3 Property Rights Theory

Coase (1960) initiated a flurry of property rights research that perhaps reached its peak with Alchian and Demsetz (1973). Barzel (1989) and Eggertsson (1990) provide useful discussions of the early property rights research literature. Much of this early property rights literature (with Demsetz [1967], serving as an exemplar of the neoclassical economics tradition) was quite optimistic about the evolution of property rights toward economic efficiency. Three important criteria for efficiency of property rights are (1) universality—all scarce resources are owned by someone; (2) exclusivity—property rights are exclusive rights; and (3) transferability—to ensure that resources can be allocated from low to high yield uses. In Demsetz's (1967) neoclassical economics framework, all three criteria are in place (in the long run).

In some sense, Libecap (1989), and especially North (1990), can be understood as providing historical accounts that challenge this earlier optimistic view of an inevitable evolution of property rights toward economic efficiency. The awarding of a Nobel Prize in economics to Douglass North suggests that, at the least, part of the economics profession has (implicitly) accepted that the evolution of institutional environment change toward economic efficiency often fails.

Students studying the economics of organization should take note that changes in theoretical views do take place. However, to make headway, you need to come prepared with the facts along with an analytical approach (and often a tough skin) to handle the almost inevitable initial resistance by others to new ideas that aim to overturn the conventional wisdom.

We begin this chapter on property rights with Libecap's (1989) *Contracting for Property Rights,* in which Libecap provides substantive research concerning the way property rights are formed. Libecap's research book is a synthesis of theory and history, which emphasizes the complexities of property rights formation. *Contracting for Property Rights*, in my judgment, is one of the best books in the property rights research literature,

a major contribution both to the theory of property rights and to our understanding of economic history. In particular, we learn from Libecap that distributional conflicts present political risks to politicians, giving these politicians incentives to propose regulations that do not seriously upset status quo rankings and that offer only limited relief from property rights economics inefficiencies due to common pool resource losses. Similar incentives and vested interests exist for regulatory agencies.

North (1990) applies his theories of the interplay between institutional evolution and political and economic organization to a range of historical examples, including the development of management structures, insurance, and financial markets. North offers a broad perspective on how institutions persist and change. In particular, North is concerned as much with explaining the evolution of institutional frameworks that induce economic stagnation and decline as with accounting for the successes.

Eggertsson (1990) emphasizes the variety of organizational forms and institutional arrangements that we observe in practice. Eggertsson's approach to explain such variety is to seek a new synthesis of neoclassical economic theory and institutional theory. As Eggertsson views the research literature, three important levels are identified. At the first level, the structure of property rights and forms of organization are explicitly modeled but are treated as exogenous. At the second level, organization form is endogenous, but the fundamental structure of property rights remains exogenous. At the third level, attempts are made to consider both social and political rules, and the structure of political institutions as endogenous in a positive transaction costs world. Eggertsson organizes his book on the basis of these three levels of analysis.

Barzel (1989), in the tradition of Coase (1960), provides a unified structure to analyze exchange, the formation of property rights, and organization. Barzel emphasizes that because of the costliness of measuring accurately all of an asset's attributes, rights are never fully delineated, and property is consequently in danger of appropriation by others due to adverse selection, free-riding behavior, and shirking, among other reasons.

Hart (1995) argues that contractual incompleteness and control are two concepts that can be brought together to understand a number of economic institutions and arrangements. Hart focuses on understanding firms and financial structures. For the purposes of the current book, I focus on the first half of Hart's work—understanding firms. Hart focuses on some fundamental questions: What does *ownership*

mean? What determines the boundaries of the firm? What are the economic implications of contractual incompleteness? What are the roles of nonhuman assets and the nature of authority?

In the 1990s, modern property rights theory (which provides more formalized mathematical models) has gained momentum in organizational economics, and Hart's (1995) work is an exemplar of this modern property rights framework. With the increasing importance of intellectual property rights in our current information age (both early and modern), property rights theory predictably will receive greater attention in strategic management and may prove to spur a growth area for research in the years ahead.

Contracting for Property Rights *(Libecap, 1989)*

How do institutions evolve in response to individual economic incentives, strategies, and choices? Libecap (1989) emphasizes that property rights matter.[1] Property rights provide the basic economic incentive system that shapes resource allocation. What has been largely missing is why property rights take the form that they do. Libecap argues that property rights are formed and enforced by political entities and that property rights reflect the conflicting economic interests and bargaining strength of those affected. Moreover, because today's choices are constrained by yesterday's decisions, history matters.

Property rights are the social institutions that define or delimit the range of privileges granted to individuals of specific resources, such as parcels of land or water. Private ownership of these resources may involve a variety of property rights, including the right to exclude nonowners from access, the right to appropriate the stream of economic rents from use of and investments in the resource, and the rights to sell or otherwise transfer the resource to others. Property rights institutions range from formal arrangements, including constitutional provisions, statutes, and judicial rulings, to informal conventions and customs regarding the allocations and uses of property. Such institutions critically affect decision making regarding resource use and, hence, affect economic behavior and economic performance.

[1]Seminal works in classical property rights theory include Alchian (1965), Alchian and Demsetz (1973), Barzel (1989), Cheung (1969), Coase (1960), Demsetz (1967), and Furubotn and Pejovich (1972).

Because of the huge advantages of secure property rights, economic decision makers often are hypothesized to adopt, or to modify, property rights to mitigate the economic losses of the common pool, as soon as the private benefits of so doing outweigh the private costs. Forces that drive the adjustments in property rights include new market prices and production possibilities to which old arrangements are poorly attuned (Demsetz, 1988, 1995). Davis and North (1971) are explicit in the argument: "It is the possibility of profits that cannot be captured within the existing arrangement structure that leads to the formation of new (or the mutation of old) institutional arrangements" (p. 39).

Despite these optimistic assertions in the (neoclassical) property rights literature, the actual process by which property institutions change, and whether the changes represent an efficient economic solution to a particular social problem, have received much less attention. North (1981) notes, "But the fact that growth has been more exceptional than stagnation or decline suggests that efficient property rights are unusual in history" (p. 6).

Libecap (1989) argues that because certain property rights arrangements can reduce transactions costs in exchange and production, and encourage (sunk cost) investments to promote overall economic growth, such property rights have public goods aspects. As with all public goods, though, there are economic hazards in attempting to change property rights. For example, there may be shirking and uncooperative behavior among the bargaining parties that will affect the institutions that can be established. In bargaining over creating or modifying property rights, the positions taken by the various bargaining parties, including private claimants, bureaucrats, and politicians, will be molded by their private expected gains, as well as by the actions of the other parties.

Libecap (1989) emphasizes that property rights institutions are determined through the political process, involving either negotiations among immediate group members or the lobbying activities that take place at higher levels of government. The political process of defining and enforcing property rights can be divisive because of the distributional implications of different property rights allocations. If influential parties cannot be sufficiently compensated through share adjustments in the political process to win their support, beneficial institutional change (even as modified through contracting concessions) may not occur, and the potential economic gains fostered by the proposed arrangement will be forgone.

Even though society would be better off with the public goods provided by the new property rights, the distributional implications lead influential parties to oppose institutional change. In principle, it is possible to construct a side payment scheme that would compensate those who otherwise would oppose a desirable change in property rights. But in practice, devising perfectly compensating side payments to bring agreement encounters formidable obstacles, including questions of who would receive side payments, who should pay, what size the compensation should be, and what form the compensation should take. Libecap (1989) argues that distributional conflicts, and efforts to address such conflicts, can block institutional change or so influence the property rights arrangement that what ultimately emerges as institutional change bears little resemblance to that which was initially proposed.

The roles of time and precedent suggest that there may be historical path dependences for institutional change. Past property rights decisions serve to limit the menu of possible institutional solutions to varying economic problems. Libecap (1989) states that recent historical investigation suggests a less optimistic view of property rights change is in order. This conclusion is based on examination of the role of interest groups and conflicts among these groups over the distributional effects of property law and government regulation.

Analytical Framework. Libecap (1989) notes that the nature in which property rights are defined and enforced fundamentally impacts the performance of an economy for at least two reasons. First, by assigning ownership to valuable resources and by designating who bears the economic rewards and costs of resource-use decisions, property rights institutions structure incentives for economic behavior within the society. Second, by allocating decision-making authority, the prevailing property rights arrangement determines who the key actors are in the economic system.

In contracting over proposed property rights, the bargaining positions taken by the various parties depend on how these parties view their economic welfare under the new arrangement relative to the status quo. Estimates of the likely net economic gains or losses from institutional change faced by each party require an evaluation of the overall productive possibilities with the new property rights arrangement and the distribution of economic rents it authorizes. The bargaining parties must see their economic welfare improved, or at least made no worse off, for them to support institutional change, and each party has an incentive to seek as large a share of economic rents under the new arrangement as possible. This competition for the range of economic opportunities made

possible by changes in property rights is costly to society. Competition among the contracting parties uses resources, and such competition leads to changes in the definition and assignment of property rights that affect the nature and size of aggregate economic benefits that are possible. The side-payment schemes reached through the political process may be too incomplete to resolve the distributional conflicts needed for more than minimal institutional change to occur at any time.

Primary motivations for contracting for property rights are the aggregate (common pool) losses that arise under conditions of poorly defined property rights (e.g., open fisheries, oil field dissipation). In these circumstances, resource values fall for several reasons. First, because property rights to the resource are not assigned, individuals in their production decisions do not have to consider the full social costs of their activities. Individuals use the resource too rapidly at any time, relative to interest rate and price projections. Further, competitive pressures under conditions of poorly defined property rights encourage short-time horizons in production. The economic incentive to invest (e.g., in new technology) is reduced because investors cannot anticipate that they will capture any of the resulting economic returns due to insecure property rights.

Second, resource values fall because exchange and reallocation of the resource to higher valued uses become more costly and less effective if property rights are absent. Demsetz (1967) argues that an assignment of property rights is a prerequisite before decentralized price-making markets can form to define asset prices. Well-defined asset prices are needed to reflect underlying demand and supply conditions and to facilitate socially valuable exchange among economic agents. Without the more complete market signals possible when property rights are well defined, resources may not flow smoothly to higher valued uses as economic conditions change. Whether or not the more complete defining of property rights is socially beneficial depends on the magnitude of common pool losses, the nature of contracting costs to resolve such losses, and the economic costs of defining and enforcing property rights (Coase, 1960).

In Libecap's (1989) analytical framework, pressures to change existing property rights can emerge from the following factors:

- Shifts in relative prices
- Changes in production and enforcement technology
- Shifts in preferences and other political parameters

A number of implications can be drawn from Libecap's (1989) analytical framework:

1. All things being equal, the greater the size of the anticipated aggregate economic benefits of institutional change (the greater the economic losses of the common pool), the more likely new property rights will be sought and adopted because it is more likely that a politically acceptable share arrangement can be devised by politicians to make enough influential parties better off so that institutional change can proceed.
2. The larger the number of competing interest groups, the more likely distributional conflicts will block or delay institutional change because the greater the number of competing interest groups with a stake in the new definition of property rights, the more claims that must be addressed by politicians in building a consensus for institutional change.
3. The greater the heterogeneity of competing interest groups, the more likely distributional conflicts will block or delay institutional change. Important differences across the parties in information regarding the resource, as well as in production costs, size, wealth, and political experience, will make the formation of winning political coalitions, and a consensus on the proposed assignment or adjustment of property rights, more difficult.
4. Distributional conflicts will be intensified if there are known serious information asymmetries among the competing parties regarding the evaluation of individual claims. These distributional conflicts will occur quite aside from any strategic bargaining efforts if private estimates of the economic value of current property rights and of potential economic losses from the new system cannot be conveyed easily or credibly to politicians and the other bargaining parties.
5. The greater the concentration of wealth under the proposed property rights allocation, the greater the likelihood of political opposition and the less likely institutional change will be adopted without modification by politicians. In these circumstances, enough influential parties may see their economic welfare made worse, or at least not improved, by the change that political support for such change does not materialize.

Contracting for the Unitization of Oil Fields. Libecap (1989) observes that since the first discovery of petroleum in the United States in 1859, oil production has been plagued by serious common pool losses. These common pool losses arise as numerous firms compete for migratory oil lodged in subsurface reservoirs. Under the common rule law of capture, private property rights to oil are assigned only upon extraction. For each of the firms on a reservoir, a plan of dense-well drilling and rapid production allows the firm to drain oil from its neighbors and to take advantage of the low extraction costs that exist early in oil field development. In new, flush oil fields, subsurface pressures are sufficient to expel oil without costly pumping or injection of water or natural gas into the reservoir to drive oil to the surface.

Libecap (1989) notes that under these conditions, when there are multiple firms on a reservoir, each firm has an economic incentive to

drill competitively and to drain to increase its share of oil field economic rents, even though these individual actions lead to aggregate common pool losses. Economic rents are dissipated as capital costs are driven up with the drilling of excessive numbers of wells (more than geological conditions require or price and interest rate projections warrant) and with the construction of surface storage, where the oil can be held safe from drainage by other firms. Unfortunately, once in surface storage, oil is vulnerable to fire, evaporation, and spoiling. Rapid extraction also increases production costs as subsurface pressures are vented prematurely, forcing the early adoption of pumps and injection wells. Total oil recovery falls as pressures decline because oil becomes trapped in surrounding formations, retrievable only at high extraction costs. Finally, economic rents are dissipated as production patterns diverge from those that would maximize the economic value of output over time. Some estimates indicate that oil recovery rates of only 20% to 25% occur with competitive extraction, whereas recovery rates of 85% to 90% were thought possible with controlled withdrawal.

A complete solution to the common pool problem is oil field–wide unitization. Under unitization, production rights are delegated through negotiations to a single firm, the unit operator, with net revenues apportioned among all parties on the field (including those that would otherwise be producing). As the only producer on the field and a residual profit claimant, the unit operator has an economic incentive to maximize field rents. Accordingly, unitization results in important economic gains: a time stream of output that more closely approximates the rent-maximizing pattern, increased oil recovery (2 to 5 times greater than unconstrained production), and reduced wells and other capital costs. Despite these reasons for mitigating the substantial losses involved in common pool crude oil production, complete fieldwide unitization had not been widespread. As late as 1975, only 38% of Oklahoma production and 20% of Texas production came from fieldwide units.

Libecap (1989) argues that the key issue in blocking agreement on the voluntary unitization of oil fields is the distributional conflict over the share formula to divide the net proceeds of unit production among the various contractual parties. Uncertainties and information asymmetries regarding the economic valuation of individual firms oil leases, which are the basis for unit shares, are important contributors to the disagreements that block unitization, even in the presence of large and uncontroversial aggregate economic gains from unit formation. In share negotiations, two serious problems arise. First, unitization contracts must assign, once and for all, shares at the time the contract

is completed. This assignment is needed because, in reservoir dynamics after unitization, it is impossible to link unit production to particular leases, which would be necessary for adjusting shares. A second problem in unitization contracting is general uncertainty and asymmetrical information regarding relative preunitization lease values, which determine unit shares. These serious contractual problems block agreement on lease value estimates and proposed shares in unit economic rents.

Besides the information issues, small lease owners were given preferential drilling permits by regulatory authorities under prorationing controls adopted by states in the absence of widespread unitization. Differences in lease value estimates can block consensus on any side payments to draw potential holdouts into agreement. Under unanimity voting rules, small firms could delay or block the formation of fieldwide units. The empirical evidence that Libecap (1989) presents supports the notion that as fieldwide primary production nears an end, unitization agreements become more likely. By that time, information asymmetries among the firms become less important as all leases near primary depletion.

The failure of unitization to be widespread, despite significant aggregate economic gains from unitizing oil production, is another example of how distributional conflicts over rental shares can limit the adoption of property rights to increase economic efficiency. *The analysis presented by Libecap (1989) suggests that swift institutional responses to common pool losses to promote more rational resource use and greater economic growth cannot be taken for granted. Distributional conflicts inherent in any new property rights arrangement can block, or critically constrain, the institutions that can be adopted.* More attention, accordingly, should be directed to the distributional implications of property rights arrangements, to the identity and preferences of the various bargaining parties, and to the nature of the side-payment schemes adopted. And, perhaps even more important, attention should be directed to the history of past political agreements if the observed variations in property rights and associated economic and strategic behaviors are to be more fully understood.[2]

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[2]Libecap and Wiggins (1985) provide empirical evidence of the influence of private contractual failure on regulation for the case of oil field unitization. Kim and Mahoney (2002) provide a fairly comprehensive collection of references on the property rights approach and provide resource-based and property rights perspectives concerning oil field unitization. Finally, elements of the oil field unitization case discussed in this chapter provide insight on the conflicts between Kuwait and Iraq that led to the Persian Gulf War of 1990–1991 (for some details, see Milgrom & Roberts, 1992, p. 296).

Libecap (1989) provides an exemplar for students studying the economics of organization on the use of case studies to build up and support a theoretical argument. Libecap, in my judgment, convincingly shows that the assertion that property rights will naturally move toward economic efficiency is frequently glib and inaccurate.

Institutions, Institutional Change, and Economic Performance *(North, 1990)*

Now that we have studied Libecap (1989), we next examine the work of North (1990). Early in his career (e.g., Davis & North, 1971), North held an (overly) optimistic view about the evolution of property rights toward economic value creation. In contrast, North (1990) later emphasized the persistence of inefficient property rights regimes throughout economic history to provide a main case explanation for why the whole world is not economically developed. The objective of North's research book is to provide an analytical framework to integrate institutional analysis into economics and economic history. North also provides us with a new understanding of historical change.

North (1990) examines the nature of institutions and the consequences of institutions for economic and societal performance and then outlines a theory of institutional change, not only to provide a framework for economic history but also to explain how the past influences the present and future, the way incremental institutional change affects the choice set of decision makers at a moment in time, and the nature of path dependencies. The primary objective of this research book is to achieve an understanding of the differential performance of economies through time.

North (1990) ties together the threads and illustrates the relationships between institutions, transaction costs, and transformation (production) costs. North then explores organizations and the way that they interact with institutions and argues that the nature of incremental institutional change, together with the imperfect way by which decision makers interpret their environment and make choices, accounts for path dependencies and makes history relevant.

North (1990) asks the following question: What combination of institutions best permits capturing the economic gains from trade? Institutions are defined as any constraint humans devise to shape their interactions and organizations, created to take advantage of the opportunities presented by institutions in shaping the development of

economies. The importance of institutions arises from the costliness of measuring what is valuable, from protecting rights, and from policing and enforcing agreements.

North (1990) emphasizes that history matters. History matters not just because we can learn from the past but also because the present and the future are connected to the past by the continuity of a society's institutions. Today's decisions and tomorrow's choices are shaped by the past. And the past can only be made intelligible as a story of institutional evolution.

For North (1990), the central focus is on the problem of human cooperation—specifically, the cooperation that permits economies to capture the economic gains from specialization and trade. The evolution of institutions that create a hospitable environment for cooperative solutions to complex exchange provides for economic growth.

North (1990) argues that institutions reduce uncertainty by providing a structure to everyday life. Institutions are a guide to human interactions, and these institutions define and limit the set of choices of individuals. Institutions include any form of constraint that humans devise to shape human interaction. Are institutions formal or informal? Institutions can be either, and North considers both formal constraints—such as rules that humans devise—and informal constraints—such as conventions and codes of behavior. Institutions may be created, as was the United States Constitution, or institutions may evolve over time, as does the common law. An essential part of the functioning of institutions is the costliness of ascertaining violations and the severity of punishment.

North (1990) makes an important distinction between institutions and organizations. Organizations include political bodies (e.g., political parties, trade unions, family farms, cooperatives), social bodies (e.g., churches, clubs, athletic associations), and educational bodies (e.g., schools, universities, vocal training centers). Organizations are groups of individuals bound by some common purpose to achieve objectives. Modeling organizations requires analyzing governance structures and organizational capabilities and understanding how learning by doing determines the organization's success over time (Oliver, 1997). The institutional framework fundamentally influences both what organizations come into existence and how organizations evolve. In turn, organizations influence how the institutional framework evolves.

North (1990) emphasizes that institutions are a creation of humans and suggests that integrating individual choices with the constraints that institutions impose on choice sets is a major step toward unifying

social science research. The major role of institutions in society is to reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interactions. Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions, and codes of conduct are much more impervious to deliberate policies. These cultural constraints not only connect the past with the present and future but also provide us with a key to explaining the path of historical change.

North (1990) maintains that the central puzzle of human history is to account for the widely divergent paths of historical change. North notes that although we do observe some convergence among leading industrial nations that trade with each other, an overwhelming feature of the last 10 millennia is that we have evolved into radically different religious, ethnic, cultural, political, and economic societies. Furthermore, the economic gap between rich and poor nations, between developed and underdeveloped nations, is as wide today as it ever was, and perhaps a great deal wider than ever before.

North (1990) then asks the following: What accounts for societies experiencing long-run stagnation or an absolute decline in economic well-being? North and Thomas (1973) make institutions the determinant of economic performance and relative price changes the source of institutional change. North and Thomas provide an essentially efficiency-based explanation: Changes in relative prices create economic incentives to construct more efficient institutions. North (1981), however, abandons the efficiency view of institutions. *Rulers devised property rights in their own vested interests, and transaction costs resulted in typically inefficient property rights prevailing. As a result, it was possible to account for the widespread existence of property rights throughout history (and in the present) that did not produce economic growth.*

North (1990) argues that institutions highly influence the opportunities in a society. Organizations are created to take advantage of those opportunities, and, as the organizations evolve, they alter the institutions. The resultant path of institutional change is shaped by the lock-in that comes from the tightly coupled relationship between institutions and organizations that have evolved as a consequence of the economic incentive structure provided by those institutions and the feedback process by which humans perceive, and react to, changes in the (subjective) opportunity set.

Actors frequently must act on incomplete information and process the information that they do receive through mental constructs, which can result in persistently inefficient paths. Transaction costs in political

and economic markets make for inefficient property rights, but the imperfect subjective models of the actors as they attempt to understand the complexities of the problems they confront can lead to the persistence of inefficient property rights.

North (1990) states that there is a persistent tension in the social sciences between the theories we construct and the evidence we compile about human interaction in the world around us. This tension is most striking in economics, where the contrast between the logical implications of neoclassical microeconomic theory and the performance of economies (however defined and measured) is startling. *North argues that the coercive power of the state has been employed throughout most of history in ways that have stymied economic growth.*

North (1990) maintains that the traditional behavioral assumptions of orthodox microeconomic theory have prevented economists from coming to grips with some fundamental issues that have impeded progress in the social sciences. In particular, North argues that the motivation of actors is more complicated (and their preferences less stable) than assumed in the received wisdom. Further, microeconomic theory implicitly assumes that actors possess cognitive systems that provide true models of the worlds about which they make choices. North insists that this implicit assumption is patently wrong for most of the important problems with which institutional economics and organizational economics are concerned. Individuals make choices based on subjectively derived models that diverge among individuals and the information of actors is so incomplete that in most cases these divergent subjective models show no tendency to converge. Only when we understand these modifications in the behaviors of the actors can we hope to make sense out of the existence and structure of institutions and to explain the direction of institutional change.

North (1990) argues that institutional analysis requires that we delve into two particular aspects of human behavior: motivation and deciphering the environment. Many cases are not simply of wealth-maximizing behavior but of altruism and of self-imposed constraints, which radically change the outcomes with respect to the choices that people actually make. Similarly, we find that people decipher the environment by processing information through preexisting mental constructs through which they understand the environment and solve the problems they confront.

North (1990) notes that the work of Simon (1982) captures the essence of why the subjective and incomplete processing of information plays a crucial role in decision making. Simon's work is useful for

accounting for ideology, based on subjective perceptions of reality, playing a major role in humans' choices. Simon's work brings into play the complexity and incompleteness of our information and the fumbling efforts we make to decipher information. North concludes that the regularized interactions we call institutions may be inadequate to deal with the economic problems at hand.

Culture can be defined as the transmission from one generation to the next, the teaching and replication of knowledge, values, and other factors that influence behaviors. North (1990) argues that culture provides a language-based conceptual framework for encoding and interpreting the information that the senses are presenting to our brain. Importantly, the cultural filter provides continuity and stability. Order is the result of a dense social network where people have an intimate understanding of each other. In the short term, culture defines the way individuals process and use information and hence may affect the way informal constraints are specified. Conventions are culture specific, as indeed are informal rules.

Formal Constraints. North (1990) observes that formal rules can complement and increase the effectiveness of informal rules. Formal rules also may be enacted to modify, revise, or replace informal constraints. Formal rules include political (and judicial) rules, economic rules, and contracts. Economic rules define property rights and, as a crude approximation, economic rules are derived from economic self-interest. Property rights are specified and enforced by political decision making, but the structure of economic interests will also influence the political structure. Indeed, there is a substantial amount of property rights literature that looks on the development of property rights as a simple function of changes in economic costs and economic benefits. North argues that this simplified approach needs modification to account for the obvious persistence of inefficient property rights.

Enforcement. North (1990) argues that the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment in the third world. In developed countries, effective judicial systems include well-specified bodies of law and agents, such as lawyers, arbitrators, and mediators, and one has some confidence that the merits of a case rather than private payoffs will decisively influence outcomes. In contrast, enforcement in the third world economies is uncertain not only because of ambiguity of legal doctrine (a measurement cost) but also because of uncertainty with respect to behavior of the judicial system.

Institutions. North (1990) observes that it takes resources to define and protect property rights and to enforce agreements. Institutions together with the technology employed determine those transaction costs. It takes resources to transform inputs of land, labor, and capital into the output of goods and services, and that transformation is a function not only of the technology employed but of the institutions as well. Therefore, institutions play a key role in the costs of production. The interplay between techniques, institutions, transformation costs, and transaction costs makes clear that the relationships between them are complex.

North (1990) submits that contrasting the institutional framework in countries such as the United States, England, France, Germany, and Japan with Third World countries makes clear that the institutional framework is the critical success factor of economies, both cross-sectionally as well as through time. North further argues that the institutional framework shapes the direction of the acquisition of knowledge and capabilities, and that direction will be the decisive factor for the long-run development of that society. Path dependence is the key to an analytical understanding of long-run change in property rights. Property rights and economic incentives are the underlying determinants of economic performance. Bringing property rights and economic incentives to the foreground focuses attention where it belongs, on the key success factors for the economic performance of societies. One gets efficient institutions by a polity that has built-in economic incentives to create and enforce efficient property rights.

North (1990) concludes that we need to know much more about culturally derived norms of behavior and how such norms of behavior interact with formal rules to get better answers to such issues. We are just beginning the serious study of institutions in organizational economics and strategic management. The promise is there. We may never have definitive answers to all our questions. But students in the next generation of research can do better in both institutional economics and organizational economics research, which will contribute greatly to the evolving science of organization.

An Economic Analysis of Property Rights *(Barzel, 1989)*

The third property rights book for discussion in this chapter is by Barzel (1989), *An Economic Analysis of Property Rights,* and the fourth book is an overlooked classic by Eggertsson (1990), *Economic Behavior*

and Institutions. The Barzel book is complementary to Libecap (1989), and the Eggertsson book is especially complementary to North (1990). In fact, Eggertsson notes his intellectual debt to Douglass North: "North's vision that the economic approach, augmented by transaction costs and property rights, is a general tool for the study of society at all levels has inspired this book" (p. xiv).

Barzel (1989) notes that because transacting is costly, as an economic matter property rights are never fully delineated. Property rights of individuals over resources consist of the rights, or the powers, to consume, obtain income from, and alienate those resources. Obtaining income from and alienating resources require exchange, and exchange is the mutual ceding of rights. Legal rights, as a rule, enhance economic rights, but legal rights are neither necessary nor sufficient for the existence of the economic rights. The rights people have over resources (including themselves and other people) are not constant; they are a function of their own direct efforts at protection, of other people's capture attempts, and of government protection.

Barzel (1989) views the concept of property rights to be closely related to that of transaction costs. Transaction costs are defined as the economic costs associated with the transfer, capture, and protection of rights. When transaction costs are positive, rights to resources cannot be perfectly delineated. Exchange that otherwise would be attractive may be forsaken because of such exchange costs.

What underlies this costliness of transacting? What are the factors that prevent people from realizing the full economic value of their resources? Commodities have many attributes whose levels vary from one specimen of a commodity to another. The measurement of these levels is too costly to be comprehensive or entirely accurate. How difficult it is to obtain full information in the face of variability fundamentally determines how difficult it is to delineate rights. *Because it is costly to measure commodities fully, the potential of wealth capture is present in every exchange.* The opportunity for wealth capture is equivalent to finding property in the public domain; in every exchange, then, some wealth spills over in the public domain, and individuals spend resources to capture this economic wealth. Whereas people always expect to gain from exchange, they also always spend resources on the capture of economic wealth. Individuals maximize their (expected) net gains, the gains from exchange as conventionally perceived net of the economic costs of effecting exchange.

The sale of cherries illustrates the phenomenon of wealth capture. Obvious problems of information present themselves when cherries are

exchanged. Customers must spend resources to determine whether a store's cherries are worth buying and to determine which particular cherries to buy. Store owners who allow customers to pick and choose cannot easily prevent these customers from eating cherries after they have decided whether or not to buy the cherries, nor can store owners prevent customers' careless handling of cherries. Indeed, the process of picking and choosing itself allows wealth capture in the form of excess choosing. Some of the cherries' attributes, then, are placed in the public domain. The high cost of information results in transaction costs: economic costs that would not arise if the owner and the consumer of cherries were the same person. If information about the cherries was costless, their initial owner would not have to relinquish any rights, and pilfering, damage, and excess choosing would be avoided. In business reality, such public domain problems are unavoidable; people can take steps, however, to reduce the associated economic losses.

Contracts govern the exchange of property rights and are central to the study of such rights. The exchange value of a resource is a function of the gross income the resource can generate and of the transaction costs of measuring and policing its exchange. These economic costs also determine the pattern and the degree of ownership. The ownership of a resource's attributes is expected to gravitate into the hands of those people who are most inclined to affect the income flows that the attributes can generate.

Barzel (1989) maintains that the property rights transaction costs model can generate a better understanding of the allocation of resources and of the interaction of this allocation with economic organization. The research literature that assumes that the economic costs of transactions are zero and that all property rights are perfectly well delineated is incapable of dealing with a vast array of actual observed practices. Particularly glaring is the inability of such an approach to explain why exchange parties would ever impose restrictions on each other. The property rights approach is capable of addressing such issues, and we continue our property rights study with Eggertsson (1990).

Economic Behavior and Institutions *(Eggertsson, 1990)*

Eggertsson (1990) considers the costs of transacting and the allocation of resources; transaction costs and efficiency; the quality dimensions of goods and the costs of measurement, property rights, and their

dimensions; the partitioning of property rights; property rights and contract theory; the emergence of property rights; competition and the costs of alternative economic organizations; and economic outcomes. This research book provides a clear structure to and balanced overview of the property rights literature. Eggertsson (1990) provides a mature yet compact presentation of property rights research.

Eggertsson (1990) observes that organizations and institutions are not invariant; organizations and institutions vary with time and location, with political arrangements and structures of property rights, with technologies employed, and with physical qualities of resources and services that are exchanged. In fact, production involves not only the physical transformation of inputs into outputs but also the transfer of property rights between the owners of resources and labor services.

Eggertsson (1990) refers to the rights of individuals to use resources as property rights. A system of property rights is a method of assigning to particular individuals the authority to select, for specific goods, any use from an unprohibited class of uses. The rights of individuals to the use of resources (i.e., property rights) in any society are supported by the forces of etiquette, social custom, ostracism, and formal laws that are backed up by the states' power of coercion.

It is common to distinguish three categories of property rights: First, there are the rights to use a resource, including the right to transform physically a resource. Second, there is the right to earn income from a resource and contract over the terms with other individuals. Third, there is the right to transfer permanently to another party ownership over a resource—that is, to alienate or sell a resource.

The enforcement of property rights includes excluding others from the use of scarce resources. Exclusive ownership calls for costly measurement and delineation of resources and enforcement of ownership rights. The economic value of exclusive ownership rights depends, ceteris paribus, on the costs of enforcing those rights—that is, the costs of excluding others, which ultimately depends on coercion. The enforcement of exclusive rights is usually undertaken by both individual owners and by the state.

An economic problem arises when property rights over a valuable resource—for example, the rights to the air over the factory and the neighborhood—have not been fully delineated. In fact, the dispute between the factory and the neighborhood community involves a struggle over access to a common property resource. Once ownership over the atmosphere is established, the economic problem can be

resolved. In the real business world, we often find that rights to valuable resources are not fully delineated. Reasons for why these property rights are not fully delineated include a weak state, high measurement costs relative to the economic value of a resource, rapid economic change, and struggles over the distribution of wealth.

Property rights to a resource are often partitioned. For example, in the case of land, person A and person B may possess the right to grow wheat on the land. Person C may possess the right to dump ashes on the land. Person D may possess the right to fly an airplane over the land. And each of these rights may be transferable. In sum, private property rights to various partitioned uses of land are "owned" by different persons.

According to the so-called Coase (1960) theorem, the initial partitioning of property rights does not matter for the allocation of resources (ignoring wealth effects) when all rights are freely transferable and the costs of transacting are zero. But when transaction costs are introduced, the role of the state can have a crucial effect on resource allocation. Negotiation costs and other transaction costs may block the reassignment of rights, and the initial partitioning of property rights by the state may have important consequences for the output of an economy. Thus, the property rights approach is not complete without a theory of the state.

Eggertsson (1990) notes that the structure of a contract depends on the legal system, social customs, and the technical attributes of the resources involved in exchange. The more detailed the legal framework and the stronger the ties of custom and social control, the less specific the written contracts. The state, by using its police power and the courts, assists private individuals in enforcing legitimate contracts and thus lowers the costs of exchange, particularly when the state uses its power to enforce contracts in a systematic and predictable manner. In a business world of positive transaction costs, the distribution of political power within a country and the institutional structure of its rule-making institutions are critical success factors in economic development.

Demsetz (1967) offers an optimistic theory of property rights: "Property rights develop to internalize externalities when the gains of internalization become greater than the cost of internalization" (p. 350). Eggertsson (1990) notes that *characteristic of this optimistic view, the formulation of decision making with regard to property rights is solely in terms of private benefits and private costs. The theory does not deal with the free-riding problems that plague group decision, nor is there*

an attempt to model political processes. However, as Libecap (1989) demonstrated earlier in this chapter, the state does not always act to minimize costs and maximize economic value. In particular, the state governments of Texas and Oklahoma failed to design rules that encouraged the unitization of oil fields.

Eggertsson (1990) argues that a rudimentary knowledge of economic history or modern economic systems rules out Demsetz's (1967) optimistic model as a general theory. One of the first steps to modify the optimistic model of property rights involves linking this model to the interest-group theory of legislation and government. Eggertsson (1990) refers to this extension of the optimistic model as the *interest-group theory of property rights.*

The interest-group theory of property rights takes the fundamental social and political institutions of the community as given and seeks to explain the structure of property rights, in various industries, in terms of interactions between interest groups in the political market. Property rights, which serve the narrow self-interest of special interest groups but cause substantial output losses to the community as a whole, typically are explained in terms of transactions costs, free-riding, and asymmetrical information. Eggertsson (1990) concludes (along with North [1990]) that there is overwhelming historical evidence to support the proposition that states typically do not supply structures of property rights that are appropriate for placing the economy close to the technical production frontier.

Firms, Contracts, and Financial Structure *(Hart, 1995)*

The first four books in this chapter have been in the classical property rights literature. I conclude this chapter with the modern (more formalized) property rights theory (e.g., Grossman & Hart, 1986; Hart & Moore, 1990) and the exemplar work of Hart (1995), *Firms, Contracts, and Financial Structure.* Hart's works (1989, 1995) focus on the boundary and scope of the firm in the market economy and describe an incomplete contracting or property rights approach to both explain and predict firm-level vertical integration decisions. Hart (1995) emphasizes the meaning and importance of asset ownership.

Hart (1995) provides a framework for thinking about firms and other kinds of economic institutions. The basic idea is that firms arise in situations where people cannot write complete contracts and where the allocation of control is therefore important. Given that people write an

incomplete contract, it is clear that revisions and renegotiations will take place. In fact, the contract is seen as a suitable starting point for such renegotiations rather than specifying the final outcome. Hart (1995) submits that because contracts are incomplete, the ex post allocation of control matters. Indeed, these two ideas, contractual incompleteness and the ex post allocation of control, can be used to understand a number of economic institutions.

Property rights theory focuses on how control rights are allocated in a contractual relationship when contracts are incomplete. Hart (1995) notes that in principal-agent theory, it is supposed that it is costless to write a contract. An implication is that an optimal contract will be comprehensive in the sense that the optimal contract will stipulate each person's obligations in every conceivable eventuality and impose large economic penalties if anybody fails to live up to these obligations. Control issues are irrelevant in the principal-agent model since an optimal comprehensive contract will not be renegotiated.

Hart (1995) also observes that transaction costs theory comes closest to the framework of the modern property rights theory. However, although transaction costs theory puts a lot of emphasis on the economic costs of writing contracts and the consequent contractual incompleteness, less attention is paid to the idea that institutional arrangements are designed to allocate control rights among agents.

The Meaning of Ownership. Hart (1995) points out that scholars have written a great deal about why property rights are important and, in particular, why it matters whether a machine, say, is privately owned or is common property. However, there has been less success in explaining why it matters who owns a piece of private property. To understand the difficulty, consider a situation where I want to use a machine initially owned by you. One possibility is for me to buy the machine from you; another possibility is for me to rent the machine from you. If contacting costs are zero, we can sign a rental agreement that is as effective as a change in ownership. In particular, the rental contract can specify exactly what I can do with the machine, when I can have access to it, what happens if the machine breaks down, what rights you have to use the machine, and so on. Given this possibility, however, it is unclear why changes in asset ownership ever need to take place.

In a business context where there are positive transaction costs, however, renting and owning are no longer economically equivalent. If contracts are incomplete, not all the uses of the machine will be specified in all possible eventualities. The economic question then arises:

Who chooses the unspecified uses? A reasonable approach is that the owner of the machine has this property right; that is, the owner has the residual rights of control over the machine. For example, if the machine breaks down or requires modification and the contract is silent about this contingency, the owner can decide how and when the machine is to be repaired or modified. It is now possible to understand why it might make sense for me to buy the machine from you rather than to rent the machine from you. If I own the machine, I will have all the residual rights of control. To put it another way, if the machine breaks down or needs to be modified, I can ensure that the machine is repaired or modified quickly, so that I can continue to use the machine productively. Knowing this possibility, I will have a greater economic incentive to look after the machine, to learn to operate the machine properly, and to acquire other machines that create a synergy with this machine.

The Boundaries of the Firm. Once we recognize that contracts are incomplete and transaction costs are positive, then the boundaries of the firm matter for economic efficiency. Specifically, Hart (1995) argues that firm boundaries are chosen to allocate control rights optimally among the various parties to a transaction. A merger between firms with highly complementary assets enhances economic value. If two highly complementary firms have different owners, then neither owner has real control since neither can do anything without the other. It is better to give all the control rights to one of the owners through a merger.

Agency Theory. Hart (1995) observes that neoclassical microeconomic theory ignores all economic incentive problems within the firm. Over the last 20 years or so, a branch of the organizational economics research literature—principal-agent theory—has developed that tries to rectify this neglect of an essential organizational economic problem. I discuss in more detail principal-agent theory in the next chapter. Hart (1995) argues that principal-agent theory leads to a richer and more realistic portrayal of firms but that principal-agent theory leaves unresolved the basic issue of the determinants of firm boundaries.

Hart (1995) notes that there is now a vast research literature that analyzes the form of the optimal economic incentive scheme under specified circumstances. Moreover, the basic principal-agent problem described has been extended in a number of directions. Among other things, agency theorists have allowed for repeated relationships, several agents, several principals, several dimensions of actions for the agent, career concerns, and reputation effects.

As a result of all this research, a rich set of results about optimal economic incentive schemes has been obtained. However, although these results can throw important light on the determinants of managerial compensation packages and on certain aspects of the organization of production, the agency approach does not pin down the boundaries of the firm (or say much about the internal organization of firms).

Hart (1995) points out that agency theory does not distinguish an optimal contract written by independent firms and internal transfers between divisions of a firm, and yet economically they are quite different. The principal-agent theory is consistent with there being many small, independent firms linked by optimal arm's length contracts, but this theory is also consistent with there being one large firm, consisting of a large number of divisions linked by optimal economic incentive contracts. Clearly, there is something missing from the agency theory of the firm (just as there is something missing from the neoclassical theory of the firm).

The Distinction Between Comprehensive and Incomplete Contracts. Hart (1995) argues that one important factor missing from the principal-agent view is the recognition that writing a (good) contract is itself costly (Coase, 1988; Williamson, 1985). Hart (1995) maintains that although the optimal contract in a standard principal-agent model will not be first-best (since it cannot be conditioned directly on variables like effort that are observed by only one party), the optimal contract in a standard principal-agent model will be comprehensive in the sense that the principal-agent model will specify all parties' obligations in all future states of the world, to the fullest extent possible. As a result, there will never be a need for the contractual parties to revise or renegotiate the contract as the future unfolds. The reason is that, if the contractual parties ever changed or added a contract clause, this change or addition could have been anticipated and built into the original (comprehensive) contract. One would also not expect to see any legal disputes in a comprehensive contracting world. The reason is that, since a comprehensive contract precisely specifies everybody's obligations in every eventuality, the courts should simply enforce the contract as it stands in the event of a dispute.

The Sources of Transaction Costs. Hart (1995) notes that in business reality, contracts are not comprehensive and are revised and renegotiated all the time. According to the transaction costs research literature, renegotiation is a consequence of three factors missing from the standard principal-agent model:

- In a complex and highly unpredictable business world, it is difficult for people to think far ahead and to plan for all the various contingencies that may arise.
- Even if individual plans can be made, it is hard for the contracting parties to negotiate about these plans, not least because the contractual parties have to find a common language to describe states of the world and actions with respect to which prior experience may not provide much of a guide.
- Even if the contractual parties can plan and negotiate about the future, it may be difficult for them to write their plans down in such a way that, in the event of a dispute, an outside authority—a court, say—can figure out what these plans mean and enforce these plans.

Hart (1995) concludes that as a result of these three contracting costs, the parties will write a contract that is incomplete. That is, the contract will contain gaps and missing provisions.

The Economic Implications of Contractual Incompleteness. Hart (1995) notes that, as observed, an incomplete contract will be revised or renegotiated—or both—as the future unfolds. In fact, given that the contractual parties can fill in the gaps as they go along, one may ask why contractual incompleteness matters. The reason is that the renegotiation process imposes several transaction costs. Some of these costs are ex post costs incurred at the renegotiation itself, and others are ex ante costs incurred in anticipation of renegotiation.

First, the contractual parties may engage in a great deal of haggling over the terms of the revised contract. Argument about division of surplus serves no overall productive purpose, and, to the extent that haggling is time-consuming and wastes resources, such haggling is inefficient. Second, there may be costly legal disputes because an incomplete contract will be ambiguous, and the contractual parties will look to the courts to resolve the ambiguity. Third, not only may the process of ex post bargaining be costly, but also, to the extent that the contractual parties have asymmetric information, the contractual parties may fail to reach an efficient agreement.

Hart (1995) argues that if these three costs are high, it must be because there is something binding the partners together and making it difficult for them to switch at the recontracting stage. The leading candidate for that "something" is an ex ante relationship-specific investment, that is, a prior strategic commitment, which creates economic value if the contractual parties' economic relationship extends over time.

Hart (1995) maintains that once the existence of relationship-specific investments is recognized, it becomes apparent that there can be a third cost of contractual incompleteness that may dwarf the haggling and

ex post inefficiency costs. Specifically, because contracts are incomplete, the contractual parties may be deterred from making the relationship-specific (sunk cost) investments that would be optimal in a first-best world. Given each contractual party's fear that the other party will hold it up at the renegotiation stage, the contractual parties are likely to make investments that are relatively nonspecific. Such decisions sacrifice some of the efficiency benefits of specialization, but, in a world of incomplete contracting, these efficiency losses are more than offset by the security that a nonspecific investment provides for each contractual party.

Hart (1995) asks the following: How would these costs change if the two independent (i.e., nonintegrated) firms merged and became a single firm? If there is less haggling and hold-up behavior in a merged firm (as transaction costs theory submits), it is important to provide reasons why. The modern property rights approach developed by Grossman and Hart (1986) and Hart and Moore (1990), the so-called Grossman-Hart-Moore (GHM) model, focuses on this efficient boundaries question.[3]

The Property Rights Approach. Hart (1995) maintains that (in contrast with the principal-agent approach) the property rights approach tries to address head on the question of why there are less haggling and hold-up problems in a merged firm than between two independent (i.e., nonintegrated) firms. Why does ownership of physical or non-human assets matter? The answer, Hart submits, is that ownership is a source of control rights when contracts are incomplete.

Given that a contract will not specify all aspects of resource usage in every contingency, who has the property rights to decide about missing usages? According to the property rights approach, it is the owner of the resource in question who has these property rights. That is, the owner of a resource has residual control rights over the resource: the property

[3]The modern property rights approach, discussed in Hart (1995), builds on Grossman and Hart (1986), Hart (1989), and Hart and Moore (1990). Byrnjolffson (1994) provides an insightful extension and application of the GHM model to information assets and information technology. Both extensions and critiques of the GHM model are many (see, e.g., Holmstrom & Roberts, 1998; Williamson, 2000). For the relevance of the property rights approach to strategic management see, for example, Liebeskind (1996) and Mahoney (1992c). Mahoney (1992c) notes an isomorphism between the Coase (1960) theorem that in the absence of transaction costs liability rules do not matter for achieving economic efficiency and the idea expressed in the previous chapter that, in the absence of transaction costs, organizational form (governance structure) does not matter for achieving economic efficiency. Of course, the main point of Coase (1937) is that in a world of positive transaction costs, organizational form choice does impact economic efficiency, and the main point of Coase (1960) is that in a world of positive transaction costs, initial property rights assignments do impact economic efficiency (as well as income distribution).

rights to decide all usages of the resource in any way not inconsistent with a prior contract, custom, or law. In fact, possession of residual control rights is taken to be the definition of ownership in the modern property rights approach.

Hart (1995) concludes that the economic benefit of integration is that the acquiring firm's economic incentive to make relationship-specific investments increases since, given that the firm has more residual control rights, the firm will receive a greater fraction of the ex post surplus created by these relationship-specific investments. One implication of the property rights theory is that, ceteris paribus, a party is more likely to own a resource if he or she has an important (sunk cost) investment decision.

Another strategic implication of the property rights theory is that highly complementary assets should be under common ownership. For example, Joskow (1985) has investigated the ownership arrangements governing electricity-generating plants that site next to coal mines. Such relationship-specific assets are highly complementary, and Joskow finds a high incidence of common ownership. Stuckey (1983) has investigated the case of aluminum refineries that site next to bauxite mines. In this business situation, the degree of complementarity is arguably even greater because, in addition to the two entities being located next to each other, the refinery also installs equipment that is specific to the particular bauxite mine. Stuckey finds that vertical integration occurs in essentially every case. I submit that students studying the economics of organization who provide further case studies along the lines of Joskow and Stuckey that empirically test this modern property rights perspective would enrich the organizational economics research literature.

The Role of Nonhuman Assets and the Nature of Authority in Property Rights Theory. The crucial economic features of the property rights approach are that contracts are incomplete and that there are some significant nonhuman assets in the economic relationship. So far, I have focused on why contractual incompleteness is important to the modern property rights approach. I now discuss why (at least some) nonhuman assets are an essential economic feature of a property rights theory of the firm. These nonhuman assets might include tangible assets, such as machines, inventories, or buildings, or intangible assets, such as patents, brand names, or the firm's reputation.

To understand better the role of nonhuman assets, consider a situation where Firm 1 acquires Firm 2, which consists entirely of human capital. What is to stop Firm 2's workers from quitting? In the absence

of any physical assets (e.g., buildings) Firm 2's workers would not even have to relocate physically. For example, if the workers are linked by telephone or computer terminal (assets that the workers own themselves), workers could announce that they have become a new firm.

For Firm 1's acquisition of Firm 2 to make any economic sense, there must be some source of Firm 2's economic value over and above the workers' human capital. This source of economic value may consist of (a) a place to meet, (b) the firm's reputation, (c) a distribution network (assets that might be relevant to newspapers, journals, or publishing houses), (d) the firm's files containing important information about its operations or its customers (assets that might be relevant for insurance companies or law firms), or (e) a contract that prohibits Firm 2's workers from working for competitors or from taking existing clients with them when they quit (such a contract may be relevant for accounting firms, public relations firms, advertising agencies, or R&D labs, as well as law firms). Thus, a firm's nonhuman assets represent the glue that keeps the firm together.

Hart (1995) notes that it is important to emphasize that there is no inconsistency between defining a firm in terms of nonhuman assets and recognizing that a large part of a firm's economic value derives from human capital. Suppose Firm 2 consists of nonhuman asset a2 and one worker W2. Assume that W2 can make $300,000 a year using a2 and only $200,000 in its absence, and suppose that W2 is the only person who knows how to operate a2 and that the scrap value of a2 is zero. Then, under the assumption of Nash bargaining, asset a2 is worth $50,000 to an acquirer since the acquirer will be able to obtain 50% of W2's incremental $100,000 by threatening to deny W2 access to the asset. That is, the economic value of the firm to an acquirer is significant even though the value of a2 in its next-best use (its scrap value) is zero.

Hart (1995) argues that the concept of nonhuman assets is also helpful for clarifying the concept of authority. Coase (1937), Simon (1947), and Williamson (1975) have argued that a distinguishing feature of the employer-employee relationship is that an employer can tell an employee what to do, whereas one independent contractor must explicitly compensate another independent contractor to do what he or she wants. However, as Alchian and Demsetz (1972) point out, the source of an employer's authority over an employee is unclear. It is the case that an employer can tell an employee what to do, but it is also the

case that one independent contractor can tell another independent contractor what to do. The pragmatically interesting question is why the employee acts accordingly, whereas the independent contractor (perhaps) does not pay attention.

When nonhuman assets are present, there is a pragmatic difference between the employer-employee situation and the independent contractor situation. In the employer-employee case, if the employment relationship breaks down, the employer walks away with economically relevant nonhuman assets, whereas in the independent contractor case, each independent contractor walks away with nonhuman assets. This pragmatic difference gives the employer leverage. Put compactly, *control over economically relevant nonhuman resources leads to control over human resources.* This argument connects the behavioral theory of the firm (March & Simon, 1958; Simon, 1947), transaction costs theory (Coase, 1937; Williamson, 1975), and modern property rights theory.

I next discuss an application: the vertical merger of Fisher Body and General Motors (Klein, Crawford, & Alchian, 1978) in light of modern property rights theory. The next chapter covers agency theory. I first discuss the classic work by Berle and Means (1932) concerning the potential agency problem due to the separation of ownership and control. I then develop the basic foundations for the mathematical principal-agent model.

Application: The Vertical Merger of Fisher Body and General Motors

Originally, automobiles were constructed of open wooden bodies. By about 1919, however, closed metal bodies were being manufactured using giant presses to stamp the body parts. Making closed bodies required stamping dies that were in large measure specific to the particular requirements of the model to be produced. In the early period of the automobile industry, the producers of the dies were independent of the automobile manufacturers themselves. Soon after the shift toward closed bodies, which entailed a large specific investment on the part of the die manufacturers, long-term contracts appeared.

Because Fisher Auto Body had to develop specialized production devices that could only be used for General Motors (GM) cars, Fisher Body was reluctant to sign a short-term contract because at renegotiation time, Fisher Body would be at the mercy of General Motors. On the other hand, GM was reluctant to depend so heavily on one supplier, fearing that, with a short-term contract, at renegotiation time, GM would be at the mercy of Fisher Body. Because each party feared a short-term contract would leave it at the mercy of the other firm, Fisher Body and General Motors signed a long-term contract for ten years, according to which GM agreed to buy virtually all of its closed bodies from Fisher Body. This clearly protected Fisher Body from being held up by GM. But now opportunities have been created for Fisher Body to take advantage of GM. At what price would GM buy? Suppose demand conditions change greatly and GM wants to renegotiate the contract? How would quality be assured? Contract negotiations became increasingly complex, until by 1926, the two firms merged as a final attempt to mitigate bargaining difficulties, thereby replacing the transaction costs in the marketplace with internal organization. Vertical financial ownership replaced long-term contracting, which allowed the parties to adjust in an adaptive, sequential manner.

An important aspect of this case, based on the Grossman and Hart (1986) property rights theory of ownership, is that much of the asset specificity came from investment in relationship-specific know-how by the Fisher Body workers, which would have made it difficult for General Motors to find another supplier if Fisher Body had tried to engage in holdup. Thus, vertical integration via financial ownership is persuasively explained in these property rights/transaction costs terms.

SOURCE: Adapted from Klein, Crawford, & Alchian (1978)