CHAPTER 3

Realizing Gains from Competition

The organization of the firms that contribute to our Nation's economic output is constantly in flux. Some changes in organization are limited to a firm's internal operations, as when firms develop innovative ways to produce an existing good or service, or introduce incentives that encourage workers to be more efficient. Other organizational changes involve changing a firm's size or scope. This might include expanding production or offering new goods or services, to gain a greater share of a market or to broaden the firm's geographic reach. Finally, firms may alter their relationships with other firms that supply them, buy from them, or compete with them. For instance, they might merge to combine operations with a former rival, or outsource some part of their operations to another firm.

Some of these changes may be quite visible to consumers. They may change the names of companies with which consumers have become familiar. They may even affect the types of products available in the market. Other changes may be less visible.

At the same time, the overall composition of the economy is also undergoing constant change. In particular, high-technology industries such as biotechnology and information technology have become a much more prominent part of the economy than they were even a decade ago. Innovations are central to the success of the firms that make up these industries. These innovations have brought us remarkably more powerful computers, more effective drug therapies, and much else.

One might naturally ask what the Federal Government's role in the economy should be in light of these ongoing changes in the organization of firms and the composition of the economy. The vast majority of firms face healthy competition from other firms. A great virtue of this competition is that it yields a number of benefits for consumers without the need for government to intervene in the day-to-day decisions of firms. First, competition keeps prices low. Competition in its various forms discourages any one firm from raising prices above what others would charge for similar goods or services. Second, competition ensures that only those firms that can meet consumer demands at the lowest possible cost will remain viable. Finally, competition encourages innovation in products and services, as well as in production and distribution methods, among other things.

Many of the organizational adjustments that firms undertake are necessary responses to changing conditions, as competition motivates them to

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constantly seek ways to lower their costs and improve their products. But in some limited cases these changes in organization may have the effect of reducing the vigor of competition. Recognizing this possibility, since the end of the 19th century all three branches of the Federal Government have contributed to the development of antitrust policy, a particularly important component of competition policy.

Three laws passed by Congress form the statutory basis of antitrust policy in the United States. Together, the Sherman Act of 1890, the Clayton Act of 1914, and the Federal Trade Commission Act of 1914 set forth broad principles forbidding behavior or changes in the organization and relationships of firms that may harm competition. The specific implications of these laws have evolved as Federal courts have interpreted their broad principles in deciding cases brought before them. Two Federal agencies, the Department of Justice and the Federal Trade Commission (FTC), actively enforce these laws. Under the Sherman and Clayton Acts, private individuals and firms may also bring suit against firms they believe are engaged in anticompetitive practices. As the courts consider each new case, they are given an opportunity to further refine their interpretation of these antitrust laws.

Competition policy seeks to prevent behavior and changes in the organization and relationships of firms that may harm competition and therefore consumers. But the fundamental challenge in developing competition policy is to ensure that government measures intended to accomplish this goal do not inadvertently prevent the other, more beneficial behavior and changes that firms undertake. To do so would handicap the ability of firms to lower their costs, improve their products, and thereby benefit consumers and society generally.

This chapter examines the various motivations for changes in the organization of firms, and the resulting implications for competition policy. It begins by focusing on what motivates a firm to combine its assets with those of other firms or to take a financial interest in them. Taking as a starting point the progress that has been made in policies relating to mergers, the chapter then discusses how economic ideas and analysis have been and can continue to be incorporated in the ongoing refinement of competition policy. Next, in view of the increasingly global markets in which firms compete, the chapter addresses how the international nature of competition and of some firms' operations can affect both the motivations for changes in their organization and the impact of other nations' competition policies on our economy. Finally, the chapter addresses the implications for competition policy of the increasingly prominent role of innovation-intensive industries in the economy.

The longstanding core principles of U.S. competition policy remain sound. But competition policy continues to evolve to recognize changes in

modern firm structures, market competition, dynamic forms of competition, and advances in our knowledge of the effects of firm behavior. This evolution is proceeding along several fronts. First, because firms today are engaging not only in mergers, but also in hybrid organizational forms such as partial acquisitions and joint ventures, policy must be sensitive to the efficiency gains these forms of organization create. Second, because firms' activities, and therefore national competition policies, more frequently cross international borders than in the past, inefficient competition policies in any one nation may impose costs on firms and consumers worldwide. The United States is pursuing harmonization of these policies in a way that will spread best-practice and efficient competition policy to all countries. Finally, industries characterized by active innovation and dynamic competition are raising new issues for competition policy, which must respond in ways that foster this innovative activity and maximize the resulting benefits to society.

Motivations for Organizational Change

Firms may change their organization for any of a number of reasons. One of the fundamental forces driving the behavior of firms is the desire to maximize their profits. This leads firms to strive constantly to minimize the costs and maximize the value of the goods and services they produce.

Meanwhile developments in individual markets and in the broader economy are constantly changing the costs associated with each of the various ways that firms can choose to organize their operations. These developments may also alter the business opportunities they face, perhaps opening new markets or affecting the competition they encounter. In the past two decades, some of the most significant of these developments have been improvements in the power and reductions in the costs of information technology; deregulation of certain industries; and the globalization of markets. These or other developments may make it profitable for firms to alter their organization or operations.

The work of Nobel Prize-winning economist Ronald Coase provides a framework for understanding how and why firms might restructure their organizations in response to developments such as these. Coase views a firm's operations, internal and external, as a set of transactions, whether it be obtaining materials for production or arranging for the promotion of the firm's products. To maximize its profits, the firm will seek to minimize the cost of each of these transactions. These costs are influenced in part by whether the transaction is performed within the firm or with another party on the open market. The relative costs of these two options will largely determine which one the firm will choose. When developments in its markets or

in the broader economy change these relative costs, the firm will review these options and may decide to change an internal transaction to an external one, or vice versa. The result is a change in its organizational structure. For instance, a firm may perceive an opportunity to outsource some of its inventory management to another firm that specializes in that task. But if this task needs to be closely integrated with other operations in the firm, outsourcing may become preferable only when communications costs fall below some threshold. In this chapter we address the fact that firms today face more than just two alternatives in choosing how to organize their operations. We highlight some of the alternatives that constitute particularly important developments in the organization of firms and industries for the future.

The Role of Agency Costs in Organizational Change

Agency costs are an important component of costs that a firm can lower by adjusting its organizational structure. They can arise whenever one person or firm (the agent) contracts to perform certain tasks for another (the principal). Differing incentives facing the two parties, coupled with the inability of the principal to costlessly monitor the agent's actions, cause the latter to perform the contracted tasks in a way that does not best serve the principal's interest. Ultimately, a firm's owners (in the case of a corporation, its shareholders) are those most interested in maximizing its profits. Not only are they the residual claimants on the firm's profits, but the value of their shares is affected by expectations of those profits today and in the future. Yet there are many others, both within and outside the firm, whose actions affect the firm's profits but who do not benefit enough from an increase in those profits to make maximizing them their only objective.

For example, the decisions of a firm's chief executive officer (CEO) can clearly have a significant effect on the firm's profits. Although the CEO may be interested in maximizing those profits, he or she may also have other, conflicting objectives: perhaps the CEO would like to increase his or her perquisites by purchasing a company jet, even though that would not be an efficient allocation of the firm's resources. Because the CEO runs the firm's day-to-day operations, the CEO is an agent of the firm's shareholders, and the cost associated with the CEO's pursuit of interests aside from profit maximization is an agency cost. This cost arises from the separation of ownership of the firm from control of it.

Just as they may choose to outsource an operation in order to minimize costs, so, too, may shareholders alter the organization of their firm in order to reduce these agency costs. Certain internal institutional arrangements can serve to better align owner and manager incentives. For publicly traded corporations, a commonly used compensation package for CEOs and other senior managers consists of "pay for performance": executive pay is

determined in part by bonuses based on sales or profits, often coupled with the grant of stock options. When managers own stock or stock options in the company they manage, their interests become more aligned with the shareholders' interests. One study found that, with the recent dramatic increases in such forms of compensation, the average effect of a change in the value of a firm on its CEO's wealth grew by almost a factor of 10 between 1980 and 1998. Clearly, pay for performance has become an increasingly prominent feature of corporate life, suggesting that it may prove a valuable way for shareholders to reduce agency costs.

In addition to the CEO, many other individuals and entities influence a firm's profits, and so a comprehensive definition of agency costs must include costs due to their actions as well. Therefore changes in the organization of firms designed to reduce agency costs may extend well beyond arrangements for compensating managers. For instance, if the actions of a particular supplier can significantly affect a firm's profits, the firm may seek to arrange its relationship with that supplier in a way that aligns the supplier's interests more closely with those of the firm's shareholders. Much as in the case of pay for performance contracts, this may be achieved by having the supplier hold stock in the firm.

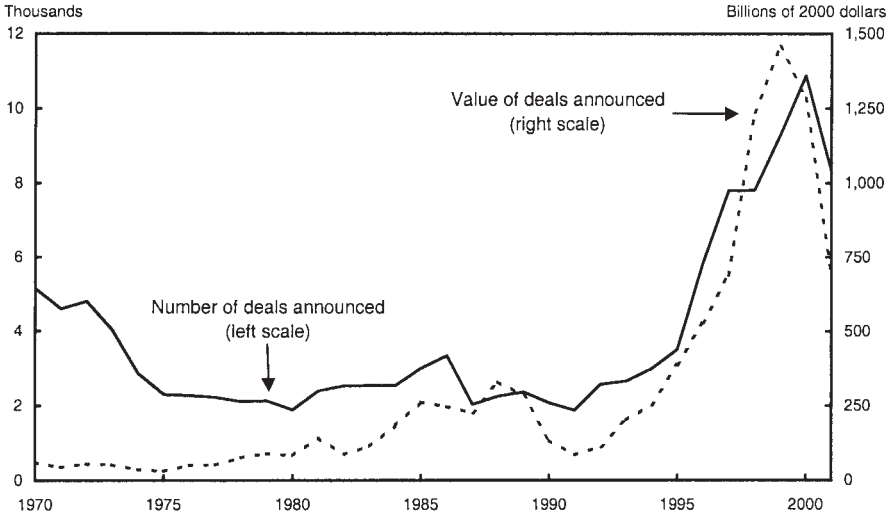
Mergers

One of the most visible manifestations of changes in the organization of firms is the growing number and value of mergers and acquisitions. During the second half of the 1990s the United States witnessed a remarkable surge in merger activity (Chart 3-1). Indeed, even with the economic slowdown, merger activity in 2001 was well above average levels during the past three decades.

In a significant share of mergers today, one or both parties are firms with operations in more than one country, and many mergers even involve firms with headquarters in different countries. These are often referred to as cross-border mergers. In 2001, 29 percent of all announced mergers and acquisitions in which a U.S.-headquartered firm was a party also involved either a foreign buyer or a foreign seller. This was a markedly higher percentage than was common during much of the 1970s and 1980s (Chart 3-2).

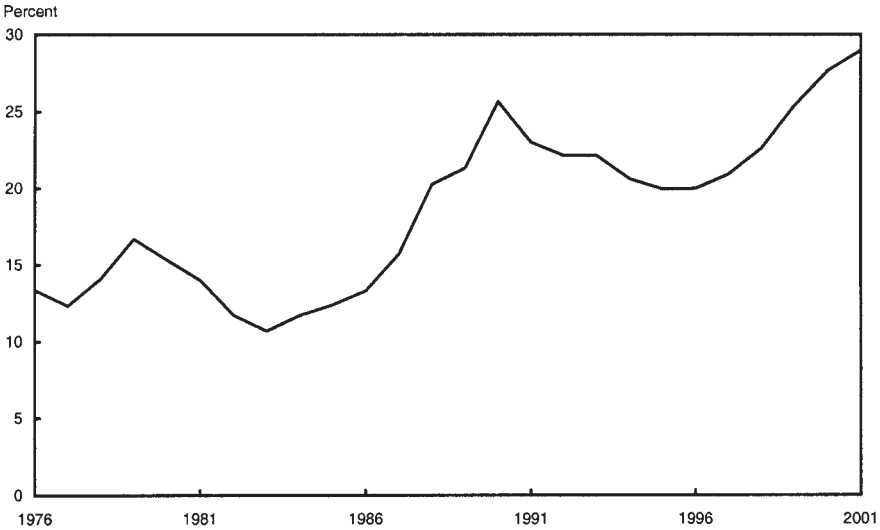
Although general economic theory and empirical research provide a broad framework within which to understand organizational changes across firm boundaries, such as mergers, a substantial body of research has developed that specifically examines the motivations for mergers. The motivations behind each merger are, of course, unique. But some mergers may share certain motivations, and motivations may generally differ across the three broad types of mergers: horizontal, vertical, and conglomerate. Horizontal mergers involve a joining of firms that compete in the same market; vertical

Chart 3-1 **Announced Mergers and Acquisitions Involving U.S.-Headquartered Firms**
Although mergers and acquisitions increased in number and value during the 1980s, activity since the mid-1990s has far surpassed this earlier wave.



Note: Includes publicly announced mergers and acquisitions of $1 million and greater that involve at least 10 percent of the target firm's equity. Value is the base equity price offered.
Sources: Department of Commerce (Bureau of Economic Analysis), Mergerstat, and Council of Economic Advisers.

Chart 3-2 **Fraction of U.S. Mergers and Acquisitions Involving a Foreign Buyer or Seller**
Compared with most of the 1980s, recent years have witnessed a greater proportion of cross-border mergers.



Note: Includes publicly announced mergers and acquisitions of $1 million and greater that involve at least 10 percent of the target firm's equity. Foreign is defined here as having headquarters outside the United States.
Source: Mergerstat.

mergers occur when a customer buys a supplier, or vice versa; and conglomerate mergers join firms in different businesses. The international nature of cross-border mergers adds another set of potential motivations.

One motivation for mergers is efficiency gains. Two firms may consummate a merger because they expect that the assets of the two firms can be used more efficiently in combination than separately. This might be achieved if merging allows them to lower their costs, improve their products, or expand their operations more effectively than they could as separate entities.

In some cases these efficiencies can be realized through cost savings arising from the increased size of the merged entity, often referred to as economies of scale or scope. This may result from consolidating and spreading certain fixed overhead costs across the combined operations. For instance, economies of scale appeared to be a factor motivating mergers and acquisitions in the food retailing industry during the late 1990s. When two supermarket chains merge, distribution centers made redundant by the merger can be eliminated, and the costs of the remaining distribution centers can be spread over a larger number of supermarkets.

In a horizontal merger, efficiencies might also come from combining the best elements of each firm's operations. One motivation for vertical mergers may be that certain transactions between a supplier and a customer are particularly difficult to arrange between independent firms and can be more efficiently arranged if both parties are part of the same firm. Vertical mergers may also be an efficient method of removing pricing distortions that arise when firms transact with one another in the chain of production, each adding its margin along the way. Elimination of these so-called double margins leads to lower final product prices.

Reduction of agency costs, discussed above, can be another significant source of efficiencies. If a corporation's executives are unwilling to make or incapable of making decisions to increase shareholders' profits, they may be replaced in a merger or acquisition. Or if the firm has assets that a new set of managers could put to higher value use, the firm may be acquired and new, better managers introduced. In some cases, the existing management team may be underperforming because the incentives it faces may be inadequate for it to act in the shareholders' interest, or may even promote behavior that runs counter to their interest. The acquisition or merger of such a firm provides a valuable opportunity for new owners not only to replace management, but also to change the firm's governance structure in order to fix these inadequate or perverse incentives.

Although merger and acquisition activity may sometimes be a response to agency problems, in some settings it may actually be a manifestation of such problems. Some acquisitions may be motivated by a manager's ambition to increase the size of the firm under his or her control, even though the

acquisition is likely to reduce the shareholders' profits. But research also suggests that such poor acquisitions can increase the likelihood that the acquirer itself will become a target for acquisition.

Cross-border mergers can enjoy efficiencies similar to those described above, but the international nature of these transactions introduces another set of potential efficiency gains as well. Just as the opening of world markets to international trade raises productivity, so, too, might a cross-border merger create benefits that no purely domestic reorganization could achieve. These might result, for example, from overcoming barriers to trade that hinder a firm from exporting to another country but not from acquiring production facilities and producing the same goods there. Other efficiency gains from cross-border mergers might come from gaining a better understanding of customers in a foreign market, or from a company with good products acquiring a company with good foreign distribution channels. Alternatively, efficiencies may arise from differences in wages between countries that make it more profitable for firms to locate their labor-intensive operations in countries with abundant unskilled labor, while locating other operations, such as research and management, in countries where skilled labor is relatively plentiful.

Of course, some of these gains may not require mergers, but can be realized simply by establishing new operations overseas. But in some cases, merging with an established firm may be more efficient. Two advantages that mergers can provide are quicker entry into new markets and access to existing proprietary resources and capabilities, such as established brands. A further benefit that a merger or joint venture may provide is the transfer of managerial or technological know-how across national and firm boundaries. The transfer of innovative manufacturing systems may be best achieved through some form of integration. This is discussed in greater depth later in the chapter in the context of the General Motors-Toyota joint venture.

As described above, firms constantly look for potential efficiencies from possible mergers in order to enhance their profitability in a competitive market. Mergers with these motivations have the potential to provide consumers with less expensive and better products or services. But some mergers may reduce competition. This can happen if a merger of competitors allows the merged firm or a collection of remaining firms to raise the prices of the goods or services they sell, or lower the prices they pay for the goods or services they buy from suppliers. In the case of a vertical merger, a firm may be able to reduce the competition it faces by gaining control of either an important supplier to its industry or a significant customer. As in virtually all transactions that come under antitrust scrutiny, this potential to reduce competition may be either a deliberate motivation for, or an inadvertent consequence of, the merger.

Higher prices to consumers as a result of reduced competition are due to what economists call monopoly power, that is, the power of a single seller to affect the market price. Lower prices to input suppliers as a result of reduced competition are due to what economists call monopsony power, that is, the power of a single buyer to affect the market price. Both effects are exercises of market power, and thus a concern of competition policy. Government has a role in preventing those mergers whose adverse effects on competition exceed any benefit from accompanying efficiency gains. The evolving way in which the Federal Government performs this role through its competition policy will be described in more depth later in the chapter.

Other Organizational Forms: Joint Ventures and Partial Equity Stakes

The various possible sources of increased efficiency from mergers, including those that reduce agency costs, can also motivate other forms of organizational change that do not involve complete transfer of both ownership and control. The distribution of ownership and control across parties to an organizational structure affects the parties' incentives and opportunities, their ensuing decisions, and therefore the creation of social value.

Joint Ventures

A joint venture is a business entity created and jointly controlled by two or more separate firms, each of which makes a substantial contribution to the enterprise. Firms may seek to enter a joint venture for any of a number of reasons. Joint ventures may allow firms to combine their complementary skills or assets in a way that improves their ability to accomplish a project. Such a venture may also allow the participants to expand the scale of a project to a size necessary to realize certain cost savings. By avoiding additional costs associated with a full merger, a joint venture may best accomplish the firms' objectives.

One specific type of joint venture, the research joint venture, has its own particular advantages. A joint venture to undertake scientific, technical, or other research may appropriately reward innovation and spread development costs in a setting where the resulting new knowledge, if created by a single firm, would spill over to benefit others. Since in that case no single firm would reap all the benefits of its research, a joint venture may be the most efficient avenue for undertaking it.

But joint ventures might also raise concerns. For example, a production joint venture between horizontal competitors might reduce their ability or incentive to compete independently. Conceivably the participants could

contribute all their manufacturing assets to the joint venture, and their financial stakes in the joint venture could then lead to a reduction in output by the two firms comparable to that in an anticompetitive merger. Even if the joint venture participants retain independent production assets, the joint venture may create the environment for the exchange of competitively sensitive information on prices and costs. This might facilitate an attempt by the firms to raise prices in an anticompetitive manner.

Partial Equity Stakes

A merger or complete acquisition occurs when the ownership of the assets of two firms is combined, for example through one firm's acquisition of 100 percent of the shares of the other, or when two firms exchange all of their shares for those of a new, successor corporation. In contrast, a partial acquisition occurs when one firm takes a partial equity stake in another firm, which remains legally independent.

Partial equity acquisitions, like merger transactions, must be reported to the Department of Justice and the FTC under the 1976 Hart-Scott-Rodino Act if the transaction meets certain conditions. In fiscal 2000, 23 percent of all transactions reported to the two agencies resulted in the acquirer having less than a 50 percent share of the target firm's equity. Although these may be supplemented by later purchases, it suggests that partial purchases are not uncommon.

Partial acquisitions create a form of corporate governance that raises some basic questions about the "ownership" and "control" of one party over another. Partial equity investments by one firm in another can grant the investing firm substantial influence over the other firm. A majority shareholder can be presumed to exercise control, although under some constraints imposed by the duty toward minority shareholders. But research suggests that even ownership of far less than a majority of a company's shares may allow the exercise of control, if the remaining shares are widely dispersed.

PepsiCo, Inc.'s investment in the Pepsi Bottling Group, Inc., is an example of a partial equity stake that involves some control. The Pepsi Bottling Group is the world's largest manufacturer, seller, and distributor of Pepsi-Cola beverages. It has the exclusive right to manufacture, sell, and distribute these beverages in much of the United States and Canada, as well as in Spain, Greece, and Russia. PepsiCo holds the licenses for Pepsi-Cola beverages and is a minority shareholder, although also the largest shareholder, in the Pepsi Bottling Group. There is close coordination between the two businesses, but each remains a legally independent entity whose interests are not legally presumed to align with the other's.

At the other extreme, an individual who buys a few shares in a public company may do so as an investment for retirement or for other purposes.

These small purchases best exemplify so-called passive investments, in that the shareholder has no current plans to gain influence over the firm's conduct or to access certain information about its operations, and there is no good reason to expect such plans to emerge in the future. Likewise, one firm may purchase a small equity stake in another firm without such plans or any realistic potential for such plans to emerge.

A partial acquisition can affect the firms' subsequent decisions through three distinct channels: by altering incentives, altering information, or altering control. Through these channels, an acquisition could have anticompetitive or pro-competitive effects. The potential anticompetitive effects are considered first, because without those effects there is no concern for antitrust policy.

Even if a firm has only a passive investment in another firm, this might, through altering incentives, affect the former's production and pricing decisions. For example, if firm A owns a 5 percent stake in firm B, it will make production and pricing decisions to maximize its own profits plus 5 percent of firm B's profits. The acquirer of a partial equity stake will consequently internalize some of the spillover effects of its actions on the target's profits. This is true whether or not the acquirer can exercise control over the target.

Such a passive investment could have an anticompetitive effect in an imperfectly competitive market if the two firms are direct competitors. If firm A raises its price, for example, the 5 percent stake in firm B could reduce the effect of any loss of customers on firm A's profits because some of the lost customers would begin purchasing from firm B. Firm A would capture part of firm B's increased profits, reducing its overall losses from raising prices. This diminishes firm A's incentives to keep prices at a competitive level. Nonetheless, this concern should not arise if other firms in the market are able to expand their output and win most of the customers that firm A loses when it raises its prices. Thus competition guards against the rise in prices.

The information effect arises from closer unilateral or bilateral communication between the partial acquirer and the target about business operations. For example, if the partial acquirer receives a seat on the target's board of directors, that may become an avenue for improved communication between the firms. This improved communication could facilitate anticompetitive conduct, for example if two competitors attempted to coordinate a rise in prices.

Finally, a partial acquirer may be able to influence the target's business decisions through the control effect. This could have anticompetitive consequences if the two firms are competitors. For example, the acquirer might raise its price and exert its influence so that the target responds by increasing its own price. But these effects can also be prevented if other firms in the market expand their output in response to higher prices.

Partial acquisitions may have socially desirable consequences, operating through these same channels. In particular, partial equity stakes may be

undertaken as part of a larger business relationship, such as a marketing or supply agreement. Such partial equity stakes may align incentives, internalizing spillovers in ways that are socially beneficial. These business relationships may also be cemented by the information and control benefits facilitated by a partial equity stake.

One study examined 402 partial ownership stakes established between 1980 and 1991 in which a nonfinancial corporation held a minimum of 5 percent of the outstanding shares of another firm. Thirty-seven percent of the target firms had explicit business relationships with the corporation holding their shares.

More recent, although preliminary, data suggest that about 5 percent of Fortune 500 nonfinancial companies in 2001 had a corporate blockholder of 5 percent or more of their shares in that year. (This sample examines the Fortune 500 companies, excluding those in finance, insurance, real estate, or retail trade. Companies in which there was a majority shareholder were also excluded.) In this preliminary research, corporate blockholders appear to be more prevalent in certain industries than others. In the rapidly evolving telecommunications sector, for example, about a third of major U.S. corporations had at least one corporate blockholder in 2001.

An example of how partial equity stakes may align the incentives between parties in a business relationship is the 1997 co-production agreement between Walt Disney Company and Pixar. At the time of their co-production agreement, Disney acquired about a 5 percent stake in Pixar. This example is described in Box 3-1.

The potential for a partial equity stake to encourage efficiency gains in the long-term relationship between a supplier and a customer highlights an advantage of this form of organization. In a long-term supply relationship, both customer and supplier may make relationship-specific investments, such as fabricating machine tools to produce a part according to the buyer's specifications. If the buyer's input needs change unexpectedly, it may want rapid delivery of a modified input from its supplier. If the supplier has an equity stake in the customer, and hence a claim to some of the customer's profits, the supplier may have a stronger incentive to meet the customer's request, even if it must incur overtime costs to adjust its machine tools. If the partial equity stake allows one firm to exercise some control over the other firm, the coordination between their operations is likely to be further strengthened.

Box 3-1. A Co-Production Agreement and a Partial Equity Stake: Pixar and Disney

Pixar was formed in 1986. Its first fully computer-animated feature film, "Toy Story," was released in 1995, also the year of the company's initial public offering of shares. "Toy Story" was distributed by the Walt Disney Company, under a contract in which Disney also bore all the budgeted production costs. In return, it received a standard distribution fee from Pixar and the vast majority of the film's revenue, including about 95 percent of box office receipts during the year after its release.

In 1997 Disney and Pixar entered into a co-production agreement to produce and distribute five new computer-animated feature films. Under the agreement, Pixar would produce the films, on an exclusive basis, for distribution by Disney. Disney and Pixar would split production costs and all related receipts in excess of the amount necessary to cover Disney's distribution costs and an associated distribution fee. The films would also be co-branded.

This agreement was cemented by Disney's acquisition of a partial equity stake in Pixar. Disney initially acquired 1 million of Pixar's shares and received warrants to purchase up to an additional 1.5 million shares. At the time, exercising all these warrants would have given Disney about a 5 percent stake in Pixar.

The Pixar-Disney co-production arrangement brought "A Bug's Life" to the big screen in 1998, and "Monsters, Inc." in 2001. The alliance benefits both companies and exploits a logical division of labor between the firms. As Pixar's 2000 10-K filing states, "This agreement allows [Pixar] to focus on the production and creative development of the films while utilizing Disney's marketing expertise and substantial distribution infrastructure to market and distribute our co-branded feature films and related products."

An interesting wrinkle is that Disney is not only a partner with Pixar but also a competitor. Pixar notes in its 2000 10-K filing that, under the agreement, Disney directly shares in the profits from their co-branded films, and therefore Pixar believes "that Disney desires such films to be successful." But the filing also points out that, "Nonetheless, during its long history, Disney has been a very successful producer and distributor of its own animated feature films."

Thus, although the profit-sharing terms of the agreement give Disney powerful incentives to use its marketing and distribution acumen to further the success of the co-branded films, the partial equity stake plays a complementary role. Through this investment, Disney shares directly in Pixar's success, and so has additional reasons to foster the collaboration.

Incorporating Economic Insights into Competition Policy

Economists have long studied the implications of changes in the structure and conduct of firms, creating a body of knowledge that encompasses the insights described above. Developments in this body of knowledge provide an important basis for improving the effectiveness of competition policy.

The evolution of U.S. policy relating to horizontal mergers—those between companies that compete for customers in the same market—provides one example of how economic thought has substantially enhanced competition policy in the past two decades. As explained above, a merger between such companies can bring about benefits through reductions in the cost and improvements in the quality of the merging firms' products. But some such mergers have the potential to harm competition. In determining whether to challenge a particular merger, the Department of Justice or the FTC must assess whether the merger threatens to harm competition, and whether the potential benefits of increased efficiencies outweigh any adverse effect the merger could have on competition. To do so, the agencies have developed an analytical framework that allows them to move from a set of observable characteristics of the merging firms and the markets in which they compete to an assessment of the likely competitive effect of the transaction, balanced against any efficiency benefits.

The analytical framework used is important in that it influences the types of characteristics considered in evaluating mergers and related acquisitions, whether the enforcement agencies challenge them, and how they are ultimately viewed by the courts. This framework provides a focus for arguments about the merits of or problems associated with a merger. Finally, an analytical framework that is consistently adhered to increases firms' ability to assess whether a merger they are considering will be challenged, before they embark on the costly process of initiating it.

It is in contributing to the improvement of this analytical framework that developments in economic thought have significantly affected merger policy. This effect is visible in the evolution of the Horizontal Merger Guidelines, a description of this framework that was first established by the Department of Justice in 1968 and periodically revised since then by both the Justice Department and the FTC. Although the need for flexibility in enforcing antitrust law causes these guidelines to be somewhat general in nature, the trend toward an increasing incorporation of a rigorous economic framework is nonetheless still apparent in the periodic revisions to the guidelines. Because the ability to gain the favorable ruling of a judge in an antitrust case affects these agencies' ability to successfully challenge mergers, changes in the

guidelines also to some extent reflect accompanying changes in the judicial interpretation of antitrust law.

Of the various revisions made during the past two decades, the 1982 guidelines and the revisions made to them in 1984 together marked the most dramatic departure from prior guidelines in their incorporation of contemporary economic thought. One significant advance in these revisions was a shift away from a singular focus on market concentration in assessing the effect of a merger. Market concentration is a measure of the extent to which the supply of products and services in a particular market is concentrated among few providers. The earlier focus was consistent with economic thinking, developed in the middle decades of the twentieth century, according to which increases in the concentration of markets harmed competition. As a result, in the 1960s, mergers that raised concentration by increasing a firm's market share to even as little as 5 percent were at risk of being challenged.

The 1982 and 1984 revisions reflected an evolving economic perspective on the effect of concentration on competition in a market. This perspective had been increasingly gaining judicial recognition by the mid-1970s. Theoretical and empirical work had begun to call into question the idea that there is a simple link between a market's concentration and the intensity of competition in that market. By 1982, judicial decisions and enforcement policies had already begun to incorporate the conclusion from economic research that, although high concentration could contribute to reduced competition, by itself it was not sufficient to bring about that outcome. Thus the 1982 and 1984 revisions codified the increasingly accepted view that examining market concentration provides only a useful first step in considering whether a merger raises competitive concerns, and that other factors needed to be present to validate this concern. In line with this view, the revisions described quantitative levels of market concentration and changes therein that would likely cause the Justice Department and the FTC to go on to examine the full set of factors and possibly challenge a merger. The 1984 guidelines also clearly established a level of market concentration below which, "except in extraordinary circumstances," mergers would not be challenged. This "safe harbor" level of market concentration is important in that it reduces the uncertainty that firms considering a merger may have about how the government will respond. Such a clear safe harbor was absent in the 1968 guidelines.

One of the additional factors that the 1980s revisions incorporated as an important consideration in evaluating the intensity of competition in a market was the ease with which new firms could enter that market. Although existing firms in a market are the most visible source of competition for each other, they are not the only source. In considering whether it would be

profitable to raise prices above existing levels, a firm or group of firms must not only consider the response of firms already in the market. They must also consider the possibility that higher prices will encourage other firms to enter the market, adding to competition. Thus, in some cases, even if there are few firms in a market today, the threat of new firms entering tomorrow can provide a strong incentive for incumbent firms to keep prices competitive. In an improvement on the earlier merger guidelines, the 1980s guidelines recognized that a merger could only harm competition if there were reasons to believe that other firms would not or could not enter the market to the extent necessary to keep the merging firms from maintaining prices above premerger levels.

Another substantial advance in the 1984 guidelines, and improved upon since then, was a greater recognition of potential efficiency gains from mergers. Today it is widely accepted among economists that mergers should be evaluated in terms of a tradeoff between any potential adverse impact on competition and their potential enhancement of competition by improving the merging firms' operations. The 1968 guidelines had focused attention almost exclusively on whether a merger could harm competition, with little consideration given to the potential benefits, because these were considered hard to evaluate and often realizable by other means. In contrast, the 1984 guidelines recognized that mergers that might otherwise be challenged may nonetheless be "reasonably necessary to achieve significant net efficiencies." The guidelines set forth a number of types of efficiency improvements that could be considered in assessing the impact of a merger, such as economies of scale. Moreover, the tradeoff often presented by mergers was explicitly recognized in the 1984 guidelines, which state that "a greater level of expected net efficiencies [is needed] the more significant are the competitive risks identified." Improvements in the consideration of these efficiencies, and in other elements of the analytical framework applied to evaluating mergers, continued in later revisions.

Competition Policy, Corporate Governance, and the Mergers of the 1980s and 1990s

In the years leading up to 1982, some elements of the new thinking that would later appear in the revisions to the Horizontal Merger Guidelines had already begun to be incorporated in the Justice Department's and the FTC's enforcement practices, and in the interpretation of antitrust laws by the courts. Nonetheless, the revisions were important in codifying this dramatic adjustment in antitrust policy, which allowed firms greater flexibility during the substantial restructuring of the economy that occurred in the 1980s. In contrast, during the 1960s and much of the 1970s, in line with the 1968

guidelines, Federal policy and judicial decisions relating to horizontal and vertical mergers had been quite restrictive.

During the 1980s the total value of merger activity picked up considerably. In 1988 the total dollar value of mergers and acquisitions was, in real terms, more than four times greater than it had been a decade earlier. Two types of reorganization were prevalent during this period, both of which might have faced greater opposition under the 1968 guidelines. The first involved the merging of two large firms in the same industry, and the second involved the breakup of a conglomerate, in which individual business lines were often sold to firms competing in the same market as the business line they were acquiring. Although such mergers and acquisitions might still be opposed under the revised guidelines if they presented significant concerns about the effects on competition, the improved economic understanding of competition in markets that was reflected in the revisions caused antitrust enforcement policy to be less restrictive toward such mergers. The trend whereby mergers increasingly involved two firms in the same industry continued in the 1990s.

In the 1980s and 1990s, mergers were clustered in particular industries, although the industries in which they were clustered varied over time. This suggests that mergers may have provided an important means for companies to respond to industry-wide shocks such as deregulation, technological innovations, or supply shocks. Between 1988 and 1997, on average, nearly half of annual merger deal volume was in industries adjusting to changing conditions brought about by deregulation. One study of Massachusetts hospitals shows the effect of technological innovation on merger activity. The study found that new drug therapies and improvements in medical procedures were partly responsible for a significant decline in the number of inpatient days from the early 1980s to the mid-1990s. This reduction in the need for hospital beds contributed to a significant consolidation among hospitals during this period, much of which was facilitated by mergers.

Evidence of stock market reactions to merger announcements during the 1980s and 1990s suggests that, on the whole, they created value for the shareholders of the combined firms. Moreover, studies have found that, in the aggregate, the operating performance of merging firms has improved following the merger. But these aggregate results present evidence of only modest gains, the source of which is unclear.

Yet this is to be expected, because mergers have numerous motivations, and, as with all business decisions in a competitive market, not all will yield the success that is hoped for. As a result, more narrow studies of particular industries, particular types of mergers, and even specific mergers can yield a richer understanding of the sources and extent of gains. For instance, detailed examinations of bank mergers during the 1990s found cases of postmerger performance improvements that likely came from a variety of sources,

including opportunities afforded by the merger to expand service offerings and the efforts of a vigorous management team acquiring a laggard bank. Perhaps indicative of larger trends, however, along with uncovering successes, these examinations also revealed some bank mergers with disappointing results.

The important point for competition policy is that, although the overall efficiency consequences of the mergers of the 1980s and 1990s may be debated, there is little evidence that they harmed competition. Thus it appears that thoughtful and adaptive antitrust policy has afforded businesses greater flexibility to respond to changing economic conditions while preventing such responses from significantly harming competition.

The agencies' improved understanding of the sources of possible competitive harm also helped firms structure or restructure their proposed transactions so as to achieve the efficiencies they sought without raising competitive concerns. For example, a 1998 transaction sought to combine two of the Nation's largest grain distribution and trading businesses. The combination had the potential to lower operating and capital costs but might also have depressed the prices farmers received in certain locations for their grain. The parties agreed to divest certain facilities at certain locations, settling the Department of Justice's challenge to the transaction and allowing the acquisition to proceed. Cases such as this one can be seen as a manifestation of an increasingly thoughtful and adaptive competition policy.

The Role of Corporate Governance Changes

For many of the mergers and takeovers of the 1980s that appeared to create social value, changes in corporate governance and ensuing reductions in agency costs often played an important role. In some cases, takeovers led to the breakup of large conglomerates, forcing apart business units that were presumably more valuable on their own or in other companies' hands. Many incumbent managers resisted these restructurings until forced to accept them through the market for corporate control, as takeovers or the threat thereof often led to changes in the organization of firms.

Although many types of mergers and acquisitions may have led to changes in corporate governance, some of the most dramatic changes therein came about as a result of leveraged buyouts (LBOs). Moreover, evidence suggests that LBOs during the 1980s led to significant improvements in the productivity of firms. In an LBO or a management buyout, corporations become closely held companies as their public stock is bought by a group of investors using borrowed money. Consequently, ownership becomes much more concentrated and more tightly connected to control. This new ownership and capital structure creates significantly greater incentives for managers to increase profits as much as possible. One study showed that CEOs of firms involved in LBOs during the 1980s saw their ownership stake rise by more

than a factor of four, thereby making them more interested in increasing the firm's profits. Moreover, the need to service debt issued to finance the buyout provided a disciplining force on management.

Taken together, it was likely that these incentives influenced decisions by some firms to sell off assets that had higher value outside the firm than inside it. Many LBOs did not raise antitrust issues because the initial transaction simply involved changing the ownership of an existing firm, rather than a combination with a competitor. However, some selloffs of business units that followed certain LBOs were to firms in the unit's industry. Therefore, where these selloffs could improve the performance of the firms without affecting competition, the increased flexibility afforded by adjustments to antitrust policy may have been important.

Once the firm's operations were restructured and a new governance structure was put in place, many LBO firms were successfully taken public again. Although LBO activity dwindled in the 1990s, the expansion of pay for performance suggests that mechanisms to align managerial with shareholder interests remain an important, enduring element of corporate governance.

The restructurings of the 1980s provide an example of the importance of adapting competition policy in response to improvements in the understanding of the conditions within industries that may harm or benefit consumers. The ongoing incorporation of these insights into the analytical framework used to guide competition policy has strengthened the effectiveness of antitrust enforcement, while reducing the likelihood that antitrust enforcement will hinder reorganizations whose economic benefits to society would outweigh any potential harm from reduced competition.

Policy Lessons for Promoting Organizational Efficiencies

As noted earlier, organizational change in today's economy takes place not only through mergers but also through other organizational forms such as joint ventures and partial acquisitions. The challenge for antitrust scholarship and public policy is to provide an integrated framework for all these organizational innovations that properly accounts for both competitive and efficiency effects. These types of transactions evoke intertwined issues in corporate governance and competition policy, and so an integrated framework supports sound policymaking. For example, how a given partial equity acquisition is likely to affect the acquirer's relationship with the target depends on more than just the size of the partial equity interest acquired and the nature of any accompanying shareholder agreement, which may, for example, confer the right to appoint representatives to the firm's board of

directors. It also depends on the acquirer's current and likely future plans, and those of other blockholders and the firm's incumbent managers. Even ascertaining that the acquirer will gain control need not imply that the transaction would be anticompetitive; as in merger policy, that depends upon the market environment and on the efficiencies that the transaction would create.

Policy Lessons from Joint Ventures

Joint ventures can lower the costs of producing goods and services and widen consumer choice. But partners in a joint venture may also be actual or potential competitors in the product market. In 1983, for example, General Motors (GM) Corp. and Toyota Motor Corp. agreed to establish a joint venture to produce a subcompact car at a former GM plant in Fremont, California. This venture was later formalized as New United Motor Manufacturing, Inc. (NUMMI). Both partners expected to benefit from the undertaking: GM by adding to its capabilities in producing smaller cars, Toyota from the opportunity to test its production methods in an American environment. It was an unprecedented initiative and generated an extensive, 15-month FTC investigation, which resulted in its approval.

A new organizational innovation, by definition, will not have an established track record for an antitrust agency to review. But such an organization may create genuine, important efficiencies even if those efficiencies are difficult to document at the time of the transaction. For example, a key issue before the FTC was whether the joint venture would enable Toyota to learn how its "lean" production and assembly system would function in an American factory, and enable GM to learn details of the Toyota system that could be applied to raise productivity at its other plants.

If Toyota's manufacturing success was completely embodied in a superior piece of equipment, then merely licensing that equipment to U.S. automakers might have been sufficient to transfer that success to American soil. That type of efficiency gain also would have been relatively easy to document contemporaneously. Yet, as subsequent scholarship has confirmed, Toyota's lean production system is an interrelated set of practices, affecting factory and job design, labor-management relations, relationships with suppliers, and management of inventories. As the FTC majority opinion concluded, "in depth, daily accumulation of knowledge regarding seemingly minor details is a more important source for increased efficiency than a broad but shallow understanding of Japanese methods. Such in depth knowledge appears to be achieved only through the kind of close relationship the [joint] venture will allow."

Experience shows that the joint venture did lead to productivity improvements. One study indicated that, within a few years, each automobile produced at the NUMMI plant required 19 assembly hours of labor, versus 31 hours at

one of GM's mass production plants in the United States, and 16 hours at one of Toyota's plants in Japan. The productivity of the NUMMI plant was close to that of Toyota's Japanese plant even though NUMMI workers were relatively early in the learning process about lean production, suggesting that this system could indeed be transplanted successfully. Several other welcome developments followed in the wake of the joint venture's early success. Toyota expanded its own production and assembly plant operations in the United States. GM and other U.S. automakers adopted elements of lean production, improving their productivity. And NUMMI expanded. By 1997 the joint venture had produced its 3-millionth vehicle, and in 2001 the Fremont facility was producing three vehicle models.

The broader policy lesson is that joint ventures and other organizational hybrids may create efficiencies in ways that are difficult to prove at the time of the transaction. In evaluating transactions that might also raise anticompetitive concerns, antitrust authorities face the uncertain prospect of improved efficiency as a factor in evaluating the joint venture's likely effect. A new, potentially efficiency-enhancing organization can benefit society in two ways. Society gains direct benefits from the organization. Society also receives the demonstration of the types of efficiencies that such an organization could create. This provides evidence to other firms, and to the antitrust enforcement agencies, about the private and social gains of such organizations. If the new organization proves efficient, other firms may adopt that form. If it does not prove efficient, market forces will motivate the firms to abandon it. In either case, the antitrust agencies will have a broader track record to rely upon when evaluating similar transactions that might raise competitive questions.

The guidelines describing how U.S. enforcement agencies assess mergers or collaborations such as joint ventures indicate that efficiencies arising from them will be considered if they are verifiable and cannot be practically achieved through other means, making them transaction specific. "Verifiable" here means that the parties must substantiate efficiency claims so that the agencies can verify, by reasonable means, their likelihood and magnitude. In these guidelines, certain efficiency claims are viewed as less likely to meet these criteria than are others. For instance, the agencies view improvements attributed to management as less likely to meet the criteria necessary for consideration. But efficiency gains from mergers or joint ventures may be closely tied with managerial improvements, such as combining Toyota management with unionized American workers in NUMMI. Managerial and organizational improvements may indeed be difficult to verify, but given their potential social value, expending the resources necessary to investigate those claims thoroughly is justified. This policy lesson applies to mergers as well as joint ventures.

Legislation indeed exists to encourage efficient joint ventures. In 1984 the National Cooperative Research Act (NCRA) became law, to be followed 9 years later by the National Cooperative Research and Production Act. These two acts encourage research and production joint ventures by codifying antitrust treatment of such ventures. They lowered the maximum penalty that could be assessed in a successful private antitrust lawsuit against any venture that notified the Justice Department at the time of its formation. For all joint ventures, the act also ensured that, in any antitrust challenge, the courts would consider efficiencies arising from the joint venture. This clarified that defendants could exonerate themselves by establishing the benefits of their joint ventures. Since the passage of the NCRA more than 900 research or production ventures have registered with the Justice Department.

Successful research joint ventures may foster innovation and thus bring benefits to society. This and other ways in which economic organization and competition policy promote innovation are elaborated in the section on dynamic competition later in this chapter.

Shaping Policies to Address Partial Equity Stakes

As we have seen, firms make partial equity investments under a variety of conditions, to achieve a variety of ends. The overall effect can be to promote efficiency or reduce competition, depending on the nature of the acquisition and the conditions under which it is made. Partial acquisitions most dramatically confer control, or influence, over the target company when a majority of its outstanding equity is acquired. Acquirers obtain substantial influence in some instances with much smaller stakes, however. Partial acquisitions also give the acquirer a stake in the target firm's future profits. This gives the acquirer an incentive to take those profits into account when making its own business decisions. Finally, a partial acquisition can make it easier for the acquirer to obtain access to the management of the target firm. All these elements can have substantial effects on the relationship between the target and the acquiring firm. Because strong product market competition can depend on the independence of firm actions, all of these aspects of partial acquisitions can raise serious antitrust enforcement concerns. The challenge in shaping policies to address partial equity ownership by corporations lies in distinguishing cases that pose serious threats to product market competition from those that promote efficient cooperation between suppliers. Although some of these issues are fairly new, the challenge is similar to that posed by the analysis of mergers and, of course, joint ventures.

With the emergence of partial acquisitions among major U.S. corporations, the Justice Department and the FTC have created an enforcement record that publicly illustrates some of the concerns these acquisitions can raise. For example, Primestar was formed in 1990 as a joint venture involving five of

the Nation's largest cable television providers and a satellite provider. In 1997 Primestar announced its intention to acquire satellite assets from two other companies. These assets could be used for direct broadcast satellite (DBS) service, which transmits video programming directly from satellites to subscribers' homes and competes for customers with cable television. The cable companies involved in the original joint venture would have maintained a substantial ownership and control stake in the entity resulting from the proposed acquisition. Since the assets in question were the last available that other independent providers of DBS could use or expand into, Primestar's ownership structure raised concerns at the Justice Department during its review of the acquisition. Concerned that the cable companies would exert their influence in Primestar to limit how the acquired assets would be used in competing with cable, the Justice Department challenged the acquisition, which was subsequently abandoned. The determination that this acquisition would have caused competitive harm hinged upon an assessment of how the new entity's governance structure would affect its behavior (Box 3-2).

As the Primestar case illustrates, the government's evaluation of how partial acquisitions are likely to affect competition requires the examination of conditions under which the parties to the transaction compete, as would be the case in the evaluation of a full merger. Only to the extent that competition between cable and DBS benefits consumers, or society generally, would the Primestar acquisition have been likely to have a serious adverse effect on competition. The partial nature of the cable companies' stake in Primestar thus raised questions in addition to, rather than apart from, those that arise in the traditional evaluation of mergers. Also, as in the evaluation of mergers and joint ventures, the Justice Department and the FTC typically consider the evidence on whether each partial acquisition may promote efficiency.

Some of the tools that economists use to analyze efficiency gains derived from vertical relationships generally may prove useful in the analysis of partial acquisitions between suppliers of complementary products. For example, the influence or control that the acquirer may exercise over the target raises the acquirer's incentive to make certain relationship-specific investments. Relationship-specific investments are those that, once made, are much more valuable inside a particular business relationship than outside it, such as fabrication equipment that is specialized to a particular customer's design. The acquirer's control rights make it less likely that the target will later "hold up" the acquirer, and deprive it of its appropriate return on its investment. These control rights are important because it is costly to go to court to try to enforce a written agreement. If one party effectively controls the other party, disputes over the business arrangement may be resolved at lower cost internally. Although the costs of dispute resolution may be

Box 3-2. The Primestar Acquisition

A basic assumption in assessing the competitive implications of a merger is that the merged firms will act in such a way as to maximize the new entity's profits. A firm's owners, however, may also have other objectives. Usually these other objectives are not significant enough to alter the basic assumption. But when a firm's owners clearly have other interests, such as financial stakes in other ventures, these could influence their decisions regarding the firm's actions. In such cases, those assessing a merger must consider how strong those influences might be on an owner and that owner's ability to affect firm decisions in ways that may harm competition.

Primestar was formed in 1990 as a joint venture involving five of the largest cable television providers and a satellite provider. Given that the five cable providers would control almost 98 percent of the voting shares in Primestar after the proposed acquisition, there were concerns about how this would affect its use of the acquired assets. If Primestar used these new assets to compete vigorously with cable for subscribers in order to maximize its profits, under certain assumptions the effect of lost customers on the profits of some owners' cable businesses might outweigh their share of the gains from Primestar improving its subscriber base. As a result, one might suspect that these owners would seek to influence Primestar's actions to reduce its competition with cable.

On the other hand, Primestar's managers and board of directors would have had legal obligations to serve the interests of minority shareholders that would benefit financially from Primestar competing vigorously with cable television, and the board included independent outside directors. Moreover, it appeared that not all the cable providers would have had an incentive to prevent such competition. Thus the composition of Primestar's ownership and governance structure suggested that there might be opposing forces that would seek different outcomes of decisions affecting competition in the consumer market that DBS serves.

The Justice Department analyzed the totality of incentive and governance effects in this case and concluded, on balance, that the transaction would harm competition and consumers. It filed suit to block the acquisition, leading to its abandonment. This case demonstrates that an assessment of a merger or acquisition's competitive implications can require an understanding of how the governance structure of a company allows those with a share in its control, or a financial stake in its operations, to influence decisions affecting the firm's actions.

lowered through a partial or complete equity interest of one party in the other, there are other costs to this integration, such as "influence costs" as agents seek to lobby decisionmakers within the organization. But market forces will lead firms to choose the arrangement that minimizes their total costs.

Another example derives from the lesson from scholarship that, if one firm acquires another outright, the acquirer's specific investment incentives are strengthened, but the target's specific investment incentives are weakened. In the context of a corporate acquisition, this means that stakeholders in the target company care much less how that company's assets are deployed after selling their stakes. Therefore, if a project can best succeed through such investment by both parties, an optimal ownership arrangement may be one in which one party holds a partial equity stake in, rather than completely owning, the other. This raises the investment incentives of the partial owner while not unduly undermining those of the target.

An important challenge in the development of competition policy toward these new corporate governance practices will be to make effective use of these tools in light of the evidence that has emerged on the antitrust concerns that those practices can raise, and the beneficial effects that can result from them. Some progress will arise through the identification of factors that enforcement authorities will increasingly consider in evaluating partial acquisitions, and that parties will increasingly consider when deciding whether to propose them. Other progress will emerge from a clearer understanding of how these practices affect product markets and economic efficiency more generally. With a clearer sense of the general consequences of these transactions, and of the specific factors that can lead those consequences to vary from case to case, we can expect further advances in the development of tools to evaluate these new governance practices.

Policy Toward Vertical Relations

Some tools for the analysis of these governance practices may derive from a well-developed economics literature on vertical relations between independent firms, a subject in which important issues in firm organization and competition policy arise. Firm activities and market transactions often involve a vertical production and distribution chain, such as a relationship between a manufacturer (called in this situation the upstream firm) and a distributor (the downstream firm).

Antitrust law and its enforcement have a long history of influence over these organizational decisions, such as whether a firm owns the retail outlets for its goods or services. For example, the owner of a business format and brand name for a fast-food restaurant concept may also own individual restaurants, or it may enter into a franchise agreement. A franchise agreement is one between two legally independent firms, the franchisor (the owner of

the business format) and the franchisee (in this example the owner of the individual restaurant). The agreement might specify that the franchisee may operate a restaurant at the given location according to the specified format, in exchange for a franchising fee and a royalty rate on the restaurant's sales.

This organizational choice is, in part, a response to various agency costs. In particular, since a franchisee owns the individual restaurant, he or she has incentives to exert certain types of effort to build up the value of that store. Under company ownership, the manager of the restaurant is an employee and, even if paid a bonus wage based on sales, does not have as strong an incentive as a storeowner to invest effort to raise the value of that store. But franchising may exacerbate other agency costs. For example, the owner-operator of the only restaurant on a busy interstate highway may expect to have many one-time customers, and therefore might charge prices that are too high—a decision that may be profitable for that owner but tarnishes the brand name and lowers its nationwide value. In a company-owned restaurant, the manager has less incentive or ability to act in this manner. The fact that both franchise stores and company-owned stores successfully coexist in our economy reflects differences in agency costs in various industries and settings.

These organizational choices can also be influenced by competition policy, which affects the costs of various possible terms of an agreement between independent upstream and downstream firms, such as a franchise agreement. For example, the upstream firm might wish to specify a maximum retail or "resale" price, which would prevent an individual store from taking advantage of its local market position and potentially harming the reputation of the brand name. As the Supreme Court acknowledged in its 1997 *State Oil* v. *Khan* decision, there are pro-competitive rationales for such vertical restraints, which is why such a pricing provision is now evaluated for its competitive consequences on a case-by-case basis. Before the Supreme Court's decision, however, an attempt to set a maximum resale price in an agreement between legally independent upstream and downstream firms would have been illegal per se. As a result, owners of a business format who were concerned about the possibility of franchisees pricing too high may have instead chosen to own those restaurants or stores outright. That choice would have addressed the pricing issue but increased other agency costs related to effort by restaurant managers. This example shows one way in which competition policy with regard to vertical restraints nowadays takes into account the social benefits that may be created by having transactions organized between two separate firms rather than through common ownership or vertical integration.

Cross-Border Organizational Changes

Competition policy continues to respond to other changes in the organization of economic activity. The GM-Toyota joint venture, for example, presaged something that has become much more prominent since the venture's establishment: changes in firm organization, including mergers, that occur across national boundaries. This section describes some of the challenges that the international nature of these changes presents for antitrust policy, and how the United States is responding.

Multijurisdictional Review

Merger proposals involving or creating multinational enterprises can result in reviews by the antitrust authorities of many nations, often referred to as multijurisdictional review. The United States has managed the issues posed by multijurisdictional review through both bilateral cooperative relationships and multilateral arrangements. This has produced an impressive degree of analytical convergence among the U.S. and other antitrust agencies, resulting in a long line of compatible decisions in transnational mergers. However, some differences remain, and these can have significant consequences. A striking recent example came with the proposed acquisition by General Electric Company (GE) of Honeywell International Inc. Both GE and Honeywell are U.S.-headquartered corporations, but because these multinational enterprises also have significant European sales, the deal was subject to review by antitrust authorities of the European Union.

GE and Honeywell agreed on their merger in October 2000. Although each operates in a number of product lines, a key focus of the case was the complementary goods they produce for the commercial aviation industry. GE is one of three independent global manufacturers of large commercial aircraft engines, and Honeywell makes a number of systems essential for aircraft operation, ranging from landing gear to communications and navigation systems.

After agreeing to some changes to their transaction, including the divestiture of Honeywell's helicopter engine division, the parties received conditional clearance from the Justice Department in May 2001 to proceed with their merger. But the merger could not be consummated until it received clearance from the European Commission and other authorities. The Commission sought additional changes and conditions that were unacceptable to the parties. In July 2001 the Commission rejected the deal, and so the proposed merger did not take place.

The Assistant Attorney General for Antitrust issued this statement after that decision:

> Having conducted an extensive investigation of the GE/Honeywell acquisition, the Antitrust Division reached a firm conclusion that the merger, as modified by the remedies we insisted upon, would have been procompetitive and beneficial to consumers. Our conclusion was based on findings, confirmed by customers worldwide, that the combined firm could offer better products and services at more attractive prices than either firm could offer individually. That, in our view, is the essence of competition.
>
> The EU, however, apparently concluded that a more diversified, and thus more competitive, GE could somehow disadvantage other market participants. Consequently, we appear to have reached different results from similar assessments of competitive conditions in the affected markets.
>
> Clear and longstanding U.S. antitrust policy holds that the antitrust laws protect competition, not competitors. Today's EU decision reflects a significant point of divergence.
>
> For years, U.S. and EU competition authorities have enjoyed close and cooperative relations. In fact, there were extensive consultations in this matter throughout the entire process. This matter points to the continuing need for consultation to move toward greater policy convergence.

The European Union's objection to the merger centered around advantages that the combination would yield for the merged firm over its competitors in the markets for aircraft engines, avionics, and other aircraft systems. The Commission found that, among other factors, GE's vertical integration into aircraft leasing through its GECAS subsidiary, along with GE's deep financial resources, would lead inexorably to the merged firm's dominance in markets for certain aircraft systems. In addition, the Commission found that the merger would give the combined GE-Honeywell the ability and the incentive to offer complementary products on more attractive terms than could competitors with narrower product lines. This last category of objections has been termed "range" or "portfolio" effects.

The Commission found that these mechanisms would have the effect of driving the premerger competitors of both GE and Honeywell out of effective participation in their respective markets, presumably leading to higher prices in the long run as the merged firm became unconstrained by competitive pressures. U.S. antitrust authorities, in contrast, found that most of the alleged harms under the Commission's theory flowed from what are normally considered benefits of a merger—efficiencies that lead to lower prices. They

found little evidence that competitors would be unable to respond to any lower prices generated by the merger and thus be driven from the market. Finding more efficient combinations of productive resources that lead to lower costs and lower prices is, as the Assistant Attorney General said, the essence of competition. Blocking mergers that generate such efficiencies risks serious economic harm to consumers and to markets generally.

Elements of International Policy Convergence

Halting efficient multinational mergers destroys value precisely because an integrated, multinational firm can create specific efficiencies. As noted earlier, these may include exploiting economies of scale and scope, and combining central managerial guidance and appropriate pay for performance with the local knowledge of managers in various overseas markets. The European Commission might have been more likely to clear the GE-Honeywell merger if GE had agreed to divest its aircraft leasing subsidiary GECAS. But such a divestiture might have sacrificed efficiencies.

As the GE-Honeywell example indicates, there are some important differences in competition policy between the United States and other nations. But cases that produce such conflicting results have been rare and are likely to remain the exception. Moreover, steps toward appropriate convergence have already taken place, and this Administration is committed to seeking further convergence to promote the spread of sound antitrust policy. The United States should not seek convergence for its own sake, of course, but rather in order to establish certain core principles of sound competition policy across all jurisdictions.

Core Principles of Competition Policy

Competition policy should operate according to explicit guidelines, based on clear economic principles. Economic analysis should be central, because competition policy shapes fundamental economic decisions, such as production, pricing, and the organization of firms. These guidelines should reduce uncertainty by providing an indication to firms as to what kinds of conduct and transactions may bring scrutiny from competition authorities.

Competition policy should be concerned with protecting competition, not competitors, as a means of promoting efficient resource allocation and consumer welfare. There might be rare exceptions, such as certain monopolization cases, in which consumer harm is hard to measure, and then harm to competitors may be examined as an indicator of consumer harm. Indeed, harm to competitors does not play a central role in U.S. merger policy, although it does motivate private antitrust litigation. Since such competitor complaints are often at variance with consumer interests, antitrust

enforcement agencies and courts should view them skeptically. In the European Union the more significant and involved role of competitors in the merger review process has created a perception by some that the Commission's analysis is driven more by effects on competitors than is the case in the United States.

As the International Competition Policy Advisory Committee noted in its final report to the Attorney General in 2000, "Nations should recognize that the interests of the competitors to the merging parties are not necessarily aligned with consumer interests." Indeed, a merger may be opposed by competitors precisely because it would create a more efficient firm, one that will aggressively serve customers better than the existing industry configuration. Blocking such acquisitions deprives the world of an avenue to increased productivity.

The United States and the European Union have already achieved considerable cooperation and substantive convergence. U.S. and EU antitrust authorities have come to similar conclusions about a large number of transatlantic mergers. More work is required, however. The United States has undertaken several steps in bilateral and multilateral forums to facilitate convergence of competition policy to serve efficiency ends.

Bilateral Enforcement Agreements

The United States has entered into bilateral cooperation agreements with several important trading partners—Australia, Brazil, Canada, Germany, Israel, Japan, Mexico, and the European Communities—to facilitate antitrust enforcement. These agreements are implemented by the Justice Department and the FTC, working in cooperation with their counterpart agencies in the other countries.

These agreements typically provide for, among other things, sharing of nonconfidential information, coordination of parallel investigations, and positive comity. Under positive comity one country can request that another investigate possibly anticompetitive practices in its jurisdiction that adversely affect important interests of the country making the request. Such a request does not require the country receiving the request to act, nor does it preclude the country making the request from undertaking its own enforcement. The United States has also entered into one agreement, with Australia, under the International Antitrust Enforcement Assistance Act, which among other things allows the enforcement agencies to share confidential information.

The United States and the European Union have also created a working group to identify and pursue areas of possible further convergence in merger enforcement. Having completed a successful project on remedies in merger cases, the working group has established new task forces to examine conglomerate merger issues and other important substantive and procedural topics.

The International Competition Network

In October 2001 the Department of Justice and the FTC joined with top foreign antitrust officials to launch the International Competition Network (ICN). The ICN will provide a venue for senior antitrust officials from around the world to work on reaching consensus on appropriate procedural and substantive convergence in competition policy enforcement. The ICN will initially focus on multijurisdictional merger review (procedures, substantive analysis, and investigative techniques) and the advocacy role of antitrust authorities in favoring pro-competitive government policies. To facilitate the diffusion of best practices, the ICN will develop nonbinding recommendations for consideration by individual enforcement agencies. The ICN's interim steering group consists of representatives from a cross section of developing and developed countries, including the United States. It will hold its first conference in the early fall of 2002.

The World Trade Organization

The World Trade Organization (WTO) is an international institution in which the United States negotiates agreements with 143 other members to reduce barriers to trade. At the fourth WTO Ministerial Conference in Doha, Qatar, in 2001, members adopted a ministerial declaration. That declaration included a statement that the Working Group on the Interaction between Trade and Competition Policy will focus on the clarification of core principles, modalities for voluntary cooperation, and support for progressive reinforcement of competition institutions in developing countries. The role of the WTO and other international institutions in promoting economic well-being is detailed in Chapter 7.

Benefits of Appropriate Convergence

In some cases, the lack of antitrust harmonization may yield benefits. For example, in an unsettled policy area, in the absence of harmonization, nations might experiment with different competition policies. The world could then learn from these experiences what constitutes best practice in antitrust enforcement in the area in question. The bilateral and multilateral forums into which the United States has entered address this concern by sharing information to promote best practices. This consultation will enable the results of successful policy experiments to be disseminated. Moreover, the United States remains committed to appropriate convergence, in which efficient competition policies are spread worldwide, rather than seeking harmonization for its own sake and potentially promoting less than sound policies.

Dynamic Competition and Antitrust Policy

Through its influence on the development of competition policy over the years, economic analysis has brought a dramatic improvement in the ability of government agencies and the courts to accurately judge the strength of competition in a market. This has enhanced their capacity to distinguish those cases that properly raise concerns about anticompetitive effects from those that might have raised concerns in the past, but should no longer, in light of a better understanding of competitive forces. These changes in antitrust policy are important in that they afford firms greater flexibility to lower costs and improve their products through adjustments to their operations and organization.

But many of these improvements in policy have largely focused on better understanding markets in which firms compete with one another through incremental changes in the prices, quality, and quantity of relatively similar products or services. In some increasingly prominent industries, such as the information technology and pharmaceuticals industries, another important form of competition is taking place. It arises where there is a constant threat of innovations leading to a new or improved product being introduced that is far superior to existing products in a market. This type of competition is sometimes called competition for the market, or dynamic competition.

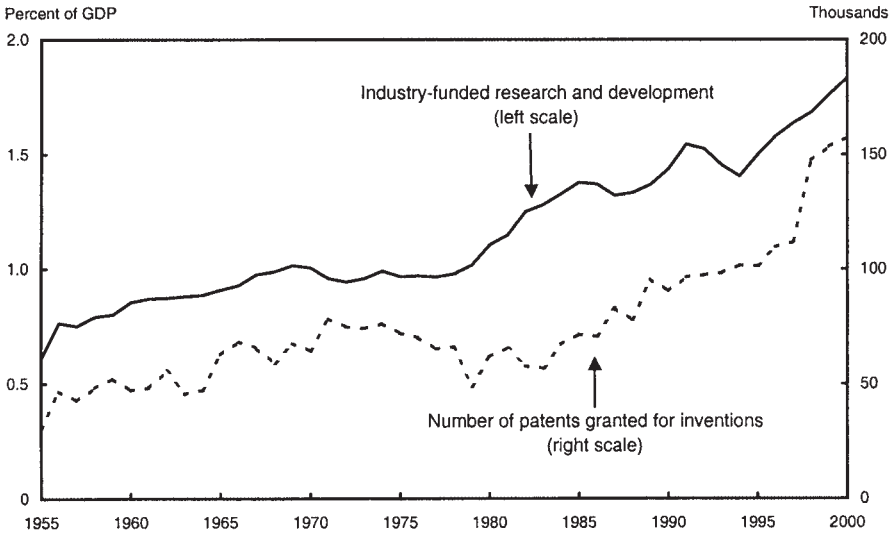
The increasingly important role of innovations in our economy can be seen in a number of indicators of innovative activity. After remaining nearly unchanged during the 1970s, industry's funding of research and development, measured as a share of GDP, grew two-thirds during the following two decades, reaching 1.8 percent of GDP in 2000. The number of patents granted each year by the U.S. Patent and Trademark Office provides some indication of the rate at which patentable innovations are being developed. Since the mid-1980s, the number of patents issued for inventions each year has grown dramatically (Chart 3-3). Although such a change could result from a number of other factors, such as increased incentives to file for a patent based on adjustments to the legal environment, evidence suggests that a burst in innovation is a driving factor behind this rise. Whereas some of the most visible innovations contributing to dynamic competition are technological in nature, such as improvements in the performance of computers, others may involve changes in management or business practices.

The importance of substantial innovations to the economy, as well as the unique form of competition they bring about, was recognized in 1942 by the economist Joseph Schumpeter. He noted that a significant part of the long-term growth of many industries resulted from what he called the "perennial gale of creative destruction." At the heart of this creative destruction is the introduction of new products or services, technologies, or organizational

forms that lead to dramatic changes in an industry's structure or costs, or in the quality of its products or services. In Schumpeter's view, it was periods of creative destruction that brought "power production from the overshot water wheel to the modern power plant… [and] transportation from the mailcoach to the airplane." Indeed, as he stated, the kind of competition resulting from firms bringing forth these changes or innovations is one that "commands a decisive cost or quality advantage and which strikes not at the margins of the profits… of the existing firms but at their foundations and their very lives." Because of his early insights, dynamic competition involving the introduction of markedly improved goods or services is often referred to as Schumpeterian competition.

The significance of innovation—and hence of dynamic competition—will vary from market to market: it will be negligible in some and a pervasive force in others. Product improvements are commonly made in virtually all markets. But in markets experiencing the kinds of substantial innovation that Schumpeter addressed, these innovations can be so dramatic or disruptive as to make the products that they improve upon significantly inferior in comparison. The benefits of these innovations to society can be found all around us. Computer processors produced today are, by one measure, more

Chart 3-3 **Industry-Funded Research and Development and Patents Granted for Inventions**
Both industry-funded research and development and the number of patents granted by the Patent and Trademark Office have grown significantly since 1980.



Sources: Department of Commerce (Bureau of Economic Analysis and Patent and Trademark Office), National Science Foundation, and Council of Economic Advisers.

than 250 times more powerful than those produced in 1980, and more than twice as powerful as those produced in 1999. New drugs have vastly improved our ability to treat various illnesses. Other examples abound.

It has long been recognized that particular incentives are necessary to foster these market-transforming innovations. These innovations are often the result of substantial research and development investments on the part of companies or individuals. Since these investments must be made before it is clear that any profitable innovations will come of them, they are fundamentally risky. Encouraging innovation rests upon an interrelated set of internal and external rewards. The external rewards are those provided in the marketplace to the successful innovating organization. The internal rewards are those provided by the firm, joint venture, or other governance structure. Both economic organization and public policy therefore play significant roles in encouraging innovation.

Sources of Incentives for Innovation

The external risks and rewards facing firms in innovation-intensive industries are highlighted by a preliminary study of firms in the computer software industry between 1990 and 1998, which found that success, as measured by sales growth over this period, was by no means certain. But, compensating for this risk, some firms that did end up being successful were extremely so. At least 10 percent of firms saw sales fall to zero, and at least half experienced negative sales growth over the period. Only 25 percent of firms experienced real annualized sales growth of at least 7 percent during the period. But about 1 percent experienced real annualized growth of greater than 130 percent. This pattern of success highlights the risk involved in investments in these innovation-intensive industries. Therefore firms must have reason to expect that, taking into account the likelihood of failure, the profits from any successful innovations that do result from their efforts will be enough to justify the initial investment.

Intellectual Property Protection

Not only is investing in efforts to develop innovations risky and often expensive, but the innovations that result often produce beneficial knowledge or insights that others can copy at relatively low cost. Furthermore, in the absence of laws to the contrary, knowledge embodied in an innovation can be hard to keep others from using.

For instance, the research and development costs incurred by a firm in determining the correct chemical composition and treatment regime for a particular drug therapy may be substantial. But it may be difficult to keep much of this information out of the hands of competitors that have not

borne any of these costs, yet could use that information to produce the new drug themselves. As a result, competition between the innovator and imitators could keep the price of the drug at the cost of manufacturing it. In such a competitive environment, a firm's profits from its innovation would not suffice to cover its original research and development costs or justify its decision to risk undertaking expensive research efforts that may bear no fruit. Foreseeing this potential outcome, the innovator would have little incentive to embark on the research and development in the first place.

Even if a firm did not face competition from other firms benefiting from the knowledge produced by its innovation, firms or individuals may use aspects of the innovation for other purposes. Given how difficult it can be to keep them from doing this, in the absence of laws to prevent it, the innovator may receive little compensation from those that benefit from its innovation. As a result, the rewards that a firm enjoys from its innovation could fall far short of the benefits that the innovation produces for society. Consequently, in many cases, firms or individuals might not embark on developing an innovation because, although the social benefit from it may be large enough to justify its development costs, the firm or individual could not expect to reap enough of that benefit to justify those costs.

The consequences of this problem were recognized in the U.S. Constitution, which empowered Congress to develop a body of intellectual property laws, including those establishing patents. A patent for an invention confers on an individual or firm (the patentholder) limited rights to exclude others from making, selling, or using the invention without the patentholder's consent. Patents generally are granted for 20 years, and as the rights they provide imply, the patentholder can license to other individuals or firms the right to use its innovation. Patents give a firm the legal power to keep others from using its innovation to create competing products without bearing the cost of the innovation. Licensing provides a means whereby the innovator can receive compensation, in the form of licensing fees, from others that find a beneficial use for the innovation. Thus policy has long recognized that, to encourage innovation, firms must expect that successful innovations will yield a market position that allows them to earn profits adequate to compensate for the risk and cost of their efforts.

Indeed, intellectual property protection often plays an important role in dynamically competitive markets. But it is not the only mechanism that may allow a firm to gain an adequate return on risky investments in developing innovations. Intellectual property laws cannot always provide inventors complete protection against competitors using the knowledge embodied in their inventions without compensation. First, even if they are valuable, not all innovations can be protected by intellectual property law. Second, firms can often "invent around" a patent to create a competing product that,

although similar in value to consumers, is different enough in its composition or features so as not to violate the patent. Although this entails some development costs, these may be substantially reduced by the knowledge gained from studying the original innovator's efforts. On the other hand, some innovations may be difficult enough to imitate that, even without intellectual property protection, the innovator can enjoy a substantial cost or quality advantage over its competitors for some period. In either case, other characteristics of some dynamically competitive industries are important in making it likely that a successful innovation will yield a firm the leading position in a market, and profits that are essential to encourage such innovations.

Economies of Scale

Many industries that may experience dynamic competition are characterized by substantial economies of scale. In such industries, creating a new product entails high fixed costs, such as the costs of research and development and of setting up production and distribution facilities. But once these costs have been incurred, the incremental cost of making each unit of the product is small, indeed sometimes close to zero, and it is often easy to expand production to high levels. In markets with these characteristics, an innovator may be able to introduce its new product and keep production levels high enough to gain substantial market share before others can offer products of competing quality. As a result, economies of scale may allow the innovator to keep its average costs well below that of new entrants offering similar products that have smaller initial market shares. In some cases this advantage may be enough to keep other firms from providing significant competition unless they can offer a product that is notably superior.

Network Effects

Network effects are another mechanism that can help an innovator maintain a market-leading position in many dynamically competitive industries. A product or service is subject to network effects if its value to a consumer increases the more it is used by others. For instance, over the past decade, the number of people using e-mail has grown dramatically, making it a much more valuable means of communication for any individual user today than it was a decade ago. Network effects can also influence the value of some computer software. The more people who use a particular software application, or at least software compatible with it, the more valuable that software is to any individual who wants to share or exchange files with others who use that software. One study of prices of spreadsheet software between 1986 and 1991 found that consumers were willing to pay a significant premium for software that was compatible with Lotus 1-2-3, which was the dominant spreadsheet program during this period.

As more people use a particular good, its value to consumers can also increase because this wider use encourages the production of complementary goods. For instance, as more offices use a particular type of photocopier, businesses offering repair services and spare parts for that copier may become more common, making the copier even more attractive to offices.

As a result of these network effects, the value that consumers attach to a product that is already widely used may be substantially greater than the value they place on a relatively similar product that is used by fewer people. For instance, a manufacturer may introduce a new copier that offers performance largely similar to that of the market leader. But if the new copier is built in such a way that users cannot draw from the same service and spare parts network, it may be less valuable than the incumbent product. Thus, if a firm can quickly gain market share after introducing a new innovation, network effects can play an important role in helping the firm maintain that market leadership in the face of competition from new entrants offering similar products. This, in turn, increases its ability to reap the profits that are necessary for it to earn an adequate return on its risky investment.

Many have expressed concern that network effects can give such substantial advantages to incumbent products that new firms with potentially superior products are unable to compete. In theory, this could happen, but it does not happen necessarily. If a new product is clearly superior to the leading product, whether network effects are large enough to keep the new product from successfully competing will depend on the value of those effects compared with the net advantages it offers after taking into account the cost of switching to it. But, of course, measuring either of these—the value of the network effects or that of the new product's superior features—is difficult.

Although there have been cases where a new product took over a market-leading position from one that presumably enjoyed network effects, conclusive evidence that network effects have prevented the widespread adoption of a markedly superior product has not yet been found. For example, one common case put forward to argue that network effects can hinder the entry of superior products is that of the QWERTY keyboard, the familiar, century-old keyboard arrangement that virtually all typewriters used and that most computer terminals use today. In the 1980s a study suggested that a keyboard arrangement called the Dvorak keyboard, introduced in the 1930s by August Dvorak, was superior to QWERTY but had failed to gain market share because of the network effects that the already-established QWERTY enjoyed. Yet a more recent study raises significant doubts about claims that the Dvorak keyboard was superior. For instance, the most dramatic claims of its superiority are traceable to research by Dvorak himself, who stood to gain financially from the patented keyboard's success. Examination of his research revealed that experiments comparing keyboards

often failed to account for differences in the ability and experience of participating typists. The best-documented experiments, as well as recent ergonomic studies, suggest little or no advantage for the Dvorak keyboard. This highlights that generalizations cannot be made about the significance of network effects in deterring the entry of superior products into a market. Their impact must be judged on a case-by-case basis.

Fostering Innovation Through Organizational Structure

Although the prospect of gaining a market-leading position can encourage firms to innovate, firms can reap the benefits of innovation through other means as well. As was mentioned above, the benefits of innovation are often shared by many. Licensing agreements offer one means by which a firm can capture some of these spillovers. But such arrangements are an imperfect way of ensuring that innovators benefit from the spillover effects of their innovations while also encouraging additional beneficial uses of the innovation by others. As noted earlier, addressing this spillover problem is one motivation for a research joint venture among firms that expect to mutually gain from an innovation. Moreover, firms that develop new innovations subject to network effects will benefit from the production of complementary products that enhance those network effects. Partial equity stakes may provide a useful mechanism to foster the development of these complementary products.

Even when conducted within a single firm, successful research requires appropriate effort from multiple parties. This includes not only the work of research scientists and engineers, but also efforts by managers to craft an organizational structure that attracts and rewards such personnel appropriately. Thus, successful innovating firms must address various agency costs in product discovery and development, to align the interests of these various participants with the interests of the firm.

For example, one study indicates that research programs in pharmaceutical companies that encourage publication by their scientists experience higher rates of drug discovery. Whereas stock options are often the focus of discussions about means of resolving agency costs, this example makes clear that incentives must be carefully tailored to the desired objective. In this case, keeping a firm's researchers closely connected to leading-edge developments in fundamental science may provide a critical advantage in developing commercially valuable drugs. Thus, just as firms can use stock options as an incentive for managers to pursue shareholders' interests, so, too, they can create incentives for researchers to be connected to developments at the leading edge of their science, by making a researcher's standing in the greater

scientific community a significant factor in promotion decisions. A further study suggests that these firms provide a balanced system of incentives: those firms that use a scientist's publication record as a positive factor in promotion are also more aggressive in rewarding research teams that produce important patents. This reward structure helps direct scientists' efforts to engage in both basic and applied research, culminating in successful drug discoveries.

Decisionmaking at all levels of a firm can play an important role in determining its success in introducing substantial new innovations. A study of the computer hard disk drive industry found that established firms often had the technological know-how to develop what would turn out to be the next disruptive technology in their market, such as the 3.5-inch disk drive. In fact, they were sometimes among the first to develop them. But new entrants were always the leaders in commercializing the disruptive technologies examined in this study.

In this industry, the failure of incumbents to lead in commercializing disruptive innovations was often traced to decisionmaking that focused on the needs of their established market, failing to promote new technologies whose initial applications fell outside that market. Yet it would be these technologies that would eventually develop to become the leader in the established market. Thus the organizational structure and incentives faced by managers of established firms played a more important role than technological know-how in their failure to lead the commercialization of disruptive innovations. Of course, innovation benefits society whether it arises from established or from entrant firms, but in either case, successful innovation requires good organization.

Dynamic Competition as Repeated Innovations

All the factors we have examined—the market-transforming nature of some innovations, the presence of intellectual property protection, the potential for economies of scale, and the presence of network effects—provide explanations for why a firm can gain a market-leading position and earn high profits after introducing an innovation. But what makes a market subject to dynamic competition is the fact that the very same factors can allow another firm, with an even greater innovation, to take much or all of the market away from the leading firm. Indeed, as Joseph Schumpeter commented, the competition provided by new innovations "acts not only when in being but also when it is merely an ever-present threat. It disciplines before it attacks. The businessman feels himself to be in a competitive situation even if he is alone in his field."

One example of a market where dynamic competition prevails today is that for personal digital assistants (PDAs). Apple Computer, Inc., made substantial investments to develop the Newton, the first handheld PDA,

which it introduced in 1993. This product did not succeed, but by 1996 at least six firms had operating systems for handheld PDAs either in development or already available to consumers. The Palm Operating System soon emerged as the preferred PDA, with a 73 percent market share in 1998. Although the innovations embodied in its products have made Palm a leader in this market, it is losing market share to new PDAs.

This example demonstrates a number of the elements often found in markets undergoing rapid innovation. First, firms that make substantial upfront investments in product development do not always experience the success necessary to gain an adequate return on those investments. Second, significant innovations can make a product the clear leader in a market at a particular point in time. Finally, even these innovative market leaders face challenges from later innovations by other firms that have the potential to make the leader's product obsolete. Therefore a potential innovator must believe that, if it gains a market-leading position through innovation, the resulting profits will be adequate to justify the development costs, given not only the possibility of failure but also the likelihood that future innovations will make any market leadership short-lived. Box 3-3 describes another market in which dynamic competition has been particularly intense.

Implications of Dynamic Competition for Competition Policy

Competition policy also has a role to play in markets characterized by dynamic competition. Markets experiencing rapid or substantial innovation can still be subject to conditions or behavior by firms that hinder competition. For instance, price fixing among firms will harm competition even in industries undergoing dramatic innovation. Other behavior may have more ambiguous implications for competition, dynamic or otherwise. Therefore the antitrust agencies will continue to scrutinize behavior by firms in these markets. Since the lawfulness of certain actions by a firm depends, in part, on the degree of competition in the firm's market, the ability to properly assess all types of competition is essential. Consequently, the analytical framework used to assess competition must encompass its potentially dynamic dimension. This involves recognizing the shortcomings of traditional methods for assessing competition when applied to markets undergoing rapid innovation, and developing new methods for determining how significant dynamic competition is in a particular market.

Highlighting the importance of developing and applying such methods is the fact that markets characterized by significant dynamic competition may not appear competitive through the lens of some common tools of traditional competition policy. Thus continuing adjustments in competition

Box 3-3. Dynamic Competition in the Market for Prescription Anti-Ulcer Drugs

The dramatic nature of innovations in the drug industry can give a firm that introduces a new drug significant market share. But subsequent, equally dramatic innovations by competitors can make this market leadership short-lived. Such leapfrog leadership is one characteristic of markets subject to dynamic competition.

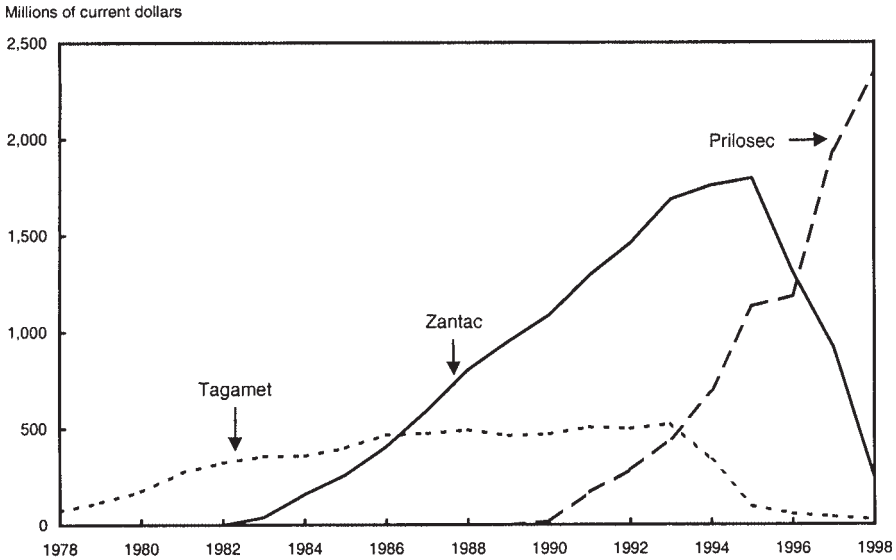
As an example, in 1977 SmithKline introduced the first anti-ulcer prescription drug, Tagamet. Just 6 years later, however, Glaxo plc introduced a competing drug called Zantac. Compared with Tagamet, Zantac had fewer adverse interactions with other drugs and needed to be taken only twice rather than four times a day. Within a year, on a revenue basis, Zantac had gained more than a quarter of the market for prescription anti-ulcer drugs, and by 1989 that share had risen to more than half while Tagamet's had fallen to about a quarter (Chart 3-4).

In 1989 Merck & Co., Inc., introduced a drug developed by Astra AB called Prilosec, the first of a new class of anti-ulcer drugs called proton pump inhibitors. The new drug had to be taken only once a day. Also, studies have shown that it heals a greater percentage of patients than Zantac does in a 4-week period. By 1998 Prilosec accounted for about half of total sales revenue for prescription anti-ulcer drugs, while Zantac's share of sales revenue had fallen to about 5 percent. (In the wake of mergers and other developments, the names of the firms that sell all three drugs have changed.)

This example demonstrates the rapid rate of innovation in the drug industry and how it can quickly render obsolete even highly innovative drugs that companies have spent hundreds of millions of dollars developing. In such a competitive environment, patents play an essential role in encouraging firms to spend the huge resources needed to develop ideas and products that competitors could easily copy in the absence of legal protection.

This example also shows that, even with a patent, a firm can see its market share taken away by another firm that develops an even better drug for the same illness or condition. In this example, Prilosec was introduced into the market well before Zantac's patent expired. Given the substantial upfront investments in drug research and development, companies will be motivated to develop drugs only if successful drugs can achieve high profits and capture a leading market share in the relatively short time before new innovations emerge. In the drug industry, substantial market share can easily be lost in just a few years.

Chart 3-4 **Sales Revenue of Selected Prescription Anti-Ulcer Drugs**
The rise and fall of sales revenue for these three anti-ulcer drugs reflects how dynamic competition can lead to substantial success, but can also make that success short-lived.



Source: IMS Health Incorporated.

policy are needed to avoid incorrect conclusions. Likewise, continuing adjustments are needed to correctly identify markets in which high profits and market leadership cannot be explained by the ongoing nature or pace of innovation, suggesting that the market may indeed not be competitive.

As noted in the discussion of merger policy above, a market's degree of concentration is typically used as a screening mechanism to evaluate competition in that market. Although finding that a market is highly concentrated does not by itself suffice to conclude that competition is limited, finding that it is not highly concentrated usually does suffice to allay any such concern. Thus measures of concentration provide a useful screen, because many markets may not be concentrated enough to warrant further investigation.

However, given the significant role of innovation in markets characterized by dynamic competition, it is common to see one leading firm that, through innovation, has for the time being created a superior product. Although such a market would be highly concentrated, there may in fact be substantial dynamic competition in the market, with new innovations emerging to threaten the leading firm's position. Consequently, because many markets undergoing rapid innovation will have a high measured concentration, such measurements may not be as useful a screening device if dynamic competition is the primary form of competition in that industry. In light of this

shortcoming, the development of effective screening mechanisms to evaluate dynamic competition may be a useful supplement to concentration measures. Such screening mechanisms could allow businesses in innovative industries to better predict the responses of antitrust agencies to their actions, just as the safe harbor provisions relating to concentration measures did in the 1980s.

In assessing competition in a market, antitrust agencies and the courts also examine whether the threat of entry by a firm into that market would be both likely to occur and sufficient to counteract any ability of existing firms to exercise significant market power. However, for it to be adequate to assuage concerns, entry in response to such behavior must generally be able to take place within a period of 2 years, essentially ensuring that the incumbent firm or firms' ability to profitably raise prices is only that durable. As the length of patents indicates, firms may need substantially more than 2 years for profits to provide an adequate return on their research and development investments. Moreover, in a typical assessment of the impact of a merger on competition, the threat of entry can be viewed as adequate to counteract anticompetitive price increases if it would prevent the merging firms from keeping prices significantly above premerger levels. But as Schumpeter pointed out, even if they may take longer than a few years to emerge, innovations in dynamically competitive markets may not only reduce incumbents' profits that are above competitive levels, but indeed threaten the very viability of incumbent companies. Such competition surely threatens the durability of a firm's market power.

Some common tools of antitrust policy may thus be less complete and informative in dynamically competitive markets than in other situations. But just as the antitrust agencies improved on simple concentration measures in assessing competition during the late 1970s and early 1980s, so, too, the existing toolkit can be further augmented to deal with dynamic competition. The central role of innovation in these markets suggests the kind of information that is useful in assessing this type of competition.

In general, antitrust enforcement must continue the effort to understand the patterns, nature, and pace of innovation in a given market. In established industries, the antitrust agencies and the courts can examine firm and industry history to assess the significance of innovative activities. These activities would include research and development expenditures and complementary investments in production or distribution that would have much less value if the product they support lost its market to a competitor's innovation. The risky investments associated with developing innovations go well beyond research and development to include all investments that future innovations could render obsolete.

An industry's history can also provide indications of the fragility of market leadership to substantial innovations in that industry. For instance, the history of innovations in the market for prescription anti-ulcer drugs, reviewed in Box 3-3, suggests that the threat of future innovations will remain an important competitive force. Where such threats are important, one might conclude that the industry is dynamically competitive.

Brand-new industries, of course, lack such a history. Nonetheless, antitrust officials should still endeavor to assess the importance of innovative activity in these markets, and thus the potential significance of dynamic competition. For both new and old markets, the potential for competition from developments in other rapidly innovating fields should also be considered—even if the technologies of the respective fields are fundamentally different—as long as the application of those technologies is converging. For instance, vascular grafts are used today to repair and replace diseased or damaged blood vessels. But any assessment of competition in that market must take into account the potential for substantial innovations in other invasive procedures or in drug therapies that could either reduce the incidence of diseased or damaged blood vessels or provide alternative treatments. In both new and established industries, we must encourage dynamic competition and the benefits of innovation it secures, by updating competition policy appropriately.

Such updating has already taken place with respect to the scope of intellectual property protection and the effect it might have on other firms' abilities to innovate. Although intellectual property protection is important to encourage firms to innovate, it can also be used in ways that hinder the development of future, and potentially competing, innovations by other firms. The FTC and the Justice Department have addressed this possibility in guidelines that recognize the interaction between intellectual property law and antitrust law. These guidelines encourage the development of new technologies and the improvement of existing ones, while seeking to preserve the desired incentives underlying the creation of intellectual property.

Conclusion

Antitrust policy has contributed greatly to the economy by fostering competition and allowing the efficient adaptation of markets to new opportunities. This chapter has showcased some recent changes in the organization of economic activity and market competition and outlined the adjustments that competition policy is making in response.

First, corporate governance and structure continue to evolve, as the rapid pace of merger activity proceeds and hybrid organizational forms such as joint ventures and partial equity stakes continue to be established.

Competition policy should be sensitive to the efficiencies that new structures have brought and can continue to bring to society. Since a large source of these efficiencies may be rooted in managerial and organizational improvements, it is worthwhile for the enforcement agencies to investigate such factors thoroughly.

Second, the growth of multinational enterprises and cross-border mergers will continue to make more goods and services available to consumers at lower cost. But possible anticompetitive concerns arising out of such mergers can now result in reviews by antitrust authorities from many nations. The application of inefficient competition policies worldwide could harm U.S. interests. The United States is working to narrow divergences in countries' competition law and policy through cooperation with other national antitrust authorities, under a number of bilateral cooperation agreements. Through the creation of the International Competition Network, the United States has joined with other nations to facilitate procedural and substantive convergence.

Finally, competition policy in the United States and abroad must address the greater prominence of markets characterized by dynamic competition. Competition policy should take into account that characteristics, such as high profits and substantial market share, that might warrant concern about competition in some markets may mask vigorous dynamic competition among firms in innovation-intensive markets.