Contract or vertical integration	Contract or vertical integration
High	Contract	Contract or vertical integration	Vertical integration

as trying to *influence* senior management's decisions (salaries, allocating capital to the divisions, and so on).[18]

These arguments suggest that *the likelihood of vertical integration increases with the specificity of the asset.* With less specialized assets, market transactions or long-term contracts are more likely to produce efficient investment incentives. This proposition is one of the most important ideas in the economic literature on organizations. Empirical tests support its validity. As an example, J. Stuckey examined aluminum refineries that are located near bauxite mines.[19] Not only are the refineries specific to particular mines owing to transportation costs, but the refineries also invest in specialized equipment. Stuckey found that in virtually all cases, there is vertical integration.

Research indicates that specific assets are especially likely to motivate integration in *uncertain environments.* In uncertain environments, the contracting problems with specific assets are particularly severe: It is nearly impossible to specify what actions each party should perform under all future contingencies. In more stable environments, the range of possible circumstances to cover is more limited and relatively complete contracts that mitigate holdup problems can be negotiated at low cost.

The arguments in this section are summarized in Figure 19.5. When asset specificity is low, it is generally best to rely on market exchange, regardless of the level of uncertainty.

[18]P. Milgrom and J. Roberts (1994), "Bargaining Costs, Influence Costs, and the Organization of Economic Activity," in J. Alt and K. Shepsle (Eds), *Perspectives on Positive Political Economy* (Cambridge University Press: Cambridge), 57–89.

[19]J. Stuckey (1983), *Vertical Integration and Joint Ventures in the Aluminum Industry* (Harvard University Press: Cambridge, MA). See also E. Anderson (1985), "The Salesperson as Outside Agent or Employee: A Transaction Cost Analysis," *Marketing Science* 4, 234–254; E. Anderson and D. Schmittlein (1984), "Integration of the Sales Force: An Empirical Examination," *Rand Journal of Economics* 15, 385–395; and W. Kim, D. Mayers, and C. Smith (1996), "On the Choice of Insurance Distribution Systems," *Journal of Risk and Insurance* 63, 207–227.

Lease versus Buy

Firms frequently must decide between leasing and buying an asset. Economic theory suggests that firms are most likely to own assets that are highly firm-specific. For example, Le Roy Industries leases some of its forklifts and other vehicles but buys outright the very specialized machinery it needs to make suspension parts for Ford, General Motors, and Chrysler cars. To quote Charles Teets, vice president and chief financial officer of the company,

> It takes about a year to make the machinery we need. It would be very hard to find a lessor interested in our type of equipment because of the long lead-time. After the lease expired, no lessor would want the equipment back.

Source: B. Gatty and M. Finney (1987), "The New Attraction in Leasing," *Nation's Business* (March), 50–54.

As the degree of asset specificity increases, the desirability of nonmarket transactions increases. Uncertainty increases the desirability of vertically integrating firm-specific assets; when asset specificity and uncertainty are both high, vertical integration is likely to be the preferred alternative.

This analysis of firm-specific assets helps explain why catering, trucking, copying, and mainframe computing are among the most frequently outsourced services. These activities are sufficiently specialized that spot-market transactions are not viable. Nonetheless, these activities involve assets that are not highly firm-specific. Food-service equipment, trucks, copy machines, and computers can be used by many different companies; therefore, the potential for holdup actions is relatively low. Furthermore, for activities like copying, it is easy to write a relatively complete contract (uncertainty is reasonably low). There also are potential benefits from using independent firms that specialize in large-volume production. Moreover, the transactions are quite *repetitive;* thus, it makes sense to contract with a single supplier on a long-term basis. (The supplier makes customer-specific investments in learning how to serve the customer; hence, it is expensive to change suppliers.) These factors imply that it often is optimal to contract for these services.

One advantage of having IBM provide computer services to Kodak is that IBM provides similar services to other companies. This higher volume can lower the cost for Kodak. The costs of training technical specialists can be spread across more users; software can be written that is used by more than one company. Also, IBM is able to attract higher-quality computer specialists than can Kodak, since IBM's scale of operation provides a much richer set of future career opportunities. Conceptually, Kodak could capture some of these gains by purchasing IBM and operating the two companies as one large enterprise. However, the costs of managing such a large, diverse enterprise likely would outweigh the benefits.

Vertical Integration in the Aerospace Industry

Scott Masten studied the make-versus-buy policies of a major aerospace contractor. The firm made many products for the United States government. The company had to choose between making each product or subcontracting it to another firm for production. Economic theory suggests that internal production is more likely when the assets are specific and the uncertainties in contracting are large.

Masten used two measures of asset specificity for each product. The first measured design (physical-asset) specificity, whereas the second measured site specificity. He also measured the complexity of the product design, which was intended to proxy for uncertainties in contracting. Consistent with the theory, he found that products which were more design specific and quite complex were more likely to be produced internally. When the product was both design specific and complex, there was a 92 percent probability of internal production. If the product was design specific but not complex, the probability of internal production was 31 percent. The probability of internal production was only 2 percent when the product was neither design specific nor complex. For this particular company, site specificity was unimportant.

Source: S. Masten (1984), "The Organization of Production: Evidence from the Aerospace Industry," *Journal of Law & Economics* 27, 403–417.

Asset Ownership[20]

We have concentrated on potential holdup problems that occur after the initial investment. Our major point is that these problems can be reduced through vertical integration. However, common ownership can be achieved in our example either if AutoCorp owns BodyWorks or if BodyWorks owns AutoCorp. Which alternative, if either, is best? Considering ongoing specific investment provides a partial answer to this question. In their ongoing interaction, companies like AutoCorp and BodyWorks generally benefit from specific investments, which are difficult to observe or use as the basis for contracts. For example, the management of BodyWorks might invest in learning about AutoCorp's future design plans so that it can plan more effectively for potential changes. This planning might increase the speed at which new models could be developed and thus improve overall corporate performance. Similarly, AutoCorp might invest in learning more about BodyWorks' production processes to develop lower-cost body designs. Investments of this type are hard to observe and depend on the managers' incentives to make them. These incentives, in turn, can depend on ownership structure.

If AutoCorp buys BodyWorks it will structure BodyWorks as a division of the firm. As discussed in Chapter 17, the management of BodyWorks will be evaluated primarily on divisional performance and will have relatively low incentives to invest in activities that primarily benefit other divisions (although they may have limited incentives to do so through stock ownership and profit-sharing plans). Thus they will invest little in learning about AutoCorp's design plans if the benefits go primarily to AutoCorp. Yet AutoCorp's management, being at the top of the corporation, will be evaluated on overall corporate performance. They will have incentives to invest in all activities that benefit the overall corporation. Thus they will work to invest in lowering BodyWorks' costs if it increases the overall value of the firm. In contrast, if BodyWorks owns AutoCorp the reverse situation holds. BodyWorks' management has incentives to invest in activities that increase total firm value, whereas AutoCorp's management will focus primarily on divisional performance. Which ownership structure is best depends on whose investments are most important. Typically it is better for the party whose investments have the bigger impact on the value of the firm to be the owner. If both parties' investments are important, it can be best to maintain separate ownership and use contracts. This idea is explored in more detail in the appendix.

Other Reasons

Unions are another factor that can affect the choice between vertical integration and contracting. For instance, some of the major airlines have threatened labor unions that they will outsource their kitchen operations to other companies to avoid paying union wages. The major automobile companies have made similar statements with respect to the

[20]This section draws on Grossman and Hart (1986).

manufacturing of component parts. Some firms are reluctant to integrate into a unionized activity because they fear that the move might motivate their employees to organize.

Controlling sensitive, proprietary information can affect decisions of outsourcing versus vertical integration. For example, in the specific case of Kodak's outsourcing computing services to IBM, there is a potential problem with Kodak-specific knowledge about electronic imaging. Kodak invests heavily in electronic-imaging R&D. To exploit this investment fully, Kodak must guard this information carefully. Since IBM is an obvious competitor in the electronic-imaging market, outsourcing Kodak's computing services presents a potential problem, one that demands the design of careful controls to keep IBM personnel from accessing Kodak's proprietary information. Note that the costs of designing and administering these controls affects the optimal policy choice. If they are high, Kodak might reject IBM as an outsourcing partner in favor of another vendor with less overlap in the electronic-imaging market (perhaps Electronic Data Systems), or Kodak might reject outsourcing altogether. Along these lines, Prahalad and Hamel argue that it often is unwise for a company to outsource its "core competencies" (those capabilities which are fundamental to a firm's performance and strategy). Rather, according to this argument, firms should keep core competencies within the firm to enhance their development and to prevent other firms from developing similar capabilities (see Chapter 8).[21]

The financial press often argues that obtaining inputs through contracts with other firms "frees companies to use scarce capital for other purposes." This claim is questionable given access to well-developed capital markets. Having another firm produce a product does not reduce investment; it simply shifts the capital expenditures to another firm. Buyers still pay for this investment through the price of the product. The important question is whether more value is created by producing the product internally or externally. If internal production is more valuable, the firm can raise money in the capital market for financing the relevant assets: Capital is not "scarce" for good projects. If external production is more valuable, funds must be raised by the supplier.[22]

Continuum of Choice

Although we have discussed long-term contracting versus vertical integration as a choice between two policies, it is important to keep in mind that the outsourcing decision falls on a continuum. For example, sometimes it is desirable for a firm to maintain ownership of a firm-specific asset and contract with another firm to operate it. This ownership pattern reduces potential holdup problems because if there is a contract dispute, the owner can take the asset and simply contract with an alternative firm to provide the service (neither side faces large losses). This ownership pattern is most viable if the asset can be moved at low cost and the value of the asset is insensitive to asset maintenance or abuse. Alternatively, the owner must be able to provide the service operator with sufficient incentives to maintain and not to abuse the asset.

A related example is Kodak's decision to contract with IBM for providing operating software and hardware but to maintain responsibility for applications software. Development of applications software is likely to be more specific to Kodak than developing

[21]C. Prahalad and G. Hamel (1990), "The Core Competence of the Corporation," *Harvard Business Review* (May–June), 79–91.

[22]One situation where this argument might make sense could involve an international business transaction between a firm from an industrialized country and a firm from a developing economy. For example, Boeing might offer to lease airplanes to a Chinese airline—thus bundling its product with a financing package—because Boeing has more effective access to global capital markets than does its customer.

Short-Term Leases

Car rental companies know something most of us don't. People who rent cars can't drive. They fiddle with the dashboard, eyeball billowing city maps, confuse the horn with the cruise control, and they crash. A lot. Forty percent of Hertz's fleet is damaged some way each year. One rental customer said, "I'm hell on wheels. I'm a good reason not to buy a used car from a rental company." One rental agent says, "They don't even know how to put a car in gear. I have to tell them, 'P is for park, R is for reverse.' Jeez, P should be for 'pray.'" One driver in Florida ran over an alligator, demolishing the car's underside. The man claimed, "The alligator was in my way." Rental companies have started conducting background checks of customers' driving records to turn away high risks. Short-term contracts such as car rental agreements attract customers who are more accident-prone and fail to encourage customers to make investments in safety.

Source: C. Quintanilla (1995), "Hertz Is a Little Wary about Putting You in the Driver's Seat," *The Wall Street Journal* (July 28), A1.

of operating software that can be used for many different applications and firms. IBM, therefore, has greater incentives to focus on developing operating software, whereas Kodak has greater incentives to focus on the applications software. The location of specific knowledge reinforces these incentives: Kodak knows more about its specific applications, and IBM knows more about general computing. The observed organizational arrangement reflects these incentive and information effects.

Contract Length

A major advantage of long-term contracts over short-term contracts is that they increase the incentives of the contracting parties to make firm-specific investments. For example, IBM would have limited incentives to invest in learning Kodak's special computing demands if it anticipated only a short-term relationship between the two companies.[23] On the other hand, it is costly to write and litigate long-term contracts in uncertain environments, where it is difficult to plan for potential changes in technology, input prices, product demands, and the like. Thus, firms might be expected to enter long-term contracts when the desired investment is relatively firm-specific and where the environment is relatively stable. Alternatively, if the firm faces a highly uncertain environment and large investments in firm-specific assets, vertical integration is more likely to be the preferred alternative. Finally, if the investment in firm-specific assets is relatively low or if the lives of the assets are relatively short, the firm can more easily enter into short-term contracts with suppliers or rely on spot market transactions.

Contracting with Distributors

Although our examples have focused on supply contracts, the same analysis applies to distribution contracts. As assets become more specific, vertical integration becomes

[23]Long-term contracts provide the greatest incentives when they have uncertain expiration dates (the parties expect the contracts might be renewed). There are strong incentives to cheat in the last period when a contract has a known ending date, since maintaining the reputation as a good partner has no benefit (ignoring third-party effects). The parties, knowing that they will not cooperate in the last period, have incentives to cheat in the next-to-last period. (There are no reputational concerns since they know that the other party will not cooperate in the last period.) The incentives to cheat in the next-to-last period affect the incentives in the previous period, and so on. In this case, the contract can unravel, so that the parties have the incentive to cheat in the first period. L. Telser (1980), "A Theory of Self-Enforcing Agreements," *Journal of Business* 53, 27–44.

Divorce between Outsourcing Partners

Not all outsourcing ventures work—some end in divorce. Hibernia National Bank and Capital Bank used to outsource their computer operations to IBM. To cut its costs, IBM pooled the software support staff for the two banks. Both banks used software from Hogan Systems, a business partner with IBM from 1987. In 1993, Hibernia estimated it could save $40 million over 8 years by switching to a new outsourcing partner, Systematics Financial Services Inc. Capital followed Hibernia and also shifted to Systematics. Subsequently, Hogan and IBM parted ways. This example and others like it suggest that prospective outsourcing partners should anticipate the possibility that the venture will not work out and plan accordingly (for example, by negotiating the equivalent of a prenuptial agreement—what to do with assets, severance payments, and so on).

Source: "ISSC: A Tale of Marriage and Divorce" (1994), *Information Week* (July 18), 13.

more desirable. Yet a number of other interesting issues arise in distribution contracts. We now examine these issues.

Free-Rider Problems

Earlier in this chapter, we noted the incentives of independent distributors to free-ride on the reputation of a brand name and how these incentives can motivate suboptimal sales efforts—for example, insufficient expenditures on advertising and other inputs. One method of reducing this problem is vertical integration.[24] The other method is to use contracts with specific provisions to control free-rider problems. Two contract terms that specifically address this concern are advertising provisions and exclusive territories.

Advertising Provisions

Firms use several related methods to increase advertising at the local level. First, a company can charge its retail units an advertising fee and have the central company retain the responsibility for advertising. For instance, most franchise contracts require that, in addition to the base royalty payment, individual units pay a percentage of sales to the central company to provide advertising. One potential problem with this approach is that the local unit, not the central company, might have the specific knowledge relevant for effective local advertising. A second alternative that addresses this concern is for the central company to share in the local advertising costs; for example, it might pay half of any

Conflicts over Advertising Provisions

Meineke Discount Muffler Shops was ordered to pay $347 million to its franchisees by a federal district court in North Carolina. Franchisees started noticing that the franchiser had been cutting back on advertising. Newspaper ads were waning, and TV spots were appearing after midnight. Eventually, they discovered that instead of the contractually specified 2 percent, Meineke was pocketing $17 million, or 15 percent of the communal ad funds. The judge said the franchiser had a fiduciary duty to ensure that the franchisees' funds were properly managed.

Source: N. Harris and M. France (1997), "Franchisees Get Feisty," *Business Week* (February 24), 65–66.

[24]H. Marvel (1982), "Exclusive Dealing," *Journal of Law & Economics* 25, 1–25.

advertising expenditures. The decisions on local advertising are made by the local managers, but by reducing the effective cost of advertising, they encourage the local unit managers to advertise more extensively. A third alternative is to require distributors to contribute to regional advertising funds. The distributors have the primary decision rights to decide how to spend the monies in the funds.

Exclusive Territories

One of the most common methods of reducing free-riding is to grant individual distributors exclusive rights to operate in a given market area. For example, an AutoCorp dealership might have a contract that prevents the company from opening another dealership within 30 miles. By giving distributors monopoly rights for specific market areas, there are fewer incentives to free-ride, since the distributors internalize more of the benefits from their sales efforts and fewer benefits go to other units not owned by the given distributor. Exclusive territories also can create extra profits for local distributors. These profits can provide additional incentives not to free-ride: If the manufacturer catches the distributor free-riding and terminates the contract, future profits are lost.[25]

Double Markups

Granting distributors market power within specific areas reduces free-rider problems, but it can create another problem—*double markups*. Since both the manufacturer and the distributor face downward-sloping demand curves, each has the incentive to mark up the product's price above marginal cost. Unchecked, this results in the customer's facing two markups rather than one. Hence, both the quantity of the product demanded and the combined profits for the manufacturer and distributor are less than they would be if this incentive were controlled. The following is a numerical example illustrating this problem, as well as the contract terms that might be used to control it.

Example

Suppose that AutoCorp faces the following demand for its Rhino automobiles in the Medford, Oregon, market area:

$$P = 55{,}000 - 100Q \tag{19.3}$$

Conflicts over Exclusive Territories

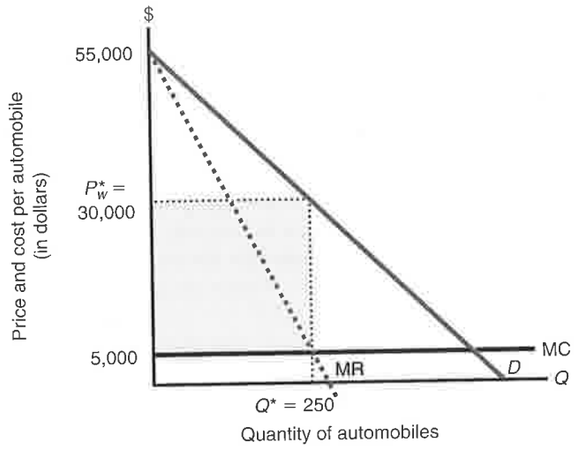
Granting distributors exclusive territories reduces free-riding among distributors but can induce dysfunctional behavior within the company. For example, McDonald's generated growth by building thousands of new restaurants in the late 1980s and early 1990s—restaurants which proceeded to divert customers and profits from existing franchises. McDonald's has lots of small franchisees—4,500 worldwide. It got so bad in the mid-nineties that U.S. franchisees told McDonald's management, "It's like you're flying the plane, and we operators are stuck in the back of a smoke-filled cabin with no idea what's going on." To solve this problem, McDonald's began consolidating some of its franchisees. The CEO, Jack Greenberg, said, "From here on out, we're going to grow with our existing licensees rather than add hundreds of new ones each year. I want the stores in the hands of the best operators."

Source: P. Sellers (1998), "McDonald's Starts Over," *Fortune* (June 22), 34–36.

[25]B. Klein and K. Murphy (1988), "Vertical Restraints as Contract Enforcement Mechanisms," *Journal of Law & Economics* 31, 265–97; and J. Brickley (1999), "Incentive Conflicts and Contractual Restraints: Evidence from Franchising," *Journal of Law and Economics* 42, 745–774.

Figure 19.6 Optimal Output in an Example of the Double Markup Problem

AutoCorp can produce automobiles at a constant marginal cost of $5,000. To maximize profits, AutoCorp must select the quantity and price where marginal revenue equals marginal cost. The optimal quantity and price are $Q^* = 250$ and $P_W^* = \$30{,}000$. Firm profits are $6.25 million (assuming no fixed costs).



AutoCorp can produce Rhinos at a constant marginal cost of $5,000. To simplify the computations, assume that there are no fixed costs in producing or selling cars. To maximize profits, AutoCorp must select the quantity and price where marginal revenue equals marginal cost. As depicted in Figure 19.6, the optimal quantity and price are $Q^* = 250$ and $P^* = \$30{,}000$. The firm's profits are $6.25 million.

Now suppose that AutoCorp sells its vehicles through SUVmart, an independent distributor that has the exclusive right to sell Rhinos in the Medford market area. Under the contract, AutoCorp sets the wholesale price, while SUVmart selects the quantity to purchase and the retail price. For simplicity, suppose that the only marginal cost facing SUVmart for Rhinos is the price charged by AutoCorp. (There are no variable distribution costs.) The owners of SUVmart care only about their own profits, and the managers of AutoCorp care only about AutoCorp's profits. The problem facing AutoCorp is to choose the wholesale price, P_w, that maximizes its profits.

To solve this problem, AutoCorp's management would like to know the quantity that SUVmart would purchase at each possible wholesale price. AutoCorp can infer this demand curve by analyzing the problem from the perspective of SUVmart. SUVmart faces the retail demand curve for autos given in Equation (19.3). SUVmart maximizes its profits by setting its marginal revenue, implied by this retail demand curve, equal to P_w, its marginal cost. Thus, SUVmart's marginal revenue curve is the effective demand curve AutoCorp faces. (At any wholesale price, SUVmart buys the quantity indicated by its marginal revenue curve.) As depicted in Figure 19.6, this curve is

$$P_w = 55{,}000 - 200Q \tag{19.4}$$

Company Ownership versus Franchising

We have discussed how a central company can reduce the incentives of an independent distributor to free-ride on the brand name through contracts with terms that motivate increased sales efforts. When the free-rider problem is severe, it can be less expensive simply to own the distribution units centrally. Managers of a company-owned unit have fewer incentives than an independent distributor to free-ride on the reputation, since they do not get to keep the profits from the unit—the reduction in costs (for example, from decreased advertising) flow through to the central company, not the managers.

Most franchise companies do not franchise all their retail outlets. The typical company franchises about 80 percent of the units and owns the other 20 percent. Our argument suggests that central companies are most likely to own the units that receive a significant amount of business from customers who are unlikely to make repeat purchases at the particular units (the incentives to free-ride in this case are large). On average, fast-food restaurants are more likely to serve transient customers than auto-service companies. (Customers tend to use the same unit repeatedly for oil changes and tune-ups.) Consistent with the theory, the typical restaurant franchise company owns about 30 percent of its units, and the typical auto service franchise company owns about 13 percent of its units.

Source: J. Brickley and F. Dark (1987), "The Choice of Organizational Form: The Case of Franchising," *Journal of Financial Economics* 18, 401.

Given SUVmart's demand for Rhinos, what wholesale price will AutoCorp choose? AutoCorp maximizes its profits by setting its marginal revenue equal to its marginal cost of $5,000. Since AutoCorp faces a demand curve of $P_w = 55{,}000 - 200Q$, its marginal revenue is $\text{MR} = 55{,}000 - 400Q$. AutoCorp's profits are maximized by selecting a wholesale price of $P_w^* = \$30{,}000$. At this price, SUVmart will buy 125 Rhinos and set a retail price of $42,500. AutoCorp will have profits of $3.125 million, and SUVmart will have profits of $1.563 million, for combined profits of $4.688 million.

This outcome, which is depicted in Figure 19.7, is inefficient. AutoCorp and SUVmart fail to maximize their joint profits. Both parties could be made better off by coordinating their prices and volume choices—we already have shown that they could earn up to $6.25 million—versus $4.688 million. In addition, with the double markups, consumers pay $42,500 for 125 Rhinos rather than $30,000 for 250.

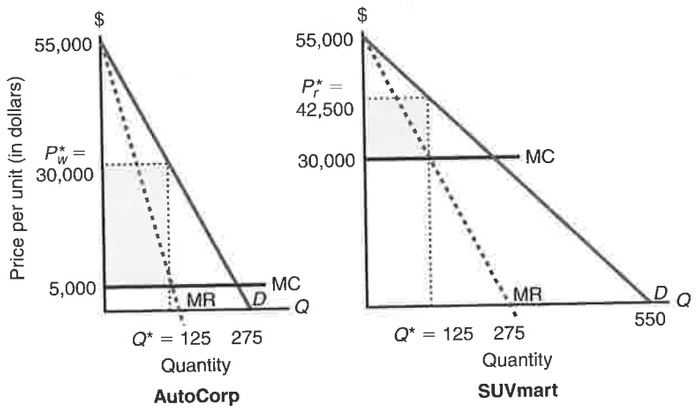
This problem does not automatically disappear if AutoCorp merges with SUVmart. We saw in Chapter 17 that exactly the same problem can arise within firms, when products are sold between two profit centers using internal transfer prices. As we discussed, the transfer-pricing problem can be reduced by appropriate organizational design. Our current focus is to look at how this problem might be reduced between two independent firms through specific contractual terms.

Two-Part Pricing

SUVmart will purchase 250 Rhinos if AutoCorp sets a wholesale price of $5,000. This quantity maximizes the joint profits of the two firms and results in a retail price of $30,000. The entire profits, however, go to SUVmart, since AutoCorp is selling the automobiles at cost. One solution is for AutoCorp to charge SUVmart an up-front franchise fee—thereby extracting its share of the profits through this fee—and then to sell automobiles to SUVmart at $5,000 each. Since SUVmart's purchasing decision is based on marginal cost, not total cost, it still will purchase 250 automobiles and set a retail price of $30,000. If AutoCorp charges SUVmart an up-front fee of $3.125 million for the exclusive rights to the Medford market area, the combined profits of $6.25 million are

Figure 19.7 Example of Double Markups

AutoCorp sets the wholesale price for its automobiles, while SUVmart selects the quantity to purchase and the retail price. SUVmart maximizes profits by setting the wholesale price equal to its marginal revenue. Thus, SUVmart's marginal revenue curve is AutoCorp's demand curve. AutoCorp maximizes profit by setting its marginal cost of \$5,000 equal to its marginal revenue. AutoCorp selects a wholesale price P_w^* of \$30,000, a \$25,000 markup above its marginal cost, whereas SUVmart selects a retail price P_r^* of \$42,500, a \$12,500 markup above its marginal cost. SUVmart sells 125 cars at this price. The combined profits are \$4.688 million. The two companies could earn combined profits of \$6.25 million if they cooperate and sell 250 automobiles to consumers at a price of \$30,000.



split evenly between the two companies. Once the fee is collected, AutoCorp might try to increase the wholesale price of the automobiles to increase its profits. Thus, for such a solution to work, AutoCorp must be able to commit credibly to sell automobiles to SUVmart at marginal cost.

Quotas

An alternative method for maximizing the combined profits is for the two companies to agree on a minimum purchase requirement. SUVmart could agree to purchase at least 250 automobiles at a prespecified wholesale price (above \$5,000). Given the details in this example, SUVmart will purchase exactly 250 automobiles and sell them at \$30,000 to retail customers. The level of the prespecified wholesale price determines the split of the profits between the two companies. A wholesale price of \$17,500 splits the profits evenly (each company nets \$12,500). AutoCorp must be able to commit credibly to the wholesale price, and SUVmart must purchase the agreed-upon quota.

Regulatory Issues

Some regulators and scholars are suspicious of contract terms such as exclusive territories that potentially limit competition. Nonetheless, most nonprice contract terms are not *per se* illegal (always illegal) under federal antitrust law. They are judged on a *rule of reason*, where the court attempts to consider the benefits of the terms (such as increased

sales efforts) against potential anticompetitive effects. In some states, automobile dealers and franchisees have successfully lobbied their legislators to limit the control that central companies impose—for example, in setting quotas and terminating contracts. In addition, federal law restricts central companies from directly controlling the pricing by distributors at the retail level. A detailed treatment of these regulatory issues is beyond the scope of this book.[26] Suffice it to say that it usually is important for firms to engage expert legal counsel to advise in designing supply and distribution contracts.

Recent Trends in Outsourcing

The 1990s have witnessed a huge expansion in outsourcing by major companies. At least four factors have contributed to this trend. First, new flexible production technologies allow suppliers to adapt more easily to customer demands. Thus, in some cases, assets are becoming less firm-specific—a technological innovation that favors contracting over vertical integration. Second, improvements in information and communications technology make it easier to identify potential partners and to communicate with them after an agreement is reached. Electronic data interchange allows firms to connect their computers to each other. These computers can automatically order inventory directly from a supplier with little human intervention. Third, there has been a dramatic increase in worldwide competition. This competition has placed greater pressure on firms to reduce costs and increase efficiency. Some scholars argue that many American firms were "flush with cash" in the 1960s and 1970s and were more likely to waste this cash through such actions as engaging in too much integration.[27] Some recent outsourcing decisions thus might be corrections for poor investment decisions of the past. Fourth, during the early 1990s, there was a worldwide recession, which caused excess capacity in many industries. In this environment, firms often could obtain large discounts from external vendors. (This effect should be more cyclical than permanent.)

Many recent outsourcing decisions do not move firms from internal production to the other end of the spectrum (spot market transactions). Rather, the movement has been to an intermediate arrangement—long-term contracting. Many firms also have moved away from acquiring inputs in the spot market. To improve quality and lower unit costs, firms such as General Motors and Xerox have cut their number of suppliers dramatically and correspondingly have increased the number of long-term partnerships with independent firms. Thus, those trends can be viewed as movements from each end of the spectrum toward the middle.

Technological changes, such as just-in-time production methods, electronic data interchanges, and total quality manufacturing, require close links between manufacturers, suppliers, and distributors. Rather than inspecting parts and materials from numerous suppliers on delivery, a few suppliers are selected and their production processes are certified as meeting high-quality standards. Thus, although the various activities in the manufacturing/distribution process are conducted by different firms, it is important that these firms remain closely linked. In such cases, these factors make spot market transactions undesirable.

[26] For a more detailed treatment of these issues, see R. Posner (1976), *Antitrust Law* (University of Chicago Press: Chicago); and D. Carlton and J. Perloff (1990).

[27] M. Jensen (1986), "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers," *American Economic Review* 76, 323–329.

CASE STUDY: *AutoCorp*

AutoCorp produces automobiles. It has asked the Amalgamated Fabric Company to consider a proposal to become a supplier of automobile seats. Under the proposal, Amalgamated Fabric would construct a $20 million plant near one of AutoCorp's production facilities. AutoCorp would purchase 100,000 car seats per year at a price of $280 per seat for 15 years—the useful life of the plant. (The actual proposal contains an adjustment for inflation. Ignore this complication in the analysis.)

Amalgamated Fabric's financial analysts have examined the proposal. It appears to be a profitable opportunity. The amortized cost of the plant is $2.6 million per year (at a discount rate of 10 percent). The annual costs are $25.4 million per year. Therefore, the average total cost is $280 per seat—ATC = ($25.4 million + $2.6 million)/100,000 = $280. The financial analysts have examined AutoCorp's financial outlook. Although it has not been highly profitable in all years, there is essentially no probability of bankruptcy over the next 15 years. Since the proposed price covers the cost, the financial analysts think that the proposal should be accepted. (It breaks even with a fair rate of return on invested capital of 10 percent.)

You have been asked to analyze the contract proposal. You have seen the financial analysis and think the cost estimates are reasonable. You are aware that, due to its location, the proposed plant has no alternative use other than supplying seats to AutoCorp. The salvage value of the plant, in the event of liquidation, is $2 million.

Discussion Questions

1. One concern you have is that AutoCorp might try to lower the effective purchase price of the seats after the plant is built (by reneging on the contract or demanding higher-quality seats for the same price). Once the plant is built, how much can the purchase price fall before Amalgamated Fabric liquidates the plant?
2. What factors would you consider to decide whether opportunistic behavior by AutoCorp is a likely possibility?
3. Does AutoCorp have to worry about any opportunistic actions by Amalgamated Fabric?
4. What factors might make it difficult to write a contract that would limit opportunistic behavior by both companies?
5. What are the costs and benefits of AutoCorp vertically integrating and supplying its own automobile seats?
6. What are the costs and benefits of having AutoCorp construct the plant and letting Amalgamated Fabric operate it on a contractual basis?

Summary

When a firm participates in more than one successive stage of the production or distribution of a product or service, it is said to be *vertically integrated.* Firms change their degree of integration over time. An organization that begins to produce its own inputs is engaging in *backward* or *upstream* integration, whereas an organization that begins to market its own goods or to conduct additional finishing work is engaging in *forward* or *downstream* integration. The term *outsourcing* frequently is used to describe a movement away from vertical integration—moving an activity outside the firm that formerly was done within the firm. The term *outsourcing* also is used to describe an ongoing arrangement where a firm obtains a part or service from an external firm. It is useful to think of the outsourcing decision as a choice along a continuum of possibilities, ranging from spot market transactions to vertical integration with an array of long-term contracts in between.

Well-functioning markets provide powerful incentives for efficient production and low prices; thus, firms acquire many goods and services through market transactions.

Economists have identified at least three primary reasons why a firm might want to engage in nonmarket procurement: *contracting costs, market power,* and *taxes/regulation.* Four factors can make the contracting costs of nonmarket procurement lower than the costs of market exchange. These factors include firm-specific assets, costs of measuring quality, externalities, and coordination problems.

Firm-specific assets are assets that are substantially more valuable in their current use than in their next best alternative use. Investment in firm-specific assets can cause enormous problems between suppliers and buyers and is a primary reason for nonmarket transactions. Once the investment in firm-specific assets is made, there is a *sunk cost*—the supplier has incentives to continue the relationship as long as the variable costs are covered—even if total costs are not. This incentive subjects the supplier to a potential *holdup problem.* The buyer also can be held up by the supplier. One way of reducing these problems is to integrate vertically. The other method is to negotiate a detailed contract that spells out the rights and responsibilities of each party.

Due to contracting costs, most contracts are *incomplete:* Many contingencies are unspecified and subject to future negotiation. The prospect of future negotiations can motivate suboptimal investment in both capital and effort. Parties to the contract realize that part of the gains from their investments are likely to go to other parties: They are not protected by a complete contract.

The owner has the right to determine the *residual use* of an asset—any use that does not conflict with prior contract, custom, or law. Residual rights give an individual increased ability to capture the gains from an investment and thus can provide investment incentives. Vertical integration and long-term contracts differ in their assignment of ownership rights. Vertical integration keeps the ownership rights for the relevant assets within one firm, whereas long-term contracting apportions them between firms. The choice between vertical integration and long-term contracts depends, at least in part, on which ownership structure creates more productive investment decisions.

A primary prediction of the economics literature is that as an asset becomes more firm-specific, the firm is more likely to choose vertical integration over long-term contracting. The analysis suggests that firms will enter long-term contracts when the desired investment is relatively firm-specific and where the environment is relatively stable and predictable (in stable environments, the range of possible circumstances to cover is more limited and negotiating more complete contracts is less costly). Conversely, if the firm faces a more uncertain environment and large investments in firm-specific assets, vertical integration is more likely to be the preferred alternative. Finally, if the investment in firm-specific assets is relatively low (the assets are unspecialized) or the lives of the assets relatively short, the firm can either enter into short-term contracts with suppliers or rely on spot market transactions.

Independent distributors can have incentives to *free-ride* on a brand name. One method to reduce this problem is vertical integration. Another method is to use contracts with specific provisions that control free-rider problems. Two types of contract terms that specifically address this concern are *advertising provisions* and *exclusive territories.* Exclusive territories help internalize free-rider problems, but they create another problem—*double markups.* This problem (which is analogous to the transfer-pricing problem examined in Chapter 17) can be reduced through *two-part pricing* or *quotas.*

At least four factors have contributed to the recent trend in outsourcing—increased worldwide competition, the development of less firm-specific production technologies, improvements in information and communication technologies, and excess capacity from a worldwide recession. The recent trend, however, is not from vertical integration to spot market transactions. It is a movement from both ends of the spectrum toward an

intermediate solution of some form of long-term contracting. Technological changes, such as just-in-time production methods, electronic data interchanges, and total quality management, require closer links between manufacturers, suppliers, and distributors. These changes reduce the desirability of spot market transactions in many cases.

Appendix

Ownership Rights and Investment Incentives[28]

This appendix provides a more detailed example of how ownership rights can affect investment incentives (in this case, investments in effort). Through this example, some of the important trade-offs between vertical integration and long-term contracts become more evident.

Basic Problem

The AGT Company manufactures computer modems. The company is owned by Valentina Vezzali. The Custom Circuit Company makes circuit boards for AGT. AGT is Custom's only customer, and Custom is AGT's sole supplier of circuit boards. The boards are tailor-made for AGT and cannot be used by other manufacturers (the boards are firm-specific). Custom Circuit is owned by Phillipe Daurelle.

AGT might want to make future design changes in its circuit boards. For simplicity, suppose that the future benefit of a design change to AGT can take only two values, 20 or 40, whereas the costs to Custom of making the change can be either 10 or 30. The likelihood of a high benefit and a low cost is influenced by both Tina's and Phil's efforts. Let x equal the probability that the benefit is 40. Tina can affect this probability through her efforts—in fact, we assume that Tina's efforts completely determine x. For instance, by working with customers, she can determine the best design change to make. She also can spend time marketing the revised product. These types of activities increase the probability that the benefits from the design change will be large. However, the personal cost to Tina of exerting effort is $10x^2$. As an example, if Tina exerts enough effort so that x is 0.5, she incurs a personal cost of $10(0.5)^2 = 2.5$. Similarly, Phil's actions completely determine y, the probability that the cost equals 10, at a personal cost of $10y^2$. For instance, Phil can exert effort on developing more cost-effective ways to manufacture the new circuit boards.

Neither Tina's nor Phil's effort choices are observable by the other party. Tina does not know y and Phil does not know x. Although both Tina and Phil ultimately can observe the realized costs and benefits of the design change, they cannot be verified by a third party. Thus, neither effort, costs, nor benefits are contractible; it is not possible to provide either party with incentives through a contract tied to realized costs or benefits of the design change.

Ideal Effort Choices

Value is created by a design change whenever the benefits of the change exceed the costs. The only time that the design change does not create value is when the benefits are 20 and the costs are 30. Both Tina and Phil are risk-neutral. It is in their joint interests to choose effort levels that maximize expected surplus. By maximizing the size of the pie,

[28]This appendix uses elementary probability theory and calculus. This section draws on B. Holmstrom and J. Tirole (1989), "Theory of the Firm," in R. Schmalensee (Ed.), *Handbook of Industrial Organization,* Volume 1 (North Holland: Amsterdam), 69–72.

there is more value to share and both parties can be made better off. Ideally, the joint expected surplus S_J for the two companies is

$$\begin{aligned} S_J &= (40-10)xy + (40-30)x(1-y) + (20-10)(1-x)y - 10x^2 - 10y^2 \\ &= 30xy + 10x(1-y) + 10(1-x)y - 10x^2 - 10y^2 \\ &= 10xy + 10x + 10y - 10x^2 - 10y^2 \end{aligned} \tag{19.5}$$

This equation is maximized by choosing effort levels of $y = x = 1$.[29] The joint expected surplus net of effort costs is 10.

Actual Effort Choices under the Contract

The specific contract between AGT and Custom requires that a design change be approved by both companies. Since Tina and Phil have equal bargaining power, they anticipate splitting the surplus that is available from any future design change. For instance, if the benefits are 40 and the costs are 10, the total surplus is 30. A price for the circuit boards of 25 splits the gains: Tina gains $40 - 25 = 15$ and Phil gains $25 - 10 = 15$.

Tina and Phil *choose their effort levels privately* (the effort choices cannot be observed by the other person). Each person chooses an effort level that maximizes his or her own surplus, given the anticipated effort choice of the other party. As we shall see, both parties choose effort levels below the values that maximize the joint surplus. The low effort choices result from the standard free-rider problem. Tina and Phil bear the total costs of their personal efforts but receive only half the benefits.

Consider Tina's problem. Her expected surplus S_T is

$$\begin{aligned} S_T &= .5(40-10)x\bar{y} + .5(40-30)x(1-\bar{y}) + .5(20-10)(1-x)\bar{y} - 10x^2 \\ &= 15x\bar{y} + 5x(1-\bar{y}) + 5(1-x)\bar{y} - 10x^2 \\ &= 5x\bar{y} + 5x + 5 - 10x^2 \end{aligned} \tag{19.6}$$

where $\bar{y}$ is the effort level that she expects Phil to exert.[30] Taking the partial derivative with respect to x and setting it equal to zero,

$$\partial S_T/\partial x = 5\bar{y} + 5 - 20x = 0 \tag{19.7}$$

Phil's first-order condition is, similarly,

$$\partial S_P/\partial y = 5\bar{x} + 5 - 20y = 0 \tag{19.8}$$

In a Nash equilibrium, both Phil's and Tina's first-order condition will be met and the effort choices will be $x = 1/3$ and $y = 1/3$ (at these values, neither party has the incentive to alter his or her choice). The total surplus, net of effort costs, is 5.6 [substitute $y = x = 1/3$ into Equation (19.5)].

Vertical Integration

One way to change effort incentives is for the two firms to integrate vertically, either by having AGT buy Custom or by having Custom buy AGT. Consider the case where Tina purchases Custom from Phil and hires him as an employee to manage AGT's "Custom

[29]Technical note: The first three terms in Equation (19.5) are the three possible outcomes of positive surplus multiplied by the probability of the outcome. The last two terms are the effort costs. Note: If the benefits are 20 and the costs are 30, the design change is not implemented; the term $(0)(1-x)(1-y)$ drops out of Equation (19.5). The first-order conditions are $10 + 10y - 20x = 0$ and $10 + 10x - 20y = 0$. The solution is $x = y = 1$.

[30]She bears the full cost of her effort, $10x^2$, but receives only half the benefits.

Circuit Division." Ownership gives Tina the decision rights to implement the design change without Phil's approval (she has the *residual use rights*). Since Phil has no bargaining power, all the surplus goes to Tina. Phil has no incentives to exert effort on increasing the likelihood of a low production cost: He bears all the costs for his personal effort and reaps none of the benefits. (Recall that we have ruled out incentive contracts tied to realized costs or benefits of design changes.) Given $y = 0$, the cost of implementing the design change is 30 for certain. Tina's benefits from investing are

$$(40 - 30)x - 10x^2 \tag{19.9}$$

Tina will choose $x = 1/2$. The total surplus, net of investment costs, is 2.5.[31] The case where Custom buys AGT is symmetrical, Phil invests $y = 1/2$, and total net surplus is 2.5.[32] Clearly, vertical integration is not superior to a long-term contract.

Optimal Organizational Choice

When Tina and Phil negotiate the sale of either company, they can share the expected surplus in any manner by negotiating the appropriate purchase price. They have incentives to choose the ownership structure that maximizes the expected net surplus. Given the numbers in this example, they will choose not to combine the two companies. Separate ownership creates more value than integration.

This example illustrates that ownership structure can matter because it affects investment incentives. (In this case, investments in effort.) Ownership gives individuals increased power to capture the fruits of their efforts (see Chapter 10) and thus can provide important incentives. In this example, separate ownership is better than integration because both parties' investments are important. It is better to provide moderate incentives to both Phil and Tina than strong incentives to only one party. It is easy to envision cases where integration will be the preferred alternative. For instance, suppose that Tina can exert effort to affect the benefits of the design change, but Phil has little control over the costs. Here, it would make sense for AGT to own Custom. This ownership structure provides strong incentives for Tina to exert effort and weak incentives for Phil. These incentives are optimal, since only Tina's effort matters. Conversely, it makes sense for Custom to own AGT when Phil's effort is substantially more important than Tina's.

In this example, we have ruled out the possibility that effort can be motivated by incentive compensation (making payments based on the realized costs and benefits). We made this extreme assumption specifically to isolate the important incentive effects of ownership. More generally, owners can motivate internal employees through incentive compensation. For instance, if AGT purchased Custom, Tina might be able to pay Phil in a manner that would encourage him to exert some effort to reduce costs. Similarly, in the separate ownership case, AGT and Custom might be able to include incentive clauses in the contract that would encourage investment (for instance, Custom might receive extra revenue from AGT if it can produce the new design at low cost). As we discussed in Chapters 15 through 17, incentive schemes and performance evaluation are not costless activities. In a more detailed analysis, AGT and Custom would have to compare the value that could be created using an optimal supply contract without integration to the value that could be created using optimal incentive compensation contracts

[31]Tina's first-order condition is $10 - 20x = 0$. The solution is $x = 1/2$. The total surplus is found by substituting $x = 1/2$ and $y = 0$ into Equation (19.6).

[32]This symmetry is a result of the cost and benefit functions in our example. More generally, it can matter who buys whom.

under integration. The basic point of our analysis continues to hold—*ownership structure matters because it can affect investment incentives.*

Appendix Problems

1. Insurance companies contract with independent agents to sell policies and provide ongoing services to customers. Ongoing client services tend to be more important in auto insurance companies than life insurance companies. In some insurance companies, the agents "own" the client list. If they stop representing the firm, they can take the clients with them to a new company. In other cases, the insurance company owns the list. The agent is not allowed to take clients to another company. (There is a formal contract with this provision.) Do you think life insurance companies or auto insurance companies are more likely to employ independent agents who own their client lists? Explain.
2. In explaining a decision to purchase an independent R&D laboratory, an executive of the acquiring company said,

   We felt we had to purchase the company to give us patent rights on any important discoveries. Without these rights, we would have few incentives to invest in the marketing and distribution systems that are necessary to support the discoveries.

   Evaluate this logic.

Suggested Readings

D. Carlton and J. Perloff (1999), *Modern Industrial Organization,* 3rd edition (HarperCollins: New York), Chapter 16.

O. Hart (1995), *Firms, Contracts, and Financial Structure* (Oxford Press: Oxford, UK).

B. Klein, R. Crawford, and A. Alchian (1978), "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law & Economics* 24, 297–326.

P. Rubin (1990), *Managing Business Transactions* (Free Press: New York).

O. Williamson (1985), *The Economic Institutions of Capitalism* (Free Press: New York).

Review Questions

19–1. Discuss the pros and cons of the policy described in the following quote from *Fortune:*[33]

According to the new thinking, any kind of work to which a company can't bring a special set of skills should be spun off, outsourced or eliminated. Thus AT&T, GE, IBM, and Shell Oil are in the process of spinning off legal, public relations, billing, payroll, and other services. What's left, whether it's a $100 million corporation or a $100 billion corporation, is the ideal size. . . . For example, if marketing is a competitive advantage in an industry, then it should build up its marketing muscle and employ outside suppliers and service firms to do everything else.

19–2. The Black Diamond Company mines coal. It would like to build a processing plant right next to its major mine. The location of this mine is relatively remote and is not near other coal mines. Tax considerations, as well as government regulations, dictate that the processing plant be owned and operated by some independent company (other than Black Diamond). Your company, the Greg Norman Coal Company, is considering building and operating the plant for Black Diamond on a contract basis. Your job is to negotiate the contract with Black Diamond. Discuss the terms that you will try to get Black Diamond to agree to in the contract. Explain why these terms are important to you.

[33]B. Dumaine and J. Labate (1992), "Is Big Still Good?" *Fortune* (April 20), 50.

19–3. Evaluate the following quote:

The major advantage to outsourcing is that it reduces a company's capital costs, freeing the company to use scarce capital for other purposes.

19–4. Assume that Ford Motor Company can produce an automobile at a constant marginal cost of $4,000. The demand for the car in the Rochester area is $P = 60{,}000 - 100Q$.

a. What is the profit-maximizing price and quantity? What are the profits from this activity?

b. Now suppose that Ford sells its cars through an independent distributor, Rochester Autos, which has the exclusive right to sell new Fords in the Rochester area. Under the contract, Ford sets the wholesale price, and Rochester Motors selects the quantity to purchase and the retail price. The only cost facing Rochester Motors is the wholesale price of the car. Ford and Rochester Autos both strive to maximize their own profits. What are (1) the wholesale price, (2) the retail price, (3) the quantity sold, and (4) the combined profits of Ford and Rochester Autos?

c. Describe how Ford might use a two-part pricing scheme to eliminate this successive monopoly problem with Rochester Motors. (No calculations are necessary.)

19–5. BioChem has a patent on a chemical product that is used as a key input in producing farm and home agricultural fertilizer. Currently, BioChem produces the product and sells it to companies who manufacture the final products for the farm and home users. BioChem faces the following demand curves from the farm and home market segments:

$$\text{Farm:} \quad P = 300 - 10Q$$

$$\text{Home:} \quad P = 100 - 5Q$$

BioChem can produce the product at a constant marginal cost of $1. Calculate the optimal prices that BioChem would like to charge in each market segment to maximize profits. Discuss how vertical integration might be used to accomplish this pricing policy. Be sure to indicate the market into which BioChem should vertically integrate (assume they can integrate only into one). Explain why you chose this market.

19–6. In explaining the recent acquisition of a supplier, an executive made the following argument: "We purchased the supplier so that we could keep the profit rather than pay it to some other firm." Evaluate this argument.

19–7. Cable television companies lay cables to individual households in the communities they serve to carry the television signal. How specific is this investment? What kind of arrangements would you expect the cable companies to make with local communities about the pricing and taxation of cable services? Explain.

19–18. The Hidden Fence Company sells invisible electric fences to contain dogs within yards. For a half-acre lot, the cost is $2,000 for the system and installation. The market for invisible dog fencing is competitive: Several companies sell similar products at about the same price. In each case, the dog wears a battery-powered collar. The collar give the dog a shock if it gets near the boundary of the property. Hidden Fence uses a specially designed collar that uses batteries made specifically for Hidden Fence by the Battery-O-Vac Company. The batteries last for 3 months and cost $25 apiece. Hidden Fence has a patent on these batteries, and there are no alternative sources of supply. Other fence companies produce products that use generic batteries. Currently, the battery costs of these other systems are the same as for Hidden Fence.

a. Suppose that you purchase the system from Hidden Fence. After you purchase the system, how much will Hidden Fence be able to raise the price of its batteries before you discontinue use of the system and buy a different system from another company? (Suppose that you do want to maintain an invisible fence.) For this question, assume a 10 percent annual discount rate, no inflation, and an infinite life for the invisible fence, yourself, and the patent for the batteries.

b. As the manager of Hidden Fence Company, what might you do to convince a worried prospective customer that opportunistic behavior with respect to battery prices is not a likely occurrence?

19–9. Major oil companies use a dual distribution system for gasoline. Some stations are *direct-serve,* where the oil company delivers gasoline to the station. Other stations are served by distributors. Distributors are independent businesspeople who buy gas from the oil company and sell it to stations. Distributors also own their own stations. The land, tanks, and equipment at the direct-serve stations are owned by the oil company and leased to the dealer (franchisee). The dealer buys gas from the oil company and pays rent for the land. The dealer keeps the profits from the station over the life of the lease. (Some direct-serve stations are centrally owned by the oil company. At these locations, the oil company hires a manager to operate the station.) At direct-serve stations, the oil company is responsible for environmental cleanup, local advertising, monitoring of the station (to protect the brand name), and so on. The distributors are responsible for these activities at the stations they serve. Typically the oil company sells gas to distributors at about 7 cents less per gallon than it sells gas to dealers at its direct-serve stations.

a. Oil companies do not allow dealers (franchisees) to buy gas from distributors. Dealers must buy gas from the central oil company. Dealers often complain that this is unfair. The practice has been the subject of antitrust lawsuits. Oil company executives argue that this policy is important because it limits *free-riding* on the part of the distributors. Explain the executives' arguments in more detail.

b. Suppose the courts ruled that the oil companies must allow the dealers to buy gas from distributors. What effects do you think such a ruling would have on the operational policies of the oil companies?

c. Some direct-serve gasoline stations provide repair services, and others concentrate almost exclusively on self-service gasoline sales. Which type of station is more likely owned by the central oil company and which type is more likely to be franchised? Explain.

d. Typically the stations served (and owned) by distributors are located in rural areas, whereas the direct-serve stations are located in urban areas. Give two economic reasons to explain why you might expect such a pattern.

19–10. Advanced Interconnect Manufacturing Inc. (AIM) is an independent company. It is located in the Elmgrove plant at Kodak. It was formerly owned by Kodak, but was purchased by five managers (with the help of outside investors). AIM assembles wire harnesses for use in machines such as copiers and x-ray machines. The vice president of the company claims that the company is more efficient because "as an independent company, AIM doesn't have to share any of Kodak's corporate overhead." As he notes, "Kodak's CEO doesn't get paid by us."

a. Evaluate the vice president's explanation for the increased efficiency of AIM since the ownership was changed.

b. Give an alternative explanation for the increased efficiency.

19–11. Jimmy's Stereo Company manufactures stereo equipment. Its business strategy is to provide retail customers with high-quality equipment, along with good service and warranty protection. It currently distributes its products through licensed dealers who have exclusive territories. Discuss (1) why Jimmy's might offer its distributors exclusive territories, (2) the potential problems that this policy might create in terms of retail pricing, and (3) potential policies that Jimmy's might use to address this pricing problem.

19–12. BQT Manufacturing produces electric lamps. To produce these lamps, BQT must either make or acquire bases for the lamps. Currently, the company outsources the production of the bases for their lamps to the ACE Lamp Company. BQT maintains ownership of the machinery that is used to produce the bases. ACE uses BQT's machines at plants owned by ACE.

a. Why do you think BQT is subcontracting the production of the bases?

b. Why do you think BQT maintains ownership of the production equipment?

c. What problems might be caused by BQT's maintaining ownership of the production equipment?

d. What might BQT do to reduce the magnitude of these problems?

19–13. Most of the McDonald's restaurants in the Rochester area are owned by one individual. Discuss why this ownership pattern makes economic sense.

19–14. You are at a cocktail party, where you meet the CEO of a pharmaceutical company who has been thinking recently about her overseas distributors who have exclusive sales territories. She can't quite figure out what is troubling her, but she is dissatisfied with these distributors. You describe the "double markup" problem. The CEO's eyes light up. "You are exactly right," she says. "The distributors are setting prices for our product that are too high." A year passes. You meet the CEO at another party. She heads straight for you and says,

> *You were wrong. There was no double markup problem. After our talk a year ago, I terminated the contracts with all our overseas distributors. I sent our own people overseas to set up in-house distributors. To motivate the region managers I tied a big part of their compensation to the profitability of their regions. I was sure I would see a big change, but overseas prices are just about the same as they were when we used exclusive distributors. I guess prices weren't that bad with the distributors.*

Do you think the CEO's conclusions are correct? Why or why not?

19–15. The Boswell Medical Center is the only hospital in a rural community. It requires significant janitorial services to clean its buildings and equipment. It also requires a relatively large lab for conducting tests of various types (for example, MRIs, blood tests, and ultrasound tests). Do you think that Boswell is more likely to outsource its janitorial services or lab work? Explain.

19–16. The Hanson Clinic is a well-regarded medical center located in a semirural area in the Midwest. One of its specialty areas is treating rare forms of cancer. To support this activity Hanson wants to construct a new lab. The lab will require very specialized equipment, a specially designed building, and a skilled staff. The estimated cost of the equipment and building is $50 million.

The clinic is considering three possible organizational arrangements. The first is vertical integration. The second is outsourcing (where another company constructs the building, purchases the equipment, and provides contractual services to the clinic). The third is for the clinic to purchase the equipment and building, and lease them to an independent operator (who would provide contractual services to the clinic).

Discuss the pluses and minuses of each of the three alternative structures. What factors do you think are most important in making this choice?

19–17. Koji Incorporated produces high-end cameras. Its typical camera comes with an array of options. The company has a good brand name.

- **a.** Koji distributes its cameras through independent dealers who are given exclusive distribution rights for their respective market areas. Discuss why it might make economic sense for Koji to grant its distributors exclusive territories.
- **b.** Since Koji adopted this distribution system, it has experienced a double markup problem. What is a double markup problem?
- **c.** Discuss how Koji might use a two-part pricing scheme to reduce the double markup problem. (Be sure to specify what the two-part pricing scheme would entail.)
- **d.** Describe one other method that Koji might use to address the double markup problem.

Leadership: Motivating Change within Organizations

CHAPTER 20

CHAPTER OUTLINE

In 1982, David Kearns was appointed CEO of Xerox Corporation, the leading producer of copy machines in the world.[1] At that time, the company faced serious problems. Between 1976 and 1982, Xerox's share of installations of new copiers in the United States dropped from about 80 percent to 13 percent. Japanese companies—Canon, Minolta, Ricoh, and Sharp—had become major players in this

[1]Details of this example are from D. Kearns and D. Nadler (1992), *Prophets in the Dark* (Harper Business Press: New York).

market. These companies were selling copiers at prices that at times were lower than Xerox's costs for producing competing machines.

A major reason for Xerox's decline in market share was poor product quality. As Kearns put it,

> *Our customer cancellations were rapidly on the rise, our response to the problem was to try to outrun them by pushing hard to get enough new orders to offset the customers we had lost. Customers were fed up with our copiers breaking down and our service response.*

Kearns reasoned that if something was not done, "Xerox was destined to have a fire sale and close down by 1990. [The] only hope for survival was to urgently commit the company to vastly improving the quality of its products and services."

According to Kearns, most Xerox employees understood neither the extraordinary gravity of the problem nor the fundamental importance of improving product quality. He realized that even as CEO, he could not implement his vision of increasing product quality simply by ordering thousands of employees to focus more on quality. First, employees did not necessarily possess all the skills required to produce quality products. Second, unless employees were convinced that it was in their individual interests to focus more on quality, it would be difficult to motivate them to alter their behavior. Certainly, Kearns did not have the time to monitor each employee to see if his vision was being implemented. Third, Kearns faced a difficult balancing act; he feared that painting too dismal a picture would induce some key people to leave the company.

In response to these concerns, Kearns initiated a strategy to shift corporate direction. He realized that many Xerox employees would oppose the kind of dramatic change he envisioned. They might fear for their jobs, worry about changes in job assignments, or be concerned about having to relocate. Kearns began by convincing a select group of key executives that additional focus on quality was essential. These individuals helped refine this quality vision and convince other employees of the potential benefits of this change in focus. Employees throughout the company received substantial training in quality techniques. The importance of quality was emphasized at every opportunity—media releases, management speeches, signs on bulletin boards, and so forth. In addition, they stressed the potential crisis posed by the Japanese successes.

Yet after much training and promotion, the desired change in culture simply was not occurring. It was then that Kearns realized that to affect employee behavior, senior management had to do more than just exhort, cajole, and plead—the performance-evaluation and incentive systems also had to change. As Kearns says,

> *Unless people get rewarded and punished for how they behave, no one will really believe that this is anything more than lip service. A widespread problem [with implementing change] that was singled out was that people said we were still promoting and rewarding employees who weren't true believers and users of the quality process. This was creating noise in the system and sending mixed signals. It had to stop.*

Kearns thereafter initiated changes in the criteria for promotions and compensation decisions, placing major emphasis on customer satisfaction and quality. Eventually, the culture at Xerox did change. In 1989, Xerox won the Malcolm Baldrige National Quality Award.

This example suggests that effective leadership involves a great deal more than just developing an appropriate vision for the company. It is critical to motivate people to implement that vision. Changes in a firm's organizational architecture—the assignment of decision rights, reward system, and performance-evaluation system—can play an important role in motivating material organizational change. Marketing the concept to other employees also is important.

The framework developed in this book provides insights for more effective leadership—both structuring an appropriate architecture as well as implementing new ideas. Rudolph Giuliani stresses that an important responsibility of a leader is to impose a structure suitable to an organization's purpose.[2] This was our focus in Part 3. In this chapter, we concentrate on how effective leaders implement new ideas, which might include a new organizational architecture. The insights in this chapter thus are useful not only for executives at the top of the organization, but also for employees who have the opportunity to assume various leadership roles and want to have their ideas implemented. Our leadership discussion presents an important example of how this book's framework can be used to provide a structured analysis of this popular (though ill-understood) topic.

We begin by discussing the concept of leadership in more detail. Next, we discuss decision making within firms and present a framework for understanding attitudes toward change within organizations. We use this framework to analyze various strategies for motivating employees to endorse proposals for change. These strategies include changing the organizational architecture, analyzing the strategic design of the proposal, and marketing the proposal. In the final sections of the chapter, we provide an analysis of the sources of individual power within an organization and a brief discussion of the use of symbols—role modeling, formal creeds, stories, and legends—in leadership. In the appendix, we present a simple example of the strategic value of commitment and crisis.

Leadership

Webster's defines *leadership* as "leading others along a way, guiding." This definition suggests that there are at least two important characteristics of good leadership. First, the leader must help the organization choose the right path—vision, goal, or plan. Second, the leader must help motivate people to follow it. Much of the popular literature on leadership stresses these two characteristics. To quote John Gardner, "The two tasks at the heart of the popular notion of leadership are goal setting and motivating."[3] Since these tasks are performed by people throughout the organization, leadership is in no sense the exclusive domain of senior executives. Throughout the firm, many employees assume important leadership roles.

Vision Setting

By vision, we simply mean a course of action for the firm.[4] Sometimes leaders devise a corporate vision by themselves. According to Kearns, he was among the first people to envision Xerox as a quality-based organization. But senior executives normally do not have all the relevant specific knowledge and cannot be expected to conceive important

[2] R. Giuliani with K. Kurson (2002), *Leadership* (Hyperion: New York).

[3] J. Gardner (1990), *On Leadership* (Free Press: New York), 11.

[4] The management literature differentiates among the terms *vision, strategies,* and *plans.* Visions represent goals and objectives, whereas strategies and plans relate to how to achieve them. For our purpose, this differentiation is unimportant. We are interested in any type of proposal that implies change for the organization. We use the term *vision* as a catchall for these proposals.

Vision Setting: Lessons from the Enterprise

In my experience, the best-run companies have a basic philosophy that the people in the company know and understand. Sometimes this philosophy is formalized in a mission statement. Here is the best mission statement I have ever heard:

> These are the voyages of the Starship Enterprise. Her 5-year mission: To explore strange new worlds, to seek out new life and new civilizations, to boldly go where no one has gone before.

Crew members of the Starship *Enterprise* know exactly what they are supposed to do. Suppose you are the dumbest person on the ship. And suppose you encountered a strange new world. What should you do? Explore it, perhaps. There is even an emotion telling you how you should go about exploring it: Boldly.

What if your company encounters a strange new opportunity? Without a basic philosophy, even a business's smartest employees have to improvise when they meet a new or challenging situation. We could do worse than rewriting the Star Trek mission statement for whatever venture we are on. Make the language exact, the goal specific, and even your worst employee will make you proud.

Source: D. Marinaccio (1994), *All I Really Need to Know I Learned from Watching Star Trek* (Crown Publishers: New York).

visions entirely by themselves. In many cases, a vision emanates from a lower-level employee or even from a person outside the firm—for example, a consultant. Often, the information for formulating a vision has to be assembled by combining the knowledge of numerous individuals. Firms typically involve many employees in developing mission statements. One aspect of effective leadership involves structuring organizational architecture in a manner that motivates employees with the relevant specific knowledge to initiate value-enhancing proposals—to take part in vision setting. It is this view that has prompted much of the current literature on the role of managers in empowering employees to "unleash their untapped creativity."

Motivation

Although an appropriate vision is important, it cannot increase a firm's value unless it is implemented. Thus, the task of motivation is at least as important as the task of goal setting. It is often better to implement a pretty good plan than to identify yet fail to implement the perfect plan. Literature on leadership often emphasizes motivation skills:[5]

- *Leadership is the* process of persuasion *or example by which an individual induces a group to pursue objectives held by the leader or his or her followers.*
- *I define leadership as leaders* inducing *followers to act for certain goals that represent the values and the motivations—the wants and needs, the aspirations and expectations—of both leaders and followers.*
- *The one who knows the right thing but cannot achieve it fails because he is ineffectual. The great leader* needs . . . the capacity to achieve.

Some people argue that leaders motivate people to follow visions through personal charisma, style, and inspiration. Under this view, the bonds between leader and follower

[5]Emphases in the following quotes are ours. The quotes are taken, respectively, from Gardner (1990), 1; J. Burns (1978), *Leadership* (Harper & Row: New York), 19; and R. Nixon (1982), *Leaders* (Warner Books: New York), 5.

are more emotional than rational. Certainly, strong emotional ties sometimes motivate individuals to follow a leader's call to action. Leaders often cited as charismatic include Mahatma Gandhi, John F. Kennedy, and Martin Luther King, Jr. Charisma undoubtedly explains much of the behavior of individuals in particular settings (for example, in certain religious cults). Business managers might glean some valuable lessons from studying the styles of inspirational leaders, but for most people, charisma is difficult to learn.

Yet the economic framework suggests that other attributes of effective leadership can be learned. Economics stresses that people make choices that are in their own self-interest. They are more concerned about their own welfare (which can include concerns about family, community, and so on) than they are about the welfare of the owners of the company. In this sense, the problem of motivating employees to follow a proposed direction or course of action is just the standard incentive problem. Below, we discuss techniques that managers can use to address this problem.

Decision Making within Firms

Incentive Problems and Organizational Politics

Academic discussions often treat decision making as a purely intellectual exercise: Relevant alternatives are identified, analysis is conducted, and the best alternative is chosen. (Consider the standard treatment of capital budgeting in finance courses.) Implementation problems often are ignored. In this context, good leadership is equivalent to *initiating* good proposals and conducting careful analysis. Within most firms, the decision process is much more complicated than this simple characterization reflects. Although developing good proposals and conducting careful analysis are important, they are far from sufficient for effective leadership. Just because a proposal would enhance the value of the firm is no guarantee that it will be either *ratified* or *implemented*.[6] Due to incentive problems, decision making within firms often resembles decision making in *political settings* such as government. There are self-interested people involved in group decision making.[7] To quote Jeffrey Pfeffer,

> *Organizations, particularly large ones, are like governments in that they are fundamentally political entities. To understand them, one needs to understand organizational politics, just as to understand governments, one needs to understand government politics.*[8]

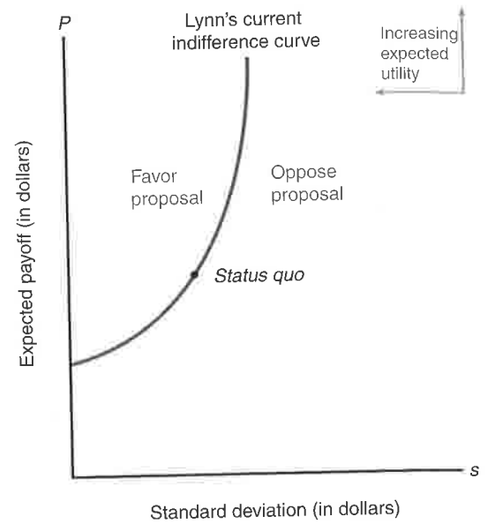
[6]Recall that four important steps in the decision-making process are initiation, ratification, implementation, and monitoring (see Chapter 12).

[7]As we have discussed in previous chapters, if there were no transaction costs, individuals in the group would agree unanimously on a course of action to maximize value. By maximizing the size of the pie, all of the individuals are made better off: Every individual's piece of the pie can be enlarged by the appropriate side payments. Transaction costs limit the likelihood of this outcome within large organizations. For example, suppose that laying off a group of workers will create value but that the labor union has the power to veto the layoff. With no transaction costs, the owners and labor will agree on the layoff. The owners share the increase in value by making appropriate severance payments to the workers. Both parties are better off. Bargaining costs often prevent this result from occurring (asymmetric information is a particular problem). In this case, the parties do not have a shared common interest in maximizing value. Similar to other political settings, conflicts arise as all parties try to increase their own share of the pie.

[8]J. Pfeffer (1992), *Managing with Power* (Harvard Business School: Boston), 8.

Figure 20.1 Framework for Understanding Attitudes toward Change

In this example, Lynn Vestergaard is a department manager at the BCT Corporation. Lynn is risk-averse. Her utility increases with her expected payoffs from the company and falls with the standard deviation of these payoffs. This figure displays her indifference curve associated with the *status quo* (assuming the company does not change its direction). Lynn will support proposals for change in the *favor proposal* region of the figure and be against proposals in the *oppose proposal* region.



Understanding Attitudes toward Change

To provide deeper insights into the decision-making process within firms, consider the problem facing Christian Seidler, a general manager at the BCT Corporation. Like David Kearns at Xerox, Chris is convinced that his division must adopt a quality-improvement program to remain competitive. He needs support from Claudia Kobatzki, the CEO, for ratification of the program and support from employees in his division for implementation. Chris does not think that the quality program will be a success unless he has the full support of his department managers. He also depends on these managers for advice, because they have important specific knowledge about whether his proposal is a good idea. If the managers were to oppose his proposal strongly, Chris would consider withdrawing it. We focus on Lynn Vestergaard, a department manager who reports to Chris.

Consider the proposal from Lynn's perspective. She is risk-averse and interested in maximizing her own utility, which increases with the expected payoffs that she receives from BCT, P_L, and falls with the standard deviation of these payoffs, s_L (see Chapter 2):

$$U_L = f(\overset{+}{P_L}, \overset{-}{s_L}) \tag{20.1}$$

Expected payoffs include both monetary and nonmonetary compensation from the company. For instance, Lynn gains utility from her salary, supervising a large number of employees, administering a large budget, and working in California. She will not support Chris's proposal simply because it increases the firm's value. It must increase her personal utility.

Figure 20.1 displays Lynn's expected payoff and standard deviation under the *status quo* (assuming the company does not adopt the proposed program). Also displayed is the indifference curve, which contains all combinations of expected payoffs and standard deviations that provide Lynn with the same utility as the *status quo*. (Recall that northwest

Henry Kissinger on Decision Making

Former Secretary of State Henry Kissinger offers the following observation about decision making:

> Before I served as a consultant to Kennedy, I had believed, like most academics, that the process of decision-making was largely intellectual and [that] all one had to do was to walk into the President's office and convince him of the correctness of one's view. This perspective I soon realized is as dangerously immature as it is widely held.

Source: H. Kissinger (1979), *The White House Years* (Little, Brown: Boston), 39.

movements in the graph are utility-increasing.) For Lynn to favor Chris's proposal over the *status quo*, she must view the proposal as placing her in the region of the graph labeled "favor proposal."

Lynn will oppose the proposal if it reduces her utility. For instance, if she thinks that the proposal will increase the likelihood that she will be laid off, she is likely to be against the change. Now Lynn is unlikely to come right out and say that because she fears for her job; she does not like the proposal. She is more likely to question his underlying analysis—even if she thinks it is right. She might waste time developing spurious evidence to convince people that the proposed program is unworkable. She might try to block the program by failing to do her part during implementation. If many employees in the firm undertake similar actions, the proposal will fail.

Chris cannot observe Lynn's personal preferences. But he can analyze how the proposal is likely to affect her and make an educated guess of how she will react. One important factor to consider is the existing organizational architecture. What decision rights does she have currently and how will she be affected by implementation of the proposal? How is she rewarded? If Lynn is paid a bonus based on divisional sales and the proposal is likely to reduce those sales, it is reasonable for Chris to assume that Lynn will oppose the proposal.

Suppose that Chris forecasts that Lynn will oppose the proposal. He might gain her support by employing one of three general tactics. First, he could change organizational architecture so that it is in Lynn's interest to support the proposal. Second, he could

Mismanaging Organizational Politics at Xerox

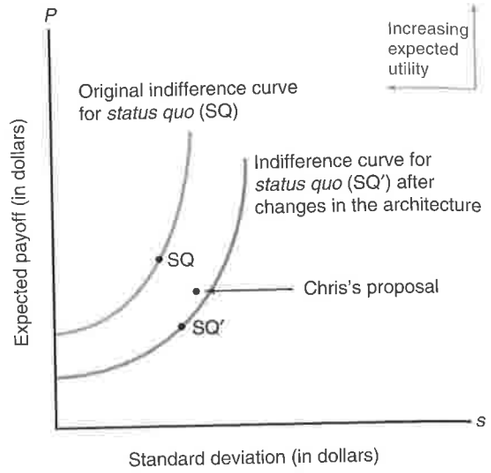
Good analysis is not enough to motivate the implementation of new ideas in an organization. Often, a concerted effort to gain the support of other employees is necessary. Xerox's Palo Alto Research Center (PARC) invented the first personal computer, the first graphics-oriented monitor, one of the first handheld computer mouses, the first word processing program for nonexpert users, the first local area communications network, the first object-oriented programming language, and the first laser printer. Xerox failed to capitalize commercially on this inventive technology. One reason was that PARC was physically removed from the rest of Xerox and apparently did not understand the importance of motivating other units in the firm (such as marketing) to support its technological visions. Employees at PARC were characterized as being arrogant and suffering from a "we/they attitude toward the rest of Xerox." In the words of Jeffrey Pfeffer,

> By not appreciating the interdependence involved in a new product launch and the skills required to manage that interdependence, PARC researchers lost out on their ambition to change the world of computing, and Xerox missed some important economic opportunities.

Source: J. Pfeffer (1992), *Managing with Power* (Harvard Business School: Boston), 38–39.

Figure 20.2 Changing the Architecture to Gain Support for a Proposal

In this example, Lynn Vestergaard will not support Chris Seidler's proposal, given her current compensation plan. The *status quo* provides her with higher utility. Chris changes the architecture so that the *status quo* is worse—if Lynn does not improve quality, she is likely to be fired. Now, when Chris introduces the proposal, Lynn will support it and will do her part during the implementation phase.



change the proposal so that she is more likely to support it. Third, he might be able to market the proposal to Lynn by convincing her that actually it is in her self-interest to support the proposal. We discuss each of these general tactics below.

Changing Organizational Architecture

Chris can make two general changes in his division's architecture that would help him gain support for his proposal. First, he can identify individuals who are likely to support the proposal and give them increased decision rights, and he correspondingly can reduce the decision rights of individuals who are likely to oppose the proposal. Second, he can change the performance-evaluation and reward systems so that it is in the self-interest of more employees to support the new program. Kearns implemented both types of changes in architecture at Xerox.

To illustrate the effect of changes in the performance-evaluation and reward systems, suppose that Lynn currently is paid a salary plus an additional bonus, based on sales by her department. Denote Lynn's expected payoff and standard deviation, given this compensation plan *without implementing* Chris's proposal, as the *status quo* (SQ). The indifference curve associated with SQ is depicted in Figure 20.2 (labeled "original indifference curve"). His proposal makes Lynn worse off relative to the *status quo:* The expected payoff is lower and the standard deviation is higher. Lynn will try to convince Chris that his proposal is a bad idea and is unlikely to exert great effort in implementing it, should it be adopted. Now suppose that before suggesting the proposal, Chris changes the performance-evaluation and reward systems. Lynn now will be evaluated on product quality. If the quality in her department is poor, she has an increased likelihood of job loss. This change in the reward system produces a new *status quo* (SQ′). Without adopting a quality program, chances are that Lynn's quality would suffer and she might be fired. This change in architecture places her on a lower indifference curve (labeled "after changes in architecture"). Now when Chris proposes his quality program, he receives Lynn's support. She will want to attend quality workshops, provide instruction to her

employees in quality techniques, and participate in the program in other ways.[9] She wants to take actions to improve quality in her department because now, participation makes her better off.

Obtaining the approval of the CEO for the program and the support of department managers will not ensure that Chris's proposal will be implemented successfully. There are potential incentive problems with other employees within the division (for example, production workers). He can anticipate some of these problems by carefully analyzing these employees' incentives. For instance, will these employees fear for their jobs, face fewer promotion opportunities, or have less challenging task assignments? Through this analysis, he can identify the employees who are most likely to resist implementation. Chris can make changes in the architecture to reduce the anticipated problems. He can make sure that certain groups of employees are monitored closely in the implementation phase (recall from Chapter 12 that monitoring is the fourth step in the decision-making process). He also might make additional changes in the performance-evaluation and reward systems. For example, he can reward employees—perhaps, through promotions—for successfully implementing the quality concept. Or he can promise employees that they will not lose their jobs due to quality improvements. This promise increases support for these programs (see Chapter 23).

David Kearns wanted to make dramatic changes in the culture at Xerox. To motivate employees to support these changes, he altered the firm's performance-evaluation and reward systems. But most employees *must exercise leadership within the existing architecture:* They have only limited authority to make changes in either the performance-evaluation or reward systems. Even CEOs often choose to work within the existing organizational architecture, since changing the architecture can be expensive. (Remember, frequent changes in the evaluation and reward systems can discourage employees from making long-run investments and undercut incentives to develop relationships with teammates—see Chapter 11.) The following discussion suggests methods that managers can use to get their proposals implemented within the existing organizational architecture. These techniques also can be used in conjunction with changes in the architecture.

Proposal Design

Managers can analyze the incentives of key decision makers and design proposals that are likely to be supported. We discuss three issues relating to proposal design: flexibility, commitment, and distributional consequences.

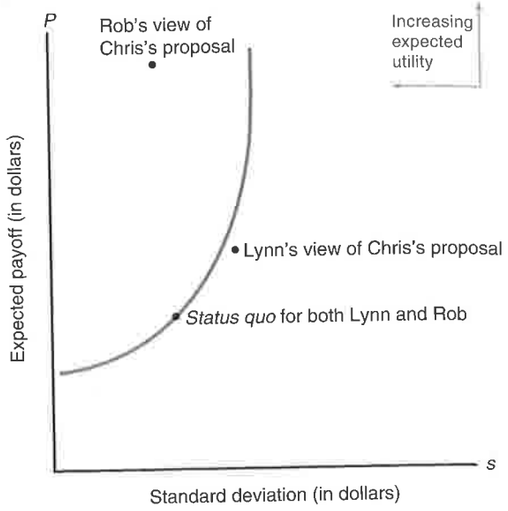
Maintaining Flexibility

Holding the expected payoffs of a proposal constant, employees are more likely to support a new proposal if it entails lower risk. One way to convince people that the risk of a proposal is low is to design the proposal so that it can be modified easily once it is under way. A manager might suggest starting with a limited pilot program, involving only one region or a single product. If this pilot is successful, the program can be expanded. If not, it can be discontinued at low cost. A small-scale test does not commit the firm to adopt

[9] In this illustration, the change in the reward system affects Lynn's assessment of the *status quo.* Chris's changes in the reward system also might affect Lynn's expected payoffs and risk under the proposed change. The basic point continues to hold: Chris can influence Lynn's attitude about the proposal by making changes in the architecture.

Figure 20.3 Analyzing the Distributional Consequences of a Proposal

In this example, Chris Seidler's initial design of a proposal would be strongly supported by Rob Lewis and only mildly opposed by Lynn Vestergaard (both have the same initial indifference curve under the *status quo*). Chris can obtain both managers' support by redesigning the proposal. For instance, Chris might reassign some employees that would have reported to Rob under the original proposal to Lynn. Assuming that both Rob and Lynn gain utility from supervising larger departments, Lynn gains and Rob loses utility. Chris's objective is to make changes until both Lynn and Rob view the proposal as being better than the *status quo*.



the program throughout the company: It provides an option to do so. Experiments of this type commit only limited resources while providing more precise estimates of the costs and benefits of proposed actions. And this information is available both to senior executives who must approve an expanded program as well as to the employees in other areas of the firm where the program might be implemented subsequently.

Commitment

Maintaining flexibility has benefits, but also can impose costs. If employees think that senior management is not committed to the change, they have less reason to take the change seriously. In addition, employees who are against the change have increased incentives to take actions to convince senior management that the change is a poor idea. David Kearns made it quite clear that he was committed to the quality program at Xerox and that employees should take the change seriously. The appendix presents a more detailed example of the strategic value of commitment.

Distributional Consequences

Most proposals for change have distributional consequences—some employees gain and others lose. For instance, a plan to reduce the power of middle managers will harm middle managers but benefit certain line employees. Managers can design proposals so that the distributional effects promote support among key decision makers. Returning to our example, Figure 20.3 considers the case of Lynn and another department manager, Robert Lewis. Both Rob and Lynn have the same utility function. They also view the *status quo* exactly the same (so they are on the same initial indifference curve). Chris's proposal greatly benefits Rob but harms Lynn slightly. Chris can obtain support from both Rob and Lynn by modifying the original proposal so that Rob is less well off and

Leverage and Commitment

Firms obtain financing through combinations of equity and debt. Common stock is the most frequently used source of equity capital for large firms. Dividend payments to holders of common stock are discretionary. The board of directors can reduce dividend payments without placing the firm in bankruptcy. Payments to debt holders must be made in a timely fashion to avoid bankruptcy. During the 1980s, many firms increased their amount of debt substantially through activities such as selling bonds and repurchasing common stock.

High leverage can serve as a commitment that management intends to make changes in the firm to increase cash flows to meet the higher debt payments (for example, through cutting costs), since failure to increase cash flows can result in bankruptcy. Managers have their "feet to the fire," since they do not want to lose their jobs. Managers in firms financed primarily by equity can be under less pressure to make changes to increase cash flows, since they have more flexibility to decrease cash payouts to security holders. There are many determinants of the optimal amount of debt in a firm's capital structure. This discussion suggests that one determinant can be the desire of senior managers to commit to employees and outside stakeholders that they will take actions to increase or maintain high cash flows.

Source: M. Jensen (1986), "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review* 76, 323–329.

Lynn is slightly better off. For instance, some of the employees who would have reported to Rob under the initial proposal might be reassigned to report to Lynn. If Lynn values supervising a larger number of employees, she is more likely to support the revised proposal.

Marketing a Proposal

Employees' attitudes toward a proposed change depend on their assessment of the expected payoffs and risk under the new proposal, relative to the *status quo*. The sponsor of the proposal often will have information that can affect this assessment. The sponsor might be able to convince an employee to support the proposal by conveying this information credibly to the employee.

Careful Analysis and Groundwork

Chris can anticipate initial opposition to his quality proposal because people are risk-averse. Individuals who are confronted with a new idea are likely to be unsure of the personal consequences of the action relative to the *status quo*—thus, they are likely to oppose it. Chris correspondingly should take time to explain his analysis to key employees and to convince them that his analysis is correct. He might meet with these employees to discuss the proposal and answer questions. He might give speeches on the topic, write an article for the company paper, and so on. By carefully communicating the reasons he supports the plan—by lowering the costs for others to analyze the consequences—uncertainty is reduced. Correspondingly, there is increased support for the proposal: More people view the proposal as being in the "favor proposal" region of Figure 20.1.

As a general rule, it is unwise to introduce important proposals at meetings and then request on-the-spot decisions. Without laying the appropriate groundwork, such proposals are likely to be tabled for further study or simply rejected. Since people are risk-averse, they tend to favor the *status quo* until they are convinced otherwise.

Some Tips on Being a Leader

Many of our most memorable leaders have emerged during wars or crises: Winston Churchill, Abraham Lincoln, and, most recently, Rudy Giuliani and George W. Bush. People want to be led out of a "devotion born of distress" as sociologist Max Weber observed. People want leaders to be a repository of people's fears. A few simple tips can help make you a more effective leader, especially in times of crises.

Stand up and be seen. Followers are more reassured if the leader is visible and seen as taking charge of the situation.

Be brutally optimistic. Showing fear will make team members pessimistic. Tell people the bad news straight, but remind them that eventually they will succeed. Remember Churchill's famous statement of "blood, toil, tears, and sweat" in the near term, but England would prevail "however long and hard the road may be."

Stick to the facts. Do not exaggerate successes, gloss over risks, or wade into questions that can't be answered. Speak either straightforwardly or not at all.

Think long term. Don't worry about short-run profits. This sends the wrong message to team members that they are expendable.

Make team members feel important. Every person has an important role to play in resolving the crisis. Find that role and instill it.

Find a story. Use simple narratives, not complicated PowerPoint slides, to convey your vision; be forward looking. Recall Churchill's message: "This is not the end, it is not even the beginning of the end, but it is the end of the beginning."

Source: A. Wheat (2001), "What It Takes," *Fortune* (November 12), 126.

Relying on Reputation

People have reasons to listen to a person with an established reputation for offering sound proposals. First, past success is an indicator of analytical and organizational skills as well as the likelihood of future success. Second, a successful person has strong incentives to conduct a careful analysis to avoid damaging that established reputation. If other employees are confident that a manager usually makes good decisions, they will attach less risk to that manager's proposals and hence are more likely to support them. A manager with an established reputation can garner support for a proposal by asserting forcefully that it is beneficial. It is important for managers not to misuse their reputations by arguing passionately for marginal proposals. A manager's reputation is diminished whenever proposals turn out to be unsuccessful.

Reputation and Influence

Decision makers often rely on the advice of people with established reputations. This tendency is emphasized by H. Mintzberg:

> I found that chief executives faced complex choices. They had to consider the impact of each decision on other decisions and on the organization's strategy. They had to ensure that the decision would be acceptable to those who influence the organization as well as ensuring that resources would not be overextended. They had to understand the various costs and benefits as well as the feasibility of the proposal. They also had to consider questions of timing. All this was necessary for the simple approval of someone else's proposal. At the same time, however, delay could cost time, while quick approval could be ill considered and quick rejection might discourage the subordinate who had spent months developing a pet project. One common solution to approving projects is to pick the man instead of the proposal. That is, the manager authorizes those projects presented to him by people whose judgment he trusts.

Source: H. Mintzberg (1975), "The Manager's Job: Folklore and Fact," *Harvard Business Review* (July–August), 49–61.

Wage Concessions at United

In November 2002 United Airlines announced that it had negotiated wage concessions totaling $5.4 billion from its employees. These reductions were accepted by United's unions to help the firm avoid bankruptcy. Given the fall in demand and increases in costs following the September 11, 2001, terrorist attacks as well as the bankruptcy filing by US Airways, it certainly was credible for United to argue that the *status quo* was not sustainable.

Source: M. Maynard (2002), "United and Machinists Reach Deal on Concessions," *The New York Times* (November 21) C1.

A sponsor also can increase support for a proposal by obtaining the endorsement of other managers with good reputations. Therefore, it is often useful to conduct detailed discussions with these managers. If they agree with the analysis, it is more likely that it is correct. Moreover, their endorsements will garner additional support and forestall opposition from elsewhere within the organization.

Emphasizing a Crisis

A complementary strategy to overcome the normal preference for the *status quo* is to argue that the current situation is worse than people think. The popular literature frequently argues that employees are most likely to favor change when an organization faces a *crisis:* If change doesn't occur, the organization is going to fail. Managers can promote a willingness to change if they can convince employees that the firm does face a crisis. Kearns gained support for his program at Xerox by repeatedly highlighting the threat from Japanese competition. Of course, this strategy works best if in fact the firm faces an actual crisis. Individuals understand the incentives that proponents of proposals have to state that the organization faces a crisis and correspondingly are unlikely to accept this argument unless it is credible. In the case of Xerox, it was easy to document the lost business. Also, it was easy to point to other industries, such as steel and automobiles, which were having similar experiences. The effect of this action is to reduce employee assessments of the utility associated with the *status quo.* This shift enlarges the support region, similar to the analysis in Figure 20.2. Thus, Chris can gain Lynn's support if he provides her with new information that causes her to be less optimistic about the *status quo.* The appendix illustrates how an employee's attitude toward change can depend on whether the firm faces a crisis.

Organizational Power

Economics suggests that an employee's attitude toward change will depend on the personal effects of the proposal. These effects are likely to depend on the identity of the sponsor. Some proposal sponsors have more personal *power* than others to affect the payoffs received by other employees. To be effective, it is important for managers to understand the sources of this power and how to acquire it.

Sources of Power[10]

What is the source of power within organizations? There are no laws that require people to obey or support the wishes of others within the firm. Corporate power does not come

[10]This section draws on Pfeffer (1992).

Ford Motor Company and the $5 Day

In 1914, Ford Motor Company paid a wage rate of $2.20 per day to factory workers. This rate was very close to the prevailing market rate in the Detroit area. Annual turnover at Ford was over 300 percent, as employees would take jobs at other companies for slightly higher wages. Management had little power over its employees. If a supervisor was too demanding or difficult, employees would simply quit and go to work for a different firm. To combat this problem, Henry Ford increased the daily wage to $5 per day. This wage rate gave Ford tremendous power over his employees since they did not want to lose their jobs and work elsewhere for $2.20 per day. To quote Henry Ford,

> I have a thousand men who if I say "Be at the northeast corner of the building at 4 A.M." will be there at 4 A.M. That is what we want: Obedience.

Sources: D. Halberstam (1986), *The Reckoning* (Avon Books: New York); and S. Meyer (1981), *The Five Dollar Day: Labor, Management, and Social Control in the Ford Motor Company, 1908–1921* (State University of New York Press: Albany, NY).

from the ability to force others to follow commands. Ultimately, it comes from other people who *voluntarily agree* to comply with a leader's wishes or proposals. For this voluntary action to occur, it must be in the interests of these people to cooperate with the leader. This section discusses potential sources of power and influence.

Formal Authority

Some power comes from the formal position within the organization. If a manager has the right to fire, promote, and compensate an employee, the employee obviously has an economic incentive to comply with the manager's wishes.[11] In our example, Chris can count on some support from his employees even if the employees think that the proposal will harm them because not supporting it might harm them even more—Chris might be less supportive of raises or promotions; he might even fire them. For instance, these employees are likely to speak in favor of the proposal at public meetings. In addition, his formal authority gives Chris the right to make certain decisions without consulting others. But power attached to a formal position is not without limits. There is the usual incentive problem that employees might ignore their manager's wishes. Also, employees can take actions to get the manager replaced (a "palace revolt"). Disgruntled employees might form a coalition to complain to the CEO that Chris is incompetent. Finally, some companies conduct 360-degree performance reviews where employees provide formal input into the performance evaluations of the managers.

Control of Budgets and Resources

People are granted rights to control resources within organizations. Some individuals have budget authority, and others decide on the allocation of office space or the priority for using copy machines. Control over these resources is a source of power. Individuals are reluctant to challenge a person who controls an important resource because they fear that it will affect their access to this resource. For example, department managers might support Chris because he controls the budget from which they receive funds.

This discussion suggests that individuals can increase their organizational power by gaining control over key resources. This concept can be important in deciding whether to apply for a particular job or task within the firm: Jobs and tasks are more attractive if

[11]Assuming the employee cannot shift to a comparable position costlessly at another firm.

Power and Resource Control—Voting on Antitakeover Amendments

Economic theory suggests that the control of important resources provides a person with power. Other people are afraid not to support the person's proposals because they fear that they will lose access to the important resource.

An illustration of the importance of this argument is provided by studies of corporate voting on antitakeover amendments. These amendments make it more difficult for outsiders to take control of a company through a corporate takeover. The existing evidence suggests that some of these amendments reduce the wealth of shareholders but benefit incumbent managers who become more secure in their jobs. The decision on whether to adopt these management-sponsored amendments is held by the shareholders, who would appear to have the incentives to vote against the amendments. Management, however, has power over certain institutional investors, such as banks and insurance companies, because they derive business from the firm that is under management control: If they don't vote in favor of management-sponsored amendments, they risk losing important business. Empirical evidence indicates that these types of institutional investors are more likely to support management-sponsored antitakeover amendments than other, more independent, investors. The evidence also suggests that management groups who lack the power to get amendments passed tend not to propose amendments because they do not want to bear the reputation costs of proposing an amendment that fails.

Source: J. Brickley, R. Lease, and C. Smith (1994), "Corporate Voting: Evidence from Charter Amendment Proposals," *Journal of Corporate Finance* 1, 5–31.

they contain decision rights over resources others value. Also, a person sometimes can create power by developing a service or product that becomes important to other people within the organization. For example, the data processing manager in a company might increase personal influence and power by offering a repair service for computers within the organization. This action will create greater power if the firm prohibits the use of external vendors, requiring employees to use this internal service for computer repair.

Throughout this book, we have argued that it is important to link decision rights and specific knowledge. Our current discussion suggests a secondary factor that executives might consider in assigning decision rights over key resources: It can be important to grant power to managers who have the most potential to increase firm value.[12] For example, suppose that an executive can assign decision rights over corporate computing to one of two divisional managers, Sanjai Kumar or Maria Lopez. Both managers have the specific knowledge to manage the computer resources effectively. Sanjai, however, has a greater potential to affect the firm's value through his proposals than Maria (Sanjai manages a division with greater opportunities to create value). Further, Sanjai's proposals require the support and cooperation of employees in other divisions of the firm. In this case, the executive will want to assign the decision rights over computing to Sanjai, since they will give him control over additional resources that he can use to persuade other employees to support his proposals.

Control of Information

A particularly important resource in most organizations is information. The information held by any particular employee depends on things like the employee's position, office location, social network, and special skills. Not all employees have equal access to information. Since most employees require various types of information to be effective in their jobs, people with information have power—they can trade information for support. Some employees at BCT might support Chris because they depend on him to keep them informed about what is going on in the company. Individuals can attempt to

[12]This point relates to Hart's argument that the allocation of power and control of resources can affect investment decisions and thus value. O. Hart (1995), *Firms, Contracts, and Financial Structure* (Oxford Press: Oxford, UK).

The Power of Information: Evidence from a French Tobacco Factory

An interesting example of the power of information comes from a French cigarette plant in the 1960s. The equipment in this plant was highly automated and subject to mechanical failures. The manuals that explained how to repair this equipment had been destroyed in a fire, and the only people with the knowledge to fix the machines were the maintenance engineers at the factory. This monopolistic access to important information gave the engineers enormous power. Without them, the plant could not run, and it was impossible to replace them. Indeed, the engineers had sufficient power to have a managing director of the company removed from his job. When new engineers were trained in the plant, they were instructed verbally and asked to destroy any notes once they mastered the material. These actions helped these engineers maintain their power over time.

Source: M. Crozier (1964), *The Bureaucratic Phenomenon* (University of Chicago Press: Chicago).

increase their access to information (and power) by lobbying for centrally located office space (for example, at the corporate headquarters), developing a social network within the organization, applying for jobs that are "in the information loop," or volunteering for key committee assignments.

Viewing the firm as the focal point for a set of contracts (see Chapter 10) provides a useful way to think about the control of information in a firm. Under this view, the firm is characterized as a network of contracts between the firm and other parties such as suppliers, customers, and employees. Many of these contracts are informal, and important information is held by people at the various contracting nodes. Controlling access to this information can vest a person with substantial power. It would be quite difficult for a firm to fire an employee who has been the primary contact with a key customer for 20 years. The employee possesses specific information on issues from company promises to customer requirements, and turnover in this position would be costly for the firm.[13]

Friends and Allies

Having close personal ties with decision makers increases the likelihood that they will act on your behalf. Managers sometimes hire or promote their friends into key positions over more qualified candidates. One reason for such actions is that the managers expect that their friends will provide support. Some employees make a point of doing favors for other individuals within the firm (for example, providing assistance on difficult projects or filling in for other people when they are on vacation) to increase the likelihood that these individuals will support them in the future. Chris is more likely to obtain support for his proposal if he has developed allies within the company.[14] Concerns over inappropriate concentrations of power have led some firms to adopt policies with respect to nepotism.

Tying the Proposal to Another Initiative

Sometimes it is possible to free-ride on the power of other people in the firm to gain support for a proposal. Perhaps, in our example, BCT's CEO has stressed the importance

[13]Andre Shleifer and Robert Vishny argue that managers sometimes choose investment projects that give them an informational advantage and thus make it more costly for shareholders to replace them. A. Shleifer and R. Vishny (1989), "Management Entrenchment: The Case of Manager-Specific Investment," *Journal of Financial Economics* 25, 123–139.

[14]For an economic analysis of gift giving and exchange, see G. Akerlof (1982), "Labor Contracts as Partial Gift Exchange," *Quarterly Journal of Economics* 97, 543–569; and J. Rotemberg (1994), "Human Relations in the Workplace," *Journal of Political Economy* 102, 684–718.

Logrolling in Government and Business

Many of the classic examples of logrolling come from government. For example, one stylized example involves big business, unions, and farmers, where a winning coalition consists of any of the two groups. Farmers have an advantage in this setting because their demands are less likely to be inconsistent with the demands of unions or big business while the demands of big business and unions are more likely to be inconsistent with each other. Indeed, farmers often want things that are relatively unimportant to the other two groups. Farmers, in turn, often don't care much about the demands of the other groups. This mutual indifference makes farmers good partners in a coalition. In contrast, big business and labor unions are likely to make a poor coalition. This helps explain why farmers have been unusually successful in getting favorable regulation established by the government.

Although many of the examples of logrolling come from government, it is also prevalent in most types of organizations. For example, a marketing executive and a manufacturing manager might form a logroll to provide mutual support for each other's funding requests. In contrast, two manufacturing executives who are interested in mutually exclusive projects would not enter into a coalition. To quote Professor James March,

> Logrolls are found not only in the United States Congress, but also in business firms, military organizations, and universities.

Source: J. March (1994), *A Primer on Decision Making* (Free Press: New York), 157–159.

of product quality to the media and to customers through a program entitled "Quality 2002." Chris might claim that his proposal is an integral part of the CEO's vision for the company and fits nicely within the Quality 2002 program. Casting up the proposal in this manner makes it less likely that other employees will raise objections because they will hesitate to argue against an important initiative sponsored by the CEO.

Coalitions and Logrolling[15]

A manager sometimes can increase power through *logrolling*. A logroll consists of a coalition of individuals who are largely indifferent to one another's proposals but agree to support the various requests so that each can get what he or she wants. A classic example is the coalition that forms each year in the United States Congress to pass the Rivers and Harbors Act. This act contains many local projects that individually would receive support from only a few legislators. Yet this act regularly passes by a comfortable majority because certain legislators band together to provide mutual support for one another's proposals. In our example, Chris might form a logroll with other general managers in the company to support his proposal. He can agree to support proposals by these managers to expand their divisions if they back his quality proposal. In business firms (as in many other settings), these types of agreements virtually always take the form of implicit promises or understandings rather than formal contracts. However, in some cases the scope of the proposal can be expanded so that provisions valued by other managers can be included in the package. As in the case of the Rivers and Harbors Act, any quid pro quos are explicit and potential coalition defections are less troublesome if the issues can be considered simultaneously.

[15]This section draws on W. Riker (1962), *The Theory of Political Coalitions* (Yale University Press: New Haven, CT).

Logrolling at General Motors

J. L. Pratt, who was chairman of General Motors' Appropriations Committee, noted that there was no corporate headquarters coordinating the company's various divisions before Alfred Sloan became CEO. The Executive Committee was composed of division managers. "When one of them had a project, why he would get the vote of his fellow members; if they would vote for his project, he would vote for theirs. It was a sort of horse trading."

Source: A. Chandler (1962), *Strategy and Structure* (MIT Press: Cambridge, MA), 127.

Coalition Obstacles

In trying to form a logroll, Chris should anticipate at least two potential problems. First is the issue of credible promises. Major decisions in firms do not occur simultaneously. He might need immediate support from other managers, whereas proposals from these managers might not be considered until later. Other managers might be reluctant to support Chris because they fear that he will not follow through on his part of the bargain. Second, identifying potential candidates for the logroll is not always easy. There is likely to be asymmetric information about how the proposal affects other people's welfare. Chris does not know for certain who is indifferent to his proposal. Individuals who are truly indifferent might claim that they would be harmed by the proposal and are unwilling to support him unless he makes many concessions to their wishes. As discussed in Chapter 10, this type of strategic misrepresentation can result in bargaining failures—in this case, the logroll might fail to materialize. Despite these problems, however, effective coalitions often are formed. Indeed, this type of deal making, or "horse trading," is common within organizations.

Proposal Detail and Logrolling

As we discussed, Chris is concerned not only about getting his proposal adopted, but also about incentive problems that could occur after the program is under way. He can reduce these incentive problems by being quite specific about what is expected of each key employee (so he leaves little discretionary decision authority). This strategy, however, entails two potentially significant costs: First, it limits the ability of employees to act on their specific knowledge in the implementation phase. In this sense, Chris faces a basic trade-off in project design that we have emphasized throughout this book—the trade-off between the effective use of specific information and incentive problems. Second, being overly specific in the ratification phase can make it more difficult for Chris to assemble an effective coalition. Logrolling often requires that terms of the proposal be somewhat vague to limit potential conflicts. Specific proposals provide employees with greater opportunities to argue about details.[16]

Is Organizational Power Bad?

We have argued that leaders often use personal power and political skills to motivate change within organizations. Yet words like *power* and *politics* frequently connote negative images to many people. It is easy to conjure up visions of Machiavelli offering

[16] J. March (1994), *A Primer on Decision Making* (Free Press: New York), 170–171.

Political Skills and Organizational Productivity

The development and exercise of power in organizations is about getting things accomplished. The very nature of organizations—interdependent, complex systems with many actors and many points of view—means that taking action is often problematic. Failures in implementations are almost invariably failures to build successful coalitions. Although networks of allies can obviously be misused, they are nevertheless essential in order to get things done.

Source: J. Pfeffer (1992), *Managing with Power* (Harvard Business School: Boston), 108.

insidious advice to the prince on how to increase his power. Similarly, one easily can envision managers becoming completely absorbed in office politics.

Obviously, attempts to gain power involve costs. For instance, having key employees spend time on logrolling can be expensive. In Chapter 12, we discussed how these influence costs can affect the appropriate architecture of the organization. Firms that survive in the marketplace are likely to be those which effectively limit unproductive uses of employee time. It also is important to recognize that power and political skills can provide important benefits. Organizations involve people working together. Without political skills and power, leaders might fail to implement value-increasing plans and the organization would suffer immensely.

In summary, power and political skills are, in and of themselves, neither good nor bad. They are important attributes that can be used for either productive or unproductive purposes. Managers would be naive to think that they could be effective without such attributes.

The Use of Symbols

Our analysis thus far in this chapter has focused on the formal organizational architecture and strategies for garnering support for proposals. The popular literature often stresses that effective leadership requires the clever use of symbols such as role modeling, formal creeds, stories, and legends. For example, an executive interested in increasing customer service might take the time to talk to customers directly—ensuring that these actions are visible to other employees through media releases and videotapes. The executive might

The Use of Symbols at Nordstrom's

Nordstrom's is a department store chain that is famous for stressing customer service and satisfaction. The vision of the Nordstrom family (who manage the firm) is to offer the customer the best in service, selection, quality, and value.

The importance of customer service is stressed to employees by the frequent telling of stories about sales clerks who performed such heroics as changing a customer's flat tire in a store parking lot, paying a customer's parking ticket, and lending money to a customer who was short on cash to make a purchase. One particularly interesting story is the one about the sales clerk who refunded money to a customer irate about some newly purchased tires. The clerk cheerfully refunded the money even though the customer did not have a receipt. The fascinating part of the story is that Nordstrom's does not sell tires!

Nordstrom's does not rely on these types of stories alone to motivate employees to provide customer service. It has an extensive incentive system that stresses sales and customer service.

Source: H. Weston (1991), *Nordstrom: Dissension in the Ranks,* Harvard Business School Case, N9-191-002.

CASE STUDY: *Global Insurance*

Global Insurance is a disability insurance company. Traditionally, it has organized its corporate headquarters around functional specialties. After an application for an insurance policy arrives at headquarters from a field agent, it is processed through a series of functional departments. One department checks to see if the application is filled out correctly, another department checks the medical history of the applicant, and so on. Among the final steps is the underwriting decision, where the company agrees to accept the policy. This task is handled by trained underwriters.

One of the more important departments at Global is human resources. The human resources department administers the personnel system (for instance, screening job applicants, reviewing promotion decisions, having key decision rights on salary levels and job classifications, and providing training throughout the organization). Currently, the system includes nearly 2,000 discrete job titles. The director of human resources is viewed by most employees as a key person in the organization.

A major problem at Global is that it takes nearly a month to process an insurance application. Applications can sit for days in in-boxes, as they move from department to department. Global's CEO has decided that the company must reorganize to remain competitive. He has a vision to do away with most of the functional departments. Insurance applications would be handled by *caseworkers* responsible for all the steps from initial inspection of the application through underwriting. These caseworkers would be supported by a computer system that would allow access to medical record databases and other information necessary for processing an application. The management information system manager would be charged with developing the information system. Caseworkers would receive training in underwriting from the existing underwriters in the firm. Entry-level caseworkers would be required to have at least a 2-year degree from a community college. The number of job titles would be reduced significantly. Most of the people would have titles like *associate* or *partner*. Training, promotion, and hiring rights, currently held by human resources, would be decentralized to senior case managers (partners). The human resources department would play an important role in transitioning to the new system (dismantling existing training programs and turning them over to case managers, reducing the size of its staff, and so on). Through similar programs, other insurance companies have been able to reduce their application processing times dramatically. They also have reduced their workforces significantly.

Discussion Questions

1. Which employees in the organization do you think will oppose the new proposal? Who will support it?
2. What problems can the opponents cause in implementing the plan?
3. What actions should the CEO take to increase the likelihood that his plan will be implemented successfully?

retell stories about employees who have gone out of their way to serve customers. The company also might adopt formal creeds and statements to emphasize the manager's basic vision for the company.

We view such symbols as an aspect of corporate culture that performs a potentially important communication function; the symbols inform employees about what is valued in the company (see Chapters 11 and 22). But again, symbols are unlikely to be effective in motivating employees to take particular actions unless reinforced by the firm's performance-evaluation and reward systems. David Kearns came to realize this and ultimately had to change the reward system at Xerox before he could implement his quality program successfully.

Summary

This chapter uses the framework developed in Part 3 of this book to provide insights into more effective *leadership*. The analysis presents an important example of how this framework can be used to provide a structured discussion of this popular, but not necessarily well-understood, topic.

The leadership literature stresses two important tasks that all leaders must perform—setting goals and motivating employees. To accomplish these tasks, management must design decision-right, performance-evaluation, and reward systems that effectively link relevant specific knowledge with decision-making authority and provide appropriate incentives for decision makers to act on their information. In this sense, much of this book has focused on key components of leadership.

Academic discussions often treat the process of decision ratification as a purely intellectual exercise. In most firms, however, the decision process involves significant incentive problems. As a result, decision making in firms often resembles decision making within political settings.

Effective leadership is facilitated by careful consideration of other employees' perspectives on proposals for change. It is important to recognize that people typically are risk-averse and interested in their own well-being. An important factor to consider is the existing organizational architecture. How will a proposed change affect specific employees in terms of their decision rights and rewards from the organization?

Managers can make two general types of changes in architecture that can assist in gaining support for their proposals. First, they can identify individuals who are potential supporters of their proposals and give them increased decision rights. Second, they can change the performance-evaluation and reward systems so that it is in the self-interest of more employees to support their suggestions.

Developing proposals that can be discontinued at low cost can reduce opposition. Flexibility, however, has costs as well as benefits. Sometimes it is better for managers to demonstrate a greater commitment to a change so that employees take the change more seriously. Managers can analyze the incentives of key decision makers and design proposals that are more likely to be supported.

The sponsor often will have information that can affect other employees' assessments of a proposal. The sponsor might be able to convince other employees of the merits of the proposal through careful analysis and groundwork, relying on a reputation for good decision making, and/or emphasizing a crisis.

Some managers have more personal *power* than others to affect the payoffs to other employees. Power within organizations generally does not come from the ability to force others to follow commands. Rather, power comes from other people who *voluntarily agree* to comply with a leader's proposals. For this voluntary action to occur, it must be in the interests of these other people to cooperate with the leader. Sources of power include formal authority derived from the position in their firm, control over important physical or budgetary resources, control over information, and friends/allies. Sometimes it is possible to use the power of another employee by tying the proposal to a program backed by the powerful employee.

Employees can gain support for proposals by *logrolling*. A logroll consists of a coalition of individuals who are largely indifferent to one another's proposals but agree to support the various requests so that each can get what he or she wants.

Words like *power* and *politics* often conjure up negative images. Our view is that power and political skills are neither universally good nor bad. Rather, they are important attributes that can be used for either productive or unproductive purposes. Managers are naive if they think that they can be effective without such attributes.

Symbols such as role modeling, formal creeds, stories, and legends can play an important role in communicating a manager's vision to employees. However, they are unlikely to be effective in motivating employees to take particular actions unless they are reinforced by the firm's performance-evaluation and reward systems.

Appendix

Strategic Value of Commitment and Crisis

In this chapter we discussed how a crisis and a leader's demonstrated commitment to change sometimes helps motivate change within an organization. In this appendix we use a simple game-theoretic example to illustrate these ideas.

Tomoka Hayashi is chief financial officer of the GSA Company. Simon Lewellen is the general manager of the company's largest division. The board of directors is scheduled to meet next week. Tomoka will recommend the firm's leverage ratio for the next year. She will recommend either high leverage, where the firm will borrow money to repurchase common stock, or low leverage, where the company maintains its current low debt-to-equity ratio. Simon will recommend whether his division should invest in a major new technology. The board is expected to accept Tomoka's and Simon's recommendations.

Figure 20.4 displays the personal payoffs to Tomoka and Simon for the four possible combinations of leverage and investment. Tomoka prefers low leverage and investment in the new technology, whereas Simon prefers low leverage and not investing in the new technology.[17] Tomoka, however, prefers high leverage and investing to low leverage and not investing. Currently both are scheduled to make their first public disclosures of their recommendations at the board meeting. This schedule effectively requires them to make simultaneous announcements. Each must prepare extensive presentations supporting their recommendations. It is unlikely that either person will want to change his or her recommendation in the middle of the board meeting: Board members might view such a change as troublesome evidence with respect to that person's abilities. The Nash equilibrium is for Tomoka to propose low leverage and for Simon to propose no new investment.[18]

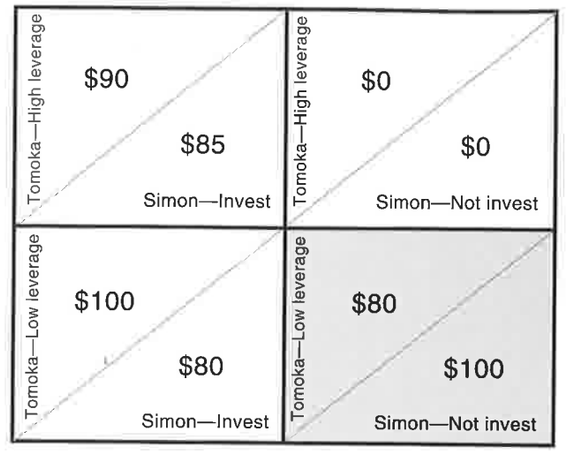
Tomoka potentially can affect Simon's choice by *committing* to propose high leverage. Simon views high leverage as placing the firm in a financial *crisis*. If the company does not invest in the new technology, the firm will not generate sufficient cash flow to service the debt, the firm will go bankrupt, and both will lose their jobs. The new technology, on the other hand, is likely to generate enough cash flow to avoid this outcome. If Simon were convinced that Tomoka would recommend high leverage, he would propose investing in the new technology. She might effectively commit to high leverage by announcing to the financial press that she intends to make this recommendation. Simon will realize that Tomoka has "backed herself into a corner"; surely she would not alter her recommendation—it would ruin her reputation as a decisive CFO. To affect his choice, it is important that Tomoka's commitment is binding. If he is not convinced, he is more likely to recommend not to invest, expecting that she will recommend low leverage to the board. Simon also might be able to influence the outcome in his favor by being the first to commit to a specific recommendation—in this case, to reject the new technology.

[17] Tomoka anticipates that the new technology will increase the firm's value. As CFO she is evaluated based on the stock-price performance of the company. She favors low leverage because of its lower likelihood of bankruptcy. Simon, on the other hand, views the investment as more work for him, with little direct personal benefit. Also, the new investment will reduce his division's reported profits for a few years (there are initial start-up expenses, and it will take some time to build sales) and thus the size of his annual bonus. He expects to retire in 3 years and will not be with the firm when the division begins reporting higher profits.

[18] Simon knows that Tomoka will recommend low leverage regardless of what she expects him to do. (Holding Simon's recommendation fixed, she always receives a higher payoff by recommending low leverage.) Thus, Simon's optimal strategy is to recommend not to invest in the new technology.

Figure 20.4 Strategic Value of Commitment

Tomoka Hayashi is CFO of the GSA Company, and Simon Lewellen is the general manager of the company's largest division. At the next board meeting Tomoka will recommend the degree of leverage; Simon will recommend whether his division should invest in a new technology. If they both wait until the board meeting to announce their policy choices, the Nash equilibrium is low leverage and no investment. Tomoka may be able to achieve a preferred outcome—high leverage and investment—by effectively *committing* to recommend high leverage prior to the meeting.



Appendix Question

The analysis in this appendix suggests that a leader can sometimes motivate desired change by making a strong commitment to a particular action. Do you think it is always in the leader's interest to make this type of commitment? Explain.

Suggested Readings

J. Gardner (1990), *On Leadership* (Free Press: New York).

D. Kearns and D. Nadler (1992), *Prophets in the Dark* (Harper Business Press: New York).

D. Kreps (1990), "Corporate Culture and Economic Theory," in J. Alt and K. Shepsle (Eds.), *Perspectives on Positive Political Economy* (Cambridge University Press: Cambridge).

J. March (1994), *A Primer on Decision Making* (Free Press: New York).

J. Pfeffer (1992), *Managing with Power* (Harvard Business School: Boston).

Review Questions

20–1. What is leadership?

20–2. It is frequently claimed that meaningful change is difficult to achieve in large companies. Why do you think this might be the case?

20–3. What does leadership have to do with organizational architecture?

20–4. What is organizational power, and where does it come from?

20–5. The PPP Company recently purchased a large chain of supermarkets (over 1,000 stores). Following this acquisition, PPP's management announced its plan to cut labor costs dramatically so that the stores could remain competitive. Labor unions responded by saying that they would not agree to large wage cuts. After negotiating with a labor union for a short time,

PPP announced that it was closing several of its most profitable stores because labor would not agree to wage cuts. On the surface, this seemed like a silly move, given that the stores were profitable. Why do you think PPP made this move?

20–6. The TRF Company has not fared well with recent increases in foreign competition. Management indicates that it must substantially cut costs to survive. Cost cutting entails dramatic change for the company. TRF had been an all-equity firm. Recently, the company borrowed nearly 90 percent of its value and used the money to repurchase shares. The required annual debt payments exceed the company's realized earnings over the past few years. What might have motivated management to make this dramatic increase in leverage, given that it placed the firm in a near "financial crisis"?

20–7. Alex Cohen is the general manager of the textile division in a large diversified company. Recently, Alex argued strongly to the CEO that an expansion request by the drug division be approved. On the surface, Alex's actions seem strange, given that Alex is not affected by this decision (it does not affect his budget or his compensation). Further, Alex spent substantial time developing his presentation for the CEO.

a. Why do you think Alex took such an active role in supporting the drug division's request?

b. Since Alex is not affected by the decision, should the CEO consider Alex as an unbiased observer who is focused on trying to maximize company value? Explain.

20–8. Poorly performing employees in Japanese firms are sometimes punished by being sent to remote locations or placed at desks away from their colleagues. Discuss the effects that such a penalty will have on the leadership effectiveness of the punished employees.

Understanding the Business Environment: The Economics of Regulation

CHAPTER 21

CHAPTER OUTLINE

In May 1998, the U.S. Justice Department charged Microsoft Corp. with crushing competition and stifling innovation in the software industry.[1] Even though the lawsuit had been rumored widely, Microsoft shares still fell 3.8 percent upon filing the legal action. Nineteen states ranging from California to New York joined the suit. This litigation alleged that Microsoft's long-standing practice of adding features to its Windows operating system without a separate charge amounts to predatory pricing: It drives out existing competitors and dissuades other firms from entering the software market. In particular, Microsoft was accused of damaging rivals Netscape and Sun Microsystems.

The federal government contended that Microsoft has used its Windows, which was installed on 90 percent of new machines, to pressure personal computer makers to favor Microsoft's browser over Netscape's. Offered as evidence were records of a meeting

[1] J. Wilke (1998), "U.S. Sues Microsoft on Antitrust Grounds," *The Wall Street Journal* (May 19), A3; "Microsoft Says It Was 'Set Up,'" *Democrat and Chronicle* (October 27, 1998), D12; D. Bank (1998), "Is Microsoft a New Public Utility?" *The Wall Street Journal* (May 19), B1; and M. France, P. Burrows, L. Himelstein, and M. Moeller (1999), "The Microsoft Ruling," *Business Week* (November 22), 38–41.

between Microsoft and Netscape executives in June 1995 where Microsoft allegedly proposed dividing the browser market between the two companies. At the trial in October 1998, Microsoft argued that it was "set up" by Netscape. According to Microsoft, Netscape used the June 1995 meeting to create a record that could be passed to the Justice Department to further its case against Microsoft.

The government's case was based on the assumption that the PC operating system is an "essential facility." So many people rely on their Windows-based computers that software "competitors now need the hand of government to give them a place on the PC screen." Microsoft had acquired a virtual monopoly in the market for PC operating systems—but by itself, that was not illegal. The government also had to show that the company used predatory practices to restrain trade. For example, the government made much of a quote from a Microsoft vice president who stated that it was "necessary to fundamentally blunt [Sun Microsystems'] Java to protect our core Windows assets." But Microsoft Chairman Bill Gates scoffed at the idea that such statements indicate illegal actions. "It's no surprise to me that there are quotes from inside Microsoft that say, 'Let's compete, let's do a better product.'" Microsoft defended its actions by arguing that consumers have not been harmed and that "this suit is about Microsoft's right to innovate."

One remedy the government considered would be to prohibit Microsoft from dictating what Internet content appears on the Windows desktop. For example, users seeking travel reservations on the Web were routed to Microsoft's Expedia site. Such routing was unfair, claimed Terrell Jones, president of Sabre Interactive, which operated the competing travel-arrangement site, Travelocity. Jones claimed that Microsoft denied him a favored position on desktops.

On November 5, 1999, U.S. District Judge Thomas P. Jackson concluded that Microsoft routinely used its monopoly power to crush competitors. Judge Jackson's fact findings were so critical of Microsoft that the breakup of Microsoft became a real possibility. After two year of appeals, legal maneuvering, and a new president in the White House, on November 2, 2002, U.S. District Court Judge Colleen Kollar-Kotelly accepted a settlement between Microsoft and the Justice Department. The agreement prevents Microsoft from participating in exclusive deals that could hurt competitors, allows manufacturers and customers to remove icons for some Microsoft features, and requires Microsoft to release certain types of sensitive technology to its rivals so software developers can write programs for Windows that work as well as Microsoft products do. Nine states (including Iowa and California) are still suing Microsoft saying the agreement reached with the Justice Department is insufficient to protect Microsoft's competitors.

Importance of Regulation to Managers

Recall Figure 11.1, which provides a flowchart of the framework underlying this book. In that figure the external business environment—technology, markets, and regulation—drives the firm's choice of business strategy and in turn the firm's organizational architecture. Numerous examples have been provided throughout the book regarding how the three legs of the organizational architecture stool can become unbalanced when the firm's business environment and its strategy change. In Chapter 8 we discussed how a firm might develop a business strategy that both creates consumer value and allows the firm to capture that value.

In the federal and state lawsuit against Microsoft, government regulators argued that they were trying to protect consumers by fostering competition. Yet government regulation often limits entry into industries. For instance, electric utilities explicitly were

granted effective monopolies to supply electricity to customers within specific geographic regions. New entrants were prohibited from building generating plants or selling electricity at lower prices. As states now deregulate power production, new companies are competing for customers. This has lowered prices and created new businesses ranging from consulting firms who advise large power customers about ways of exploiting the new competitive environment to power brokers who buy electric power from new power plant operators and resell it to large consumers of electricity. Thus, these regulatory changes have altered firms' strategies as well as their organizational architectures.

Government regulation takes a variety of forms: The Microsoft lawsuit is only one example of the government regulating business conduct. The following is but a partial list of the many ways regulation affects business:

- The U.S. government has enacted an array of antitrust legislation that makes illegal such practices as collusive pricing that restrict trade.
- The Environmental Protection Agency (EPA) was established in 1970 to limit pollution of air and water by controlling the disposal of solid waste, pesticides, radiation, and toxic substances.
- All companies with publicly traded stock must follow the Securities and Exchange Commission regulations; for instance, financial disclosure regulation requires that these companies file audited financial statements prepared in accordance with Generally Accepted Accounting Principles with the SEC.
- Intellectual property laws, price and entry restrictions, labor laws, occupational safety regulations, import and export laws, and immigration acts both protect and constrain commercial activities.
- Some regulations focus on specific industries; for example, financial services (banks, savings and loans, credit unions, mutual funds, investment banks, and insurance companies), energy (electric utilities, gas pipelines, coal, and oil), and transportation (airlines, railroad, and trucking).
- Federal corporate tax rates of roughly 33 percent imply that all firms in effect have a partner who is entitled to about one-third of the firm's profits.

This chapter discusses various roles of government including its role in regulating business, how the market for regulation works, and how successful managers manage the regulatory process.

Europe Relaxes Its Labor Laws

Europe has rather strict worker protection laws that regulate the days people work, their vacations, layoffs, and other aspects of the employment relationship. One manager said, "We can divorce from our husbands and wives, but we can't divorce from our employees." These laws have made it quite expensive to dismiss employees when business slowed. This has caused companies to be extremely cautious in expanding within Europe during upturns, preferring to expand production in less regulated countries, often in Asia. The result has been slow job growth in Europe. But since the mid-1990s, with the support of politicians, companies are increasingly getting around these restrictive labor laws by hiring temporary employees—many of the most restrictive laws apply only to permanent employees.

Most European countries now have adopted laws legalizing temporary employee agencies, such as Manpower. These temp companies provide employers more flexibility to dismiss "long-term temporary help." And the countries that have relaxed their labor laws the most have enjoyed the greatest job growth.

Source: H. Cooper and T. Kamm (1998), "Much of Europe Eases Its Rigid Labor Laws, and Temps Proliferate," *The Wall Street Journal* (June 4), A1.

Economic Reasons for Government Intervention

Governments perform various functions; they provide a system of laws and legal institutions that define and enforce property rights, and they address market failures. Markets are said to fail whenever a competitive, unfettered market does not generate an efficient resource allocation for those within the economy. Later we describe a number of reasons for such market failures: externalities, public goods, monopolies, and information asymmetries. To finance these potentially beneficial government functions of enforcing property rights and resolving market failures, revenues must be raised—usually through taxes. However, governments also use taxes as well as other means to redistribute resources in ways that impose costs on society. We now discuss each of these aspects of government intervention.

Defining and Enforcing Property Rights

When engaging in trade, each party to the transaction generally expects that its rights in the contract will be enforced. If Mark Danchak promises to deliver 200 spring suits to Melanie Caoile's store next February in return for $20,000 today and $80,000 in April, Mel expects that Mark will deliver the clothing that she ordered and Mark expects that he will receive the $80,000. If the suits do not arrive and she has no legal recourse, her future willingness to buy clothing from his factory is reduced. Similarly, if Mel does not pay the $80,000 she promised and Mark has no legal recourse, his willingness to sell Mel clothing in the future is reduced.

The government creates legal institutions, such as courts, that enforce property rights. To enforce its rulings, the court has access to police powers of the state. If Mark breaches the contract that states he will deliver 200 suits, the court can force him to make restitution. If Mel does not pay, the court has the power to force compliance.

By enforcing contracts between private parties and adjudicating disputes, the government reduces transaction costs. With lower transaction costs, there are greater gains from trade, more transactions, more consumer and producer surplus,[2] and greater wealth. If Mel could obtain comparable suits from an extremely reputable supplier (one with no risk of default) for $102,000 and she expects to incur more than $2,000 in costs of litigating the transaction with Mark, she will not buy his suits. But if she believes the government will enforce the contract at a cost to her of less than $10 per suit, then she will buy the 200 suits and will have consumer surplus of as much as $2,000. If the government can enforce this contract for less than $2,000, then it's efficient for the government to perform this role (even ignoring any producer surplus).

Chapter 3 discussed the importance of property rights and gains from trade. A system of well-enforced, stable property rights increases incentives for people to make investments. Knowing that Mark can sell his output incurring low transaction costs supports his incentives to build a suit factory. Not only will more customers be willing to buy Mark's products because their transaction costs will be lower, but his transaction costs also will be lower. The government enforces property rights in other ways as well; for instance, Mark expects that the state will provide protection against someone stealing his goods prior to their delivery.

[2]Chapter 7 defined consumer surplus as the difference between what the consumer is willing to pay and what is actually paid for a product. Analogously defined, producer surplus is the difference between the price the producer receives for the product and the cost of producing it.

War and Hunger

Wars, such as those in Africa, Kosovo, Chechnya, and Afghanistan, regularly produce widespread hunger among the population. During wars, the power of the central government to enforce property rights and contracts is reduced dramatically. Without protection from the government supporting their ability to reap the rewards of a harvest, farmers are reluctant to plant crops. Especially near contested areas, farmers fear that their land might turn into a battlefield and any crops they grow might be seized by one of the combatants. Agricultural output is slashed due to the reduced incentives to plant because the farmers' ability to capture the fruits of their investments is diminished. Besides the obvious reason that wars create hunger by consuming real resources (labor and property), wars also create hunger by reducing incentives to invest in agriculture.

Most governments enforce patents, copyrights, and trademarks. By granting inventors patents (which protect the inventor from others copying their inventions for a stipulated time period), inventors and investors devote more resources to inventive activities. Developing countries without strong patent and trademark protection often have difficulty attracting investment because people fear that their investments will be expropriated.

The transaction costs of writing and enforcing contracts are higher in countries with poorly enforced property rights. For instance in the former Soviet Union, large firms employ their own security forces for protection. Workers are frequently paid in cash because the banking system is unreliable. Delivering the payroll to remote sites requires expensive security measures. All these transaction costs reduce gains from trade, lower the volume of transactions, limit investment incentives, and reduce wealth.[3]

In developed countries, relatively few commercial transactions are litigated. The threat of litigation as well as concerns about one's reputation—especially in repeated business dealings—cause most businesspeople to honor contracts voluntarily.[4] Nonetheless, commercial litigation is a growing problem in the United States. Between 1971 and 1991 more than 4 million federal lawsuits were filed, with almost 2.5 million involving at least one business entity. Moreover, this litigation is quite expensive. Combined wealth losses by firms have been estimated to be 1 percent of their equity value or about $21 million per lawsuit.[5] Lawsuits also increase operating costs. For instance, experts argue that one reason health care costs are so high is that doctors practice defensive medicine—for example, by ordering extra tests to bolster their legal defense in the event that they are sued. Similarly, to limit their liability, few public swimming pools have diving boards. Excessive litigation limits consumers' choices and thus their welfare.

On the one hand, the legal system can promote efficiency by lowering transaction costs by making property rights more secure; on the other, the legal system can raise costs by creating incentives to litigate frivolous suits. A jury ordered McDonald's to pay $2.7 million to Stella Liebeck, a drive-through customer who burned herself with hot coffee after placing the cup between her legs to remove the top and add cream: She claimed the coffee was just too hot. The U.S. Securities Acts potentially lower transaction costs in security markets by regulating brokers and requiring publicly traded firms

[3]A. Grief and E. Kandel (1995), "Contract Enforcement Institutions: Historical Perspective and Current Status in Russia," in E. Lazear (Ed.), *Economic Transition in Eastern Europe and Russia: Realities of Reform* (Hoover Press: Stanford, CA).

[4]In Chapter 22, we discuss these issues in greater detail.

[5]S. Bhagat, J. Brickley, and J. Coles (1994), "The Costs of Inefficient Bargaining and Financial Distress," *Journal of Financial Economics* 35 (April), 221–247.

Pirated CD-ROMs

In Beijing, a peddler hawks one of China's hottest consumer products: pirated CD-ROMs. Just across the street from the U.S. Embassy, he and other street merchants sell ripped-off versions of everything from Microsoft's Windows to music CDs. Most of these CDs come from underground factories in Hong Kong and Macao that satisfy soaring demand in China. Most of these CDs come from underground factories in Hong Kong and Macao that satisfy soaring demand in China. Price—less than $5. Conservative estimates put the counterfeit disk market in China at $1 billion. CD piracy is now the No.1 problem between the United States and Hong Kong.

Under U.S. pressure, Beijing began to crack down. In 1997 Hong Kong's Customs & Excise Department had 188 agents conducting approximately 30 raids a week. Although that contributed to an eightfold rise in seizures of counterfeit goods over the previous two years, the agency said that it still could not keep up. Beijing is drafting a new copyright law, which the National People's Congress might pass. Experts hope it will help close loopholes in existing legislation.

All three governments have incentives to protect the intellectual property of software and music. The U.S. government is trying to enforce the property rights of American firms. Hong Kong and Beijing are trying to avoid commercial sanctions that could be imposed on them if they appear lax in preventing counterfeiting.

Source: B. Einhorn (1997), "China's CD Pirates Find a New Hangout," *Business Week* (December 8), 33.

to make timely operating information disclosures. However, these acts also allow investor lawsuits if the firm makes what turn out to be false disclosures. The out-of-pocket cost to plaintiffs of filing such a lawsuit is under $200, whereas the average settlement is $7 million. Such a disparity encourages frivolous suits. (In some other countries, the incentive to file frivolous suits is reduced by making the losing party responsible for part of their opponent's legal expenses.)

Redressing Market Failures

Chapter 3 describes how a well-functioning market provides an efficient allocation of resources without shortages or surpluses. But unregulated markets do not always function well. Externalities, public goods, monopolies, and informational failures can produce "market failures" that limit the efficient allocation of resources. In these cases, some economists argue that an appropriate role of government is to enter and regulate the market to redress the failure. Yet, even after accepting the fact that such market failures exist, two questions still must be addressed before one should conclude that government regulation will help. First, can government resolve the problem at a cost lower than that of the inefficiency caused by the market failure? Government intervention is not free. Regulators must be hired and their regulations enforced. These actions consume real resources. Are these total resources lower than the cost of the market failures eliminated? Second, will the regulators act in the public interest to resolve the market failure and not in their self-interest? Later in this chapter we examine this second question.

Alternative Dispute Resolution

To reduce the high cost of commercial litigation, many companies are turning to alternative dispute resolution (ADR) mechanisms: arbitration and mediation. Many commercial contracts now contain provisions binding the parties to use ADR instead of litigation. Professional ADR firms providing such services streamline the dispute process by avoiding lengthy court delays and more costly legal procedures.

Frivolous Lawsuits

In June 1994 Orange County, a California municipality, which defaulted on its debt payment because of losses from trading interest-rate derivatives, received $400 million from Merrill Lynch in an out-of-court settlement. Merrill Lynch was the investment bank that sold the derivatives to Orange County. The dispute revolved around whether Merrill should have known that the county officials were trading inappropriately and, if so, whether it should have refused to do business with the county. Merrill argued that county officials were sophisticated, acting in full public view.

> Because cases such as these tend to be settled out of court, precisely what duty a seller of financial products owes to its clients remains horribly vague. As a result, there is nothing to stop a loss-making client's imagination from running wild over the settlement that threats might achieve. Until legal uncertainties are resolved, bankers had better remember that they cannot know their clients too well.

Orange County is an extreme example of the hindsight often employed by courts. As long as Orange County was not losing money on its derivatives, there was no lawsuit. Courts enter and undo deals that go sour. Thus lawsuits are like embedded options. If the product or service works, there's no legal action. If the product or service fails, a lawsuit results. This is all right as long as the seller of the product or service can price the option at the time of sale and the buyer is willing to pay for this option. The market for the product or service collapses if the seller and buyer cannot agree on a price for the product/service including the embedded option.

Source: "Orange County Seller Beware," *The Economist* (June 6, 1998), 75.

Externalities

Government regulation can reduce market failures caused by externalities. Chapter 3 describes externalities as the costs or benefits created by the actions of one party imposed on involuntary participants where the consequences of these actions are not regulated by the system of prices. Air pollution is an example of an externality. When you buy and consume gasoline, the purchase price compensates everyone in the supply chain from landowners to oil explorers, drillers, refiners, and gas station owners for providing that gallon. But the people who breathe the carbon monoxide produced when you use that gasoline are not compensated. The Coase Theorem (Chapter 3) states that resource allocations remain efficient, even in the presence of externalities, as long as property rights are clearly assigned and the transaction costs of enforcing and exchanging them are sufficiently low. Hence, government can reduce market failures caused by externalities by defining property rights or by reducing the transaction costs of enforcing property rights.[6]

Consider the example of the federal government's creating a market in pollution rights. In 1995, it set a cap on the number of tons of sulfur dioxide allowed into the air.[7] Each year thereafter, the cap declines. The government issued to the 110 dirtiest power plants tradable certificates that matched their share of the cap. If companies cut their emissions below their caps, they could sell the excess to other companies that hadn't made the necessary cuts. Companies can save certificates from year to year, but federal clean-air standards still limit pollution. Sulfur dioxide certificate trading reached

[6]Note that some regulations establish and enforce property rights, but effectively make them nonmarketable (inalienable). For example, the Occupational Safety and Health Administration is charged with enforcing workplace safety regulations that specify an employee's right to work in an environment that satisfies certain conditions. Employees cannot waive these rights. Thus, even though an employee might be willing to bear a risk for additional compensation that was lower than the cost of reducing the risk, such an employment agreement is not allowed, and potential gains from trade are unexploited.

[7]J. Fialka (1997), "Breathing Easy," *The Wall Street Journal* (October 3), A1; J. Fialka (1998), "EPA Plans Emission-Trading Program to Reduce Nitrogen-Oxide Pollution," *The Wall Street Journal* (April 30), B11.

Direct and Indirect Costs of the Food and Drug Administration

"The FDA ensures that the food we eat is safe and wholesome, that the cosmetics we use won't harm us, and that medicines, medical devices . . . are safe and effective." To accomplish its mandate, the FDA has 9,000 employees and a 1999 budget of over $1 billion. Yet, the cost of protecting consumers from unsafe drugs includes more than just the FDA's $1 billion budget. Following FDA-mandated procedures, it can take 15 years to approve a new drug; in the meantime, people who could have been helped are not. And despite all its efforts, the FDA process is not foolproof. Many new drugs are pulled off the market because of some unforeseen problem. Duract was yanked after four patients died and eight needed liver transplants. Pretrial tests cannot include all the possible drug interactions from other medications. And doctors often prescribe drugs for conditions other than those for which the drugs were approved.

This example illustrates that regulation generates both direct costs and indirect costs. The indirect costs are opportunity costs—drug therapies denied to potential patients because of delays in the approval process.

Sources: www.fda.gov/opacom/faqs/genfaqs.html; and A. Barrett (1998), "The Big Hole in the Drug Safety Net," *Business Week* (July 6), 37.

$3.3 billion in 2001.[8] One company had to reduce emissions by 30,000 tons. It removed 20,000 tons cheaply by switching to low-sulfur coal. The remaining 10,000 tons could be removed only by spending $130 million on scrubbing equipment. Instead, it bought certificates for the remaining 10,000 tons, saving the company $100 million. This program, which reduced emissions 30 percent nationwide, is an example of the government's reducing an externality using market-based mechanisms by defining and enforcing tradable property rights in pollutants.

The market for pollution rights works because firms whose costs to reduce pollution are lower than the market price of the rights can sell their rights to firms that face higher costs of pollution abatement. Thus, society achieves the greatest reduction in pollution for the smallest aggregate cost.

Public Goods

Public goods are those commodities whose consumption by one person does not diminish the amount available to others. Moreover, purchasers of a public good cannot exclude nonpurchasers. A classic example of a public good is national defense; defending you against foreign attack does not necessarily reduce the amount of protection available to others. Moreover, it is difficult to exclude your neighbors from national defense if they don't pay their share. A lighthouse guiding ships at sea is a public good; one ship's use of the lighthouse does not diminish another's use of the lighthouse, and it is difficult to exclude nonpurchasers. An apple is a private good: Your consumption of an apple precludes others' consumption of that apple. It often is difficult for a market to determine the appropriate quantity and price of a public good because free-riders are not excluded easily.

Total welfare would be maximized if quantity produced were set where the public good's marginal cost equaled the sum of each consumer's marginal value. For example, suppose a firm is considering launching a new satellite that will broadcast 500 channels. Aggregate welfare increases so long as the satellite's cost is less than the sum of what each user would be willing to pay. Suppose there are 1 million potential users—half willing to pay $100 each ($50 million) and the other half willing to pay only $10 each ($5 million). If the cost of the satellite is less than $55 million, it is efficient to launch. But a

[8] www.epa.gov/airmarkets/trading.

competitive market might not reach this outcome if satellite transmissions are a public good. If the company tries to charge consumers for receiving the signals, all users might claim they only value the signal at $10, so the firm would collect only $10 million. Each user might try to *free-ride.* (Recall the incentive conflicts from free-riders involving joint ownership of assets described in Chapter 10.) Aware of this free-rider problem, the satellite firm will launch the satellite only if its cost is lower than $10 million. The problem is how to identify and charge the users who value the service at $100—a price above $10.

One solution to this free-rider problem is for the government to launch the satellite and pay for it with a tax. This is the basic rationale for using general taxes as the mechanism to finance such government-supplied public goods as defense, police, and fire services. Note that this rationale presumes that the government somehow can estimate the consumers' level of demand accurately. Yet, the government is not immune to particular groups of consumers' overstating their valuation in order to ensure that their desired project is completed. Moreover, the government will be lobbied by satellite makers and others who will profit from this endeavor should the project be undertaken.

Besides having the government provide the public good, another possibility exists: Convert the public good into a private good and exclude those potential customers with low valuations. For example, the company might scramble the satellite signals; those wishing to purchase the signal would have to rent a decoding box for something less than $100. Now, if the satellite costs plus the cost of the scrambling and decoding equipment is less than $50 million, a private firm will provide the service. But in this case, the potential gains from trade between the firm and the 500,000 customers who value the service at only $10 are lost.

Monopoly

Chapter 6 describes how monopolies create resource misallocations. A monopolist sets prices above the competitive price (long-run marginal production cost) and output below the competitive output level. Some customers are willing to pay more than marginal cost, yet do not receive the product. Thus, not all gains from trade are exhausted. One potentially beneficial role of government is to limit the amount by which the monopolist's price exceeds marginal cost, and thus realizing more of the potential gains from trade. For example, state and federal regulators retain the authority to set or approve public utilities' prices. However, performing this role well requires the regulator to know the utility's true cost function.

In the United States, antitrust laws dating back to the 1890 Sherman Act give the federal government the power to limit the ability of these monopolies to set prices above competitive levels. The U.S. Justice Department and the Federal Trade Commission have broad powers to ensure the effectiveness of the market and protect competition by overseeing pricing practices, approving mergers, scrutinizing advertising, and regulating other business practices.

In determining whether a monopoly exists, the government must show that the alleged defendant has substantial market power to set prices above the competitive level. In most antitrust cases, the definition of the relevant market becomes a central focus of the lawsuit. In the Microsoft case the government argued that the relevant market that Microsoft controlled involves operating systems, and Microsoft has 90 percent of that market. Microsoft contends that the relevant market is for browsers and that in that market Microsoft's Explorer does not have a dominant position.

Moreover, for this regulation to improve the overall resource allocation, regulators must operate in the public's interest and not be "captured" by the utility or some other

Interstate Commerce Commission

During the 1880s, midwestern farmers complained bitterly that rail rates were unfair; the sum of the costs to ship goods from Chicago to Cleveland, Cleveland to Buffalo, and Buffalo to New York City was substantially greater than the cost of shipping from Chicago to New York—the sum of the short-haul rates exceeded the long-haul rates. At this time, railroads competed on long hauls but not on short hauls because there was usually just one railroad serving adjacent cities such as Chicago and Cleveland, but several railroads serving more distant cities such as Chicago and New York. The federal government created the ICC to regulate railroad freight rates. To ensure that the commissioners understood the industry they were to oversee, railroad executives were appointed to the commission. The ICC "fixed" the rate disparities by raising the long-haul rates and prohibiting price competition. When the trucking industry began competing with railroads for short hauls (competition that would have eliminated the initial problem if the industry had been left unregulated), the ICC expanded its scope to regulate the interstate trucking industry as well. Regulation raised interstate trucking rates where trucks had been taking short-haul business from the railroads. The ICC provides an example of how regulators can be "captured" by the industry they are regulating and end up protecting producers and not consumers.

party. For example, some politicians think that Internet users should pay a tax to subsidize low-income individuals' access to the Internet. These politicians argue that the poor deserve the same Internet access as the wealthy and that an Internet tax is a good way to achieve such an important social end. While this goal might be laudatory, such taxes are inefficient: They discourage Internet use whenever the tax exceeds the user's marginal benefits. Moreover, some low-income individuals value receiving other goods and services more than they value a connection to the Internet.

It is somewhat ironic, given this array of efficiency issues raised by firms with market power, that many of the monopolized industries were created by various government acts. For example, public utilities (such as electric companies, cable TV, or telephone companies) often are granted exclusive operating franchises to provide services within a specific geographic region.

Finally, some advocates of additional regulation implicitly presume that the government can act with almost surgical precision, identifying and stopping inappropriate activities while leaving appropriate activities unaffected. Yet it is difficult to implement regulation perfectly. Even well-meaning regulators make mistakes. Recognizing that regulatory sanctions might be imposed on managers who are not behaving illegally (or inappropriately), these managers quite rationally might modify their actions to reduce the likelihood that sanctions will be imposed. And such modified actions reduce the firm's value to the extent that they are costly—perhaps because managers are diverted from actions that would have increased value.

Informational Failures

Chapter 10 describes how adverse selection can lead to market failures. Adverse selection refers to the situation in which an individual with private information that affects a potential trading partner's benefits makes an offer that is detrimental to the trading partner. The classic example is the "lemons" problem—sellers of used cars generally know more about their mechanical condition than buyers.[9] Thus, at any given price, sellers are more likely to offer "lemons" than high-quality cars. Suppose the average resale price of 1-year-old Ford Broncos is $20,000. Used-car buyers do not expect vehicles offered will

[9]G. Akerlof (1970), "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics* 84, 488–500.

Cost of Regulation: Proprietary Information

IRS officials now release portions of the "advance pricing" agreements they make with businesses. Through these APAs, companies agree in advance with the IRS on how to set transfer prices for internal transactions among units. Although the IRS says it removes sensitive details (taxpayer's identity, trade secrets, and other confidential information), some tax specialists worry. "Companies really bare their souls in filing for APAs," says Timothy McCormally of Tax Executives Institute. He says companies may skip the program rather than risk disclosure.

This is an example of the opportunity costs imposed by regulation. A firm can reduce expected legal costs by negotiating an APA with the IRS. However, filing an APA can expose the firm to considerable risk by having some of its most sensitive cost information outside its control in the hands of a government regulatory agency.

Source: "Tax Report," *The Wall Street Journal* (February 3, 1999), A1.

be in perfect mechanical condition. The $20,000 price thus reflects buyers' forecasts of mechanical problems for 1-year-old Broncos offered in the used-car market. For instance, Lena Cardone is the owner of a 1-year-old Bronco with no mechanical problems. But if she cannot credibly convince a potential buyer that her Bronco has no problems and that she has another reason for selling, she must sell her Bronco for $20,000. Knowing that it is worth more than $20,000, Lena might prefer to keep it—some economists argue that a market failure results.[10] Some state governments have tried to limit this market failure by passing a "lemon law," which requires used-car dealers to fix mechanical defects in used cars up to 30 days after the sale. (Note that although this law might raise retail prices of used cars by increasing the demand by buyers, it will not raise the wholesale price to sellers.)

The U.S. securities laws attempted to overcome alleged market failures that were blamed for the 1929 market crash. Here the information asymmetry involved investors and corporate executives. Advocates for the securities acts claimed that investors were fooled into buying overvalued securities because unscrupulous executives did not disclose information about companies honestly. Of course investors have incentives to anticipate such behavior and only offer prices that reflect expected quality.[11] The U.S. securities acts require such disclosures to reduce the asymmetry, thereby increasing the demand for securities.

Again, these laws are not costless. Regulators must be hired, and firms must expend real resources publishing financial results. Some of the mandated disclosures might involve proprietary information that is more valuable to competitors in crafting effective corporate strategies than to potential investors. And knowing that the information cannot be kept confidential, managers might be less likely to invest in its production. Moreover, external auditors must be hired to attest to the accuracy of the disclosures.

[10]We believe that this argument requires care. It is true that if information were costless, unexploited gains from trade would exist. But information is a good, one that is expensive to produce and transfer. Given the distribution of information and technology for producing and transferring information, the allocation of resources is efficient. We see little difference in arguing that "compared to a world where information costs are lower, the current allocation of resources is inefficient" and that "compared to a world where the cost of steel is lower, resources are misallocated." Ultimately, efficiency must be judged given the costs implied by available technology—not against a benchmark of zero costs. This is another example of the Nirvana fallacy discussed in Chapter 17.

[11]Moreover, for the price to be too high, it is not enough that some investors are misled (or even that the average investor is unsophisticated and is misled); the marginal investor must be misled to affect prices. The marginal investor—that investor who is just on the fence between buying and not buying, so that small differences in price or information may change the decision to buy—is likely to be knowledgeable.

Note that private solutions might be less costly than government regulation. Investors discount the price of securities unless the company makes credible disclosures. Thus, firms face private incentives to provide information for investors. Similarly, used-car buyers can hire auto inspectors or used-car sellers can certify that their preowned cars do not have mechanical defects and voluntarily provide warranties. Car buyers will pay more for used cars with warranties. In these cases, the contracting parties have incentives to overcome potential information asymmetries.

Redistributing Wealth

So far we have discussed two potentially beneficial roles of government: enforcing contracts to facilitate trade and eliminating market failures. In both roles the invisible hand of the free market can be improved (at least in principle) by government intervention. However, details of the implementation of policies to address these problems create opportunities for self-interested individuals to use this intervention as an opportunity to enrich themselves. For example, national defense clearly is a valuable service provided by the government—one that addresses a potential market failure. But if an influential legislator can ensure that a defense contract is granted to a favored firm on lucrative terms, a large transfer of wealth results. Moreover, government must finance this intervention. It generally does so by levying taxes, but governments also raise revenue through user fees for toll roads, tariffs on imports, and licensing and registration fees. In financing government intervention, there are additional opportunities to engineer wealth transfers. Throughout this book (see especially Chapters 2 and 10) we employ the standard assumption that individuals operate in their own self-interest. This assumption also is useful in explaining how individuals behave when working for the government or interacting within the political process. For example, auditors have an incentive to lobby for securities laws that increase the total demand for audited financial statements, especially if they can restrict entry into the auditing profession.

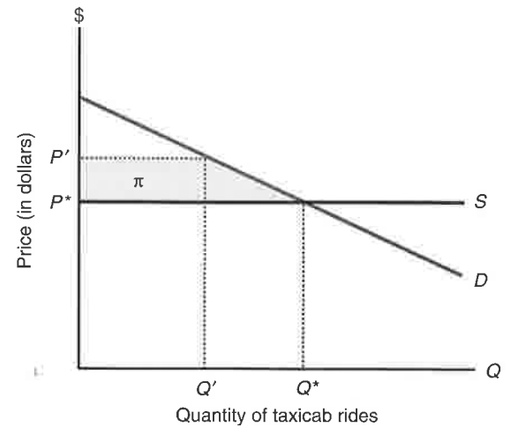
As an example of government effecting wealth transfers, consider taxi licensing that restricts the number of cabs. Figure 21.1 depicts the supply and demand curves for taxi rides in a perfectly competetive, unregulated market. Each cab owner charges price P^* equal to average (and marginal) cost and hence (assuming identical suppliers) makes no economic profit. Absent government intervention, the price of a cab ride is P^* and the number of cab rides is Q^*. Suppose the government—in the name of protecting the public from low-quality cabs—restricts the number of taxis and thus the number of cab rides to Q'. To operate a cab, the driver must display a taxi medallion, which are limited in number. The price of a taxi ride rises to P', and the marginal cost per ride is P^*. Consumer surplus falls by the shaded area. Profit per ride is $P' - P^*$, and total industry profit is the rectangular area π. There are fewer taxi owners, but those expecting to be in business are willing to spend up to π, lobbying the government to restrict the number of cabs. In the extreme case, this entire profit stream will be expended on lobbyists and political campaign contributions.[12]

Consumers should be willing to spend their forgone consumer surplus (the shaded area) lobbying to prevent restricting the number of cabs. Yet because of free-rider problems, it is difficult to raise this amount for an effective lobbying campaign. So long as the cab owners are easier to organize—there are fewer of them and their wealth implications are more concentrated—taxi regulation can be passed despite the fact that the forgone

[12]Note that profit π is a flow. Thus, the taxi owners should be willing to spend up to the present value of the incremental profit stream on lobbying activities.

Figure 21.1 Wealth Transfers via Government Quotas on the Number of Taxis

S and *D* are the supply and demand curves for taxicab rides. Absent government intervention, the price is P^* and Q^* is the equilibrium number of cab rides. If the government restricts the number of cabs and thus cab rides to Q', the price of a ride increases to P'. Consumer surplus falls by the shaded area. Industry profit is the area π. Those cab owners expecting to survive should be willing to spend up to π, lobbying government to restrict the number of taxis.



consumer surplus for the riders exceeds the surplus gained by the owners. The lobbying expenditures by the surviving cab owners and consumers yield no productive benefits to society. If the number of taxis is limited to, say, Q', there is a wealth transfer from cab riders to taxi owners, lobbyists, politicians, and regulators. This example illustrates how government regulation can transfer wealth among various parties. The example also indicates that both consumers and producers have incentives to lobby.

Other examples of wealth transfers exist. Taxes are among the most obvious. Import quotas and tariffs transfer wealth from domestic consumers to domestic producers. Import quotas also help foreign producers act as a cartel. Licensing of doctors, dentists, and lawyers restricts entry into these professions and transfers wealth from the consumers of these services to the incumbent members of the professions. Although zoning restrictions can address externalities, thereby raising land values, they also transfer wealth. These wealth transfers generally are from the initial landowners whose property is restricted to those landowners whose land has no restrictions (or land where the restrictions are not expected to be binding). Subsequent owners of the restricted-use land buy

Regulated Limos in Las Vegas

The Nevada State Transportation Services Authority (TSA) requires all limousine operators to have a certificate of public convenience and necessity. One would-be limo owner describes the system like this: "The TSA regulatory system is designed to protect large companies and to prevent entrepreneurs like me from competing." To get a limo certificate, applicants must show that "the granting of the certificate will not unreasonably and adversely affect other carriers operating in the territory." Existing certified limo companies can pose questions and raise objections that the applicant must answer. One applicant filed 1,000 pages of information ranging from maintenance records to customer lists and spent over $15,000 on the process. His application was denied. In 20 years, only three new certificates have been granted. The area's two largest firms (with 170 limos between them) have lodged objections to all new applicants.

The existing limo firms thus have used the TSA system to help limit entry, reduce competition, and maintain high prices for limo services.

Source: R. Fitzgerald (1999), "Mugged by the Law," *Readers Digest* (January), 98–103.

the land at lower prices that reflect the value of the restrictions. Government farm supports, which pay farmers not to grow certain crops, transfer wealth from consumers to the producers when the subsidy is created. (Again, subsequent purchasers of the farm land pay a higher price for the land as long as the subsidy is linked to the land.) Student financial aid, government support of university research, welfare, and Small Business Administration loans with below-market interest rates all involve wealth transfers.

Managers interested in understanding how government regulation affects the value of their firms must understand the inherent "market" for government regulation. There is both a demand for and a supply of government regulation. If they ignore this market, managers place themselves and their firms at risk. Most organizations find themselves at times lobbying for or against various proposed regulations at the local, state, federal, and even international levels. For example, General Motors argues for lower property assessments and local property taxes, fewer state environmental regulations, increased federal defense department procurement of its products, and more aggressive intervention by international trade organizations to help it gain better access to foreign consumer markets. In the next section we present an economic theory of this market for government regulation.

Economic Theory of Regulation

Before presenting the theory of how the market for regulation works, we begin by first describing the underlying principles (demand, supply, self-interested politicians, and coalition formation).

Demand for Regulation: Special Interests

Special interest groups are composed of self-interested individuals who, because of their current circumstances, stand to benefit from a proposed government legislation. The special interest group might be bicycle riders seeking a bike lane; they might be landowners, construction companies, and labor unions seeking a new federal highway project in their area; they might be milk farmers, organized labor, or the Sierra Club sponsoring legislation that furthers their causes. In most cases the demanded legislation comes at the expense of some other group who either will pay for the legislation or will have their rights restricted by the legislation. The special interest group backing legislation to raise the sales tax collections to pay for a new sports stadium might consist of football fans, construction companies, skilled trades people, hotel and bar owners in the area, and sports reporters working for the local media. A new stadium would make each of these individuals better off. People who are not sports fans are made worse off by the higher sales taxes. For most proposed government action, two special interest groups can be identified—those made better off and those made worse off.

Special Interests and the Microsoft Antitrust Suit

Only 19 of the 50 states joined the federal government suit alleging Microsoft violated the antitrust laws. It is interesting to look at which states participated in the suit and the special interests located in the state. Microsoft's major competitors, Sun Microsystems and Netscape, are California-based companies; Novell is located within Utah. Both California and Utah joined the suit. Washington, home of Microsoft, is not participating, nor is Texas. Texas computer makers Dell, Compaq, and Tandy—who bundle Microsoft Windows into their machines—oppose the suit. It appears as though politicians and regulators in the various states represent the interests of the computer firms in their states when it comes to joining the federal government suit against Microsoft.

Source: C. Georges (1998), "Politics Play a Role in States' Status in Microsoft Suit," *The Wall Street Journal* (May 28), A24.

Political Support

U.S. Senator Trent Lott collected $850,000 from 144 individuals for his and other Republican representatives' campaigns. *The Wall Street Journal* contacted these individuals and reported that "four out of five donors to the Lott [Political Action Committee] had identifiable stakes in specific programs and policies pending before government. One shipping executive said, 'I gave because I have an interest in how he votes on maritime issues. It's self-interest.'"

Source: G. Hitt and P. Kuntz (1998), "The Money Trail," *The Wall Street Journal* (May 28), A1.

Supply of Regulation: Politicians

Politicians, including members of the legislative and executive branches of government, are the primary market participants who supply the regulations. They act as brokers among special interest groups favoring and opposing regulations. But more than just brokering these transactions, they often are active entrepreneurs in proposing regulations and then helping mobilize special interest groups. Politicians must get elected and reelected. They do this by promising to pass (or defeat) legislation that helps (or harms) their constituents. This frequently involves proposing new legislation.

Economists assume that consumers, business owners, and managers are self-interested (Chapters 2 and 10); politicians are similarly motivated. Just because politicians claim that they are public-spirited does not make it so. As in private organizations, agency problems exist within the government. Politicians' activities are difficult to monitor. Simply promising to help deliver a particular regulation does not mean a politician will exert substantial effort to do so. It is difficult for voters to observe the level of effort exerted: Although politicians' voting records are observable, their behind-the-scenes actions generally are not.

This view of public officials as self-interested individuals seeking to enrich themselves by supplying legislation that benefits some group is based on numerous, carefully executed studies of public choice.[13] Our purpose here is to summarize the major managerially relevant insights from that research.

Incentives to Free-Ride and Form Coalitions

The market for government regulation is a competition among those special interest groups supporting and opposing the regulation. The political power of a coalition depends on both its size and how well it is organized to deliver votes and political contributions relative to its opposition. For instance, opinion polls typically show that the majority of Americans favor stricter gun control. Yet the relatively small, but quite well-organized and well-financed National Rifle Association regularly defeats most proposed firearm regulation. Although most Americans favor additional firearm regulation, they

[13]For a review of the material, see R. McCormick (1993), *Managerial Economics* (Prentice Hall: Englewood Cliffs, NJ), Chapter 15.

Regulators Exhibit Self-Interest in Microsoft Antitrust Suit

The states' suit against Microsoft is brought by the attorneys general (AGs) in each state. AGs are either elected or appointed public officials. According to *The Wall Street Journal,*

> [A] number of the AGs (the letters sometimes are said to stand for "aspiring governors") involved in the suit are seeking higher office. [The Microsoft suit is] the type of case attorneys general dream about, regardless of how deeply it affects—or fails to directly affect—their states' consumers or businesses. It's a case filled with legal twists and turns, and high publicity. "We look forward to taking on big players," says West Virginia Deputy Attorney General Jill Miles.

Thus, regulators (or at least attorneys general) are more than just passive representatives of their constituents' interests. Rather, they also have their own interests, which often include election to higher public offices.

Source: C. Georges (1998), "Politics Play a Role in States' Status in Microsoft Suit," *The Wall Street Journal* (May 28), A24.

do not feel strongly enough to take the time and expend the resources to organize an effective coalition. They rationally choose to stay on the sidelines. This example illustrates several important points. Forming a politically effective special interest group is costly. Its members must be kept informed of pending legislation. They must be willing to write letters to politicians, to make campaign contributions, and ultimately to vote for those who support their position. Whether for emotional or financial reasons, people must feel strongly enough about the cause to overcome their incentives to free-ride on the actions of others. Organizing an effective coalition involves many of the same organizational architecture issues described throughout this book—namely, creating incentives and monitoring devices to generate participation in the process.

For a coalition to be effective, the benefits of the government regulation each party in the coalition expects to receive must exceed the costs they bear in forming the coalition and lobbying. Consider a government import quota on foreign cars that raises the price of domestic cars $100. If consumers keep their cars an average of 5 years, they could save about $20 per year by effectively opposing such quotas. Yet these diffuse costs are generally too small to justify incurring the costs of forming a broad coalition, becoming informed of pending legislation, and acting on this information. Thus, most consumers rationally choose to remain uninformed. However, a $100 price hike on each car amounts to hundreds of millions of dollars for each domestic car company. These concentrated benefits are more than sufficient to justify the costs of forming and maintaining their coalition.

Washington Lobbyists

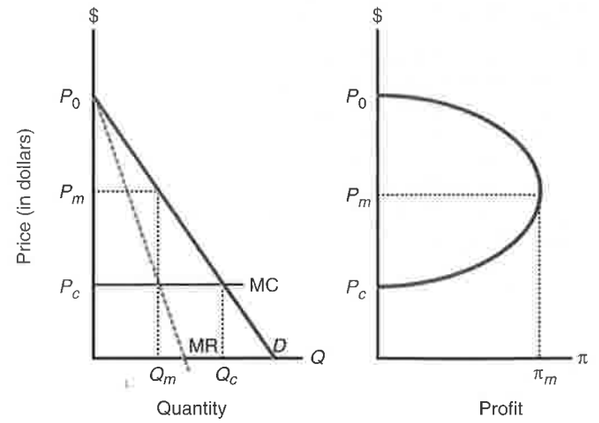
Harold Ickes, former White House deputy chief of staff to President Clinton, has become a lobbyist charging clients anywhere from $10,000 to $20,000 a month. His clients include the American Federation of Teachers, the New York City Council, Greater New York Hospital Association, and the Commonwealth of Puerto Rico. One client, the Coalition for Asbestos Resolution, wants protection from huge worker-health claims. Another, American Crop Protection Association that represents pesticide makers, worries that a new pesticide law passed in 1996 is so broad that the EPA is going to run wild.

Ickes says, "I know a lot of people [in Washington] and how the place works. Business operates on paranoia. This fear leads to a thirst for information—and with my contacts, I can supply it."

Source: L. Walczak (1998), "Got a Problem? Dr. Ickes Is In," *Business Week* (July 13), 106.

Figure 21.2 Industry Profits in Competitive and Monopolized Markets

The left panel graphs industry demand and marginal cost. The unregulated competitive price is P_c and the monopoly price is P_m. The right panel represents industry profit as a function of price. Maximum profit π_m occurs when the price is set at the monopoly price P_m.



Market for Regulation[14]

To illustrate the market for regulation, consider an industry represented by the demand curve in the left panel of Figure 21.2. Marginal cost is constant at MC. If the industry is competitive and unregulated, the market price is P_c = MC. But if all the firms in the industry could collude and behave as a single monopolist, the price would be P_m—the monopoly price would be set where marginal cost and marginal revenue are equal. The right-hand panel of Figure 21.2 represents industry profit as a function of price.[15] Maximum profit π_m occurs when the price is set at the monopoly price P_m (assuming no price discrimiation among customers). If the price is P_0, nothing is sold and hence (with no fixed costs) profit is zero. Profit also is zero when the price is at the competitive level, P_c.

In Figure 21.3 suppose an industry regulator, Ann Melville, is interested in maximizing political support from her constituents—owners of the firms in the industry and the consumers of the industry's output. Regulation gives her the right to set the price in this industry and thus to determine industry profits. Owners want high profits; consumers want low prices.

Figure 21.3 displays two curves that represent those combinations of prices and profits that yield equal political support in terms of campaign contributions and votes.[16] For example, Ann is indifferent between setting price at P_x and profit at π_x and setting price at P_y and profit at π_y. Both combinations yield equivalent political support. At P_x and π_x she gets more support from consumers but less from producers. At P_y and π_y she gets less consumer support but more producer support. Ann prefers to be on political support curves that are lower and to the right—for instance, she prefers PS_2 to PS_1. On PS_2, consumers have lower prices (and hence Ann gets more consumer support) for a given level of profit. For example, hold industry profits constant at π_x; if Ann is on PS_2, consumers

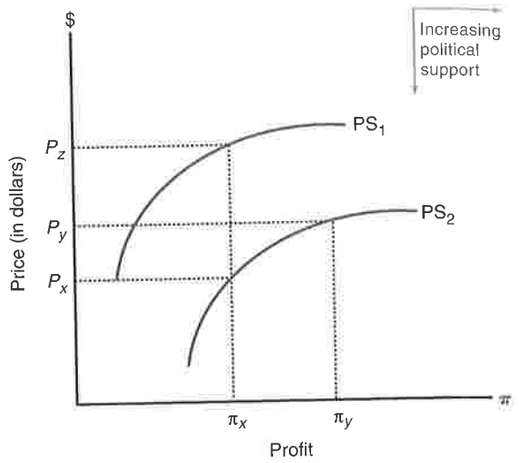
[14]This section draws on G. Stigler (1987), *Theory of Price,* fourth edition (Macmillan Publishing Company: New York), Chapter 20.

[15]Although we usually think of profit as a function of price, we plot price as the vertical axis to make comparisons across the graphs easier.

[16]Note that these curves are similar in concept to indifference curves in Chapter 2 and isoquants in Chapter 5.

Figure 21.3 Political Support Functions

A PS curve graphs combinations of profit and price levels that produce equivalent political support from industry and consumers. Thus, the regulator is indifferent between setting price at P_x and profit at π_x and setting price at P_y and profit at π_y—both combinations yield equivalent levels of political support. However, the regulator prefers to be on PS_2 than on PS_1.



face a lower price P_x than if Ann is on PS_1 and consumers face a higher price P_z—Ann thus receives less consumer support. These political-support functions have positive slope. Higher prices reduce consumer support that can be offset only with higher support from industry via higher profits. These curves are concave because at low prices, small price changes are little noticed by consumers. But at higher prices, they garner greater notice, thereby requiring larger industry profits to offset them. For example, when gasoline prices increased dramatically in 2000 following OPEC's production cuts, politicians appeared on television supporting consumers and promising to investigate the high prices.

Although Ann prefers to be on a political support function as far to the right as possible, the actual political support function she can achieve depends on the trade-off between profits and prices as determined by specific conditions in the industry. Figure 21.4 combines the analysis in the earlier two figures. Given the profit-price profile in Figure 21.2, Ann is able to achieve political support PS_2. Here she will set the regulated price at P_r^*. Industry profits are π_r^*, which is less than maximum profits of π_m. Ann favors a price between the monopoly and competitive prices. If she sets a higher price to generate more support from the industry, she loses support from consumers and finds herself on a lower political support curve. If she sets a lower price to garner more consumer

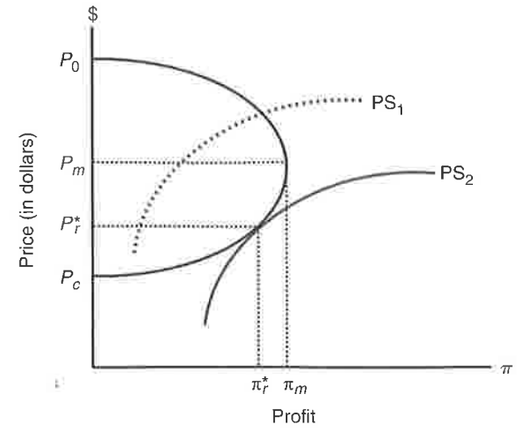
Cost of Protection: Automobile Import Restrictions

In the 1980s, the U.S. and Japanese governments agreed on a "voluntary restriction" on Japanese cars imported into the United States to protect American auto jobs. By limiting the number of cars imported, the price of Japanese cars rose about $1,000, the price of European cars rose about $2,000, and the price of U.S. cars rose about $500. By one estimate, the cost of saving one U.S. automotive job via this voluntary import restriction approached $200,000. Thus, U.S. consumers paid about $200,000 per American auto job saved.

Source: E. Dinopoulos and M. Kreinin (1988), "Effects of the U.S.–Japan Auto VER on European Prices and on U.S. Welfare," *Review of Economics and Statistics* 70, 484–491.

Figure 21.4 Equilibrium Regulated Price

The regulator sets the regulated price P_r^* to be less than the monopoly price P_m, but more than the zero-profit competitive price P_c. At higher prices, the regulator loses more support from consumers than is gained from industry. At lower prices, the regulator loses more industry support than is gained from consumers.



support, she loses so much industry support that again she finds herself with lower overall political support.

Several important insights arise from this analysis:

- Regulators do not always behave in obviously consistent ways. They might reduce monopoly prices but seek to form cartels in competitive industries where they can raise prices. Although appearing inconsistent, both types of regulation move price away from favoring entirely either consumers or producers.
- If consumers are unorganized, they offer regulators little political support relative to an organized industry group. In the case of completely unorganized and ill-informed consumers, the political support function in Figure 21.4 becomes vertical (at least over the relevant range) and the regulator maximizes support by setting the monopoly price. Conversely, if consumers are well organized but industry owners are disorganized and offer no political support, the regulator faces a horizontal support function and will set the price at the competitive, zero-profit level.
- The outcome of the political process depends on the relative political support a special interest group can achieve. The more organized and the larger the special interest group, the more political support it can offer. Executives attempt to make

Brazil Deregulates Airfares

"For decades, Brazil's airlines competed only in the corridors of [the capital] Brasilia, where politicians dispensed favors in return for free airline tickets and other goodies." Airfares between Rio de Janeiro and São Paulo averaged $500 (round trip). Deregulation has sparked intense competition. Fares on this route have fallen to about $200, and Brazil's largest airlines are currently complaining that they are losing money. This is an example of how regulators can choose between prices and industry profits.

Source: P. Fritsch (1998), "Brazilian Carriers Plunge into First Fare War as Deregulation Ignites Ferocious Competition," *The Wall Street Journal* (May 12), A15.

Conservative Choices of Accounting Methods

Large, highly visible firms like IBM, General Motors, and Microsoft tend to use more conservative accounting procedures than smaller, less visible firms. For example, large firms are more likely to use depreciation methods that write assets off faster, thereby lowering reported earnings. This evidence is consistent with these firms' seeking to reduce their political exposure by reporting lower accounting earnings. Since large accounting profits are often viewed as measures of monopoly profits and hence attract more media attention, managers of firms subjected to these charges attempt to blunt them by choosing income-decreasing accounting methods. This can reduce the amount of political opposition these firms face.

Source: R. Watts and J. Zimmerman (1986), *Positive Accounting Theory* (Prentice Hall: Upper Saddle River, NJ).

the political support function steeper by increasing political contributions, organizing their employees to vote for the candidate, and reducing consumer opposition through a public relations campaign.

- Government programs tend to benefit small groups (aerospace contractors) at the expense of large groups (taxpayers). Holding constant the total amount of wealth transferred, the larger the losing group, the smaller the average loss per loser. Similarly, the smaller the winning group, the larger the benefits per winner.

Deadweight Losses, Transaction Costs, and Wealth Transfers

Because special interest groups can enrich themselves at the expense of others, each group is willing to spend up to the amount they are expected to win or lose providing political support. Recall from Figure 21.1—where government restricts the supply of taxis, thereby driving up the cost of cab rides—that the lost consumer surplus (the shaded area) is a deadweight loss to society. The surviving cab owners are making a profit because now price is above their cost. But to limit the number of cabs, a government taxi licensing office must be created to issue permits. Police and courts must incur costs as they attempt to catch and punish unauthorized cab drivers. In addition to these costs, each side will incur costs of organizing, lobbying, and providing political support for the politician. Minimizing these costs and deadweight losses is in both the winners' and losers' interests. Thus, government policies that generate smaller reductions in economic efficiency are more likely to be adopted because the losers are harmed less and will oppose the regulations with less zeal, and winners will lobby harder since they have more to share.

Why Do Ships Register in Liberia?

Taking a cruise from Miami to the Caribbean? Why is the ship registered in Liberia? In fact most cruise lines register their ships in Liberia. The answer is simple. If the ship is registered in the United States, it must be owned and crewed by Americans, making it subject to U.S. labor laws, including the minimum wage. Liberia does not have such labor laws and hence registering the ship in Liberia exempts it from U.S. laws, saving the ship's owner a boatload of costs. This is an example of how companies seek creative ways to reduce the costs of costly regulation.

Source: R. Tucker (2001), "Why Do Ships Register in Liberia?" *Fortune* (June 11), 42.

Managerial Implications

Having laid out the essential features of the market for regulation, in this section we describe the important managerial implications such as entry restrictions, forming coalitions, and business participation in the political process.

Restricting Entry and Limiting Substitutes

In Chapter 8 we describe how firms develop strategies that both create value and capture value. Recall that it is not enough to build a better mousetrap; you must prevent others from copying your ideas and entering the market. We discussed patents, copyrights, and trademarks as means to protect intellectual property. Now we examine how government regulations might be used to create additional barriers to entry.

The most direct way to restrict competition is a government regulation limiting entry. For example, labor union laws that prevent unionized firms from hiring nonunion employees raise wages in these firms. Immigration laws limit the numbers of foreign workers allowed into the country to protect the domestic labor force. It is illegal for private delivery services to deliver mail to a customer's mailbox. Professions like law, medicine, accounting, and dentistry limit competition by setting professional licensing standards such as passing exams and requiring work-related experience. Public utilities such as telephone, gas, electric, and cable television companies have been granted exclusive franchises within specific geographic areas.

A less direct method of limiting competition is a government regulation that imposes a cost on certain competitors and potential entrants. For example, consider health codes that require restaurants to meet various regulations concerning the preparation and storage of food. Although such health codes increase all restaurants' costs, they increase street vendors' costs proportionately more than those of full-service restaurants. Thus, health codes restrict the number and types of street vendors and hence potential competition from new entrants. Or, recall Netscape's involvement in the federal government's antitrust suit against Microsoft. Microsoft argues that it was "set up" by Netscape in a June 1995 meeting where Netscape allegedly created a record that Microsoft proposed splitting the browser market with Netscape. Documents referring to this meeting were a key argument in the government's case. In its settlement agreement with the Justice Department Microsoft agreed to disclose various technical data on software currently being developed so that other companies can write programs for Windows that

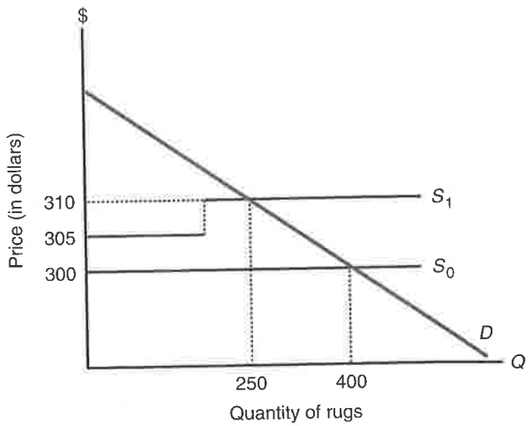
Restricting Entry into European Retailing

"The fight against outlet malls will continue. If we allow one, the dam will break, and we'll be swamped," stated the director of the German Retailers' Association. U.S. and U.K. retailers are trying to enter European markets. To keep them out, shops cannot stay open evenings and Sundays. Mall developers must contend with high wage rates, restrictive zoning laws, and high property taxes. Public officials battle developers over signage and government permits. In Austria, the chamber of commerce is lobbying hard to keep out foreign competitors. One retailer says, "Low prices will be our downfall." Thus, to limit the competition they face (especially from foreign firms), European retailers use a wide variety of government regulations to restrict entry.

Source: E. Beck (1997), "Outlet Malls Make Headway in Europe Despite Opposition by Local Retailers," *The Wall Street Journal* (September 17), A17.

Figure 21.5 Imposing a Payroll Tax Allows Low-Labor Firms to Earn Profits

Two hundred labor-intensive and 200 material-intensive firms are selling 400 rugs at $300 each. Imposing a payroll tax shifts the supply curve for all firms, but it shifts more for labor-intensive firms. The equilibrium price rises by $10, and the quantity falls to 250. One hundred and fifty labor-intensive firms exit the industry and each material-intensive firm earns economic profits of $5 per rug—so long as they can prevent new material-intensive firms from entering.



compete with Microsoft products. This remedy reduces Microsoft's competitive position and makes Netscape more competitive.

To illustrate how government regulation can change the relative competitiveness of firms, consider the market for rugs.[17] Suppose there are two ways to produce the same rug. Labor-intensive firms employ 10 workers an hour at $15 per hour and use 30 pounds of wool at $5 per pound. It takes 1 hour to produce a rug at a total cost of $300 ($10 \times \$15 + 30 \times \$5$). Material-intensive firms also produce 1 rug per hour, also at a cost of $300, but they use 5 workers at $15 per hour and 45 pounds of wool at $5 per pound. Material-intensive firms cannot switch to become labor-intensive firms, and vice versa; moreover, firm sizes are fixed. The rug market is competitive and each rug sells for $300. There are only 200 labor-intensive firms and only 200 material-intensive firms. Total quantity produced and sold is 400 rugs per hour. In Figure 21.5 the market demand curve and the original supply curve intersect at a quantity of 400 rugs and a price of $300. Neither type of firm makes abnormal profits.

Now the material-intensive firms are able to get a $1 per employee per hour payroll tax implemented by the government. All firms are required to pay this tax. The total cost of a labor-intensive firm rises to $310 ($10 \times \$16 + 30 \times \$5$). The total cost of a material-intensive firm rises to $305 ($5 \times \$16 + 45 \times \$5$). The price of rugs rises to $310 because the demand curve intersects the new supply curve at a price of $310. The material-intensive firms are making abnormal profits of $5 per rug. The remaining labor-intensive firms are breaking even. But only 250 rugs per hour are produced. The result is that 150 labor-intensive firms go out of business. The 200 material-intensive firms continue to make abnormal profits of $5 per rug so long as they can prevent new material-intensive firms from entering.

This example illustrates an important managerial implication. A firm might rationally support government regulations that impose costs on itself, as long as competing firms incur higher costs. This drives the high-cost firms from the industry and allows remaining firms to earn economic profits because the marginal firm (or the next firm to

[17]This example is based on R. McCormick (1993), Chapter 15.

Skyway Robbery

In June 1997, Southwest Airlines ran ads urging travelers to lobby their elected representatives to oppose a change in the federal tax on airline tickets. The largest seven airlines proposed a fixed head tax on each ticket instead of a tax based on the ticket's cost. For a given route, this change would raise the ticket price of low-fare airlines such as Southwest more than that of the seven big airlines. This is an example of how the largest airlines tried to use details of the structure of federal taxation of airline tickets to reduce competition from low-fare carriers.

Source: *The Wall Street Journal* (June 15, 1997), A5.

enter) is a high-cost firm. Managers often support these regulations by arguing that they are in the public interest. For example, managers might argue the payroll tax is used to support social programs such as employee health benefits.

Other examples illustrate the pervasiveness of cost-increasing regulations that restrict entry. General Motors lobbied for stringent miles-per-gallon standards in the early 1980s. Burlington Industries supported Occupational Safety and Health Administration cotton dust standards for textile manufacturers. These standards imposed relatively higher costs on smaller plants, thereby allowing the larger plants to generate economic rents. Truckers support train safety regulation. Local merchants want tougher building codes. In the 1800s, English steam-powered mill owners argued for rules limiting child labor in factories. (This case is like that in Figure 21.5 where a payroll tax is imposed; it favors capital-intensive firms—steam-powered mills—at the expense of other labor-intensive firms.) Finally, large accounting firms supported regulations that required all CPAs to have extensive periodic peer review evaluations. These requirements impose relatively higher costs on smaller CPA firms, forcing them out of markets (such as those for publicly traded client firms) where large CPA firms dominate.

Forming Coalitions

The economic theory of regulation emphasizes the critical importance of coalition formation. Winning coalitions supply more political support to politicians (votes and campaign contributions) than losing coalitions. One way to increase political support is to expand the number of people supporting the regulation. This process sometimes produces unusual alliances. For instance, in the South during the early 1900s, illegal liquor producers (bootleggers) wanted to reduce competition from legal distillers. Bootleggers supported a coalition of church members who wanted to ban the sale of all alcohol. Responding to this lobbying, a number of counties in southern states became "dry" by passing legislation prohibiting the sale of alcoholic beverages. Since the bootleggers had been operating illegally for years and avoiding prosecution from federal alcohol tax collectors, continuing to operate their underground businesses posed relatively few new problems. This is a classic case of "politics make strange bedfellows" and has been called the "Bootleggers and Baptists Phenomenon."[18]

We often observe a special interest group that lobbies to restrict entry because it furthers its economic interest (bootleggers) joining forces with a special interest group that lobbies to correct a social ailment (Southern Baptists). Another example is western coal producers supporting environmental groups who lobby for tighter air-quality emission

[18]McCormick (1993), 649.

standards that make burning high-sulfur eastern coal more expensive than their low-sulfur coal. Winning coalitions frequently contain industry groups, "public interest" groups, and regulators to produce a strong political force pitted against consumers and rival companies. For example, aerospace contractors to the space program form coalitions with science "buffs" to lobby Congress for more space funding.

Recall the discussion in Chapter 20 regarding leadership. Forming political coalitions is similar to forming coalitions within the firm to advocate new proposals. Members of a political coalition are usually risk-averse, and so new government regulations that are uncertain are more likely to be opposed. Ways of increasing the coalition's support of a proposed regulation is to reduce the uncertainty in the regulation, emphasize a crisis, and organize a logroll.

On Business Participation in the Political Process

Some will question whether a firm should be an active participant in the political process. Certainly our analysis suggests that collectively, we would be better off if we could limit the government's ability to pass regulation that restricts competition. In such a case, consumer prices would be lower and the deadweight costs and transaction costs associated with both lobbying for government regulations and enforcing the regulations would be saved.

Yet in evaluating company participation, we believe several points are important to consider. First, managers have a fiduciary responsibility to maximize the value of their firm—not to maximize social welfare. Regulation can have a material impact on a firm's value. Second, companies did not create this system that allows these welfare-reducing regulations to be adopted—politicians did. Unfortunately, eliminating this wasteful activity seems unlikely. Far too much wealth is at stake. Too many vested interest groups (including politicians, regulators, lobbyists, and lawyers) exist to expect that these very same people will adopt new laws reducing the demand for their services. Third, even if a firm decides not to pursue political activities designed to produce wealth transfers, it almost certainly will be confronted with trying to prevent regulation aimed at reducing its value. Remaining passive does not mean that everyone else will leave it alone. Managers who avoid participation in the political process that would benefit their firms reduce shareholder wealth. This places their company's continued existence at risk and calls into question their fiduciary responsibility to shareholders.

Finally, it is important to evaluate carefully the strategic aspects of participation in the political process. As described in Chapter 9, managers must consider carefully how government regulators and other affected parties will react to the manager's lobbying activities. For example, managers must decide whether it is better to be a "first mover"

Effect of the Microsoft Case on Other Computer Firms

One might expect that the government's antitrust actions against Microsoft would have affected the values of other computer firms. In particular, direct competitors such as Netscape and Sun should be made better off, whereas firms selling complementary products such as Dell and Compaq are made worse off. A study of the stock price movements of 159 computer-related firms surrounding major news announcements of antitrust actions against Microsoft from March 1991 to December 1997 yields some interesting findings. These 159 computer firms (excluding Microsoft) had a total stock market value of $754 billion in December 1997. This group experienced an aggregate drop in stock value of $35 billion on the 3 days surrounding the 29 news announcements that increased the antitrust enforcement against Microsoft. Conversely, when antitrust news favorable to Microsoft was announced, these firms' value increased $70 billion. Negative (positive) movements of Microsoft stock at the time of antitrust enforcement actions coincide with negative (positive) returns for the industry. Notice that the 159 computer firms include those firms supposedly wanting the government antitrust suit to succeed. Surprisingly, there is no evidence that individual firms such as Netscape, Sun, Novell, or Apple realized higher stock returns when antitrust actions were taken against Microsoft. Repeated antitrust actions against Microsoft have not increased the expected earnings of other computer firms. "Surprisingly, government action against Microsoft appears to inflict capital losses on the computer sector as a whole. . . . Withdrawals from policy enforcement have been accompanied by positive shareholder returns throughout the computer sector."

Source: G. Bittlingmayer and T. Hazlett (2000), "DOS *Kapital*: Has Antitrust Action against Microsoft Created Value in the Computer Industry?" *Journal of Financial Economics* 55, 329–359.

CASE STUDY: *World Motors*

World Motors (WM) is a large U.S. automobile manufacturing company. Eighty percent of its plants and sales are in the United States. WM is considering whether it should hire lobbyists to try to influence a variety of pending legislation. There are bills in Congress proposing to tighten automobile emission standards as part of the clean air laws, laws restricting union activity, increasing worker safety rules, reducing the miles-per-gallon standards on automobiles, and imposing import quotas. WM supports legislation that increases its firm's value. Each piece of pending legislation is evaluated using this criteria. The following briefly describes each piece of pending legislation.

Emission Standards Tighter emission standards increase the cost of cars because they require more expensive emission-control devices such as more precise fuel injection systems and catalytic converters. One of WM's major competitors has a patent on a proprietary fuel emission system that allows cars equipped with its technology to meet the tighter emission standards. WM's competitor can install this proprietary technology on its cars cheaper than WM can install its device required to meet the higher emission standards.

Labor Union Laws Labor laws increase the bargaining power of unions and thus their ability to extract higher pay or benefit concessions or provide lower amounts of work. The pending legislation proposes rules that make it harder for a local union to call a labor strike.

Worker Safety Rules The Occupational Safety and Health Administration (OSHA) is proposing that plants making metal castings (such as automobile engine blocks) be equipped with air ventilation systems that replace the air in the plant more frequently than the current air-quality standard requires. Most of WM's engines are cast off shore, whereas most of its competitors cast their engine blocks in the United States.

Miles-per-Gallon Standards To conserve gasoline, the federal government has mandated that automobiles produced by each company must comply with a minimum miles-per-gallon standard. These standards are met by producing lighter cars with more efficient fuel systems. New rules requiring tighter, more fuel-efficient vehicles are being proposed. The mix of WM's produced vehicles is very similar to those of its major competitors in terms of car sizes and their fuel efficiency. No auto company has any proprietary technology to improve fuel system efficiency.

Import Quotas Citing the unfavorable trade deficit, the U.S. government is considering regulations limiting the number of foreign cars imported into the United States.

Discussion Questions

1. For each piece of proposed legislation, should WM support or oppose it?
2. Which pieces of legislation do you expect WM's local labor unions to oppose or support?

or "second mover" in lobbying. Managers must ensure that their lobbying is "credible" in the sense that rivals change their beliefs because the manager has sufficient commitment to the strategy. And, managers must consider how their lobbying on the current government regulation will affect repeated interactions in the future. Government regulation is another example of where game theory (Chapter 9) can help managers better understand and plan their actions.

Summary

This chapter presented a framework for understanding how government regulation affects a firm's strategy and hence the value of a firm. Chapter 8 and Figure 11.1 emphasize that government regulation is a key environmental factor affecting a firm's value. From changing the extent and nature of the competitiveness of markets, to regulating labor and capital markets, to taxation, governments touch virtually all aspects of organizations. In this chapter we discuss the managerial importance of government regulation and the benefits and costs of this regulation, and present an economic theory of regulation. This theory helps managers to understand better how various regulations come about and how to better participate in the markets for regulation more effectively.

Governments provide a system of laws and legal institutions that facilitate production and exchange; they also address various market failures. Legal institutions which define and enforce property rights lower transaction costs, thereby increasing both producer and consumer surplus. For example, the patent process increases the amount invested in research and development and ultimately the value of goods and services flowing from this R&D. Governments also seek to redress market failures such as externalities (air pollution), public goods (national defense), monopolies (antitrust laws), and informational failures (lemon laws).

It is important to realize that it is costly to enforce property rights and to resolve these market failures. To finance these beneficial functions, governments must raise revenues, usually through taxes. In the process of performing these functions and raising the revenues to finance them, governments also can redistribute wealth, which imposes costs on society. Government agencies, courts, and legislative processes must be financed out of taxes and fees. And besides the direct costs of operating governments, there are indirect costs imposed on society because of the wealth transfers that undoubtedly arise from most government actions. These wealth transfers are not merely zero sum games, in the sense that what one group receives another loses. Rather, there are transaction costs and deadweight losses (reduced consumer and producer surplus). In the process of transferring some of the pie from Peter to Paula, the pie is smaller because knowing that he might lose some of the pie to Paula, Peter has *less* incentive to make the pie as big as possible. Income taxes are another example. Paying, say, 30 percent of my income to the government in the form of income taxes causes me to engage in less work[19] and consume more leisure.

The economic theory of regulation is based on those who demand regulation (special interests) and those who supply it (politicians). Special interest groups who are made better off by the regulation will lobby in its favor, whereas those harmed will lobby against it. Politicians are made better off by brokering these transactions. They generate political support in the form of campaign contributions and votes from the various coalitions formed to support or oppose the regulation. The size and political power of a

[19]Suppose I am paid \$20 per hour, H, and my utility function for work is $\$20H(1 - t) - 0.5H^2$. I have disutility of work that is quadratic. The tax rate on income is t. Taking the first derivative with respect to H and setting it equal to zero yields $H^* = 20 - 20t$. If $t = 0$, I work 20 hours. If $t = 50$ percent, I work only 10 hours.

coalition depend on both how well it is organized to deliver votes and political contributions as well as how poorly organized its opposition is. People must feel strongly enough about the cause for either emotional or financial reasons to overcome their incentives to free-ride on the actions of others. If consumers are unorganized, they offer regulators little political support relative to an organized industry group. The outcome of the political process depends on the relative political support a special interest group can achieve. The more organized and the larger the special interest group, the more political support it can offer the regulator.

This theory of regulation has several important managerial implications. To develop strategies that both create value and capture value—it is not enough to build a better mousetrap—you must limit entry by competitors. The most direct way to limit competition is a government regulation limiting entry (for instance, zoning laws or taxi medallions). A less direct method for limiting competition is a government regulation that imposes a cost on certain competitors and potential entrants (for instance, health codes, worker safety standards, and pollution emission laws).

Another implication of the economic theory of regulation emphasizes the importance of coalition formation. Effective coalitions supply political support to politicians (votes and campaign contributions). One way to increase political support is to expand the number of people supporting the regulation. Coalitions are like other types of organizations—they have organizational architectures. To make coalitions more effective within the political process, the coalition should be structured using the concepts of organizational architecture presented throughout this book. In particular, incentives to participate and performance measures can be used to reduce free-rider problems within the coalition.

Finally, regulation can have a material impact on a firm's value. Managers must decide whether or how to participate in the market for regulation. Remaining neutral does not guarantee that your firm's value is unaffected. Managers who avoid participating place their company's continued existence at risk and call into question their fiduciary responsibility to shareholders.

Review Questions

21–1. "When I bought this land, it was zoned only for farming. But the longer I live here, the more I resent the wealth transfer I'm paying to other landowners without such restrictions." Comment.

21–2. Adam Smith often is quoted as saying, "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public or in some contrivance to raise prices." If Smith is right, does this justify a role for government?

21–3. At a city council meeting, the Taxi Cab Owners Association argued for a fare increase. They note that the market price to buy or rent taxi medallions has been rising, and with these higher costs, profitability is reduced. Evaluate this argument.

21–4. In 1997 Canadian 2 × 4 lumber studs with two holes drilled in them (so that electricians could run wires) were categorized by customs agents as Category #4418 and free of any tariffs. If they had been categorized as #4407, they would have fallen under a quota system whereby only the first 14.7 billion board-feet of lumber Canada imports to the United States are duty free. The next 650 million are subject to a \$50 export fee per 1,000 board-feet, and beyond that, a \$100 fee. Roughly 15 billion board-feet of lumber is imported to the United States each year from Canada. If the Canadian 2 × 4 studs with holes are classified as #4407, this adds about \$3,000 to the cost of a new home. Discuss the expected lobbying behavior of lawmakers from timber producing states (Montana and Alabama), the National Association of Homebuilders, and U.S. lumber companies (for instance, Georgia Pacific).

21–5. What would be the impact of raising the federal minimum wage?

21–6. What are the benefits and costs of government regulation of air quality within cotton mills—for instance, specifying maximum levels of cotton dust (prolonged exposure leads to "white lung" disease)?

21–7. What are the benefits of government regulation of air pollution from automobiles? What are the costs of this regulation?

21–8. Sun, Netscape, and Apple have encouraged the government to pursue its antitrust suit against Microsoft; California, where these firms are headquartered, has joined the suit; yet Bittlingmayer and Hazlett (2000) *JFE* no evidence that these firms realize higher stock returns when antitrust actions are taken against Microsoft. How might you explain these facts?

21–9. Various politicians have proposed an Internet tax. One proposal would be to tax both outgoing e-mail and every Web page downloaded. What groups are likely to support such a tax and what groups would oppose it?

21–10. Dubliners often complain that there are too few pubs in their city. At night pubs can be quite crowded and prospective customers often are turned away. Some Dubliners blame this pub "shortage" on the English who originally enacted laws restricting pubs centuries ago when they ruled Ireland. Is it appropriate to blame the English? Explain.

21–11. Proposed legislation would required 48-hour notification to all neighbors (within 150 feet of your property) for all pesticide applications that may be made to your property by trained, professional applicators. This legislation is labeled "environmentally friendly." Analyze the impact to the environment. (Note that pesticides come in varying strengths with more toxic products having a longer residual impact and thus requiring less frequent application.)

21–12. California (and other states) has passed laws that restrict the exercise of termination provisions in franchise agreements. Your boss says that he thinks this is a good idea—firms have an incentive to terminate profitable franchises and replace them with company-owned outlets. He asks what you think.

21–13. Passing through Louisiana you notice billboards proclaiming "Louisiana's shame—the only state that does not license chiropractors." Who do you expect finances these billboards? If licensing were adopted, who would be affected and how?

Ethics and Organizational Architecture*

CHAPTER 22

CHAPTER OUTLINE

In December 1990, the head of Salomon Brothers' government-bond trading desk, Paul W. Mozer, submitted bids for 35 percent of a 4-year Treasury note auction. He also submitted another $1 billion bid under the name of Warburg Asset Management—a Salomon Brothers customer—but without the customer's knowledge or consent. The two bids, which represented 46 percent of the issue, violated the Treasury's auction rules limiting the amount sold to any single bidder to 35 percent of the issue.[1] Mozer repeated this tactic at Treasury note auctions in February and April.

In April, Mozer became concerned that the Treasury was about to uncover his illicit bidding tactics. He admitted his unauthorized bidding in the February auction at a meeting with Salomon Chairman John Gutfreund, President Thomas Strauss, Vice

*Portions of this chapter were published in C. Smith (1992), "Economics and Ethics: The Case of Salomon Brothers," *Journal of Applied Corporate Finance* 5:2, 23–28; and J. Brickley, C. Smith, and J. Zimmerman (1994), "Ethics, Incentives, and Organizational Design," *Journal of Applied Corporate Finance* 7:2, 20–30.

[1]In auctioning Treasury bonds, the U.S. Treasury awarded bonds first to the highest bidder at their quoted prices, then they moved to the next-highest bidder. This process continued until the issue was exhausted. If the Treasury received multiple bids at the price that exhausted the issue, it allocated bonds in proportion to the bid size. But Treasury auction rules limited the amount of an issue sold to any single bidder to no more than 35 percent of the issue.

Chairman John Meriwether, and General Counsel Donald Feuerstein. They apparently accepted his confession to a one-time, not-to-be-repeated mistake and no immediate action was taken.

In May, he again employed this bidding tactic in another Treasury note auction. In June, the Securities and Exchange Commission and the Justice Department issued subpoenas to Salomon and some of its clients for records involving bond auctions. Salomon then initiated a review of its government-bond operations and in August disclosed its unauthorized bids over the period between December and May.

By May 1992, the government had imposed a number of penalties on Salomon Brothers. The Treasury barred Salomon from bidding in government securities auctions for customer accounts. While allowing Salomon to retain its designation as a primary dealer, the Federal Reserve Bank of New York suspended its authority to trade with the bank for 2 months. The firm agreed to pay $122 million to the Treasury for violating securities laws and $68 million for claims made by the Justice Department. It established a $100 million restitution fund for payments of private damage claims that might result from approximately 50 civil lawsuits that the firm still faced stemming from the scandal. Monies in this fund not paid to the plaintiffs reverted to the Treasury, not Salomon.

Although these legal and regulatory penalties were substantial, they represent but a fraction of the total costs borne by the firm. In the week that the information about the unauthorized bids was released, Salomon Brothers' stock price dropped by one-third. This $1.5 billion fall in market value suggests that the market expected Salomon to bear significant costs as a result of these actions. Further, the drop seems too large to reflect simply fines and other expected legal and regulatory sanctions. In addition to the penalties and decline in the market value of Salomon's stock, all of the senior officers who knew of the illicit bids, but failed to act swiftly, were forced to leave the firm—and none of these individuals has since worked in a major securities firm. Salomon was acquired by the Travelers Insurance Company in 1997 and, after Travelers merged with Citibank, became part of Citigroup. In 2002 Citigroup announced a major restructuring and would reduce the use of the Salomon name substantially. The case of Salomon Brothers illustrates that market forces can impose material sanctions on parties engaged in unethical behavior.[2]

Over the past decade, much public attention has been devoted to the issues of business ethics and corporate social responsibility. Politicians and social critics have deplored the materialism of the eighties and nineties; the media have treated the public to sensational accounts of corporate scandal; and business schools across the country offer courses in ethics.

In recent years, many United States corporations have responded by issuing formal codes of conduct, appointing ethics officers, and offering employee training programs in ethics. Such codes and programs cover a wide range of behavior, but most emphasize the following:

- Compliance with laws and statutory regulations
- Honesty and integrity in dealings with customers and other employees
- The avoidance of conflicts of interest with the company

[2]For a more complete discussion of the Salomon Brothers case, see C. Smith (1992), "Economics and Ethics: The Case of Salomon Brothers," *Journal of Applied Corporate Finance* 5:2, 23–28.

Although few would quarrel with such aims, equally few proponents of such corporate initiatives have bothered to ask questions like the following: Are such codes and programs likely to be effective in deterring unethical behavior by corporate managers and employees? And, more pointedly, is the behavior enjoined by such codes consistent with the normal incentives of employees or managers, *given the current organizational architecture* of the firm?

Although it is recognized rarely in most public discussions of the subject, corporate ethics and organizational architecture are closely related. To increase the likelihood that businesspeople will behave ethically in their roles as managers and employees, corporate performance-evaluation systems, reward systems, and assignments of decision rights can be designed to encourage such behavior.

In this chapter, we present five basic arguments:

First, the term *ethics* is elusive. It has many different meanings, and these meanings vary across cultures and over time. The term *business ethics* can mean everything from corporate social responsibility to maximizing shareholder value.

Second, if the corporation is to survive in a competitive environment, it must maximize its value to its owners (primarily the stockholders). Taking care of other corporate stakeholders such as employees and local communities is important, but such care can be taken too far. If the firm reduces the owners' value, this care can imperil corporate survival.

Third, a company's reputation for ethical behavior, including its integrity in dealing with noninvestor stakeholders, is part of its brand-name capital; as such, this component of the firm's value is reflected in the value of its securities. By the same token, individuals' human capital—that which determines their future earnings prospects—is based in no small part on their reputation for ethical behavior. In this sense, private markets provide important incentives for ethical behavior by imposing substantial costs on institutions and individuals that depart from accepted ethical standards. The Salomon Brothers trading scandal illustrates that the magnitude of these costs can be enormous.

Fourth, considerable emphasis in corporate ethics programs is put on what we would argue are misplaced efforts to change employees' preferences by attempting to persuade them to put the interests of the organization or its customers ahead of their own. Our approach, instead, accepts people's preferences and assumes they will follow their perceived self-interest. We focus on structuring the organization in ways that better align incentives of managers and employees with the corporate aim of maximizing value.

Fifth, even if ethical guidelines and training programs are unlikely to alter fundamental preferences, they nonetheless have the potential to add value by more explicitly communicating the firm's expectations to its employees. To be most effective, however, such guidelines must be reinforced by formal aspects of the firm's organizational architecture.

Ethics and Choices

People make choices. A cornerstone of this book is that individuals make choices to maximize their utility. Individuals have preferences over just about everything and choose how much to spend on food, transportation, housing, charitable contributions, and other purchases. People choose how to allot their time between work, leisure, and charitable activities as well as how to allocate their time among alternative leisure activities—for example, watching television, playing golf, or attending a symphony concert. Economics is the study of how people make choices; it is basically a descriptive study seeking to explain people's observed decisions. In this book, our analysis has been descriptive, not

Martha Stewart Loses $275 Million to Save $80,000

On December 26, 2001, Martha Stewart sold 3,928 shares of biotech firm ImClone for about $60 a share, the day before ImClone disclosed to the stock market that the FDA had rejected its cancer drug application. Federal authorities claim that Martha Stewart had been tipped off by her friend, Samuel Waksal, CEO of ImClone, of the FDA decision and that Stewart had illegally traded on inside information. Stewart denies the allegations. Martha Stewart's investment in ImClone on December 26 was worth about $240,000. In a little over a week, ImClone fell $20 a share. Had Martha Stewart waited a week to sell her ImClone stock, she would lost about $80,000. By selling on December 26, 2001, she saved about $80,000. But, at what cost? If Stewart knew she was trading on inside information, then she was putting her reputation and the reputation of her firm, Martha Stewart Living, at substantial risk.

Stewart owned about 31 million shares of the publicly traded stock in Martha Stewart Living, where she is CEO. She has over 90 percent of the voting rights in the company. In June 2002 stories broke in the press that Stewart and Waksal of ImClone had ties and that Waksal was being investigated for insider trading of ImClone stock. Over the next two months securities regulators began investigating Stewart for possible insider-trading violations. A shareholder in Martha Stewart Living sued Stewart claiming she had a duty to investors to "maintain her good name and reputation and to avoid situations that could negatively impact her name and reputation." Shares in Martha Stewart Living fell from about $17 per share at the beginning of June 2002 to about $8 a share in August, after the shareholder suit was filed and Congress held public hearings where Stewart denied any wrongdoing. The 47 percent decline in Martha Stewart Living compares to about a 10 percent decline in the market over the same period. This $9 per share fall wiped out about $280 million of Martha Stewart's wealth. And this does not count any likely lawsuit settlements or legal fees she will pay.

Ethics is about choices. If Martha Stewart had any hint from Samuel Waksal that she was receiving insider information about Waksal's ImClone before she sold her stock, she should not have sold the stock. Trying to save some or all of her $240,000 investment in ImClone affected Stewart's reputation and a large portion of her 90 percent ownership of Martha Stewart Living. Ms. Stewart appears to have made a bad decision on December 26, if she did in fact trade based on a phone call from Sam Waksal.

Sources:
//money.cnn.com/2002/08/05/news/companies/martha_lawsuit/index.htm; //money.cnn.com/2002/10/21/news/martha/; Dow Jones News Service, "Martha Stewart Down 12% on Concerns about Ex-Imclone CEO" (June 12, 2002); Martha Stewart Living Omnimedia, Inc., Schedule 14A, Proxy Statement (April 3, 2002).

normative. We have avoided suggesting what decisions people should make; we have not suggested that people should spend more time fund-raising for their local charities and less time watching television. We have argued that given people's preferences, they will tend to select those activities which maximize their perceived well-being (see Chapter 2).

This chapter is also about choices—in particular, choices among actions that are perceived to have ethical implications. Much of the study of ethics specifically focuses on how people should make choices: It is the study of those behaviors people should pursue. In large part, ethics is normative, not descriptive. When philosophers speak of ethics, they are dealing with the millennia-old discipline that seeks to identify those behaviors which are right or wrong, good or bad, virtue or vice. Moral philosophers have been debating ethics since ancient times, and all religions involve statements of which behaviors are ethical and which are unethical. All major religions—Buddhism, Christianity, Confucianism, Hinduism, Islam, and Judaism—espouse the Golden Rule: "Do unto others as you would have them do unto you."[3] Western religions are based on the Ten Commandments, a code of ethical behavior.

[3]W. Shaw (1991), *Business Ethics* (Wadsworth Publishing: Belmont, CA), 12.

Behaviors such as lying, cheating, stealing, and killing are almost universally viewed as wrong—except under mitigating circumstances (murder in self-defense is usually justifiable, for instance). However, certain behaviors viewed as wrong by some are viewed by others as right. For example, some people view abortion as wrong, whereas others view denying women the right to choose as wrong. Similar conflicts exist regarding birth control and a person's right to die. In these cases, there simply is no universally accepted code of ethics on which one can rely to assess right and wrong.

Business ethics seeks to proscribe those behaviors in which businesses should not engage. Such actions range from the giving or taking of gifts, bribing government officials, misrepresenting data, discriminatory hiring practices, and boycotting third parties. For example, some deemed it unethical for a company to do business in South Africa while that country practiced apartheid.

Business ethics and organizational architecture are interdependent. Organizational architecture, we have argued throughout this book, establishes incentives and thus affects the decisions managers and employees undertake. If it is important for businesspeople to behave ethically in their roles as managers and employees, it is important that the organization be structured to foster ethical behavior. In examining these issues, we first focus on external ethics policies controlling interaction between the firm and parties like customers, investors, and the local community. We then turn to internal ethics policies that deal with employees and managers.

Corporate Mission: Ethics and Policy Setting

What is the mission of the corporation, and does it involve ethics? Most people have a pretty good idea about what they mean when they describe an individual as "ethical." Most of us feel an emotional allegiance to the Golden Rule that urges us to treat others as we would have them treat us, and we value qualities such as honesty, integrity, fairness, and commitment to the task at hand. But what does it mean for a corporation to behave ethically? First, we have to understand what the term *ethical* means and then how it relates to the firm's mission.

Ethics

Ethics is a branch of philosophy. Western ethical philosophy can be traced back at least 2,500 years to Socrates, Plato, and Aristotle. These ancient Greeks searched for a generally understood set of principles of human conduct. Their treatises revolve around the terms *happiness* and *virtue*. Writing in the thirteenth century, St. Thomas Aquinas "argues that the first principle of thought about conduct is that good is to be done and pursued and evil avoided."[4]

There are numerous ethical theories, ranging from egoism (an act is correct if and only if it promotes the individual's long-term interests)[5] to utilitarianism (behaviors should "produce the greatest possible balance of good over bad for everyone affected by our action").[6] Kantian ethics judges the nature of the act, not the outcome; Kant argued

[4]J. Haldane (1991), "Medieval and Renaissance Ethics," in P. Singer (Ed.), *A Companion to Ethics* (Basil Blackwell: Oxford), 135.

[5]K. Bair (1991), "Egoism," in *A Companion to Ethics*, 197.

[6]W. Shaw (1991), *Business Ethics*, 49.

that only good deeds matter.[7] Adam Smith argued that through the invisible hand of market competition driven by self-interested traders, resources are directed to their most productive use and societal wealth is maximized. Ethical relativism holds "that moral principles cannot be valid for everybody; and . . . that people ought to follow the conventions of their own group."[8]

Even a cursory review of the major ethical philosophies yields two immediate observations. First, ethics is an enormous subject area that has engaged some of history's best minds. Second, despite considerable effort, there is no universally accepted philosophical consensus across time and societies as to which behaviors are ethical and which are not.

Furthermore, when it comes to defining the ethics of organizations like public corporations that encompass large groups of people, there is bound to be confusion. A corporation, after all, is simply a collection of individuals—or, more precisely, a set of contracts that bind together individuals with different, often conflicting, interests (see Chapter 10). In this sense, organizations themselves do not behave ethically or unethically—only individuals do. And if managers and employees are not pursuing their own interests, then whose interests are they serving? Their bosses'? The shareholders'? The board's? And what if there are major conflicts among these various interests?

Value Maximization

Economic Darwinism

Maximizing the firm's value is the mission most economists ascribe to managers. By maximizing the size of the pie, each party contracting with the firm can receive a larger slice—including shareholders, bondholders, managers, employees, customers, suppliers, charities, and local cultural institutions. If the firm faces competition for both inputs and outputs, the prices the firm pays for its inputs and receives for its outputs will be driven to competitive levels (Chapter 6), and the firm will not receive any abnormal profits. Economic Darwinism and survival were discussed in Chapter 1. Long-run survival in a competitive environment dictates that firms seek to produce products at the lowest possible cost. In the absence of barriers to entry, firms that survive in the long run are those that deliver products consumers want at the lowest cost. This means that managers must adopt policies that maximize the value of the firm—or, what amounts to the same thing, the net present value of future cash flows distributable to the firm's investors. If managers follow other policies that raise their costs, value-maximizing competitors enter, supply products at lower costs, and sell them at lower prices. Eventually, firms that deviate materially from value maximization will fail.

Role for Regulation

There are two important cases where value maximization leads to predictable resource misallocation. First, if the firm has monopoly power, it will reduce output and set price above long-run marginal cost (see Chapter 6). Second, if there are externalities—if firms' actions impose costs or benefits on uninvolved third parties—the firm has incentives to produce too much or too little of an item (see Chapters 3 and 21). For example, because no one has readily enforceable property rights to clean air, factories may produce too much air pollution. In both cases, one potential limiting factor in these problems is government regulation. Thus, if appropriate regulation constrains any resource misallocation from monopolies or externalities, firms can focus on value maximization within the bounds of the regulation.[9]

[7]Shaw (1991), 74.

[8]R. Brandt (1970), "Ethical Relativism," in T. Donaldson and P. Werhane (Eds.), *Ethical Issues in Business: A Philosophical Approach* (Prentice Hall: Englewood Cliffs, NJ), 78.

Corporate Philanthropy Comes under Fire

Pioneer Hi-Bred International, the world's largest seed company, provided financial support for Planned Parenthood of Greater Iowa. But when right-to-life groups voiced strong objections and organized boycotts in the farming communities where the firm does business, the company was forced to withdraw its sponsorship. As *The Wall Street Journal* reported,

> "We were blackmailed," declares Pioneer chairman and president Thomas Urban. "But," he says, . . . "you can't put the core business at risk," even though the company concedes that canceling funding probably upset as many farmers as it appeased and the boycott didn't end.

Source: R. Gibson (1992), "Boycott Drive against Pioneer Hi-Bred Shows Perils of Corporate Philanthropy," *The Wall Street Journal* (June 10), B1.

Compensating Differentials

Maximizing a firm's value requires managers to assess all costs and benefits of proposed actions accurately. Suppose George Wilson, manager of DisposeCo, is considering entering the business of the disposal of hazardous wastes. Employees exposed to such hazards usually demand a compensating wage differential to offset the higher risks of illness from such work (see Chapter 14). Therefore, when evaluating whether to enter this business, George must include these compensating differentials in his estimated costs.

Suppose Etsuko Kitagawa is CEO of PharmInc, which is considering the production of birth control products, a business with potential ethical dimensions. Some employees of the firm may have personal beliefs that conflict with this new business. Some of these employees might leave the firm; some might seek transfers to other divisions; others may require compensating differentials to stay; and employees with strong moral beliefs opposed to the company's position might even sabotage the project or misreport data to dissuade Etsuko from undertaking the project. In such cases, the costs of business decisions that some view as unethical are higher because of these higher compensating differentials, additional labor turnover, more pronounced incentive problems, and potential adverse publicity associated with such decisions.

Coca-Cola's View of Corporate Responsibility

In the 1996 Coca-Cola annual report, CEO Roberto Goizueta wrote, "Governments are created to help meet civic needs. Philanthropies are created to meet social needs. And companies are created to meet economic needs." In 1997 four Atlanta-based philanthropies donated $220 million to local causes. These four foundations held Coke stock valued at $7.6 billion.

Source: A. Ehrbar (1998), *EVA The Real Key to Creating Wealth* (John Wiley & Sons, Inc.: New York), 18–19.

[9]There are a number of issues implied by this brief discussion. In general, within the government, individuals are not always acting to maximize social welfare. Thus, even if appropriate regulation could reduce these problems in principle, there is no assurance that regulations are adopted to do so. See Chapter 21 and G. Stigler (1971), "The Theory of Economic Regulation," *Bell Journal of Economics* 2, 3–21.

Phone Companies Charged with Electronic "Redlining"

A coalition of public-interest groups recently charged that four leading telephone companies engage in "electronic redlining" by bypassing low-income and minority communities as they begin to build advanced communication networks. These groups asked the Federal Communications Commission to clarify its rules and issue a policy statement opposing discrimination in the building of such networks. By raising charges of redlining, these groups seek to persuade the firms to provide early, subsidized service to less profitable markets. A spokesperson for one firm pointed out that to achieve its plan of "wiring" half the state of California by 2000 "without raising rates," the company "must [first] bring the network to areas where it will generate some new business and revenues, so ultimately we can bring it to everyone in the state."

Source: M. Carnevale (1994), "Coalition Charges Phone Firms with 'Redlining' in Adding Networks," *The Wall Street Journal* (May 24), B6.

Corporate Social Responsibility

One source of confusion about the corporate mission is the concept of "corporate social responsibility," which often is used interchangeably with corporate ethics. In 1969, Ralph Nader along with several other lawyers launched their Project on Corporate Responsibility with the following statement:[10]

> *Today we announce an effort to develop a new kind of citizenship around an old kind of private government—the large corporation. It is an effort which rises from the shared concern of many citizens over the role of the corporation in American society and the uses of its complex powers. It is an effort which is dedicated toward developing a new constituency for the corporation that will harness these powers for the fulfillment of a broader spectrum of democratic values.*

As Nader's statement suggests, the goal of some advocates of corporate social responsibility is nothing less than to change the objective function of the corporation. In Nader's view, the corporation should be transformed from a means of maximizing investor wealth into a vehicle for using private wealth to redress social ills. The corporate social responsibility movement seeks to make management responsible for upholding "a broader spectrum of democratic values." Corporate support for such values could take the form of philanthropic activities, the provision of subsidized goods and services to certain segments of the community, or the use of corporate resources on public projects such as education, environmental improvement, and crime prevention. If all firms in the marketplace face the same social requirements, then the survival of any given firm is less of an issue. However, if some firms are exempted from redressing social ills, others' survival in a competitive environment is more in doubt.[11]

Economists' View of Social Responsibility

The conflict between Nader's and economists' views of the corporation is perhaps not as pronounced as it might appear. Corporations intent on maximizing firm value generally find it in their interest to devote substantial resources to noninvestor stakeholders such as employees, customers, suppliers, and local communities. For example, a company

[10] J. Collins (1979), "Case Study—Campaign to Make General Motors Responsible," reprinted in *Ethical Issues in Business*, 90.

[11] M. Jensen and W. Meckling (1978), "Can the Corporation Survive?" *Financial Analysts Journal* 34, 31–37.

Taxes and Corporate Philanthropy

One potential benefit to the owners of a firm from having the corporation donate to charities is a reduction in taxes paid to the government. Assume that both the corporate and personal tax rate is 50 percent. Suppose a corporation has profits of $5,000 before taxes and distributes all its after-tax profits to the shareholders as dividends. The firm has four equal shareholders who collectively wish to contribute $1,000 to a particular charity. If the firm makes the contribution, it is deductible from corporate income before taxes. Thus, the corporation has $4,000 of taxable income ($5,000 − $1,000), of which $2,000 is paid in taxes and $2,000 is paid to the owners who pay personal taxes on the dividends they receive. After personal taxes, each shareholder has $250 ($2,000 ÷ 4 × 50%).

Now suppose the shareholders donate $250 each to the charity and the corporation makes no contribution. The firm has pretax profits of $5,000, pays taxes of $2,500 (50% of $5,000), and distributes $2,500 to shareholders. Each shareholder receives $625 ($2,500 ÷ 4) before personal taxes, makes the contribution ($250), and has taxable income of $375 ($625 − $250). Each pays taxes of $187.50 and has after taxes $187.50 ($625 − $250 − $187.50). By having the firm make the charitable contribution, each shareholder has $62.50 ($250 − $187.50) more than when the shareholder makes the charitable contribution. When the firm makes the contribution, the gift shields $1,000 from corporate taxation.

These tax reduction gains for corporate philanthropy are most compelling when all the shareholders agree on the amount and nature of the donations. Gifts to charities not valued by some shareholders reduce these shareholders' welfare. Unfortunately, corporate stakeholders are unlikely to agree about which charities should receive corporate donations and how much each should receive. Customers, employees, or independent sales agents objecting to the firm's choice of charities may take their business or services elsewhere. Moreover, corporate managers do not have an obvious comparative advantage in choosing which charities to support. If it is time-consuming for managers to sort through charitable requests and make the selections, this is time that could have been spent on other activities that more predictably increase the firm's value. Thus, even with the tax advantage of corporate philanthropy, shareholders are not necessarily better off by having the firm make charitable donations instead of doing it themselves.

with a large plant in an inner city might decide that investing corporate resources and personnel to improve area schools leads to better-trained job applicants, more productive employees, and lower-cost products. Giving money to the local university might benefit the firm by improving its R&D, increasing its access to top graduates, or enhancing cultural and educational opportunities for its employees. Improving the environment lowers the company's legal exposure to damage claims and also might reduce its wage bill to the extent that a cleaner local environment lowers the cost of attracting and retaining employees.

Maximizing firm value means allocating corporate resources to all groups or interests that affect the value of the firm—but only to the point where the incremental benefits from such expenditures at least equal their additional costs. Thus, value maximization might require expending the firm's resources on members of an important corporate constituency to improve the terms on which it contracts with the company, to maintain the firm's reputation, or to reduce the threat of restrictive regulation.

Many managers are inclined to endorse Nobel Laureate Milton Friedman's prescription that the social mission of the corporation is "to make as much money for its owners as possible while conforming to the basic rules of society." As we have noted, some companies will find it in their shareholders' interest to "invest" in social causes of various kinds, but corporate investments that systematically fail to provide adequate long-term returns to private investors are wealth transfers that end up reducing social as well as private wealth.

Absent tax benefits, it usually is more efficient for the corporation to focus on creating wealth and to let its shareholders, employees, and customers choose the beneficiaries

Milton Friedman's View of Corporate Social Responsibility

What does it mean to say that the corporate executive has a "social responsibility" in his capacity as businessman? If this statement is not pure rhetoric, it must mean that he is to act in some way that is not in the interest of his employers. For example . . . that he is to make expenditures on reducing pollution beyond the amount that is in the best interests of the corporation or that is required by law in order to contribute to the social objective of improving the environment . . .

[The problem in this case is that] the corporate executive would be spending someone else's money for a general social interest . . . [when] the stockholders or the customers or the employees could separately spend their own money on the particular action if they wished to do so.

Source: M. Friedman (1970), "The Social Responsibility of Business Is to Increase Its Profits," *New York Times Magazine* (September 13).

of their charitable contributions. By maximizing their shareholders' (or owners') wealth, corporations effectively enlarge the pool of individual (noncorporate) resources available for charity.[12]

People who advocate ever-larger corporate contributions to charities and social causes such as retraining displaced workers and environmental cleanup (without consideration of their own long-run profitability) are effectively calling for higher implicit taxes on corporations. If all companies are so taxed, the taxes are borne ultimately by shareholders in the form of lower returns to capital, by employees in the form of lower wages, and by customers in the form of higher prices. Thus, ironically, potential social consequences of such an increase in corporate social responsibility include lower rates of economic growth,

Do's and Don'ts of Corporate Giving

Philanthropic spending by U.S. corporations in 2001 was estimated to be $9 billion or 1.3 percent of pretax profits. Nell Minow, at a corporate governance research group, argues, "Corporate charitable contributions should be seen as part of the company's marketing strategy. If they promote the company's products or brand identity, then it's fine. If the money goes to the ballet so the CEO's wife can be on the ballet board, or to the local university whose president happens to be the chair of the company board's compensation committee, not fine." An increasing number of corporate charitable gifts are coming under public scrutiny. Perhaps the most spectacular case involved Tyco International and its former chairman, Dennis Kozlowski, who was indicted for federal racketeering, fraud, tax evasion, grand larceny, and misuse of company funds. Tyco contends that a $2.5 million fund at Middlebury College was endowed with its money but named for Kozlowski. But other situations are attracting attention. Part of Jacques Nasser's retirement package as CEO of Ford Motor included a commitment by Ford to endow a scholarship at the educational institution of Mr. Nasser's choice.

Deborah Patterson, president of the Monsanto Fund, offers the advice that firms establish clear parameters for their corporate giving including categories of gifts and the focus of their giving such as education, environment, medical research, and so forth. The CEO can propose a gift, but if it doesn't fall into the preestablished parameters, then the gift is denied. Moreover, CEOs should make it very clear whether the gift is from them personally or from the corporation. For example, Dick Jenerette was insistent that his giving was not confused with Equitable Insurance's, when he was CEO at Equitable.

Source: S. Strom (2002), "In Charity, Where Does a C.E.O. End and a Company Start?" *New York Times* (September 22), B1–B12.

[12]J. Brickley (1988), "Managerial Goals and the Court System: Some Economic Insights," *Canada–United States Law Journal* 13, 79.

lower corporate values, lower employment, and reduced charitable donations (if reductions in donations by individuals more than offset the increases in corporate giving).

Corporate Policy Setting

Once a corporation has determined its mission, implementing the mission requires a set of operating policies. Again, ethical issues arise. It is futile to think that one can reduce excruciatingly difficult corporate policy issues to simple, universally applauded policy decisions. Consider questions like

- Should we use laboratory animals for product testing?
- Should we market infant formula in Central Africa?
- Should we do business with a company that employs child labor in its Asian textile factory?
- Should we adopt different procedures for handling and disposing of hazardous wastes in Latin American plants than we use in the United States?
- Should we pay "fees" to expedite paperwork for export permits to an African market?
- Should we tow our obsolete North Sea oil rig to deep water and sink it?

Because there is no widely embraced definition of ethical behavior, these problems require careful analysis in establishing appropriate corporate policy. In particular, managers should be careful to collect data for estimating the total cost and benefits of alternative actions, including costs of adverse publicity, tarnished reputation, and lost customers. Although we cannot solve the above problems, we can suggest steps to help craft an appropriate policy.

Diversity of Input

In questions with potentially contentious ethical implications, it is particularly important to obtain input from a broad cross section of potentially affected stakeholders in the firm. Here, diversity in perspective can be especially valuable in identifying potentially sensitive areas that require additional analysis prior to setting policy. Diversity in backgrounds can help the management team better assess the potential total costs of alternative policies.

Legal Standards

It is important to understand the legal consequences of potential policy choices. The first, most obvious, question is—*Is it legal?* Yet this knowledge alone is generally far from sufficient to frame policy. For example, after the United States bombed Libya in 1986, some U.S. banks faced a dilemma: The U.S. Federal Reserve and the State Department required that Libyan funds in U.S. banks be frozen. But the Central Bank of Greece simultaneously announced that under Greek law, any Libyan funds on deposit in Greece must be available on demand. If Libya had funds on deposit in Citibank's Athens branch and requested the funds, the bank would have to choose between violating U.S. law or Greek law. Or, consider potential consequences of hiring child labor in a textile mill in Pakistan, even if it is legal there; some customers might object because the practice would be illegal in the United States or Europe.

Moreover, illegality may not be the determining factor. For example, it is doubtful that Federal Express would adopt a policy of firing a driver who violates the law by

receiving a parking ticket. Hence, it is important to understand what sanctions might be imposed if a law is violated.

Finally, laws are not constant over time. For instance, although the 1995 Congress rolled back certain environmental regulations, some firms appear reluctant to take advantage of the entire range of newly allowed activities. They appear to be concerned that if the political pendulum swings back, they might face some future liability.

Business Norms

In the business community, there are expectations in transactions that do not have the force of law but nonetheless represent expected behavior. These norms are rarely written down; knowledge of them accumulates primarily with experience. These issues can be especially important when entering a new market. For instance, when Lincoln Electric decided to expand into Japan, it encountered unexpected difficulties in selling its products. Lincoln's managers had failed to appreciate the strong preference accorded long-standing business partners by Japanese companies.

In special cases, these norms are codified. Adopting procedures developed by an external group to handle sensitive issues can be quite useful. For example, standards for using laboratory animals in product testing are established by the U.S. Department of Agriculture, the National Institutes of Health, and the Public Health Service. Most organizations that undertake animal research adhere to these standards. Nongovernmental groups also participate in this process. For instance, firms in the motion picture industry frequently voluntarily adopt standards developed by the American Society for the Prevention of Cruelty to Animals. By stating that you adhere to the ASPCA code, a film company may be able to deflect much criticism.

Press Standard

Another useful device managers use in determining the ethical issues in setting corporate policies involves assessing the public's likely reaction. The example of Pioneer Hi-Bred International's withdrawal of support for Planned Parenthood illustrates the often important interaction among ethics, public relations, and the media. Ethics consultants regularly counsel corporate managers to apply the press standard to help determine which behaviors are ethical. This criteria suggests that to judge whether an action is ethical, you should ask yourself whether you would be comfortable reading about your decision on the front page of the newspaper or seeing it reported on television.[13] Suggesting that a decision is a good idea only if it is kept confidential is quite likely to be a mistake. Remember, the business press is quite sophisticated. Counting on a questionable decision being overlooked or ignored might be characterized better as wishful thinking than thoughtful analysis. Therefore, when considering a difficult ethical decision, try writing a press release. If you are unwilling to distribute the release, then the decision is unlikely to be appropriate.

Using publication of your behavior as an ethical benchmark for judging a decision highlights the linkage between ethical behavior and reputation. Below, we discuss market forces that create incentives for people and firms to behave ethically. The argument is that unethical behavior adversely affects reputation, and one way to assess a decision's reputational effects is to ask how it would read in *The Wall Street Journal* or the *Financial Times.*

Adam Smith on Merchant Reputation

Of all the nations in Europe, the Dutch, the most commercial, are the most faithful to their word. The English are more so than the Scotch, but much inferior to the Dutch, and in the remote parts of this country they [are] far less so than in the commercial parts of it. This is not at all to be imputed to national character, as some pretend; there is no natural reason why an Englishman or a Scotchman should not be as punctual in performing agreements as a Dutchman. It is far more reducible to self-interest, that general principle which regulates the actions of every man, and which leads men to act in a certain manner from view of advantage, and is as deeply implanted in an Englishman as a Dutchman. A dealer is afraid of losing his character, and is scrupulous in observing every engagement. When a person makes perhaps 20 contracts a day, he cannot gain so much by endeavoring to impose on his neighbors, as the very appearance of a cheat would make him lose. When people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does to the character.

Source: A. Smith (1964), *Lectures on Justice, Police, Revenue, and Arms,* E. Cannan (Ed.) (Augustus M. Kelley: New York).

Mechanisms for Encouraging Ethical Behavior

Ethical lapses frequently are manifestations of conflicts of interest—incentive problems. As stated earlier, in most market exchanges, parties to the contracts have incentives to devise mechanisms to reduce contracting costs, thereby raising the prices they receive for their products or services. For example, when taking their firms public for the first time, founders of companies normally retain large positions in the stock and voluntarily impose restrictions on their own future sales to help ensure that their interests are consistent with those of their new investors. Such arrangements effectively raise the price investors are willing to pay.

Likewise, external public auditors voluntarily prohibit themselves from owning stock in the companies they audit. By not owning any stock, auditors do not gain by withholding unfavorable financial information. This increases their independence from their clients, raises the value of the audit, and hence increases the price firms are willing to pay for it.

Signaling Quality by External Monitoring: Rice Aircraft

In 1991, Rice Aircraft Company became the first company in its industry to earn ISO 9002 accreditation, an international standard for quality management. This was a significant, highly visible signal of change within the firm. For in August 1989, Bruce J. Rice, CEO of Rice Aircraft, had pled guilty to fraud and was sentenced to 4 years in prison. The Defense Department forbade its contractors to do business with the company for 5 years, and annual sales fell from $15 million to $5 million. At this point, Paula DeLong Rice, Rice's wife, took over and set out to save the company by visibly and radically transforming it. She implemented a total quality initiative and provided classes in statistical process control, time management, and communications for all the company's employees.

Paula DeLong Rice's strategy appears to have been quite effective. Profit margins increased from 12 percent in 1992 to 27 percent in 1993 without benefit of price increases; order cycle time was reduced by 50 percent; and on-time deliveries increased 98 percent. Paula DeLong Rice, moreover, is now in great demand as a speaker on managing for quality.

Source: T. Pare (1994), "Rebuilding a Lost Reputation," *Fortune* (May 20), 176.

[13] Thomas Jefferson offered similar advice in a letter to Peter Carr: "Whenever you are to do a thing, though it can never be known but to yourself, ask yourself how you would act were all the world looking at you, and act accordingly." T. Jefferson (1785), in N. Beilson (Ed.), *Thomas Jefferson: His Life and Words* (1986) (Peter Pauper Press: White Plains, NY), 47.

Evidence on the Penalty from Fraud

Researchers have examined the stock market's reaction to announcements of fraud charges against corporations. They specifically focus on cases where the damaged party does business with the accused firm—thus, they focus on frauds alleged against customers, suppliers, employees, and investors (but not damages to third parties such as in pollution dumping). The evidence suggests that in the days around the first announcement in *The Wall Street Journal,* the average fall in the firm's stock price is 1.58 percent. Thus, press reports of alleged fraud are associated with statistically significant and economically material losses in value. Moreover, these losses were much too large to be explained by legal costs and fines.

Source: J. Karpoff and J. Lott (1993), "The Reputational Penalty Firms Bear from Committing Criminal Fraud," *Journal of Law & Economics* XXXVI, 757–802.

As we noted earlier, because reputational capital is an important determinant of future earnings, market forces provide incentives for firms and individuals to behave ethically. But the effectiveness of market forces in controlling conflicts of interest and enforcing contracts varies among different kinds of transactions. Among the most important characteristics of such transactions are the difficulty of ascertaining product quality prior to purchase and the likelihood that the transaction will be repeated.

Take the case of a buyer purchasing a product. For products whose quality can be determined at low cost prior to purchase, markets readily solve this problem. If buyers can cheaply monitor quality, they will do so. For example, a buyer negotiating a purchase of silver for Kodak can confidently and cheaply ascertain its quality by assay.

For some products, quality is virtually impossible to determine prior to purchase. For example, you can know the quality of an airplane ticket only after the plane has landed, it is parked at the gate, you have deplaned, and retrieved your luggage. Although sellers have incentives to cheat on quality when quality is expensive to measure, rational sellers will provide products of lower-than-promised quality only if the expected gains exceed the expected costs.

Repeat Sales

One important constraint on such cheating is the potential for future sales.[14] Moreover, corporations with established market positions and valuable brand names face higher costs of cheating and hence are less likely to cheat than start-up firms. The costs of cheating on quality also are higher if the information about such activities is more rapidly and widely distributed to potential future customers. For example, in markets like the diamond trade in New York, which is dominated by a close-knit community of Hasidic Jews, cheating on quality is extremely rare.[15]

Warranties

Seller-provided product warranties are another mechanism to reduce the likelihood of cheating. Since sellers bear higher warranty costs if they cheat on quality, they have less incentive to cheat. Seller warranties will be most prevalent when product failures result

[14]L. Telser (1980), "A Theory of Self-Enforcing Agreements," *Journal of Business* 53, 27–44.

[15]Other examples of ethnic communities, like the Chinese in Singapore, support the view that choosing trading partners from within one's own ethnic community economizes on the costs of contracting. J. Landa (1981), "A Theory of the Ethnically Homogeneous Middlemen Group: An Institutional Alternative to Contract Law," *Journal of Legal Studies* 10, 349–362.

from factors that are under the firm's control (such as manufacturing tolerances). In this case, warranties directly impose the cost of failure on the parties who have the most control over product quality or failure. However, when failures are due primarily to factors that are under the customers' control (such as the way the product is used or maintained), the moral-hazard problem will be greater and warranties are less useful as a quality-assurance mechanism.

Third-Party Monitors

In some markets, specialized information services monitor the market, certify quality, and help ensure contract performance. For example, *Consumer Reports* evaluates products from toasters to automobiles, the *Investment Dealer Digest* details activities of investment bankers, and A.M. Best Company rates financial conditions of insurance companies. These third-party information sources lower the costs for potential customers to determine quality and so increase the expected costs of cheating.

In credit markets, specialized credit information services like Moody's and Dun & Bradstreet perform both a monitoring and an information dissemination function. The existence of such intermediaries provides an opportunity for the firm to guarantee quality. For this reason, corporate issuers pay Moody's to have their debt rated over the life of the bond issue. By issuing rated public debt, a firm lowers the cost to other potential corporate claimholders (including potential customers) of ascertaining the firm's financial condition.[16]

Disclosure

The required level of disclosure in markets can also be important in determining quality. For example, a study of two wholesale used-car markets with different levels of required disclosure found higher prices in the market with more required disclosure.[17] The ability to "precommit" to disclose information reduces the potential information disparity between buyer and seller and so reduces the discount buyers apply to their demand prices. Also, eBay.com, the online auction website, encourages participants to write messages about their experiences with their partner in the transaction. This provides future participants with more information about the performance of a potential trader and thus enables them to have more confidence in their transactions. Moreover, by creating this feedback mechanism, eBay provides sellers with a means of developing a reputation. This improves the performance of auction participants.

Ownership Structure

Incentives to provide high-quality products vary across ownership structures. Take the case of franchise companies such as fast-food and lawn-care firms. Such companies typically franchise some units rather than own all their stores in order to take advantage of the incentive benefits of decentralized ownership while retaining scale economies in advertising and brand-name promotion.

Yet outlets that have little repeat business create a special problem. The franchise owners of these stores have an incentive to cheat on quality because they can benefit from a steady stream of one-time sales while reducing the reputation of the entire organization; this is another example of the standard free-rider problem. At these locations,

[16]L. Wakeman (1983), "The Real Function of Bond Rating Agencies," *Chase Financial Quarterly* 1, 18–26.

[17]H. Grieve (1984), "Quality Certification in a 'Lemons' Market: An Empirical Test of Certification in Wholesale Used-Car Auctions," working paper, University of Rochester.

the central company is more likely to own the unit than to franchise it, in part because a salaried manager has fewer incentives to cheat on quality.[18]

Companies with large amounts of debt in their capital structure can face a significant probability of financial distress. Such firms are more likely to cheat on quality than financially healthy firms because repeat sales are less likely. Therefore, some firms "bond" product quality by adopting conservative financial policies. Since financial distress is more costly for firms that market products where quality is difficult to ascertain, such firms have incentives to adopt financing policies that lead to a lower probability of financial distress—policies such as lower leverage, fewer leases, and more hedging.

Contracting Costs: Ethics and Policy Implementation

In our examples of Enron (Chapter 1), Merrill Lynch (Chapter 2), and Salomon Brothers (Chapter 22), none of these firms had formal corporate strategies of engaging in unethical behavior. Rather, their ethical problems arose from controlling the behavior of individuals granted particular decision rights within the firm. They are examples of incentive problems within firms. Chapter 10 described the general incentive problem as the difficulty in making corporate managers and employees perform in ways consistent with the aims of the firm's owners. In addressing these internal ethical issues, this section makes two key points: First, the incentive problem of shirking or of opportunistic actions by an employee often is labeled an ethical lapse; and second, if all employees reduced their opportunistic actions (behaved more ethically), contracting costs would be lower.

To review the incentive problems that can arise with performance evaluation and monitoring, take the simple case of Alice Brown's hiring Olaf Kolzig to paint her house. Especially in performing tasks that are hard to monitor by inspection after the job is completed, such as surface preparation (sanding, scraping, and priming), Olaf has incentives to shirk—or, at least, to do a job that may not be as thorough as Alice might like. Of course, Olaf also will be prompted by other considerations to do a good job. It may be a matter of private conscience; that is, Olaf's sense of self-worth might be tied up with the quality of the workmanship, and violating such a self-imposed standard would impose major "costs" in the form of a tarnished self-image. Or Olaf might be constrained by the desire to maintain his commercial reputation (and, though it might take some time for a poor job of surface preparation to show its effects, quality eventually will reveal itself). As we noted earlier in this chapter and discussed in Chapter 10, reputation is an important contributor to the capitalized value of one's expected future earnings.

But because the prompting of conscience and the desire to maintain a reputation are neither universal nor constant, it's impossible for Alice to know the extent to which Olaf is bound by such considerations. Alice faces an information problem: When hiring Olaf, she does not know the kind of surface preparation she will get, nor will she be capable of ascertaining that until well after the job is done and the bill is paid.

To reduce her vulnerability in such circumstances of informational asymmetry, Alice likely will ask for a list of references (if Olaf has not already provided one). Such references should give Alice a better basis for assessing Olaf's time horizon and the importance he attaches to reputation. Olaf also might offer, or Alice might insist on, a one-or-more-year

[18]One study finds that franchise companies in lines of business with more repeat sales at individual units (e.g., lawn-care and beauty shops) are likely to franchise a higher percentage of total units than franchise lines with less repeat business (such as motels, car rental agencies, and restaurants). J. Brickley and F. Dark (1987), "The Choice of Organizational Form: The Case of Franchising," *Journal of Financial Economics* 18, 401–420.

warranty on the job. (As discussed above, such common practices as the use of warranties, third-party references, and credit checks play an important role in reducing contracting costs in the business world.)

But despite such assurances, some uncertainties about Olaf's level of performance remain. For example, will he be around to make good on the warranty if the paint peels in a year? Perhaps Olaf has heavy debts and is about to declare personal bankruptcy. Or perhaps the job he does for Alice will be Olaf's last before he embarks on a new career painting still lifes and family portraits.

As a consequence of the possibility of shirking and her own remaining uncertainty, Alice effectively reduces the price she is willing to pay. Or, to state the converse of this proposition, if there were some means for Olaf to provide Alice with complete assurance about his level of commitment, Alice would be willing to pay a higher price for the job.

Three points emerge from this simple example. First, let's assume Alice was able to design a perfect contract; for the sake of argument, let's say that Alice had a camera which enabled her to observe Olaf's activity at random intervals (and Olaf knew she had it) and that Alice was able to structure a pay schedule based on the observed effort. Even if she were able to devise such a monitoring and reward system, it would clearly not pay her to do so. The cost to Alice of writing, of administering, and, most important, of monitoring compliance with such a contract would be substantial—perhaps even greater than the value of the painting job itself. Thus, as this simple illustration is meant to point out, in most cases it does not pay to attempt to eliminate all possible shirking; because of the costs of writing and monitoring compliance with contracts, it is efficient to leave some slack in the system. As explained in Chapter 10, the *optimal* amount of shirking or opportunistic behavior by an agent is not zero.

Second, the *expected* level of opportunism or shirking—which, again, is greater than zero—is priced in the contract. Thus, the principals do not bear the full costs of opportunistic actions by their agents. Typically, at least some of these costs are shifted back to agents in the form of lower prices for their services or products.

Third, higher ethical standards among agents, whether corporate employees or participants in market exchanges, would lead (over time) to a reduction in the level of *expected* opportunistic behavior and hence a reduction in contracting costs. As a result, there would be more transactions (including more jobs created) and higher prices paid to agents by principals (including higher corporate wages). This would occur not only because of a reduction in the amount of shirking but also because the costs of writing and monitoring contracts would fall. Both principals and agents would be better off. Economist Jack Hirshleifer makes this last point: "Altruism economizes on the costs of

A CEO's View of Verbal Contracts

Most of our products were custom-made. Customers called in their orders over the phone. The orders, ranging in value from a few hundred dollars to tens of thousands of dollars, generally required delivery of goods within one or two days. It meant we would usually begin production before receiving a confirming purchase order. (This was before faxes.) The customer's word alone was enough. In my 20-year stint as CEO, not once did a customer go back on it. Unusual? Not at all. Without such trust, business couldn't be conducted. Similar transactions happen every day. . . . [W]e learned there are two ways to go: An eye for an eye, or do unto others what you would have them do unto you. In business, the latter philosophy is far more common, simply because it makes things work better.

Source: H. Aaron (1994), "The Myth of the Heartless Businessman," *The Wall Street Journal* (February 7), A14.

policing and enforcing contracts."[19] In discussing economic development, one writer lists low business ethics as an important factor impeding growth. During the late nineteenth century, such practices as confidence men selling shares, bankruptcy with concealed assets, and squandering capital increased the difficulty of raising capital to finance new ventures such as the construction of the railroads.[20]

The retired CEO's story in the accompanying box illustrates an important point about the economic consequences of ethics: Ethical standards within an organization—or within an economy—affect the resources devoted to ensuring contract compliance and, hence, help determine overall productivity. If everyone voluntarily were to reduce opportunistic behavior (such as withholding important information about product quality), then resources devoted to monitoring and enforcing exchanges could be used in other, more productive pursuits.[21]

Codes of Ethics

We view important aspects of the corporate ethics problem primarily as problems of controlling incentive problems. And generalizing from the above discussion, there are several potential ways to control them. One way to control incentive problems would be to get corporate managers and employees to voluntarily adopt higher, more stringent ethical standards. A second is to use contracts that better align the interests of managers and employees with those of shareholders. Examples of such contracts in corporations are executive or employee stock options, bonus plans, and profit-sharing arrangements (see Chapter 15). (Such contracts also will act to reinforce voluntary codes.) Both more cost-effective incentive contracts and higher ethical standards can be expected to lead to lower contracting costs, greater corporate efficiency, higher corporate values, and greater social welfare.

As mentioned earlier, many companies and most professions have written codes of conduct, and some companies also have educational programs dealing with ethics for their employees. Such codes and programs regularly emphasize the following:[22]

- Employees must obey the laws and observe statutory regulations.
- Customer relations in terms of the reputation and integrity of the company are of great importance.
- Employees must support the company's policies to customers.
- Conflicts of interest between the company and the employee must be avoided.
- Confidential information gained in the course of business must not be used improperly.
- It is improper to conceal dishonesty or to protect others in their dishonesty.
- Advice to customers should be restricted to facts about which the employee is confident.

Why have corporations adopted such codes? The most cynical view is that a corporate code of ethics is nothing more than a document that helps the firm defend itself against charges of illegal behavior. Sentencing guidelines issued by the U.S. Sentencing Commission in November 1991 strongly encourage corporations to establish and

[19]J. Hirshleifer (1977), "Economics from a Biological Viewpoint," *Journal of Law and Economics* 20, 28.

[20]T. Cochran (1964), *The Inner Revolution* (Harper & Row: New York).

[21]E. Noreen (1988), "The Economics of Ethics: A New Perspective on Agency Theory," *Accounting, Organizations and Society* 13, 359–369.

[22]These codes are not unique to the United States. For example, similar codes are observed in Australian firms. B. Kaye (1992), "Codes of Ethics in Australian Business," *Journal of Business Ethics* 11, 857.

communicate compliance standards and procedures for employees and other agents through training programs and publications. For example, when an individual is found guilty of wrongdoing, the organization also might be vulnerable to federal sanctions such as fines. These penalties can be reduced by more than 50 percent simply by demonstrating that the organization has a compliance program that meets the Sentencing Commission's standards.[23] A compliance program consists at least of a code of ethics and a training program. These federal sentencing guidelines thus have blurred the line between legal and ethical issues.

But corporate ethical codes, as we just have argued, also have the potential to perform the economically valuable function of reducing the costs of monitoring and enforcing contracts. To the extent that they reduce managerial and employee opportunism, better ethical standards enhance the organization's reputation and hence increase shareholders' wealth.

The critical questions, however, are these: *Are ethical codes effective in deterring unethical behavior? And if they are, how and why are they effective?*

Altering Preferences

There are two basic ways to view the function of corporate codes of conduct in reducing opportunistic behavior. One way is by appealing directly to employees' consciences, attempting to instill in them loyalty to the organization and its goals. An economist might describe this as an attempt to alter people's "preferences."

Now, there is undoubtedly some value to this approach. As we noted earlier, personal codes of conduct and the guilt one suffers in violating such codes are undeniably constraints on many people's behavior. As described in Chapter 2, individuals' utility functions contain many nonpecuniary factors, including conscience and guilt. As the following statement by Nobel Laureate Kenneth Arrow suggests, subjective concepts like ethics and morality surely are consistent with the economist's notion of rational self-interest:

> *Certainly one way of looking at ethics and morality . . . is that these principles are agreements, conscious or, in many cases, unconscious, to supply mutual benefits. . . . Societies in their evolution have developed implicit agreements to certain kinds of regard for others, agreements which are essential to the survival of the society or at least contribute greatly to the efficiency of its working. . . . The fact [that] we cannot mediate all our responsibilities to others through prices . . . makes it essential in the running of society that we have what might be called "conscience," a feeling of responsibility for the effects of one's actions on others.*[24]

The problem in applying this logic to corporate management, however, is that such "agreements to supply mutual benefits to others" are likely to be too amorphous to serve as a practical guide to individual behavior in large public companies with diffuse stock ownership. If employees are understandably unmoved by serving an anonymous group of "wealthy" shareholders, then who precisely are "the others" whose interests their morality is intended to serve? And what should employees do in those cases, noted earlier, where there appear to be (at least short-run) conflicts between the interests of the corporation and those of its noninvestor constituencies? After all, as we have seen earlier, the effective management of scarce resources often means saying no to the requests or desires of some employees, customers, and local communities. Moreover, the entire situation is complicated by the fact that the fundamental goal of the corporation—making money for its owners—is viewed as immoral or unethical by many advocates of corporate ethics.

[23]N. Gilbert (1994), "1-800-ETHICS," *Financial World* (August 16), 20–25.

[24]K. Arrow (1974), *Limits of Organization* (W.W. Norton: New York), 26–27.

Given this confusion about, and even conflict between, some professed ethical objectives and the goal of the corporation, we are skeptical about organizational attempts to instill conscience or a sense of guilt in their employees—that is, to alter employees' preferences. To the extent that these corporate ethics programs are aimed at trying to bring about material changes in employees' preferences, we are skeptical that they will succeed.

Consider the transfer-pricing problem faced by corporations with multiple divisions that buy and sell to one another. In Chapter 17, the firm value–maximizing solution to this problem was described as setting the transfer price to the buyer at the seller's opportunity cost of producing one more unit. But let's assume (as tends to be the case) that managers of the selling division have better information about their costs than the purchasing division's managers.

In such a situation, to the extent that a manager's compensation is based on divisional profits, the selling division's managers have the incentive to set the transfer price substantially above opportunity cost. In such a case, managers' pursuit of their own division's profits will come at the expense of total firmwide profits (because the managers of the buying division will purchase less than the optimal number of units).

Now, if adoption of a code of ethics somehow were to succeed in inducing divisional managers to reveal their private information about costs, units within the firm would be transferred at opportunity cost, and the firm's profits would be increased. But as long as division managers are being *paid* based on the profits of their own divisions, they are unlikely to reveal their actual costs.

Most economists generally assume that individuals' preferences are given and for the most part are difficult to alter. We thus suggest that managers, rather than attempting to alter preferences, should redesign the firm's architecture to change their employees' incentives to take certain actions. For example, in the above case, senior management might attempt to find a means of giving the divisional managers some stake in the profitability of the division to which they "sell" the product. A common, though only partly effective, solution to this problem is to give divisional managers stock options with payoffs tied to the overall value of the company in addition to bonuses for divisional performance.

Education

Even if corporate codes of ethics are unlikely to either change preferences or eradicate self-interest, such codes still can play a potentially important role in modifying behavior. Up to this point, we have assumed that corporate managers and employees know the "right thing" to do to promote the interests of the organization. But this assumption does not always hold. In many cases, managers' and employees' uncertainty about ethical standards—or how to live up to them in practice—may well be a greater corporate problem than their failure to work hard or to act in accordance with standards that are well established and clearly defined.

We earlier described the confusion about the corporate mission stemming from the aims and actions of the social responsibility movement. Another potential source of confusion resides in the variability of ethical standards. What might have been acceptable behavior 10 or 20 years ago may not be so today. Social changes such as those brought about by movements as disparate as civil rights and women's rights, on the one hand, and corporate restructuring, on the other, clearly have altered conceptions of socially accepted behavior. Moreover, the progressive globalization of product markets and a more diverse workforce are increasingly forcing corporate employees to recognize and adapt to differences in national or regional cultural expectations.

The Appearance of Impropriety at Citibank, Argentina

A newspaper article reported that H. Richard Handley, the president of Citibank Argentina, had sold portions of Citibank's Argentine assets to some of his friends at "what now look like bargain prices." Citicorp spokesmen dismissed that talk as "Monday morning quarterbacking," pointing out that, at the time of the first sales, there was an equal chance that the value of Argentine investments would rise or fall thereafter.

It is not important whether the terms of this particular set of transactions were appropriate or not; they may well have been deals that furthered important business interests of Citicorp in Argentina. What this case highlights, however, are the costs associated with the *potential* for self-dealing by corporate managers and the importance of stating and enforcing policies for business dealings on less than an arm's-length basis. The structure of this deal has forced Citibank to defend its actions to employees, investors, and regulators.

Source: *Miami Herald* (April 24, 1994).

Given this large and, in some ways, growing uncertainty about what constitutes ethical behavior within large organizations, corporate codes of ethics and training programs potentially play an important educational role by communicating corporate expectations to employees effectively and by demonstrating to them how certain kinds of behavior reduce the value of the firm. For example, misrepresentations of products and services to customers for short-term gain can be shown to reduce the value of the firm by hurting its reputation and thus lowering its brand-name capital. Moreover, in the process of globalizing and thus dealing with customers worldwide, companies might be forced to respond to the increasing cultural differences—or absence of shared expectations—among their managers and employees by providing more explicit communication of standards and expectations.

Besides issuing a clear set of rules governing employee relations with consumers, corporations also are likely to benefit from communicating guidelines for dealings among managers and employees within the firm. For example, many companies develop their executives by rotating them through a series of jobs. The resulting management turnover can undermine informal agreements among managers and employees. Explicit, corporatewide communication of expectations can reduce uncertainty about enforcing unwritten agreements and thereby increase internal efficiency.

Virtually all professions—medicine, law, accounting—have professional ethics codes. Prospective candidates must pass entry exams that test their understanding of these codes. Most professional codes contain detailed descriptions of behaviors that reduce the value of the profession's services. For example, professional accountants are prohibited by their code of ethics from serving on the board of directors of their client firms. Such memberships reduce the appearance of independence of the auditor when rendering an opinion on the client's financial statements. If one accountant is caught not disclosing a known financial fraud, this reduces the value of other accountants' audit opinions. Thus, professions, like firms, have incentives to monitor their members for ethical breaches. However, the accounting profession's ethics code did not prevent the failure of Arthur Andersen arising from its involvement with Enron (see the Andersen case on page 481). Moreover, Andersen's collapse and the public outcry cast a pall over the accounting profession, which led to increased government regulation of the profession.

Corporate Culture

More generally, codes of conduct and training programs in ethics have the potential to contribute to the building and maintaining of a value-based corporate culture. Like

CASE STUDY: *The Tylenol Tragedy and J&J's* Credo

Johnson & Johnson sells a diverse array of products, including baby care, first aid and surgical products, prescription drugs, and industrial products. It operates in a decentralized fashion through 190 companies in 175 countries. Each business unit has its own focused mission. Some units employ thousands of people, and others, as few as six. Each business unit is organized around a given market and a given set of customers. In 1943, General Robert Wood Johnson, who led J&J in its metamorphosis from a small family-owned business to a worldwide enterprise, articulated the company's basic philosophy in the J&J *credo*. It has the following basic elements:

- Our first responsibility is to our customers—doctors, nurses, patients, and mothers—to supply high-quality services and products at reasonable prices.
- We are responsible to our employees to respect their dignity and job security in a safe working environment; compensation must be fair and adequate.
- We are responsible to our communities to support education, good works, and charities and bear our fair share of taxes.
- Our final responsibility is to our stockholders. To provide a sound profit, we must make investments in R&D, new products, and facilities. When we operate according to these principles, the stockholders should realize a fair return.

One manager described how the *credo* affects J&J managers:

> *All of our management is geared to profit on a day-to-day basis. That's part of the business of being in business. But too often, in this and other businesses, people are inclined to think, "We'd better do this because if we don't, it's going to show up on the figures over the short term." The credo allows them to say, "Wait a minute. I don't have to do that. The management has told me that they're really interested in the long term, and they're interested in me operating under this set of principles. So I won't."*

In 1982, J&J was stunned when seven people died in the Chicago area after taking Tylenol capsules that had been adulterated with cyanide. Tylenol (capsules and tablets), manufactured by McNeil Consumer Products division, was one of J&J's most profitable businesses and accounted for 8 percent of J&J's sales. Subsequent investigation determined that tampering with the capsules occurred outside of J&J's facilities. McNeil's operating managers took immediate action, withdrawing all Tylenol capsules from the United States and replacing them with tablets (not involved in the tampering). They stopped producing Tylenol capsules and began redesigning the packaging to make the capsules tamperproof. This redesign process took several months. J&J's profits fell by over $100 million and its stock dropped from over $46 at the time of the announcement of the first death to below $39.

Press coverage of the unfolding tragedy was extensive. In an interview, a McNeil executive was asked whether employees would receive any remuneration during the time it would take to redesign the packaging and reconfigure the production line. Rather than simply state that no decision had been made, he made the commitment that no employees involved in producing Tylenol would be laid off over this period. Similarly, a reporter probing the costs of this packaging redesign asked an executive how much this would increase Tylenol's price. Although the issue had not been discussed, he announced that the product price would not be increased.

Discussion Questions

1. Explain how the *credo* helped guide the managers in the McNeil division.
2. Most discussions of J&J's handling of this tragedy have been laudatory, yet J&J's stock price fell by more than $7. Does this mean that the stock market thinks J&J's managers reacted poorly?
3. Analyze the decision not to raise Tylenol prices.
4. Discuss the advantages and disadvantages of listing shareholders as fourth priority in J&J's *credo*, especially in light of the Tylenol tragedy.
5. Suppose the packaging redesign and retooling required a longer time period, extensive cost, and that all Tylenol products were affected—not just capsules. Might McNeil managers have taken a different set of actions and how might the *credo* have guided these decisions?

corporate ethics, *corporate culture* is an ill-defined term, but as discussed in Chapter 11, it generally encompasses such factors as the ways in which work and authority are organized within a company as well as organizational features such as customs, taboos, company slogans, heroes, and social rituals. For example, a slogan like that of Federal Express—"When it absolutely positively has to be there overnight"—helps communicate the message that employees are expected to focus on meeting delivery schedules and that this focus will be recognized and rewarded by the organization. Singling out role models or heroes for special awards is another way of communicating the values of the company. Similarly, social rituals such as training sessions and company parties can help disseminate information by increasing interaction among employees and encouraging discussion of ethical standards. Indeed, the *process* by which a code of ethics is produced and the training programs through which these standards are communicated are potentially as important as the code itself in developing and maintaining the desired corporate culture.

Nonetheless, to create the value-based or consumer-focused organization that many companies seek to become, these less tangible aspects of corporate culture must be reinforced by more tangible actions. That is, the more formal organizational systems that partition decision rights and evaluate and reward performance, as well as sanctions for unethical behavior, all must be internally consistent and designed to encourage firm value–increasing behavior.

Summary

Business ethics is the study of those behaviors that businesspeople should or should not follow. This book is also about business behaviors, in particular, about how firms are organized to motivate and control the behavior of self-interested employees to maximize a firm's value. The focus of this book has been primarily descriptive. Assuming that people are motivated by self-interest, how are they expected to behave under alternative organizational architectures? Ethics is primarily normative: It is about how people should behave. Managers often endorse the ethical philosophy espoused by Adam Smith. In Smith's view, through private ownership of property, self-interest, and competition, a society's resources are put to the best use and produce the highest quantity and quality of goods and services at the lowest prices—value maximization.

Value maximization requires that all costs and benefits be considered. If a particular business decision conflicts with an employee's or customer's own personal belief, that person is worse off. If enough people are affected, costs are imposed on the firm through compensating wage differentials, higher turnover, and forgone sales.

Moral philosophers and all religions have debated ethics since ancient times and yet we still do not have a universally accepted code of ethics. Witness the current debates over abortion or the use of animals for product testing. There is considerable confusion about the meaning of corporate ethics. It appears unlikely that a universally accepted code of business conduct will emerge. The corporate social responsibility movement has focused less on raising corporate ethical standards than on transferring shareholders' wealth to other parties such as customers, employees, local communities, charities, or cultural institutions. Although other corporate stakeholders are important, if the corporation is to survive, it must maximize its value to its owners—a goal that in turn promotes efficient use of scarce resources.

Many of the issues raised in this chapter are recurring themes in the popular press and are likely to continue to be in the future. You may be called on to resolve a sexual harassment case, an environmental issue, or a product recall dispute. There is no doubt that at least once during your career you will be faced with a key decision that some will label

a major ethical dilemma. This chapter seeks to demonstrate that the same basic framework we presented in the earlier chapters can provide guidance for understanding issues involving ethics.

A number of important managerial implications are raised by the discussion in this chapter.

First, behaviors that others classify as unethical impose real costs on the firm by lowering the firm's brand-name capital, especially when they are reported in the media. These costs from reduced reputation include forgone sales or higher costs because parties outside the firm are less willing to contract with the firm. Many ethical problems are similar to other incentive problems discussed throughout the text, and much of the same analysis of incentive problems can be used to analyze ethical problems.

Second, ethics has many different meanings, ranging from making firms socially responsible (transferring wealth from the firm to other parties) to trying to make employees less self-interested. Another use of ethics means informing employees that certain behaviors impose large reputational costs on the firm, and hence the firm will impose sanctions on employees found engaging in such actions.

Third, mechanisms arise to constrain unethical behavior. Like contracting costs, costs of unethical behavior create incentives to minimize these costs. Managers should understand these mechanisms to ascertain under what conditions unethical behavior is most likely. For example, extra care should be exerted when structuring deals with firms in financial distress.

Fourth, decisions that have major ethical dimensions almost invariably involve potential adverse publicity and a decline in the firm's brand-name capital. How the firm responds to the press affects how the public perceives the issue. In dealing with the media, the following application of our framework usually is helpful:

- News reporters are pursuing their own self-interest—not yours. They are trying to maximize their value, which usually means increasing their audience in order to sell more newspapers or TV and radio advertising. Reporters know more about their job than you do.
- Having access to the media is valuable. Developing brand-name capital is quite costly to do through advertising. Use your access to the media to present the firm's position in a credible, honest way. Lying or misrepresenting the facts to the media is likely to backfire because reporters have the incentive and skills to uncover these misrepresentations—again, because such uncovered lies make juicy stories.

Fifth, ethics programs occasionally are used to try to alter people's preferences. Senior managers concerned about the ethical conduct of their employees would do better to spend less time searching, like Diogenes, for "an honest man." Rather, they should pay more attention to the incentives created by the firm's organizational architecture (the three-legged stool). As discussed in Chapter 2, it is unlikely that Merrill Lynch would have faced widely reported consumer indignation and legal sanctions from inappropriate securities recommendations had it anticipated the (quite predictable) incentives its compensation plan would give its employees. Incentives work. If the compensation plan pays employees for unethical behavior, then unethical behavior is exactly what the company will get. Our approach suggests recognizing the potential incentive problems and then redesigning organizational architecture—not people's preferences. Managers must structure their subordinates' incentives to ensure that they do not reduce the total value of the firm.

Sixth, ethical guidelines can highlight behaviors that increase, as well as behaviors that reduce, a firm's value. Codes of conduct, rather than trying to change employee's preferences, can communicate to employees those value-reducing actions that will not be tolerated and would lead to sanctions imposed on the employee, in addition to those value-increasing actions that are encouraged and would be rewarded.

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Review Questions

22–1. Seventh Generation of Colchester, Vermont, manufactures and markets "environmentally friendly" household products—vegetable-based, chlorine-free laundry products and nontoxic cleaners. Seventh Generation used to sell its products through natural-food outlets and direct mail catalogs. In 1992, the CEO of Seventh Generation, Jeffrey Hollander, concluded that to continue to grow, his company had to appeal to a broader range of customers. The only way to do this was to lower his prices. He concluded, "The research that says people will pay more for socially responsible goods simply isn't true."

Hollander reformulated his products and compromised on environmental purity. Environmentally harmful phosphates and chlorines were still excluded, but cheaper petroleum-based cleaning agents were substituted. These changes allowed a dish detergent's price to be lowered from $3.50 to $2.50. While margins are lower, sales are up 20 percent. Also, the new formulas work better.

Seventh Generation is criticized by some of its old customers for paying less attention to core customers and substituting profits for idealism. Hollander says to his critics, "They not only have greater access to our products, they also can get them cheaper."

a. Do you agree with Hollander that people aren't willing to pay more for socially responsible goods? Explain why or why not.

b. Is Seventh Generation behaving ethically by substituting petroleum-based cleaners into its products?

c. What additional information would you request to help Seventh Generation address its ethical questions?

22–2. Ben and Jerry's Homemade Inc. has received much favorable press for its Rainforest Crunch ice cream. It uses official rain forest nuts and berries and all natural ingredients; it also sends a percentage of profits to charities. However, another flavor, Cherry Garcia, contains sulfur dioxide preservatives, and other flavors use margarine, not butter. What are the problems a firm faces if it is "politically correct" in some products but not others?

22–3. The Body Shop has been widely noted for its ethical stands in its business: natural cosmetics, "Products for People Tested by People," and First World wages for Third World products. Recently, Jon Entine published an analysis of the Body Shop in *Business Ethics,* alleging false advertising and other ethical lapses. Would you expect such charges to have more or less of an impact on a company like the Body Shop that touted its business ethics than if the same charges were leveled against a competitor who made fewer claims?

22–4. The Body Shop started its business by developing an extensive network of franchisees. Recently, franchisees have complained about the company's competing with their franchises through direct catalog sales and over the Internet. How does an expansion of Internet and direct catalog selling affect the Body Shop?

22–5. Eastman Kodak charged that the Fuji Corporation of Japan was illegally dumping film in U.S. markets. It asked the U.S. government to investigate and impose sanctions on Fuji for its unfair practices. But the world film market is dominated by Kodak and Fuji. If the government agrees to sanction Fuji, Kodak will obtain significant market power in the U.S. film market. Is it ethical for Kodak to attempt to use the government to undermine its competitor?

22–6. Wilmorite Corporation owned a large tract of land and proposed erecting a large, modern enclosed shopping mall south of town. The mall was opposed by an environmental group that argued that the land had areas with standing water that waterfowl used in their spring and fall migrations. The challenges resulted in a substantial delay in the development of the land; more extensive environmental impact statements had to be prepared and plans had to be redrawn.

a. Was this development ethical?

b. The largest contributor to the environmental group happened to own Southtown Mall, an older strip mall across the road from the proposed new mall. Was his contribution to the environmental group ethical?

Organizational Architecture and the Process of Management Innovation

CHAPTER 23

CHAPTER OUTLINE

Humana Hospital, a 555-bed institution in Dallas, Texas, fundamentally reorganized the way it was structured for delivering care to its patients. Beginning in 1990, it applied a process called *reengineering* to develop patient-focused care, enhancing the delivery of health care and reducing costs.[1]

Hospital costs in the 1980s and early 1990s had increased faster than inflation, thereby precipitating a health care crisis. The parties that paid for health care services—private individuals, employers, insurance companies, and the government—bore the higher expenses. To stem the rising health care costs, the government began reimbursing hospitals using a fixed fee for each procedure rather than paying for total costs incurred. And large employers, through their insurance companies, began to pressure local health care providers by threatening to require that their employees be treated only at those hospitals and by those physicians that better controlled costs. As a result, hospitals initiated cost containment programs and began competing for patients.

Prior to reengineering, Humana employed the traditional hospital architecture wherein patient care was provided primarily by functionally organized individuals: physicians, nurses, and a score of specialists drawing blood samples and taking x rays and administering EKGs. Most large hospitals are organized around numerous, small, clinically focused nursing units with dedicated staffs and large centrally dispatched services—physical therapists, phlebotomists, and transporters, for instance. They have 60 to 100 department heads and seven to nine layers of management between CEO and

[1]Details of this example are from J. Lathrop (1991), "The Patient-Focused Hospital," *Healthcare Forum Journal* (July–August), 17–20.

bedside caregiver. Patient care units generally are designed with excess capacity; this enables them to handle all but the sickest patient with the most complex needs. Yet 60 to 80 percent of all medical procedures are for routine services (chest x rays, basic lab tests, EKGs). Therefore, infrastructure costs and idle time account for as much as 75 percent of costs for simple procedures. For example, in a typical 650-bed hospital only $.16 of each health care dollar spent reflects direct patient care. Scheduling, documentation, and idle time account for $.63 out of every dollar. The remaining $.21 covers occupancy costs, transportation, management, and supervision.

As a result of increased pressure to attract patients and control costs, some hospitals embraced process reengineering and the patient-focused care movement was born. Nursing roles were reevaluated and tasks reassigned. After the reorganization, patient care was delivered through teams, where two-person caregiver teams of nurses and technicians were responsible for most procedures performed on each patient.

The following characteristics describe a hospital with patient-focused care:[2] At admission, each patient is assigned to a unit and given a standard protocol—sometimes called a *care map*—which details the standard set of tests and procedures to be followed by the caregivers. Instead of documenting every procedure and test performed, the staff documents only exceptions to standard protocols. Exception-based charting reduces documentation by as much as 50 percent.

Each caregiver is trained to provide basic bedside nursing, basic x ray, respiratory care, EKGs, and the like. Routine care is provided by nurses, medical technicians, laboratory technicians, phlebotomists, and other staff working in the two-person teams assigned to patients. The team "owns" the patient: They admit the patient, document the care, serve the meals, change linen, and even clean the room after discharge. During a three-day stay, patients interact with an average of 15 employees instead of 55. Rather than being transported throughout the hospital for routine tests and waiting while they are performed, patients remain in their rooms for most tests.

Traditional hospitals are arranged by level of acuity and broad medical category. For example, cardiac intensive care units and orthopedic intensive care units are two separate acute care units specializing by medical category. Patient-focused care locates patients by the type of tests, therapies, and health care resources required. Wireless technology (pagers and cellular phones) allows more flexibility in how patients are grouped. Instead of a 15- to 20-bed dedicated unit, 50- to 100-bed patient centers provide more effective service lines to be developed.

Large centralized service bureaucracies are dismantled and their resources disbursed under the control of the patient centers. Each patient service center has satellite lab, radiology, and pharmacy units. The caregivers are cross-trained to perform many of the functions that formerly had been centralized. The extent to which decentralized satellites are efficient depends on the costs of the equipment. Basic x rays are decentralized, but CAT scans are not: Small inexpensive, simple-to-operate x-ray machines are available whereas CAT scan equipment is still quite expensive and requires more specialized training to operate.

Advocates of patient-focused care emphasize that achieving these benefits requires a constellation of organizational changes. Unless the old hierarchy of specialized departments is dismantled and replaced with a new structure with new reporting mechanisms and incentives, many of the benefits of patient-focused care will remain unrealized. That is, the elements of reorganization are complements—not substitutes.

[2]C. Schartner (1994), "Principles of Patient-Focused Care," *Journal of the Healthcare Information and Management Systems Society* 7, 11–15.

> *The kind of improvement our health care system requires cannot be obtained by isolating a redesign initiative to any one of the patient-focused care principles. We need a more comprehensive effort that understands the complex interrelationships between the principles.*[3]

This example of patient-focused care illustrates how one management innovation, reengineering, was applied within a specific hospital. Many organizations successfully implemented reengineering programs. Others tried it with less success. Besides reengineering, other management innovations have come and gone. This chapter examines the general topic of management innovations—why they are popular, why some succeed while others fail, and how managers implement changes in their organizational architecture.

Management Innovations

The titles currently displayed in the business section of any good bookstore present a seemingly endless array of management prescriptions: total quality management, reengineering, benchmarking, activity-based costing, just-in-time production, quality circles, outsourcing, economic value added, balanced score cards, empowerment, self-directed teams, venturing, incentive compensation, cycle-time reduction, strategic alliances, 360-degree performance reviews, matrix organizations, downsizing, learning organizations, market-based management, core competencies, groupware, and so on. Given this cornucopia of management innovations, one might expect corporate executives' appetite for novelty to show signs of satiation. Yet judging from consulting fees, book sales, and the proliferation of seminars, the corporate thirst for managerial innovations appears to be unquenchable.

Take the cases of reengineering and total quality management, two of the more popular management techniques of the 1990s. One survey of 500 United States managers from large companies reported that 76 percent of the companies represented in the survey at least had tried TQM and that 69 percent had employed some form of reengineering.[4] Such remarkable adoption rates spawned legions of management consultants, many of whom can be counted on to claim that TQM or reengineering is essential for the success of most if not all companies. There is even a highly coveted national prize, the Malcolm Baldrige National Quality Award, which is presented each year to the most successful application of the principles of total quality management.

But for all the hype, a significant number of TQM and reengineering programs have failed to live up to expectations. Press stories have expressed growing dissatisfaction with reengineering programs, to the point where the founders of the movement, James Champy and Michael Hammer, have shifted the focus of their consulting efforts away from downsizing initiatives and toward the pursuit of growth opportunities. And reports of discontent with TQM began to appear in the early 1990s. For example, a Gallup poll of over 1,200 corporate employees in 1990 reported that although over half said that quality was *top priority,* only one-third considered their companies' programs to be *effective.*[5] A survey of 300 large companies conducted by *The Wall Street Journal* in 1991 found that executive satisfaction levels with TQM were only 40 percent.[6] Some companies, such as McDonnell-Douglas Aircraft and Florida Power &

[3]Schartner (1994), 15; and P. Milgrom and J. Roberts (1995), "Complementarities and Fit: Strategy, Structure, and Organizational Change in Manufacturing," *Journal of Accounting and Economics* 19, 179–208.

[4]"Missions Possible," *The Globe and Mail* (September 13, 1994), B22.

[5]*The Wall Street Journal* (October 4, 1990), B1.

[6]F. Bleakley (1993), "Best Laid Plans: Many Companies Try Management Fads," *The Wall Street Journal* (July 6), A1.

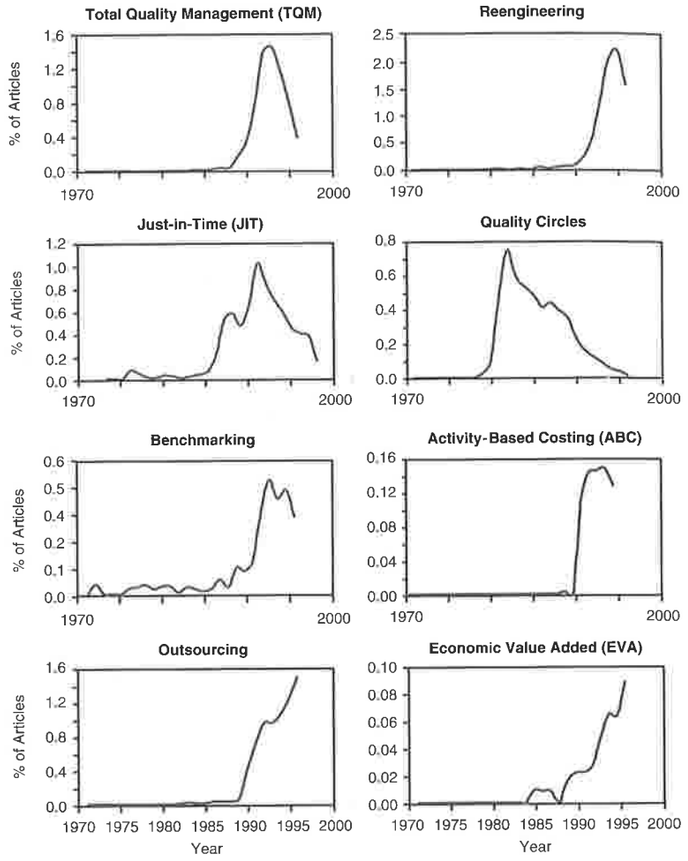


Figure 23.1 The Percentage of Business Articles Mentioning Various Management Techniques by Year

Among ABI/Inform articles that contain the words *business, management, firm,* or *managers,* the percentage of articles that mention selected management techniques between1970 and 1998.

Light, abandoned their TQM programs. After winning the Baldridge Award in 1990, Wallace Company filed for bankruptcy in 1992.[7] Finally, a study of 584 United States, Canadian, German, and Japanese firms in 1991 concluded, "Many businesses may waste millions of dollars a year on quality-improvement strategies that don't improve their performance and may even hamper it."[8]

Such mixed reviews are not confined to TQM and reengineering. Evidence of the rise and fall of a larger sample of recent management innovations is presented in Figure 23.1, which displays the percentage of published business articles that mention a particular management technique in a given year. For example, as displayed in the first graph in Figure 23.1, almost 1.5 percent of all business articles published in 1993 contained the words *total quality management* or *TQM*. The graph also shows that, after

[7]J. Mathews (1992), "The Cost of Quality," *Newsweek* (September 7), 48–49.

[8]G. Fuchsberg (1992), "'Total Quality' Is Termed Only Partial Success," *The Wall Street Journal* (October 1), B7.

reaching a peak in 1993, citations of TQM have fallen sharply. A similar pattern can be observed for *reengineering,* which achieved peak prominence in 1995. And two much-noted management preoccupations of the 1980s, *just-in-time production* and *quality circles,* have lost virtually all press coverage. The last four graphs—*benchmarking, activity-based costing, outsourcing,* and *economic value added*—represent still more recent innovations. Benchmarking and ABC are starting to fade; EVA and outsourcing continue to rise.[9]

If history offers any guide to the future, management techniques will continue to wax and wane. And new techniques—many of them reviving elements of older innovations—will doubtless appear.[10] The rise and fall of such management techniques raise a number of important questions:

- What explains the popularity of these management innovations?
- Why do they often fail to produce their touted benefits?
- How can managers tell if a particular technique is appropriate given their firm's circumstances?
- What can managers do to increase the likelihood that an adopted technique will be successful?

We use our organizational architecture framework to address these questions. Thinking in terms of organizational architecture can help managers evaluate expected benefits and costs of management innovations for their own companies. As we argue below, virtually all management techniques focus on a specific problem confronting the organization, while ignoring possible effects of their proposed solution on other aspects of the firm. In our terms, such programs typically affect one or two legs of the organizational architecture stool without careful consideration of their effect on the others. As one obvious example, a too rigid insistence on just-in-time principles can lead to big customer service problems; adopters of JIT at least should consider increases in the staffing (and perhaps the incentive pay) of their customer service department to accommodate such change. The organizational architecture framework we develop in this book can help managers considering one potentially valuable set of organizational changes to identify other facets of the organization that also require attention and complementary adjustment.

The Demand for Management Innovations

With dramatic shifts in the business environment created by expanding deregulation, more rapid technological change, and more intense global competition, whole classes of firms face new challenges (recall Figure 11.1). For many companies, what once might have been appropriate architectures began to show signs of obsolescence. As a growing number of large, once-successful companies lose opportunities to smaller, more flexible

[9]"FirstSearch," an online referencing software, was used to gain access to ABI/Inform, a database containing over 800,000 articles in 1,000 U.S. and international publications on business and management topics. To calculate the percentage of articles published, the total number of business articles in a year was determined by searching for the following: *business, management, firm,* or *managers.*

[10]The reader is cautioned against reading too much into Figure 23.1. Some of these management techniques still may be used actively, but under another term. The press publishes articles about "new" topics. "Old" topics are more difficult to attract the attention of journalists. However, the articles counted in Figure 23.1 are not just articles that describe the particular technique, but rather are articles that simply mention the technique.

(and, in some cases, overseas) competitors, the opportunity costs of ill-structured organizations are reflected in declining shareholder returns. This in turn increases the demand for management prescriptions that enable companies to respond more effectively to their new environment. Thus, we believe the demand for management innovations (or *fads,* as some refer to them) can be viewed as a rational economic response by executives to changes that cause aspects of their organizational architectures to become obsolete.

The Rise of TQM[11]

Take the case of the broad-based adoption of TQM principles in the 1990s. Before TQM, the standard approach to ensuring product quality was to *inspect it in.* Inspection stations and quality-assurance inspectors were placed along the production line to weed out defective units. Statistical sampling methods were used to draw random samples from each batch and, if an unacceptable number of substandard units was detected, the entire batch would be rejected.[12] Defects were stored waiting to be reworked or scrapped. In some cases, if market demand exceeded production over a period, marginally defective products might be released with problems corrected by the field service organization under warranty arrangements.

By the mid-1980s, two factors worked together to change this traditional approach to quality within many industries. First was a change in technology: The cost of detecting problems and monitoring production using new computerized instrumentation fell sharply relative to the cost of maintaining quality via manual inspection or warranty repairs. Increases in the cost of labor (including fringe benefits) made the manual identification of errors and field service repairs considerably more expensive than doing it electronically. Instead of manually detecting and remedying defects after production, improved instrumentation allowed identification and correction of problems during the manufacturing process.

A second key factor in the rise of TQM was the expansion of worldwide competition. Besides price wars, competition also took the form of a push for higher-quality products. Customers shifted to more reliable products, many of whose producers were based overseas. Perhaps the most dramatic case of such quality-driven competition was the auto industry in the early 1980s. Once Japanese companies gained price competitiveness against American automakers, they focused their attention on achieving quality advantages.

Thus, the total quality movement was spurred by both lower costs of identifying defects and increased global competition. To reduce defects, companies redesigned their products to require fewer different parts, making it easier to maintain tighter controls on the quality of their suppliers. Product designers redesigned parts that failed. Production processes were changed to reduce defects. Robots and additional instrumentation in the manufacturing process ensured more uniform production.[13]

[11]This section draws on J. Zimmerman (2003), *Accounting for Decision Making and Control,* third edition, (Irwin/McGraw-Hill: Burr Ridge, IL), Chapter 14.

[12]Statistical quality control (SQC) consists of a set of statistical methods used to determine if a particular repetitive manufacturing process is in or out of control. By employing common statistical procedures (means and standard deviations), normal variation of the process is established. If products exceed the normal bounds, the process is deemed "out of control" and subject to management investigation.

[13]Other factors contributing to TQM were factory automation and flexible manufacturing that allowed firms to broaden their product lines and to change products more rapidly. Because of these factors, at any time, there are more products and more new products on the factory floor. This means there is likely more specific knowledge on the shop floor now.

Other Innovations

Although many TQM programs initially were started to improve the tangible aspects of product and service quality for external customers, TQM programs expanded to include efforts to improve both the quality and the efficiency of processes and services for internal as well as external customers. In this sense, the boundaries between TQM and another popular innovation, reengineering, have become somewhat blurred.

Reengineering

One way of distinguishing between the two movements is to view reengineering as accomplishing a set of major, one-time changes,[14] as opposed to TQM's widely heralded emphasis on continuous improvement. Like TQM, the demand for reengineering stems from both technological changes and heightened competition in the 1980s. As Michael Jensen argued, we have experienced what amounts to a "third industrial revolution" over the past several decades.[15] One major by-product of this wave of technological change has been more rapid product obsolescence and, as a consequence, overcapacity in certain global industries. Many of the major restructurings, consolidations, and downsizings associated with reengineering can be seen as value-adding (if not entirely voluntary) managerial responses to excess capacity.

JIT

Technological advances in instrumentation, computers, and telecommunications also have been a key element in the rise of just-in-time production. Such advances have allowed factories to be redesigned along the continuous-flow lines required by JIT. Suppliers' computers are linked electronically to their customers' computers, and electronic order processing is commonplace. But, if JIT has been made possible by technological change, its demand also reflects a major change in market conditions. Large corporate customers increasingly are demanding that their suppliers deliver products in continuous, small-order lot sizes—in part to reduce their own inventories and hence to improve efficiency.

Outsourcing

As part of the process of shedding excess assets and capital to increase operating efficiency and shareholder value, many U.S. companies also pursued a refocusing strategy during the 1980s and 1990s. Along with selling or spinning off unrelated businesses, outsourcing of previously internal functions was a widely practiced method for sharpening corporate focus. As we noted in Chapter 19, outsourcing involves a fundamental change in organizational architecture. It reassigns ownership of certain assets, decision rights, and, in many cases, the employees who exercised them from inside the company to another firm. Recall the Chapter 19 example in which Eastman Kodak sold its mainframe computers to IBM and contracted with IBM to do much of Kodak's data processing. Such partnerships have been prompted in part by changes in the information technology that have made it easier to identify and communicate with partners outside

[14]As defined by Hammer and Champy, reengineering is "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed." M. Hammer and J. Champy (1993), *Reengineering the Corporation: A Manifesto for Business Revolution* (Harper Business: New York), 32.

[15]M. Jensen (1993), "The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems," *Journal of Finance* 48, 831–880.

the firm. Also, more flexible production technologies have reduced asset specificity, thus reducing the costs of outsourcing. Besides allowing management to focus more of their attention on those internal activities where they have a comparative advantage, outsourcing also enables companies to acquire goods and services from other firms at lower prices by allowing the latter to specialize and achieve economies of scale.

Why Management Innovations Often Fail

As we noted earlier, many companies adopting new management techniques have been less than enthusiastic with the outcomes. We now explore potential explanations for this dissatisfaction—and, more generally, for the tendency for successful innovations to rise sharply and then (often just as abruptly) to fall out of favor, thus prompting skeptics to brand them as *fads.*

Marketing

The demand for management solutions is met predictably by responses from consulting firms, academics, and management gurus (and these groups are not mutually exclusive). Frequently, a consultant working with a client firm identifies a specific set of problems and recommends a package of changes. Especially if implementing the changes appears to improve the operation of the client firm, the consultant quite naturally next seeks to identify other potential clients who are in similar circumstances. Producing a successful management innovation is difficult, but the rewards can be enormous. One challenge potential innovators face is that property rights in management innovations are generally ill-defined. Because of this, labels are quite important. Innovators frequently attempt to brand their innovation with a new term like *reengineering, benchmarking,* or *organizational architecture.*[16]

Setting Inappropriate Expectations

One potential explanation for managerial dissatisfaction is that consultants create inappropriate expectations in marketing management innovations. They frequently claim that their technique will increase productivity and raise profits. But if competing firms in the industry also adopt the technique, any abnormal profits are competed away. As we argued in Chapter 8, a basis for sustainable profits cannot be an asset that competitors can replicate. Thus, although effective and productive, adoption is not followed by higher profits. Here, the appropriate comparison is not future profits against past profits, but future profits with the innovation versus future profits were it not adopted.

A second explanation focuses on the incentives of purveyors of a given management innovation to emphasize expected benefits while understating costs. This is not to suggest that management consultants are less honest or less forthright than the rest of us. Yet as proponents as well as beneficiaries of change, consultants are likely to provide detailed information on companies where their techniques appeared to work but less information on those where their techniques failed. And having acquired knowledge and experience in addressing a set of specific corporate issues and problems, consultants are understandably less informed about other aspects and concerns of the organization. As we argue later, it is the potential linkages or interdependencies among these sets of problems that

[16]Good acronyms appear helpful (TQM, ABC, MBO). The Holy Grail in this business appears to be having a new acronym registered (EVA®).

frequently lead to unintended and undesired consequences when making organizational changes.

Of course, managers recognize that consultants have incentives to present an optimistic view of their services. And most managers attempt to adjust for such bias when deciding whether, or to what extent, to implement a consultant's recommendations. But even so, the corporate failure rate in adopting management innovations obviously would be lower if managers had a low-cost, unbiased source of information at their disposal.

Quality Is Not Free

In some instances, management consultants have offered advice that simply defies economic logic. Perhaps the most egregious example is noted quality expert Phillip Crosby's assertion, contained in the title of his 1980 book, that *Quality Is Free.* On page 1 Crosby writes,

> *If you concentrate on making quality certain, you can probably increase your profit by an amount equal to 5 to 10 percent of your sales. That is a lot of money for free. . . . What costs money are the unquality things—all the actions that involve not doing jobs right the first time.*[17]

Included in Crosby's list of the costs of "not doing things right the first time" are unnecessary or excessive costs associated with prevention of defects (design reviews, supplier evaluations, tool control, preventive maintenance), quality monitoring (prototype tests, receiving inspection and test, packaging inspection), and the costs associated with preventable failures (including the costs of redesign, engineering change orders, rework, scrap, product warranty, and product liability).

But what does Crosby really mean when he says, "Quality is free"? Taken literally, the statement suggests that managers can achieve substantial reductions in product failures, and in the costs associated with preventing them, at no cost to the organization. But this can't be the intended meaning for, as Crosby surely knows, improving product quality clearly requires a major commitment of management time as well as other corporate resources. Defects must be discovered, their causes investigated and corrected, employees must be trained in quality methods, and products redesigned. In fact, improving quality can be quite costly.

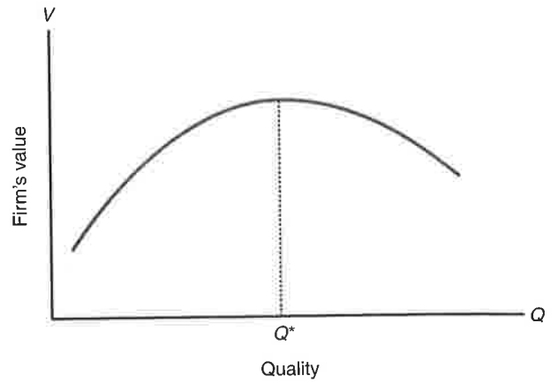
Rather than think of quality in Crosby's terms, it makes economic sense to view a TQM initiative as an investment of corporate resources with an uncertain future return in the form of lower costs or higher revenues, or both. Improving product quality usually lowers the cost of reworking defects along with inspection costs, warranty costs, and customer complaints. And, to the extent the firm's brand-name capital is higher when product quality is increased, product demand and hence revenues will increase. But, given the commitment of resources necessary to achieve such increases in quality, the critical question for senior management becomes: *Does the expected rate of return justify the initial and ongoing investment, including the management effort and other costs associated with changing the organization?*[18] Crosby asserts that the answer to this question—for all companies and for arbitrarily large commitments, as far as we can tell—is yes. We are unconvinced.

[17]P. Crosby (1980), *Quality Is Free* (Mentor: New York), 1.

[18]P. Lederer and S. Rhee (1995), "Economics of Total Quality Management," *Journal of Operations Management* 12, 353–367.

Figure 23.2 The Relation between Quality and Firm Value

Firm value increases as quality increases because consumer demand increases and costs decline. Beyond Q^*, the cost of increasing quality is greater than the manufacturing cost savings and the increased consumer demand. Maximizing quality does not maximize firm value. Too much quality lowers value.



The assertion that quality is free also obscures the reality that it typically requires larger investments of corporate resources to attain higher levels of quality and that, at some point, all companies face diminishing marginal returns from further investments in quality programs. This in turn implies that there is generally an "optimal," or value-maximizing, level of quality.

Figure 23.2 illustrates the relation between quality and the firm's value. At relatively low levels of quality (where the curve is rising), increases in quality lead to increases in firm value in two ways: by reducing production, inspection, and warranty costs and by increasing consumer demand for, and the prices commanded by, the products. But, at some point (represented by Q^*), the returns to further investment in quality-increasing measures fall below acceptable levels. Ultimately, it is the company's customers who must pay for the cost of enhanced quality. At some point, the costs of additional improvements in quality exceed the premium customers are willing to pay—along with any further production cost savings. To illustrate, wine lists at many restaurants contain a wide selection encompassing a range of prices; yet even though the quality of the highest-priced wine presumably is commensurate with its price, few diners seem to place enough value on the higher quality of the $275 bottle of 30-year-old imported Chateau Margeaux to order it instead of the $20 bottle of the 3-year-old domestic house wine. Value-maximizing managers will want to undertake only those quality improvements where the incremental benefits exceed the incremental costs of enhanced quality.

Perhaps one way to make sense of Crosby's statement would be to argue that some managers systematically underestimate the total costs of poor quality. For example, some companies might place too much emphasis on short-term financial measures. Or, if managers are about to retire, they might be reluctant to spend money today on quality programs that yield benefits after they retire. But this is just the standard horizon problem that confronts all decisions where the expected benefits of present outlays span several periods. In this sense, quality programs are no different from capital investments, R&D, or advertising. Successful firms find ways to control these horizon problems.

An alternative explanation is that some managers underestimate the costs of low quality out of ignorance. Those managers who fail to appreciate the costs of reduced consumer confidence in their products will underestimate the benefits of reducing defects and so underinvest in programs to improve quality. In cases where such myopic behavior is common, companies might benefit from educational programs focused on the importance of quality.

But regardless of whether underinvestment in quality might be attributed to ignorance or distorted incentives, quality still is not free. Decisions to improve quality, like all corporate investment decisions, require accurate estimates of all expected costs and benefits. It is just as dangerous to underestimate the costs of quality programs by arguing that quality is free as it is to underestimate their benefits. As many companies likely have discovered, overinvestment in quality-improvement programs can end up destroying just as much value as underinvestment. Management's job is to find the value-maximizing level of quality—neither too much nor too little—based on the firm's markets and internal capabilities.

Underestimating Costs of Change

Another important reason TQM and other management innovations can prove ineffective is that some managers underestimate the costs of change. As we saw earlier, changes in market conditions, technology, or government regulation can affect optimal architecture. But as we argued in Chapter 11, organizational change is by no means a costless process. In evaluating the merits of an organizational restructuring, it is important to assess these costs in addition to its benefits.

First, there are direct costs. The new architecture has to be designed and communicated. Changes in reporting structures and performance-measurement systems frequently impose costly changes on the firm's accounting and information systems; what might appear to be a minor change in the performance-evaluation system sometimes becomes a quite costly project for the firm's information systems and accounting departments. (Just look at the reported costs of identifying and correcting Y2K problems.)

Second, and at times more important, are indirect costs. Most changes in architecture will affect some employees positively but others negatively (recall our discussion in Chapter 20). Thus, attitudes toward change can be expected to vary among employees, creating incentive problems that are costly to control. And recurrent changes in architecture can have undesirable incentive effects. Increasing the likelihood of change reduces employees' incentives to invest in learning current assignments, devising more efficient production processes, or developing relationships with teammates. Constant restructuring promotes more focus on shorter-run payoffs and less on longer-run investments.

Failure to Consider Other Legs of the Stool

Perhaps the most important reason management innovations often fail, however, is their failure to address all three components of organizational architecture. In Table 23.1 we list a set of popular management techniques along with their primary focus.

For example, let's go back to the case of TQM. As shown in Table 23.1, TQM programs typically change both decision rights and performance measures, but leave the reward system largely unchanged. And this appears to be by design. Echoing quality-guru W. Edwards Deming's well-known disdain for financial incentives, Crosby argues,

> *People really don't work for money. They go to work for it, but once the salary has been established, their concern is appreciation. Recognize their contribution publicly and noisily, but don't demean them by applying a price tag to everything.*[19]

[19]Crosby (1980), 218.

	Assignment of Decision Rights	Performance Evaluation	Reward System
Total quality management	X	X	
Reengineering	X		
Outsourcing	X		
Just-in-time production	X		
Quality circles	X	X	
Benchmarking*	X	X	X
Activity-based costing		X	
Economic value added		X	X
Empowerment	X		
Self-directed teams	X	X	
Venturing	X		
Incentive compensation			X
Cycle-time reduction	X		
Strategic alliances	X		
Management by objectives		X	
360° performance reviews		X	
Matrix organizations	X		

*Any corporate policy can be benchmarked; thus benchmarking can be applied to all parts of the organization's architecture. However, in practice, firms often benchmark only one facet of the organization.

Table 23.1 Focus of Management Techniques

For each management technique, we indicate whether it focuses on decision rights, performance evaluation, or the reward system.

Apparently, this strategy has been adopted widely. For instance, a 1992 study by the American Quality Foundation and Ernst & Young found that quality performance measures were not important variables in determining senior managers' compensation in 80 percent of the firms surveyed.[20]

We would suggest otherwise. In pushing decision rights down to the people with the knowledge about processes and customer preferences, it is important that companies use their reward systems to reinforce their new performance-evaluation systems.[21]

Critics of incentive compensation like Crosby argue that pay for performance does not work because it ends up rewarding people for doing the wrong things. And such criticism is undoubtedly correct in the sense that an ill-designed compensation system indeed can elicit dysfunctional behavior. But Crosby's argument alone is not sufficient reason to conclude that incentive pay should be abandoned. Monetary and nonmonetary incentives are not mutually exclusive—employees clearly value both types of rewards.[22] A recurring theme in this book is that appropriately linking financial incentives to the new performance measures will reinforce the desired changes in behavior.

[20]R. Jacob (1993), "TQM: More Than a Dying Fad?" *Fortune* (October 8), 68.

[21]See K. Wruck and M. Jensen (1994), "Science, Specific Knowledge, and Total Quality Management," *Journal of Accounting and Economics* 18, 247–287.

[22]G. Baker, M. Jensen, and K. Murphy (1988), "Compensation and Incentives: Practice vs. Theory," *Journal of Finance* 43, 593–616.

Reengineering

A similar criticism can be directed toward many reengineering programs. As suggested in Table 23.1, reengineering focuses almost exclusively on a single leg of our three-legged stool: the reassignment of decision rights. Most advocates of reengineering pay lip service to the importance of the performance-evaluation and reward systems, but offer little guidance—and, in some cases, inappropriate advice—as to how the evaluation and reward systems must change. For example, the best-known advocates of reengineering, Hammer and Champy, are content to provide only the following advice: "Substantial rewards for outstanding performance take the form of bonuses, not pay raises."[23] But as we discussed in Chapters 14 and 15, the compensation decision is far more critical to outcomes than this treatment by Hammer and Champy suggests.

For example, one important part of corporate performance/reward systems is promotions. By creating smaller, flatter organizations, reengineering reduces advancement opportunities. But most reengineering articles are completely silent about how to create new career paths and promotion systems to motivate individuals within a flatter, process-oriented organization. As in the case of TQM, to increase the chances that reengineering efforts will succeed, significant managerial thought and effort also must be focused on reengineering the performance-evaluation and reward systems.

EVA

On the other hand, an exclusive concern with performance evaluation and rewards also can cause problems. Take the case of *economic value added,* which attempts to make the economist's concept of residual income the basis for incentive compensation, not only for corporate executives and senior divisional managers, but for rewards that extend "all the way down to the shop floor." Yet such a prescription easily can backfire if it fails to take into account the limited decision rights (and risk-bearing capacity) of lower-level employees. Employees with little control over factors that drive their business unit's EVA may find little motivation—in fact, may be subjected to excessive risk bearing—by such an evaluation and reward system.

ABC

As one final example, let's use our organizational architecture framework to explore why the practical achievements of another innovation listed in Table 23.1 have fallen well short of some managers' expectations. In the late 1980s and early 1990s a new accounting system, *activity-based costing,* appeared to great acclaim. An article in *Fortune* magazine declared, "Trim waste! Improve service! Increase productivity! But it does all that—and more."[24]

How does ABC work? Under traditional accounting systems, overhead costs of common resources such as engineering services are allocated to products or lines of business using very simple formulas, such as percentage of direct labor or percentage of total revenue. For example, suppose both riding and walk-behind lawn mowers are produced in the same plant and both models use common resources. In calculating the accounting costs of the mowers, the plant's overhead costs traditionally are allocated to mowers based on the percentage of direct labor charged to each mower. If direct labor is an unreliable indicator of the level of manufacturing overhead a given operation really generates, this traditional system misrepresents costs. For example, in the case of more complicated

[23]Hammer and Champy (1993), 73.

[24]T. Paré (1993), "A New Tool for Managing Costs," *Fortune* (June 14), 124–129.

products involving little direct labor but a great deal of engineering services, the costs of these products will be understated; managers using such costs to guide pricing decisions might charge too little for them.

Under ABC, different categories of overhead such as purchasing, engineering, and inspection are assigned to products based on underlying cost drivers of that overhead department. For example, purchasing department costs are allocated to different products based on the quantity of purchase orders issued or the number of different parts purchased for each product. By so doing, ABC is said to provide a more accurate estimate of a product's real costs and, hence, a more reliable basis for decision making than the traditional numbers.

But for all its theoretical appeal, the promise of ABC largely has failed to materialize. Although many companies have investigated ABC systems and some have conducted pilot studies, few have abandoned their older, simpler cost-allocation methods. Even though some firms employ ABC-based numbers for special studies, they continue to base performance evaluation on their traditional accounting systems.[25]

One important reason ABC is not replacing traditional accounting systems for purposes of performance evaluation goes back to the standard admonition against giving control of the accounting system to the people being monitored by that system—the separation of decision management and decision control. ABC systems typically must be designed by operating managers because they are the people with the greatest specific knowledge of the overhead cost drivers. Yet these are precisely the people whose performance the ABC measures are intended to evaluate.

But it's not just the opportunity it provides operating managers for self-enrichment that makes most companies reluctant to adopt ABC for performance evaluation. It's the internal turmoil that such changes potentially unleash—influence costs that we discussed in Chapter 12. Altering accounting cost allocations creates both winners and losers in the process. And people can be counted on to struggle mightily to ensure that they are among the winners. The fact that a good deal of subjective judgment goes into determining these ABC measures means that the internal battles are likely to be long, hard-fought, and costly.

As an example of influence costs, one firm implemented and then abandoned activity-based costing after only a year. The controller explained that under the old system, with just a few cost drivers, everyone understood the weaknesses of the system and accepted its faults. With the new system, managers were constantly arguing over the appropriate cost drivers because switching cost drivers changed product costs and thus managers' performance measures. Valuable management and employee time was consumed debating the merits of particular cost drivers. To put an end to the bickering, the controller abandoned ABC.

Because ABC changes product costs and hence product-line profits, successful implementation of ABC throughout the firm requires that new profit targets be established for managers with profit responsibility. To control influence costs, the new profit targets should attempt to eliminate any windfall gains and losses for these managers arising from the change to ABC. This requires detailed changes in compensation plans.

[25] See A. Sullivan and K. Smith (1993), "What Is Really Happening to Cost Management Systems in U.S. Manufacturing?" *Review of Business Studies* 2, 51–68; R. Cooper, R. Kaplan, L. Maisel, E. Morrissey, and R. Oehm (1992), "From ABC to ABM," *Management Accounting* 74, 54–57; and *Cost Management Update*, newsletter published by the Cost Management Group of the National Association of Accountants, Inc. (January 1991).

ABC and Business Strategy

Although ABC strives to produce more accurate product costs—a laudable goal—obtaining and using more accurate product costs could actually work against the firm's business strategy. For example, suppose a firm is unionized, and reducing labor content is part of its business strategy. Changing the overhead allocation base from direct labor to, say, number of different parts in the product will weaken managers' incentives to reduce labor content by effectively lowering the implicit tax on labor because overheads are no longer allocated on the basis of direct labor content.

Take the case of Hitachi, a large Japanese electronics producer, which manufactures VCRs in one of its plants. Even though this plant is highly automated, and the managers know that direct labor does not reflect the cause-and-effect relation between overhead and the overhead cost drivers, Hitachi continues to allocate overhead using direct labor to reinforce the managers' commitment to further automation. Taxing direct labor through conventional cost accounting is one way to accomplish this aim, thereby lowering production costs.

Source: T. Hiromoto (1988), "Another Hidden Edge—Japanese Management Accounting," *Harvard Business Review* 66, 22.

Thus, one of the main reasons ABC has failed to achieve widespread adoption is that it changes only one of the three legs of the firm's organizational architecture stool—the performance-evaluation system. Without complementary changes in decision-right assignments and performance rewards (such as establishing new profit targets in compensation plans), there is little basis for expecting that firm performance will be enhanced.

Managing Changes in Organizational Architecture

Our point in insisting that changes in architecture be coordinated is not to suggest that all facets of the firm's architecture must be changed simultaneously. Rather, we argue the importance of understanding the entire set of policies that must be changed and to develop a plan for implementing that set of changes. An effective plan for implementing a major reorganization often will specify that changes be accomplished sequentially—perhaps in stages—rather than all at once.

Perhaps an analogy will help. Watch a good teaching golf pro giving lessons. The pro knows that there are at least 30 different factors that have to come together to hit a perfect shot—factors such as grip, stance, take-away, position at top, swing plane, release, tempo, and follow-through. After watching a new pupil hit only a few balls, the pro recognizes at least a dozen things that are not quite right. But rather than tell the duffer to

Sequencing Organization Changes at GM

Choosing the appropriate sequence for implementing organizational changes can be quite important; costly problems can arise if this is not done well. Consider the case of General Motors in its attempts to implement additional outsourcing after adopting just-in-time inventory policies. When GM announced that it was planning to outsource more of its activities, workers at its Dayton brake plant went out on strike. Because of its JIT program, within a week, GM auto production throughout North America was severely curtailed. The walkout by this local's 3,000 members idled over 43,000 GM workers and closed 12 assembly plants.

In effect, the JIT program had increased the local union's bargaining power substantially. Under its old policy, GM would have had an inventory of brakes sufficient to meet production demands for several months, thus giving the company more time to negotiate without affecting overall auto production.

CASE STUDY: *Software Development, Inc.*

Software Development, Inc. produces and markets software for personal computers, including spreadsheet, word processing, desktop publishing, and database management programs. SDI has annual sales of $800 million.

Producing software is a time-consuming, labor-intensive process. Software quality is an extremely important aspect of success in computer software markets. One aspect of quality is program reliability. Does the software perform as expected? Does it work with other software in terms of data transfers and interfaces? Does it terminate abnormally? In spite of extensive testing of the software, programs always contain some "bugs" (defects). Once the software is released, SDI stands behind the product with phone-in customer service consultants who answer questions and help the customer work around existing problems in the software. SDI also has a software maintenance group that fixes bugs and sends out revised versions of the programs to customers.

SDI has been tracking the relation between quality costs and quality. The quality measure it uses is the number of documented bugs in a software package. These bugs are counted when a customer calls in with a complaint and the SDI customer service representative determines that this is a new problem. The software maintenance programmers then set about fixing the program to eliminate the bug. To manage quality, SDI tracks quality costs. It has released 38 new or major revisions in existing packages during the last three years. Table 23.2 reports the number of defects documented in the first six months following release. Also listed in Table 23.2 is total product cost and quality cost per software package release.

Product cost includes all the costs incurred to produce and market the software, excluding the quality cost in Table 23.2. Quality cost consists of these components: training, prevention, and software maintenance and customer service costs. Training costs are those expenditures for educating the programmers and updating their training. Better-educated programmers produce fewer bugs. Prevention cost includes the expenditures for testing the software before it is released. Maintenance and customer service costs are those of the programmers charged with fixing the bugs and reissuing the revised software and the customer service representatives answering phone questions. The training and prevention costs are measured over the period the software is being developed, and the number of bugs and the maintenance and service costs are measured in the first 6 months following release.

All the numbers in Table 23.2 have been divided by lines of computer code in the particular program release. Programs with more lines of code cost more and also have more bugs. Prior studies find that using lines of code is an acceptable way to control for program complexity. Thus, the numbers in Table 23.2 are stated in terms of defects and cost per 100,000 lines of code.

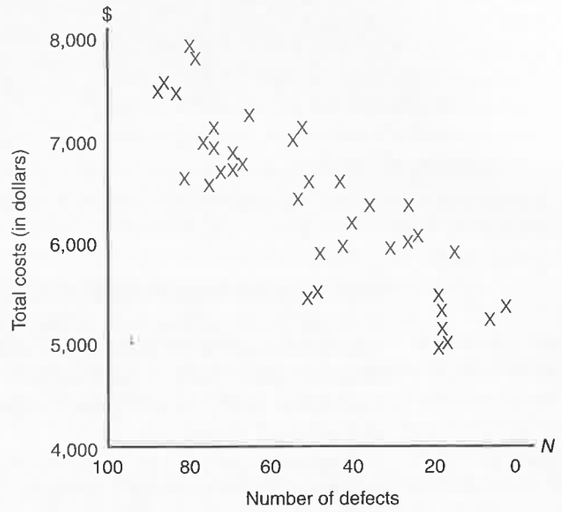
Figure 23.3 depicts the relation between total quality cost and number of defects. The vice president of quality of SDI likes to use Figure 23.3 to emphasize

	Number of Defects	Product Cost	Training Cost	Prevention Cost	Software Maintenance and Customer Service Cost	Total Cost
1	66	$3,455	$442	$ 770	$2,160	$6,827
2	86	3,959	428	447	2,658	7,492
3	14	3,609	417	1,167	687	5,880
4	73	3,948	211	655	2,334	7,148
5	17	3,104	290	1,013	544	4,951
6	48	3,179	253	547	1,556	5,535
7	80	3,112	392	508	2,633	6,645
8	41	3,529	276	577	1,563	5,945
9	50	3,796	557	634	1,666	6,653
10	67	3,444	365	947	2,140	6,896
11	42	3,922	453	869	1,444	6,688
12	64	3,846	378	1,108	1,942	7,274
13	71	3,014	555	762	2,384	6,715
14	1	3,884	301	773	423	5,381
15	18	3,183	378	1,080	857	5,498
16	85	3,475	528	1,010	2,572	7,585
17	17	3,445	357	666	631	5,099
18	50	3,203	285	427	1,546	5,461
19	22	3,839	239	1,080	891	6,049
20	73	3,060	540	1,054	2,309	6,963
21	52	3,182	329	1,079	1,867	6,457
22	75	3,075	395	832	2,697	6,999
23	35	3,456	447	969	1,518	6,390
24	53	3,987	355	651	2,042	7,035
25	25	3,836	309	1,160	1,036	6,341
26	6	3,886	234	794	252	5,166
27	78	3,846	418	833	2,800	7,897
28	82	3,106	409	1,092	2,871	7,478
29	39	3,506	448	899	1,342	6,195
30	47	3,545	450	442	1,450	5,887
31	30	3,376	456	784	1,260	5,876
32	17	3,740	542	420	607	5,309
33	67	3,479	411	821	2,018	6,729
34	51	3,773	351	1,145	1,873	7,142
35	74	3,034	497	671	2,389	6,591
36	25	3,768	268	887	1,094	6,017
37	14	3,168	356	645	837	5,006
38	77	3,561	492	1,167	2,597	7,817
Average	48	$3,509	$390	$ 826	$1,671	$6,395

Table 23.2 SDI Defects and Costs by Program Release (per 100,000 lines of computer code)

Figure 23.3 SDI Total Costs by Defects

SDI tracks the number of defects reported in the first 6 months following release and quality costs for each of the 38 revisions over the past 3 years. Product cost includes costs incurred to produce and market the software. Quality costs consist of training, prevention, software-maintenance, and customer-service costs. All the numbers are expressed per 100,000 lines of computer code.



that costs and quality are inversely related. She is fond of saying, "Quality pays! Our total costs are a declining function of the number of defects. The more we spend on quality, the lower our costs." Based on this analysis, the vice president has recommended a major investment in quality improvement, focusing specifically on prevention and training.

Discussion Questions

Evaluate the vice president's analysis:

1. What criteria should be used in deciding whether to invest more in quality?
2. Do you have sufficient data to evaluate such an investment proposal?

think about the dozen things at once, a good teacher will identify the major problem and focus the pupil's attention on fixing that one aspect of the game. In future lessons, the other problems will be addressed in turn. The pro knows that asking someone to think about too many things at once makes it virtually impossible to hit the ball. Thus, to produce better shots, the pro plans a sequence of lessons that, over time, will correct the problems and improve the game.

Fostering major change within an organization frequently takes the same tack. Telling employees that everything is going to be changed creates uncertainty, anxiety, and confusion—productivity suffers. Senior management does not have enough resources to oversee changing everything. Identifying the organization's major problem and focusing employees' attention on changing that facet of the organization is difficult enough. After that change is digested, additional complementary changes can be instituted.

This view of the process of organizational change suggests that corporate executives should understand their basic business environment and have a good sense of the kinds of organizational changes that are required to enhance performance. To help form a better sense of the entire set of changes, they might retain a consulting firm for assistance. But again, it is important to recognize that consulting firms naturally specialize in specific problems and techniques. And even though management might benefit from the specific knowledge and experience of such specialists in implementing particular types of organizational change, costly problems may arise from consulting firms' lack of experience in dealing with issues of required complementary changes in other facets of the organization outside their area of expertise.

Summary

In reviewing the business literature over the past 30 years, we find an essentially continuous stream of articles decrying then current management fads. Here are two samples from the 1970s:

> *Companies have developed many special devices to meet specific needs in their executive compensation plans. But other companies, wishing to be up to date, have indiscriminately put these devices in their own plans. The results have been—to say the least—embarrassing. The fads include: see-saw options, split-dollar insurance, . . .*[26]
>
> *Perhaps the greatest time waste of all is the casting about after fads in Organizational Development, such as constantly jumping on the bandwagons and mindlessly switching from T Group to Team Building, Transactional Analysis, Gestalt Approaches, etc.*[27]

[26]D. Thomsen (1973), "Executive Compensation Gimmicks: Look Out!" *Financial Executive* (August) 58–66.

[27]T. Patten (1977), "Time for Organizational Development," *Personnel* (March–April), 26–33.

Or consider a more recent example:

> *If a manager achieves success, the world comes asking for the key to that success. Organization after organization embraces the latest management fads, of which there certainly is no shortage. . . . Total Quality Management (TQM), like so many other elixirs, did not fail for companies because the idea was bad. TQM failed because managers dealt with it superficially.*[28]

These articles all argue in one way or another that uncritical adoption of the managerial innovation *du jour* is a prescription for disaster. Yet new management tools are being introduced and adopted continually. We believe it is helpful to understand the market for management innovations in order to make reasoned decisions about whether your organization might benefit from the newest management technique.

Environmental Change Prompts Innovation Management innovations generally arise as responses to material changes in technology, competition, or regulation. Since such environmental change frequently has similar impacts on a broad array of firms, there is a potentially large market for appropriate organizational responses to those new circumstances. Thus, for all their fadlike behavior, the persistence of management innovations suggests they serve a useful purpose; the benefits of such innovations, at least on average, exceed their costs. For example, if the external environment changes—say, because of technological advances or global competition—a formerly successful, growing firm suddenly can find itself unable to compete effectively; these environmental changes have made the firm's current strategy and organizational architecture obsolete. Changes are required if the firm is to survive and again prosper. And because changing corporate cultures can be quite difficult, some external change agent frequently is useful. The latest management technique often can prove a productive mechanism for suggesting facets of the organization that require adjustment as well as for focusing the organization on implementing these changes. Hence, the current innovation can provide a special opportunity to introduce major changes in strategy and architecture.

If It Ain't Broke, Don't Fix It Adopting the most recent innovation can destroy value unless the change is warranted by the actual circumstances your firm faces. Unfortunately, some firms appear to adopt changes without careful analysis of the relevant costs and benefits. Figure 11.1 describes the interrelations among a firm's external environment, business strategy, organizational architecture, and value. As discussed in Chapter 8, it is important that managers continually monitor their external business environment as well as internal strengths and weaknesses to identify potentially appropriate strategic changes. Material changes in the external environment require modification of your business strategy, and likely adjustments to your organizational architecture. But if the environment is relatively stable, a successful firm should be extremely cautious about undertaking massive changes in corporate strategy or organizational architecture.

One Size Doesn't Fit All Not all firms would benefit from outsourcing, improving quality, empowerment, or any other management innovation. Just because a particular management technique appears to have increased value for one firm in no sense implies that adoption would raise your firm's value, as well. Again, only if your firm's current strategy or architecture no longer fits should you consider major changes.

[28]G. Shelley (1996), "The Search for the Universal Management Elixir," *Business Quarterly* (Summer), 11–13.

Ensure That the Stool Balances At any point in time, you face an array of prominent management techniques—each touted as the key to success. Most of these techniques involve fundamental changes in organizational architecture but tend to target one aspect of business strategy or organizational architecture—decision rights, performance evaluation, or rewards—while slighting the rest. For example, advocates of reengineering recommend changing the delegation of decision rights and task assignments. Just as none of these recent management techniques provides coordinated advice for changing all three components of the firm's organizational architecture, we expect that future innovations will fail to do so, as well. Yet changes that leave one leg of the stool out of balance mean that the firm's organizational architecture no longer fits and hence requires coordinated adjustment.

Don't Bite Off More Than You Can Chew If you do decide to make a change in one aspect of the organization, then you should anticipate the effects of such change on other aspects and plan the implementation of complementary adjustments necessary to accommodate such change. Arguing that it is important to consider all three legs of the stool in designing an appropriate architecture does not imply that all changes must be implemented simultaneously. Changing too many aspects of the firm at one time can be difficult to digest and productivity can suffer. You need to understand your environment, formulate strategy, and devise a plan for implementing the entire array of required changes.

Organizational Change Checklist When analyzing business problems and challenges, managers often find it useful to ask themselves the following set of questions:

- Does our existing business strategy fit the business environment—technology, market conditions, and regulation—and the capabilities of our firm?
- What are the key features of our current architecture? And does our architecture fit our business environment and strategy?
- Are the three legs of the organizational architecture stool mutually consistent? Given the decision-right system, do the control and reward systems fit and vice versa?
- If the answers to any of the previous questions suggest a problem, what changes in strategy and architecture should the firm consider?
- What problems will our firm face in implementing these changes? What can be done to increase the probability of success?

In Closing It is critical to recognize that these policy choices represent fundamentally difficult organizational decisions. Across firms, public data on these internal organizational policies are limited, in part because management considers this information proprietary and in part because this information is not easy to summarize and aggregate. Finally, the interrelations among the various dimensions of the problem imply that these policy choices are inherently complex. When making such decisions, information costs are high and errors are potentially substantial. Thus, it is useful to recall Yogi Berra's observation: "You got to be careful if you don't know where you're going, because you might not get there." We believe that the organizational architecture framework we develop in this book can help by giving you a more detailed understanding of "where you're going"—it better focuses your attention and thus helps you frame better questions. Nonetheless, answers still are quite difficult. Yet by asking better, more focused questions and structuring more complete, coherent analysis, this framework helps ensure that you will in fact "get there."

Suggested Readings

P. Crosby (1980), *Quality Is Free* (Mentor: New York).

M. Hammer and J. Champy (1993), *Reengineering the Corporation: A Manifesto for Business Revolution* (Harper Business: New York).

J. Juran (1989), *Juran on Leadership for Quality* (Free Press: New York).

J. Juran and Gryna, Jr. (1993), *Quality Planning and Analysis* (McGraw-Hill: New York).

S. Keating and K. Wruck (1994), "Sterling Chemicals Inc.: Quality and Process Improvement Program," Harvard Business School Case 9-493-026.

K. Wruck and M. Jensen (1994), "Science, Specific Knowledge and Total Quality Management," *Journal of Accounting and Economics* 18, 247–287.

Review Questions

23–1. "Hewlett-Packard now treats TQM like any other investment: If a particular total-quality initiative doesn't show a quick return in terms of higher sales, lower costs, or happier customers, it is redesigned or scrapped."[29] Critically evaluate Hewlett-Packard's policy.

23–2. Guest Watches is a division of Guest Fashions, a large, international fashion designer. Guest Watches manufactures highly stylish watches for young adults (ages 18 to 30) who are fashion-conscious. It is a profit center and its senior management's compensation is tied closely to the watch division's reported profits. Guest Watches has succeeded in capturing the fashion market, but a lack of product dependability is eroding these gains. A number of retailers have dropped or are threatening to drop the Guest watch line because of customer returns. Guest Watches carry a 1-year warranty, and 12 percent are returned, compared to an industry average of 4 percent. Besides high warranty costs and lost sales due to reputation, Guest has higher-than-industry average manufacturing scrap and rework costs.

Senior management, worried about these trends and the possible erosion of its market dominance, hired a consulting firm to study the problem and make recommendations for reversing the situation. After a thorough analysis of Guest's customers, suppliers, and manufacturing facilities, the consultants recommended five possible actions, ranging from the *status quo* to a complete total quality management, zero defects program (level IV). The table below outlines the various alternatives (in thousands of dollars):

	Additional Training Cost*	Additional Prevention/ Compliance†
Status quo	$ 0	$ 0
Level I	80	180
Level II	200	240
Level III	350	340
Level IV	550	490

*Includes the annual costs of training employees in TQM methods.
†All annual costs, including certifying suppliers, redesigning the product, and inspection costs to reduce defects.

The consultant emphasized that although first-year start-up costs are slightly higher than subsequent years, management must really view the cost estimates in the table as annual, ongoing costs. Given employee turnover and the assumption that supplier changes, training, prevention, and compliance costs are not likely to decline over time, the costs in the preceding table will be annual operating expenses.

The consulting firm and the newly appointed vice president for quality programs estimated that under level IV, rework and scrap would be $25,000 and warranty costs zero. Level IV was needed to get the firm to zero defects. A task force was convened, and after several meetings, it

[29]"The Straining of Quality," *The Economist* (January 14, 1995), 55.

generated the following estimates of rework/scrap and warranty costs for the various levels of firm commitment:

	Total Rework/ Scrap Cost*	Total Warranty Costs†
Status quo	$500	$350
Level I	300	280
Level II	150	140
Level III	75	80
Level IV	25	0

*The costs of manufacturing scrap and rework.
†The costs of repairing and replacing products that fail in the hands of customers.

There was considerable discussion and debate about the quantitative impact of increased quality on additional sales. Although no hard-and-fast numbers could be derived, the consensus view was that the total net cash flows (contribution margin) from additional sales as retailers and customers learn of the reduced defect rate would be as follows:

	Contribution Margin on Additional Sales
Status quo	$ 0
Level I	600
Level II	1,000
Level III	1,200
Level IV	1,300

a. Assuming that the data as presented are reasonably accurate, what should Guest Watches do about its deteriorating quality situation? Should it maintain the *status quo* or should it adopt the consultant's recommendation and implement level I, II, III, or IV?
b. Critically evaluate the analysis underlying your policy recommendation in part (a). Will the senior management of the watch division make the same decision as the senior management of Guest Fashions?

23–3. According to a *New York Times* article,[30] LDS Hospital in Salt Lake City installed a computer in every hospital room in the mid-1980s. These computers replaced paper charts so everything the doctor or nurses did was entered into a database as it happened. A small number of patients get infections following surgery, which adds to the length of their hospital stay and ultimately to the cost of treating the patient. After several years, hospital personnel began using the computerized data to determine the best time to begin antibiotics for patients undergoing surgery. They found that by starting antibiotics a few hours before surgery, the rate of infections fell from 1.8 percent to 0.4 percent, saving the hospital about $9,000 per case. By using the computer system, the head of LDS's quality control program can improve quality and cut hospital costs.

Analyze the LDS quality control program in terms of basic TQM principles.

23–4. LDS Hospital in Salt Lake City has a computer system that records all procedures performed on patients and all drugs administered.[31] The computer system can track which surgeons are the best and which ones are the worst in terms of length of patient stays, complications, and death rates. They found that once a new quality-improvement program was imposed after an extensive study of past practices, nearly all the doctors improved. But some did not.

[30]J. Brinkley (1994), "At Utah Hospital, Innovative Way to Track Medical Quality," *The New York Times* (March 31), B8.

[31]J. Brinkley (March 31, 1994).

The doctor in charge of the quality-improvement program said, "I have a few bad apples. And I know who they are. But for quality improvement to work, you have to construct a 'safe' environment where doctors trust you. Any time you start taking names, you're going to start a cycle of fear, and quality improvement will not occur."

When he learned of LDS tracking system, the head of the Utah medical board said, "That's a terrible indictment of them and of the practice of medicine that they are willing to sacrifice patients to unnecessary mortality, morbidity, injury, and pain by these doctors. It's unconscionable!"

Discuss the dilemma LDS faces in terms of using its computer system to improve quality.

23–5. A company chairman was given a ticket for a performance of Schubert's *Unfinished Symphony*. Since he was unable to go, he passed the invitation to the company's quality-assurance manager. The next morning the chairman asked him how he enjoyed it and, instead of a few plausible observations, he was handed a memorandum which read as follows:

- For a considerable period, the oboe players had nothing to do. Their number should be reduced, and their work spread over the whole orchestra, thus avoiding peaks of inactivity.
- All 12 violins were playing identical notes. This seems unnecessary duplication, and the staff of this section should be drastically cut. If a large volume of sound is really required, this could be obtained through the use of an amplifier.
- Much effort was involved in playing the demi-semiquavers. This seems an excessive refinement, and it is recommended that all notes should be rounded up to the nearest semiquaver. If this were done, it would be possible to use trainees instead of artisans.
- No useful purpose is served by repeating with horns the passage that has already been handled by the strings. If all such redundant passages were eliminated, the concert could be reduced from 2 hours to 20 minutes.

In light of the above, one can only conclude that had Schubert given attention to these matters, he probably would have had the time to finish his symphony.

Although the memo obviously was written in jest,[32] how would you respond?

[32]Doug Rathbun, Internet.