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An Economic Theory of Property

There is nothing which so generally strikes the imagination and engages the affections of mankind, as the right of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.

WILLIAM BLACKSTONE,
COMMENTARIES ON THE LAWS OF ENGLAND, BK. II, CH. 1, P. 2 (1765–69)

In the African tribe called the Barotse, “property law defines not so much the rights of persons over things as the obligations owed between persons in respect of things.”

MAX GLUCKMAN,
IDEAS IN BAROTSE JURISPRUDENCE 171 (1965)

[T]he theory of the Communists may be summed up in a single sentence: Abolition of private property.

KARL MARX & FRIEDRICH ENGELS,
THE COMMUNIST MANIFESTO (1848)

THE LAW OF property supplies the legal framework for allocating resources and distributing wealth. As the contrasting quotes above indicate, people and societies disagree sharply about how to allocate resources and distribute wealth. Blackstone viewed property as providing its owner with complete control over resources, and he regarded this freedom to control material things as “the guardian of every other right.” Gluckman found that property in an African tribe called the Barotse conveyed to its owner responsibility, not freedom. For example, the Barotse hold rich persons responsible for contributing to the prosperity of their kin. Finally, Marx and Engels regarded property as the institution by which the few enslaved the many.

Classical philosophers try to resolve these deep disputes over social organization by explaining what property *really* is. The appendix to this chapter provides some examples of philosophical theories, such as the theory that property is an expectation (Bentham), the object of fair distribution (Aristotle), a means of self-expression (Hegel), or the foundation of liberty in community life (Burke). Instead of trying to explain what property really is, an economic theory tries to predict the effects of alternative forms of ownership, especially the effects on efficiency and distribution. We shall make such predictions about alternative property rules and institutions.

Here are some examples of problems addressed by property rules and institutions that we will analyze:

Example 1: “This morning in a remote meadow in Wyoming, a mule was born. To whom does that mule belong?”¹ Does the mule belong to (1) the owner of the mule’s mother, (2) the lumber company that has leased the land on which the mule was grazing, or (3) the federal government because the property is a national forest?

Example 2: Orbitcom, Inc., spent \$125 million designing, launching, and maintaining a satellite for the transmission of business data between Europe and the United States. The satellite is positioned in a geosynchronous orbit 25 miles above the Atlantic Ocean.² Recently a natural resource-monitoring satellite belonging to the Windsong Corporation has strayed so close to Orbitcom’s satellite that the company’s transmissions between Europe and the United States have become unreliable. As a result, Orbitcom has lost customers and has sued Windsong for trespassing on Orbitcom’s right to its geosynchronous satellite orbit.

Example 3: Foster inspects a house under construction in a new subdivision on the north side of town and decides to buy it. The day after she moves in, the wind shifts and begins to blow from the north. She smells a powerful stench. On inquiring, she learns that a large cattle feedlot is located north of the subdivision, just over the ridge, and, to make matters worse, the owner of this old business plans to expand it. Foster joins other property owners in an action to shut down the feedlot.

Example 4: Bloggs inherits the remnant of a farm from his father, most of which has already been sold for a housing development. The remaining acreage, which his father called “The Swamp,” is currently used for fishing and duck hunting, but Bloggs decides to drain and develop it as a residential area. However, scientists at the local community college have determined that Bloggs’s property is part of the wetlands that nourish local streams and the fish in the town’s river. The town council, hearing of Bloggs’s plans, passes an ordinance forbidding the draining of wetlands. Bloggs sues for the right to develop his property, or, failing that, for an order compelling the town to buy the property from him at the price that would prevail if development were allowed.

Example 5: A county ordinance requires houses to be set back 5 feet from the property line. Joe Potatoes buys some heavily wooded land in an undeveloped area and builds a house on it. Ten years later Fred Parsley, who owns the adjoining lot, has his land surveyed and discovers that Potatoes’s house extends 2 feet over the property line onto Parsley’s property. Potatoes offers to compensate Parsley for the trespass, but Parsley rejects the offer and sues to have Potatoes relocate the house in conformity with the ordinance.

¹ This remarkable question is how Professor John Cribbet, one of the leading scholars of property law, opened his first lecture on property to first-year law students at the University of Illinois College of Law.

² A geosynchronous orbit means that the satellite is traveling around the Earth at exactly the same speed at which the Earth is turning so that the satellite appears to remain stationary above a point on the Earth’s surface.

These five examples capture some of the most fundamental questions that any system of property law must answer. The first and second examples ask how property rights are initially assigned. Orbitcom apparently bases its ownership claim on having placed a satellite in the orbit in dispute before anyone else. This claim appeals to a legal principle called the *rule of first possession*, according to which the first party to use an unowned resource acquires a claim to it. (How might this rule apply to the mule born on the remote Wyoming meadow?) The general issue raised here is, “How does a person acquire ownership of something?”

The second example also asks what kinds of things may be privately owned. Orbitcom asserts that a satellite orbit may be privately owned like land or a musical composition, whereas Windsong feels, perhaps, that orbits should be commonly owned by all and open to all on the same terms, like the high seas. Economics has a lot to say about the consequences of resources being privately owned, commonly owned, or unowned.

The third example concerns a problem sometimes known as “incompatible uses.” May one property owner create a stench on his own property that offends his neighbors? In general, the law tries to prevent property owners from interfering with each other, but in this example, as in many other cases, there is a trade-off between competing activities. Is the cattle feedlot interfering with the homeowner by creating the stench, or is the homeowner interfering with the feedlot by moving nearby and seeking to shut it down? The legal outcome turns in part on whether the stench constitutes a “nuisance” as defined by law. Economics has a lot to say about this determination.

The fourth example, like the third, raises the question, “What may owners legitimately do with their property?” The difference is that Example 3 concerns a dispute between private owners and Example 4 concerns a dispute between a private owner and a government. The specific question in Example 4 is whether a property owner can develop his land according to his own wishes or must conform to restrictions on development imposed by a local government. The general question concerns the extent to which government may constrain a private owner’s use of her property. We will show that economics has a lot to say about government’s regulating and taking private property.

In the last example, one property owner has encroached on the land of another, but that encroachment has gone undetected and without apparent harm for many years. The question raised by this example concerns the remedy for trespass. Should the owner be denied a remedy because the trespass has persisted for so long? Alternatively, should the court award compensatory damages to the owner? Or should the court enjoin the trespasser and force him to move his house? As we shall see, economics predicts the effects of various remedies and thus provides a powerful tool for choosing the best one. We shall also see why courts prefer the remedy of issuing an order called an “injunction” to stop trespassing or otherwise interfering with the property owner.

The examples raise these four fundamental questions of property law:

1. How are ownership rights established?
2. What can be privately owned?
3. What may owners do with their property?
4. What are the remedies for the violation of property rights?

In the next two chapters we shall be using economics to answer these questions. Traditional legal scholarship on property law is notoriously weak in its use of theory, at least in comparison to contracts and torts.³ This fact contributes to the feeling of many students that the common law of property is diffuse and unorganized. Through economics it is possible to give the subject more coherence and order. In this chapter we concentrate on developing fundamental tools for the economic analysis of property: bargaining theory, public goods theory, and the theory of externalities. In the next chapter we apply these tools to a large number of property laws and institutions.

I. The Legal Concept of Property

From a legal viewpoint, property is a *bundle of rights*. These rights describe what people may and may not do with the resources they own: the extent to which they may possess, use, develop, improve, transform, consume, deplete, destroy, sell, donate, bequeath, transfer, mortgage, lease, loan, or exclude others from their property. These rights are not immutable; they may, for example, change from one generation to another. But at any point in time, they constitute the detailed answer of the law to the four fundamental questions of property law listed above.

Three facts about the bundle of legal rights constituting ownership are fundamental to our later understanding of property. First, these rights are *impersonal* in the sense that they attach to property, not persons. Any person who owns the property has the rights. In this respect, property rights are different from contract rights. Contract rights are *personal* in the sense that one person owes something to another person. Second, the owner is free to exercise the rights over his or her property, by which we mean that no law forbids or requires the owner to exercise those rights. In our example at the beginning of the chapter, Parsley can farm his land or leave it fallow, and the law is indifferent as to which he chooses to do. Third, others are forbidden to interfere with the owner's exercise of his rights. If others interfere, the court will *enjoin* them to stop—the court will issue an order that they must stop interfering on pain of punishment for contempt of court. Thus, if Parsley decides to farm his land, Potatoes cannot put stones in the way of the plow. This protection is needed against two types of interlopers—private persons and the government.

The legal conception of property is, then, that of a bundle of rights over resources that the owner is free to exercise and whose exercise is protected from interference by others. Thus, property creates a zone of privacy in which owners can exercise their will over things without being answerable to others, as stressed in the preceding quote from

³ In contracts and torts there was a classical theory that dominated American law at the beginning of the twentieth century. The introductory chapters on contracts and torts describe these classical theories. There was, however, no classical theory of property of comparable coherence, detail, or stature. Instead there is a long philosophical tradition of analyzing the institution of property at a very abstract level. Some of these philosophical theories of property are described in the appendix to this chapter.

Blackstone. These facts are sometimes summarized by saying that property gives owners liberty over things.

This general definition of property is compatible with many different theories of what particular rights are to be included in the protected bundle and of how to protect those rights. It is also consistent with different accounts of the responsibilities that a person assumes by becoming an owner. The law has tended to look beyond itself to philosophy for help in deciding which rights to include in the bundle of property rights.

In the approach taken in this chapter, we focus on how alternative bundles of rights create incentives to use resources efficiently. An efficient use of resources maximizes the wealth of a nation. We begin by showing how the right to exchange property contributes to the nation's wealth.

II. Bargaining Theory⁴

To develop an economic theory of property, we must first develop the economic theory of bargaining games. At first you may not see the relevance of this theory to property law, but later you will recognize that it is the very foundation of the economic theory of property. The elements of bargaining theory can be developed through an example of a familiar exchange—selling a used car. Consider these facts:

Adam, who lives in a small town, has a 1957 Chevy convertible in good repair. The pleasure of owning and driving the car is worth \$3000 to Adam. Blair, who has been coveting the car for years, inherits \$5000 and decides to try to buy the car from Adam. After inspecting the car, Blair decides that the pleasure of owning and driving it is worth \$4000 to her.

According to these facts, an agreement to sell will enable the car to pass from Adam, who values it at \$3000, to Blair, who values it at \$4000. The potential seller values the car less than the potential buyer, so there is scope for a bargain. Assuming that exchanges are voluntary, Adam will not accept less than \$3000 for the car, and Blair will not pay more than \$4000, so the sale price will have to be somewhere in between. A reasonable sale price would be \$3500, which splits the difference.

The logic of the situation can be clarified by restating the facts in the language of game theory. The parties to the kind of game represented by this example can *both* benefit from cooperating with each other. To be specific, they can move a resource (the car) from someone who values it less (Adam) to someone who values it more (Blair). Moving the resource in this case from Adam, who values it at \$3000, to Blair,

⁴ Bargaining theory is a form of game theory. See the section on game theory in Chapter 2 for some useful background information.

who values it at \$4000, will create \$1000 in value. The *cooperative surplus* is the name for the value created by moving the resource to a more valuable use. Of course, the share of this surplus that each party receives depends on the price at which the car is sold. If the price is set at \$3500, each will enjoy an equal share of the value created by the exchange, or \$500. If the price is set at \$3800, the value will be divided unequally, with Adam enjoying 4/5 or \$800, and Blair enjoying 1/5 or \$200. Or if the price is set at \$3200, Adam will enjoy \$200 or 1/5 of the value created, whereas Blair will enjoy \$800 or 4/5.

The parties typically bargain with each other over the price. In the course of negotiating, the parties may assert facts (“The motor is mechanically perfect. . .”), appeal to norms (“\$3700 is an unfair price. . .”), threaten (“I won’t take less than \$3500. . .”), and so forth. These are the tools used in the art of bargaining. The fact that the parties can negotiate is an advantage of bargaining or cooperative games relative to other games (called *noncooperative* games), such as the famous Prisoner’s Dilemma, which we examined in Chapter 2. Even when negotiation is possible, however, there is no guarantee that it will succeed. If the negotiations break down and the parties fail to cooperate, their attempt to shift resources to a more valuable use will fail, and they will not create value. Thus, the obstacle to creating value in a bargaining game is that the parties must agree on how to divide it. Value will be divided between them at a rate determined by the price at which the car is sold. Agreement about the car’s price marks successful negotiations, whereas disagreement marks a failure in the bargaining process.

To apply game theory to this example, let us characterize the possible outcomes as a cooperative solution and a noncooperative solution. The cooperative solution is the one in which Adam and Blair reach agreement over a price and succeed in exchanging the car for money. The noncooperative solution is the one in which they fail to agree on a price and fail to exchange the car for money. To analyze the logic of bargaining, we must first consider the consequences of noncooperation. If the parties fail to cooperate, they will each achieve some level of well-being on their own. Adam will keep the car and use it, which is worth \$3000 to him. Blair will keep her money—\$5000—or spend it on something other than the car. For simplicity, assume that the value she places on this use of her money is its face value, specifically, \$5000. Thus, the payoffs to the parties in the noncooperative solution, called their *threat values*, are \$3000 for Adam (the value to him of keeping the car) and \$5000 to Blair (the amount of her cash). The total value of the noncooperative solution is $\$3000 + \$5000 = \$8000$.

In contrast, the cooperative solution is for Adam to sell the car to Blair. Through cooperation, Blair will own the car, which is worth \$4000 to her, and in addition, the two parties will each end up with a share of Blair’s \$5000. For example, Adam might accept \$3500 in exchange for the convertible. Blair then has the car, worth \$4000 to her, and \$1500 of her \$5000. Thus, the value of the cooperative solution is $\$4000$ (the value of the car to Blair) + $\$1500$ (the amount that Blair retains of her original \$5000) + $\$3500$ (the amount received by Adam for the car) = $\$9000$. The surplus from cooperation is the difference in value between cooperation and noncooperation: $\$9000 - \$8000 = \$1000$.

In any voluntary agreement, each player must receive at least the threat value or there is no advantage to cooperating. A reasonable solution to the bargaining problem is for each player to receive the threat value plus an equal share of the cooperative surplus: specifically, \$3500 for Adam and \$5500 for Blair.⁵ To accomplish the division, Blair should pay Adam \$3500 for the car. This leaves Adam with \$3500 in cash and no car, and leaves Blair with a car worth \$4000 to her and \$1500 in cash.

QUESTION 4.1: Suppose Adam receives a bid of \$3200 from a third party named Clair. How does Clair's bid change the threat values, the surplus from cooperation, and the reasonable solution?

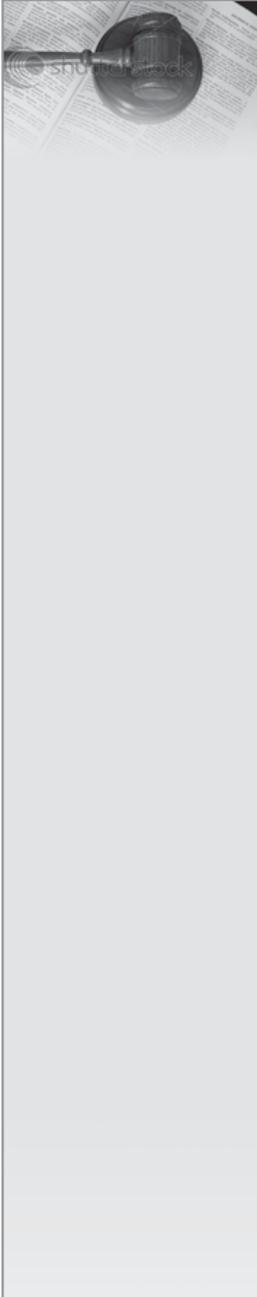
We have explained that the process of bargaining can be divided into three steps: establishing the threat values, determining the cooperative surplus, and agreeing on terms for distributing the surplus from cooperation. These steps will be used in the next section to understand the origins of the institution of property.

Before proceeding, however, we must warn you about a common problem in the economic analysis of law. In general, economic analysis sometimes uses morally or legally insensitive language to describe useful concepts. "Threat value" is an example. "Threat" connotes "coercion" and coercion often voids a contract or constitutes a tort or crime. If you are speaking to a judge or juror, do not say "threat" unless you intend to connote illegality. This is one example where you will need to substitute other terms for economic language. Refusing to cooperate with the other party and going alone is usually legal. Instead of "threat value" you might try the phrase "*fallback position*" or "*go-it-alone value*."

III. The Origins of the Institution of Property: A Thought Experiment

The bargaining model shows how cooperation can create a surplus that benefits everyone. This type of reasoning can be used to perform a thought experiment that is helpful in understanding the origins of property.

⁵ Economists have long struggled with the fact that self-interested rationality alone does not seem sufficient to determine the distribution of the cooperative surplus. That is why we use the term *reasonable solution*, which invokes social norms, rather than *rational solution*. To see the difference, consider this *rational* account of the division of the cooperative surplus. Suppose that somehow Adam knows that the cooperative surplus resulting from an agreement between Blair and him is \$1000. Being perfectly rational, he says to Blair that he will sell the car to her for \$3995. And, further, he explains to her why she should accept that price, even though it gives Adam \$995 of the cooperative surplus and Blair, \$5: "If you do not accept that price, I will not do business with you, in which case you will realize \$0 worth of cooperative surplus. At the \$3995 price, you get \$5 of the cooperative surplus and that surely is better than nothing." Leaving aside all the strategic reasons that Blair might balk at this (Will Adam *really* walk away if she refuses?), this division of the cooperative surplus is perfectly rational, but it may not be reasonable. In fact, carefully controlled experiments have demonstrated that most people would *not* accept Adam's offer, rational though it be.



A Civil Dispute as a Bargaining Game

Because trials are costly, both parties can usually gain by settling out of court. That is why so few disputes ever come to trial. As we will see in Chapter 10, the best current estimate is that approximately 5 percent of all disputes that reach the stage of filing a legal complaint in the United States actually result in litigation. Here is a problem in which you must apply bargaining theory to a civil dispute:

FACTS: Arthur alleges that Betty borrowed a valuable kettle and broke it, so he sues to recover its value, which is \$300. The facts are very confusing. Betty contends that she did not borrow a kettle from Arthur; even if it is proved that she borrowed a kettle from Arthur, she contends it is not broken; even if it is proved that she borrowed a kettle from Arthur and that it is broken, she contends that she did not break it.

Assume that because the facts in the case are so unclear, Arthur and Betty independently believe that the chances of either side's winning in court are an even 50 percent. Further assume that litigation in small claims court will cost each party \$50 and that the costs of settling out of court are nil. So, cooperation in this case is a matter of settling out of court and saving the cost of a trial. Noncooperation in this case means trying the dispute.

QUESTIONS:

- a. What is Arthur's threat value?
- b. What is Betty's threat value?
- c. If Arthur and Betty cooperate together in settling their disagreement, what is the net cost of resolving the dispute?
- d. What is the cooperative surplus?
- e. A reasonable settlement would be for Betty to pay Arthur _____.
- f. Suppose that instead of both sides believing that there is an even chance of winning, both sides are optimistic. Specifically, Arthur thinks that he will win with probability $2/3$, and Betty thinks that she will win with probability $2/3$.
 1. What is Arthur's putative threat value (what he believes he can secure on his own without Betty's cooperation)?
 2. What is Betty's putative threat value (what she believes she can secure on her own without Arthur's cooperation)?
 3. The putative cooperative surplus equals _____.
 4. Describe the obstacle to settlement in a few words.

Let us imagine a simplified world in which there are people, land, farm tools, and weapons but no courts and no police. In this imaginary world, government does not vindicate and protect the rights to property asserted by the people who live on the land. Individuals, families, or alliances of families enforce property rights to the extent that they defend their land holdings. People must decide how many resources to devote to defending their property claims. Rational people allocate their limited resources so that,

as we saw in Chapter 2, the marginal cost of defending land is just equal to the marginal benefit. This means that at the margin, the value of the resources used for military ends (the marginal benefit) equals their value when used for productive ends, such as raising crops and livestock (marginal [opportunity] cost). For example, the occupants are rational if allocating a little more time to patrolling the perimeter of the property preserves as much additional wealth for the defenders as they would enjoy by allocating a little more time to raising crops. The same statement could be made about allocating land between crops and fortifications, or about beating metal into swords or plowshares.

These facts describe a world in which farming and fighting are individually rational. But are they socially efficient? In Chapter 2 we offered the following definition of inefficient production: The same (or fewer) inputs could be used to produce a greater (or the same) total output. Can some mechanism be found that uses fewer resources to achieve the same level of protection for property claims? One possible mechanism is law. Suppose that the costs of operating this system of property rights are less than the sum of all individual costs of private defense. Such a mechanism would allow the transfer of resources from fighting to farming. For example, the landowners might create a government to protect their property rights at lower cost in individual taxes than each individual spends on fighting. The savings might come from economies of scale in having one large army in the society to defend everyone, rather than many small, privately financed armies.⁶ In other words, there may be a natural monopoly on force.

We could imagine the parties bargaining together over the terms for establishing a government to recognize and enforce their property rights. They are motivated by the realization that there are economies of scale in protecting property. By reaching an agreement to have one government backed by one army, everyone can enjoy greater wealth and security. The bargain eventually reached by such negotiations is called the *social contract* by philosophers because it establishes the basic terms for social life.⁷ It would be rational for the parties negotiating the social contract to take account of other rights of owners besides the right to exclude. Many of the rights that are currently in the bundle called property could be considered, such as the right to use, transfer, and transform. Indeed, many rights other than property rights could be a part of the social contract, such as freedom of speech and freedom of religion, but they do not concern us in this chapter.

⁶ Recall that economies of scale occur when the cost per unit (or average cost of production) declines as the total amount of output increases. A production technology for which the unit costs are falling at every level of production, even very large levels, is called a *natural monopoly* because one producer can sell at a lower price than many smaller producers.

⁷ The social contract has usually been thought of as a logical construct, but some theorists have used it to explain history. For example, it has been argued that feudalism in the Middle Ages corresponds roughly to the conditions of our imaginary world. The economic factors that caused this system to be replaced in some parts of Western Europe by a system of private property rights enforced by a central government are discussed in DOUGLASS C. NORTH & ROBERT PAUL THOMAS, *THE RISE OF THE WESTERN WORLD* (1973).

The same bargaining model used to explain the sale of a secondhand car can be applied to this thought experiment, in which a primitive society develops a system of property rights. First, a description is given of what people would do in the absence of civil government, when military strength alone established ownership claims. That situation—called the *state of nature*—corresponds to the threat values of the noncooperative solution, which prevails if the parties cannot agree. Second, a description is given of the advantages of creating a government to recognize and enforce property rights. Civil society, in which such a government exists, corresponds to the game's cooperative solution, which prevails if the parties can agree. The social surplus, defined as the difference between the total amount spent defending land in the state of nature and the total cost of operating a property-rights system in civil society, corresponds to the cooperative surplus in the game. Third, an agreement describes the methods for distributing the advantages from cooperation. In the car example, this agreement arises from the price that the buyer offers and the seller accepts. In the thought experiment, this agreement arises from the social contract that includes the fundamental laws of property.

To see the parallel more clearly, imagine that our world consists of only two people, *A* and *B*. In a state of nature, each one grows some corn, steals corn from the other party, and defends against theft. Each of the parties has different levels of skill at farming, stealing, and defending. Their payoffs in a state of nature are summarized in Table 4.1. Taken together, *A* and *B* produce 200 units of corn, but it gets reallocated by theft. For example, *A* steals 40 units of corn from *B* and loses 10 units of corn to *B* through theft. Notice that *A* ultimately enjoys 80 units of corn, and *B* enjoys 120 units, after taking into account the gains and losses from theft.

Instead of persisting in a state of nature, *A* and *B* may decide to enter into a cooperative agreement, recognize each other's property rights, and adopt an enforcement mechanism that puts an end to theft. Let us assume that cooperation will enable them to devote more resources to farming and fewer resources to fighting, so that total production will rise from 200 units to 300 units. One hundred units thus constitutes the social or cooperative surplus. In civil society there will be a mechanism for distributing the surplus from cooperation, such as government taxes and subsidies. The parties must decide through bargaining how this is to be done. A reasonable division of that surplus gives each party an equal share. So, in civil society, each party receives half the cooperative surplus plus the individual net consumption

TABLE 4.1
The State of Nature

Farmer	Corn Grown	Corn Gained by Theft	Corn Lost Through Theft	Net Corn Consumption
A	50	40	210	80
B	150	10	240	120
Totals	200	50	250	200

TABLE 4.2
Civil Society

Farmer	Threat Value	Share of Surplus	Net Corn Consumption
A	80	50	130
B	120	50	170
Totals	200	100	300

in the state of nature, which is each party's threat value. These facts are summarized in Table 4.2.

What is the meaning of this "thought experiment" concerning the origins of property? Read literally, you might conclude that individuals or tribes acquire government by meeting together and agreeing to create a system of law, including property rights. This literal reading is bad history and bad anthropology. Instead of a contract, a system of property law can begin with a military conquest, a rebellion against feudalism, or the disintegration of communism. Instead of history, the thought experiment is really about processes that go on all the time.

In a changing society, new forms of property arise continually. To illustrate, property law for underground gas and the electromagnetic spectrum (radio and television broadcasting) developed in the United States during the last century; and property law for computer software, music, video, and other material on the Internet, and genetically engineered forms of life developed in the last several decades. The need for a new form of property law arises in situations corresponding to our thought experiment. For example, like corn, digital music can be stolen. Without effective property law, people invest a lot of resources in stealing that music or trying to prevent its theft. These efforts redistribute music, rather than invent or manufacture it. Now the United States has property law that prevents the stealing of digital music. The imposition of these laws may have greatly stimulated the production of music. So, our thought experiment is really a parable about the incentive structure that motivates societies to continually create property.

The first question that we posed about property law is, "How are property rights established?" This is a question about how an owner acquires the legal right to property. Our thought experiment answers the question, "Why are ownership rights established?" This is a question about why a society creates property as a legal right. The two questions are closely connected. Societies create property as a legal right to encourage production, discourage theft, and reduce the costs of protecting goods. Law prescribes various ways that someone can acquire a property right, such as by finding and purchasing land with natural gas beneath it, inventing a computer program, or discovering sunken treasure.

We now turn to the elaboration of how bargaining theory can help the law prescribe ways for the acquisition of property that also encourage production, or discourage theft, and reduce the costs of protecting goods.

QUESTION 4.2:

- a. Is the cooperative solution *fair*? Can the resulting inequality in civil society be justified? To answer these questions, draw on your intuitive ideas of fairness or, better still, a concept of fairness developed by a major philosopher such as Hobbes, Locke, Rawls, or Aristotle.
- b. Suppose that the bargaining process did not allow destructive threats, such as the threat to steal. How might this restriction affect the distribution of the surplus?
- c. What is the difference between the principle, “To each according to his threat value,” and this principle, “To each according to his productivity”?

IV. An Economic Theory of Property

The fact that the same theory of bargaining can be applied to selling a used car or creating a civil society is proof of that theory’s generality and power. Indeed, bargaining theory is so powerful that, as this section will show, it serves as the basis for an economic theory of property and of property law. Let us briefly summarize where we are going.

By bargaining together, people frequently agree on the terms for interacting and cooperating. But sometimes the terms for interacting and cooperating are imposed on people from the outside—for example, by law. The terms are often more efficient when people agree on them than when a lawmaker or conqueror imposes them. It follows that law is unnecessary and undesirable where bargaining succeeds, and that law is necessary and desirable where bargaining fails.

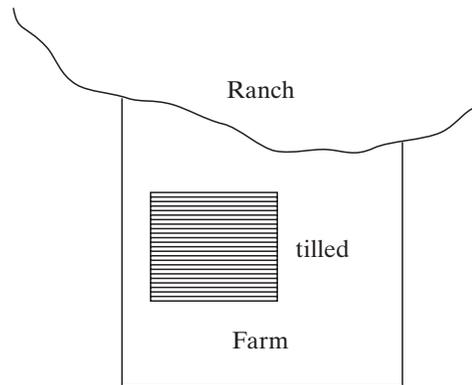
These propositions apply to the four questions about property that we asked above. In certain circumstances we do not need property law to answer the four questions that we posed at the beginning of this chapter. Rather, in those special circumstances, private bargaining will establish what things are property, who has claims to that property, what things an owner may and may not do with the property, and who may interfere with an owner’s property. The special circumstances that define the limits of law are specified in a remarkable proposition called the *Coase Theorem*. This theorem, to which we now turn, helped to found the economic analysis of law and won its inventor the Nobel Prize in economics.

A. The Coase Theorem⁸

Different commentators formulate the Coase Theorem differently. We will expound a simple version of the theorem and then acquaint you with some of the commentary.

⁸ The theorem is discussed in Professor Ronald H. Coase’s *The Problem of Social Cost*, 3 J. LAW & ECON. 1 (1960). The article has been reprinted in numerous legal and economic anthologies, notably R. BERRING ED., GREAT AMERICAN LAW REVIEWS (1984) (a compendium of the 22 “greatest” articles published in the United States’ law reviews before 1965).

FIGURE 4.1



Consider the example of the rancher and the farmer as depicted in Figure 4.1. A cattle rancher lives beside a farmer. The farmer grows corn on some of his land and leaves some of it uncultivated. The rancher runs cattle over all of her land. The boundary between the ranch and the farm is clear, but there is no fence. Thus, from time to time the cattle wander onto the farmer's property and damage the corn. The damage could be reduced by building a fence, continually supervising the cattle, keeping fewer cattle, or growing less corn—each of which is costly. The rancher and the farmer could bargain with each other to decide who should bear the cost of the damage. Alternatively, the law could intervene and assign liability for the damages.

There are two specific rules the law could adopt:

1. The farmer is responsible for keeping the cattle off his property, and he must pay for the damages when they get in (a regime we could call “ranchers’ rights” or “open range”), or
2. The rancher is responsible for keeping the cattle on her property, and she must pay for the damage when they get out (“farmers’ rights” or “closed range”).

Under the first rule, the farmer would have no legal recourse against the damage done by his neighbor's cattle. To reduce the damage, the farmer would have to grow less corn or fence his cornfields. Under the second rule, the rancher must build a fence to keep the cattle on her property. If the cattle escape, the law could ascertain the facts, determine the monetary value of the damage, and make the rancher pay the farmer.

Which law is better? Perhaps you think that fairness requires injurers to pay for the damage they cause. If so, you will approach the question as traditional lawyers do, by thinking about causes and fairness. The rancher's cows harm the farmer's crops, but the farmer's crops do not harm the rancher's cows. The cause of the harm runs from rancher to farmer, and many people believe that fairness requires the party who causes harm to pay for it.

Professor Coase, however, answered in terms of *efficiency*. All other things equal, we would like the legal rule to encourage efficiency in both ranching and farming.

This approach yielded a counterintuitive conclusion, which can be explained using some numbers. Suppose that, without any fence, the invasion by the cattle costs the farmer \$100 per year in lost profits from growing corn. The cost of installing and maintaining a fence around the farmer's cornfields is \$50 per year, and the cost of installing a fence around the ranch is \$75 per year. Thus, we are assuming that damage of \$100 can be avoided at an annual cost of \$50 by the farmer or \$75 by the rancher. Obviously, efficiency requires the farmer to build a fence around his cornfields, rather than the rancher to build a fence around her ranch.

Now, consider what will happen under either legal rule. Under the first legal rule (ranchers' rights), the farmer will bear damage of \$100 each year from the wandering cattle. He can eliminate this damage at a cost of \$50 per year, for a net savings of \$50 per year. Therefore, the first rule will cause the farmer to build a fence around his cornfields. Under the second rule (farmers' rights), the rancher can escape liability for \$100 at a cost of \$75. Consequently, the second rule will cause the rancher to build a fence around her ranch, thus saving \$25. Apparently, the first rule, which saves \$50, is more efficient than the second rule, which saves \$25. But this efficiency is only apparent; it is not real.

We may begin our understanding of this apparent puzzle by first imagining how the rancher and the farmer could have resolved their problem by cooperative bargaining and then comparing that outcome with the apparent outcomes under the different legal rules. Suppose that the farmer and the rancher had fallen in love, married, and combined their business interests. They would then maximize the combined profits from farming and ranching, and these joint profits will be highest when they build a fence around the cornfields, not around the ranch. Consequently, the married couple will build a fence around the cornfields, regardless of whether the law is the first rule or the second rule. In other words, they will cooperate to maximize their joint profits, regardless of the rule of law.

We have seen that the first rule is more efficient than the second if the farmer and the rancher follow the law without cooperating, but that the law makes no difference to efficiency when they cooperate. The farmer and the rancher do not need to get married in order to cooperate. Rational businesspeople can often bargain together and agree on terms of cooperation. By bargaining to an agreement, rather than following the law noncooperatively, the rancher and the farmer can save \$25. That is, if the parties can bargain successfully with each other, the efficient outcome will be achieved, regardless of the rule of law.

Recall that the most efficient outcome is for the farmer to build a fence around his cornfields, and that when the parties simply follow the law without cooperating, the second rule (farmers' rights) leads to the apparent inefficiency of the *rancher's* building a fence around her ranch. But consider how bargaining might proceed under the second rule:

RANCHER: *"The law makes me responsible for any damage that my cattle do to your crops. There would be no damage if there was a fence. I can fence my ranch for \$75 per year, whereas you can fence your cornfields for \$50 per year. Let's make a deal. I'll pay you \$50 per year to fence your cornfield."*

FARMER: *“If I agree, and you pay me \$50 per year to fence my cornfields, I won’t be any better off than if I did nothing and you had to fence your ranch. However, you’ll save \$25. You shouldn’t receive all of the gains from cooperation. You should give me a share of the gains by paying me more than \$50 per year for fencing my cornfields.”*

RANCHER: *“OK. Let’s split the savings from cooperation. I’ll pay you \$62.50 per year, and you build the fence. That way we’ll each receive half of the \$25 gained by cooperating.”*

FARMER: *“Agreed.”*

Note the important implication: Cooperation leads to the fence’s being built around the *farmer’s* cornfields, despite the fact that the second legal rule (farmers’ rights) was controlling. The greater efficiency of the first legal rule is apparent, not real. Note, also, the parallel between bargaining over the right of ownership of a used car from earlier in the chapter and the rights of ownership of land. Adam owns the car, and Blair values it more than Adam. By bargaining to an agreement, they can create a surplus and divide it between them. Similarly, the second legal rule imposes an obligation on the rancher to constrain her cattle, but the farmer can constrain them at less cost than the rancher. By bargaining to an agreement, both parties can save costs and divide the savings between them.⁹

Let’s generalize what we have learned from this exercise. When one activity interferes with another, the law must decide whether one party has the right to interfere or whether the other party has the right to be free from interference. Fairness apparently requires the party who causes harm to pay for it. In contrast, efficiency requires allocating the right to the party who values it the most. When the parties follow the law noncooperatively, the legal allocation of rights matters to efficiency. When the parties bargain successfully, the legal allocation of rights does not matter to efficiency. Given successful bargaining, the use of resources (the placement of a fence, the number of cattle run, the extent of land planted in cornfields, and so forth) is efficient, regardless of the legal rule.

We have discussed “successful bargaining,” but we have not discussed why bargains sometimes succeed and sometimes fail. Bargaining occurs through communication between the parties. Communication has various costs, such as renting a conference room, hiring a stenographer, and spending time in discussion. Coase used the term “transaction costs” to refer to the costs of communicating, as well as to a variety of

⁹ The bargaining situation is quite different if the law adopts the first rule (ranchers’ rights), rather than the second rule (farmers’ rights). Under the first rule, the farmer is responsible for building a fence to keep the cattle out of his cornfields. In these circumstances, cooperation between the farmer and the rancher does not save costs relative to following the law noncooperatively. Consequently, under the first rule, the farmer will go ahead and build the fence, without any bargaining. The first rule has an analogy in the used-car example. Recall that Blair values the car more than Adam does, which is why a surplus can be created by Adam’s selling the car to Blair. If Blair initially owns the car, there is nothing to be gained by bargaining with Adam or cooperating with him. Thus, Blair’s owning the car is analogous to ranchers’ rights. In the car example, there is no scope for a bargain because the party who values the car the most already owns it; in the cattle-corn example, there is no scope for a bargain because the party who can fence the cattle at least cost already has the duty to build the fence.

other costs that we will discuss later. In fact, he used “transaction costs” to encompass *all* of the impediments to bargaining. Given this definition, bargaining *necessarily* succeeds when transaction costs are zero. We can summarize this result by stating this version of the Coase Theorem:

When transaction costs are zero, an efficient use of resources results from private bargaining, regardless of the legal assignment of property rights.

Now we must relate the Coase Theorem to our larger project of developing an economic theory of property. The theorem states abstractly what our example showed concretely: If transaction costs are zero, then we do not need to worry about specifying legal rules regarding property in order to achieve efficiency. Private bargaining will take care of such issues as which things may be owned, what owners may and may not do with their property, and so on.

By specifying the circumstances under which property law is unimportant to efficient resource use, the Coase Theorem specifies implicitly when property law *is* important. The assignment of property rights might be crucial to the efficient use of resources when transaction costs are *not* zero.

To make the point more explicit, we posit this corollary to the Coase Theorem:

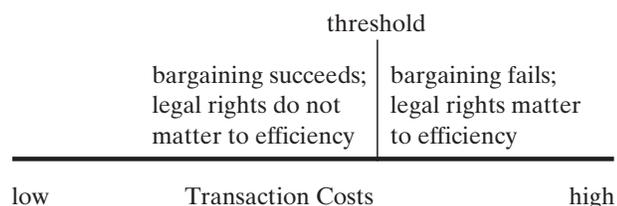
When transaction costs are high enough to prevent bargaining, the efficient use of resources will depend on how property rights are assigned.

Figure 4.2 represents the corollary graphically. Transaction costs lie on a spectrum from zero to infinity. In any particular situation, a threshold level of transaction costs divides the spectrum into a region in which bargaining succeeds and one in which it fails.

To appreciate the corollary, let us return to the rancher and the farmer. Bargaining to an agreement requires communication. Assume that communication is costly. Specifically, assume that the transaction costs of bargaining are \$35. Transaction costs must be subtracted from the surplus in order to compute the net value of cooperating. Suppose that the second legal rule (farmers’ rights) prevails, so that a surplus of \$25 can be achieved by an agreement that the rancher will pay the farmer to fence the cornfields. The net value of the bargain is the cooperative surplus minus the transaction costs— $\$25 - \$35 = -\$10$. Recognizing that the net value of the bargain is negative, the parties will not bargain. If the parties do not bargain, they will follow the law noncooperatively. Specifically, the farmer will assert his right to be free from invasions of cattle, and the rancher will fence the ranch, which is inefficient. In order to avoid this inefficiency, the law would have to adopt the first rule (ranchers’ rights), in which case the parties will not bargain, and they will achieve efficiency by following the law noncooperatively.

FIGURE 4.2

A threshold level of transaction costs that distinguishes the areas in which the Coase Theorem applies and does not apply.



Sometimes the threshold's location is obvious to everyone. For example, when a minor road crosses a main road, the law should prescribe that drivers in the minor road must yield to drivers on the main road. Motorists do not have time to bargain with each other and arrive at this result on their own. Sometimes the threshold's location is not obvious and people sharply disagree over policy. Motorists cannot buy insurance against their own pain and suffering from an accident. Legal scholars disagree sharply over whether such insurance is unavailable because transaction costs are prohibitively high or because motorists do not value compensation for pain and suffering enough to pay for it.

QUESTION 4.3: Suppose that a railroad runs beside a field in which commercial crops are grown. The railroad is powered by a steam locomotive that spews hot cinders out of its smokestack. From time to time those cinders land on the crops nearest to the track and burn them to the ground. Assume that each year, the farmer whose crops are burned loses \$3000 in profits, and that the annual cost to the railroad of installing and maintaining a spark-arrester that would prevent any damage to the crops is \$1750. Does it matter to the efficient use of the farmer's land or to the efficient operation of the railroad whether the law protects the farmer from invasion by sparks or allows the railroad to emit sparks without liability? Why or why not?

The Coase Theorem is so remarkable that many people have questioned it. Although we cannot discuss this rich literature here, we have embodied some of the most important points in the following questions:

QUESTION 4.4: The long run. Some commentators thought that the Coase Theorem might be true in the short run but not in the long run. In the example of the farmer and the rancher, changing the use of fields takes time. For example, to convert a field from grazing land to farmland, the farmer must fence and plough the land. The efficiency of the Coase Theorem in the long run depends on the ability of private bargaining to accommodate any additional costs of altering resource use over long time periods as relative prices and opportunity costs change. Discuss some ways that a contract for long-run cooperation between the rancher and the farmer would differ from a contract for short-run cooperation.

QUESTION 4.5: Invariance. With zero transaction costs, the farmer fences the cornfield rather than the rancher fencing the ranch—regardless of the rule of law. Notice that in this example, the use of the fields for cattle-ranching and corn-growing is the same, regardless of the initial assignment of property rights. This version of the Coase Theorem is called the *invariance* version (because the use of resources is *invariant* to the assignment of property rights). This version turns out to be a special case. The more general case is one in which the resource allocation will be *efficient* (but not necessarily identical), regardless of the assignment of property rights. There will be a Pareto-efficient allocation of goods and services, but it may be different from the Pareto-efficient allocation that would have resulted from assigning that same entitlement to someone else.

To illustrate, assume that farmers like to eat more corn and less beef, whereas ranchers like to eat more beef and less corn. Assume that farmers and

ranchers own their own land, that transaction costs are zero, and that fence is costly relative to their incomes. The change from “ranchers’ rights” to “farmers’ rights” will increase the income of farmers and decrease the income of ranchers. Consequently, the demand for corn will increase, and the demand for beef will decrease. Greater demand for corn requires the planting and fencing of more cornfields. Thus, the change in law causes the building of more fences. Remember the distinction between “price effects” and “income effects” in demand theory? Can you use these concepts to explain this example?¹⁰

QUESTION 4.6: Endowment effects. Surveys and experiments reveal that people sometimes demand much more to give up something that they have than they would be willing to pay to acquire it. To illustrate, contrast a situation in which people have an opportunity to “sell” the clean air that they currently enjoy to a polluter to the situation in which people currently not enjoying clean air have an opportunity to “buy” clean air from a polluter. Evidence suggests that people may demand a higher price to “sell” a right to clean air than they would pay to “buy” the same right. An *endowment* is an initial assignment of ownership rights. The divergence between buying and selling price is called an *endowment effect* because the price varies depending on the initial assignment of ownership.

Why might farmers place a different value on the right to be free from straying cattle depending on whether they were selling or buying that right? Is it rational to place different values on those rights? How do these flip-flops in the relative valuation complicate an efficiency analysis of the assignment of property rights?

QUESTION 4.7: Social norms. Social norms often evolve to cope with external costs, without bargaining or law. For example, a social norm in a county in northern California requires that ranchers assume responsibility for controlling their cattle, even though parts of the county are “open range” (that is, areas in which legal responsibility rests with farmers). Furthermore, the ranchers and farmers in this county apparently do not engage in the kind of bargaining envisioned by the Coase Theorem. How damaging are these facts to Coase’s analysis? Why would you expect neighbors in long-run relationships to adopt efficient norms to control externalities?¹¹

¹⁰ In the long run, ranchland will be more valuable if the rancher does not have to install fences, and farmland will be more valuable if the farmer does not have to install fences. If ranchers and farmers rent their land, the rule that determines the cost of fencing may affect the rental value of the land, not the profitability of the activity that occurs on it. On the various versions of the Coase Theorem, see ROBERT D. COOTER, *The Coase Theorem*, in THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS (1987). On the special assumptions underlying the invariance version of the Coase Theorem, see the graphical treatment in THOMAS S. ULEN, *Flogging a Dead Pig: Professor Posin on the Coase Theorem*, 38 WAYNE L. REV. 91 (1991).

¹¹ See Robert Ellickson, *Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County*, 38 STAN. L. REV. 623 (1986).

Web Note 4.1

There is more on the Coase Theorem at our website, where we pose additional questions and describe some experimental studies designed to test the Coase Theorem.

B. The Elements of Transaction Costs

What are transaction costs? Are they ever really negligible? We cannot use the Coase Theorem to understand law without answering these questions. Transaction costs are the costs of exchange. An exchange has three steps. First, an exchange partner has to be located. This involves finding someone who wants to buy what you are selling or sell what you are buying. Second, a bargain must be struck between the exchange partners. A bargain is reached by successful negotiation, which may include the drafting of an agreement. Third, after a bargain has been reached, it must be enforced. Enforcement involves monitoring performance of the parties and punishing violations of the agreement. We may call the three forms of transaction costs corresponding to these three steps of an exchange: (1) search costs, (2) bargaining costs, and (3) enforcement costs.

QUESTION 4.8: Classify each of the following examples as a cost of searching, bargaining, or enforcing an agreement to purchase a 1957 Chevrolet:

- a. Hagglng over the price.
- b. Collecting the monthly payments for the purchase of the car.
- c. Taking time off from work for the buyer and seller to meet.
- d. Purchasing an advertisement in the “classified” section of the newspaper.
- e. Purchasing a newspaper to obtain the “classified” section.
- f. The buyer asking the seller questions about the car’s ignition system.

When are transaction costs high, and when are they low? Consider this question by looking at the three elements of the costs of exchange. Search costs tend to be high for unique goods or services, and low for standardized goods or services. To illustrate, finding someone who is selling a 1957 Chevrolet is harder than finding someone who is selling a soft drink.

Turning from search costs to bargaining costs, note that our examples of bargaining assumed that both parties *know* each other’s threat values and the cooperative solution. Game theorists say that information is “public” in negotiations when each party knows these values. (Game theorists refer to these negotiations as “common knowledge” situations.) Conversely, information is “private” when one party knows some of these values and the other does not. If the parties know the threat values and the cooperative solution, they can compute reasonable terms for cooperation. In general, public information facilitates agreement by enabling the parties to compute reasonable terms for cooperation. Consequently, negotiations tend to be simple and easy when information about the threat values and the cooperative solution is public. To illustrate, negotiations for the sale of a watermelon are simple because there is not much to know about it.

Negotiations tend to be complicated and difficult when information about threat values and the cooperative solution is private. Private information impedes bargaining because much of it must be converted into public information before computing reasonable terms for cooperation. In general, bargaining is costly when it requires converting a lot of private information into public information. To illustrate, negotiations for the sale of a house involve many issues of finance, timing, quality, and price. The seller of a house knows a lot more about its hidden defects than the buyer knows, and the buyer knows a lot more about his or her ability to obtain financing than the seller knows. Each attempts to extract these facts from the other over the course of negotiations. To a degree, the parties may want to divulge some information. But they may be reluctant to divulge all. Each party's share of the cooperative surplus depends, in part, on keeping some information private. But concluding the bargain requires making some information public. Balancing these conflicting pulls is difficult and potentially costly.

There is an extensive literature on bargaining games, including a large number of carefully constructed experiments testing the Coase Theorem.¹² One of the most robust conclusions of these experiments is that bargainers are more likely to cooperate when their rights are clear and less likely to agree when their rights are ambiguous. Put in more formal terms, bargaining games are easier to solve when the threat values are public knowledge. The rights of the parties define their threat values in legal disputes. One implication of this finding is that property law ought to favor criteria for determining ownership that are clear and simple. The most immediate prescription for efficient property law is to make rights clear and simple. For example, a system for the public registration of ownership claims to land avoids many disputes and makes settlement easier for those that arise. Similarly, the fact that someone possesses or uses an item of property is easy to confirm. In view of this fact, the law gives weight to possession and use when determining ownership. Conversely, unclear ownership rights are a major obstacle to cooperation and a major cause of wasted resources. Thus, squatters who occupy land owned by others in developing countries fail to improve their dwellings because it is not clear that they would own the improvements.

Most of our bargaining examples concern two parties. Communication between two parties is usually cheap, especially when they are near each other. However, many bargains involve three or more parties. Bargaining becomes more costly and difficult as it involves more parties, especially if they are dispersed from one another. This fact may explain why treaties involving many nations are so difficult to conclude.

Finally, the parties may want to draft an agreement, and this may be costly because it must anticipate many contingencies that can arise to change the value of the bargain.

¹² See J. KEITH MURNIGHAN, *BARGAINING GAMES* (1992) for a highly readable summary of this literature. For specific experiments on the Coase Theorem, see Elizabeth Hoffman & Matthew Spitzer, *The Coase Theorem: Some Experimental Tests*, 25 *J. LAW & ECON.* 73 (1982), and Hoffman & Spitzer, *Experimental Tests of the Coase Theorem with Large Bargaining Groups*, 15 *J. LEGAL STUD.* 149 (1986). Ian Ayres has recently argued that, contrary to these findings, ambiguous rights induce bargaining. See our website for more.

Another obstacle to bargaining is hostility. The parties to the dispute may have emotional concerns that interfere with rational agreement, as when a divorce is bitterly contested. People who hate each other often disagree about the division of the cooperative surplus, even though all the relevant facts are public knowledge. To illustrate, many jurisdictions have rules for dividing property on divorce that are simple and predictable for most childless marriages. However, a significant proportion of these divorces are litigated in court rather than settled by negotiation. In these circumstances, lawyers can facilitate negotiations by interposing themselves between hostile parties.

Even without hostility, however, bargaining can be costly because negotiators may behave unreasonably—for example, by pressing their own advantage too hard (what lawyers refer to as “overreaching”). An essential aspect of bargaining is forming a strategy. In forming a bargaining strategy, each party tries to anticipate how much the opponent will concede. If the parties miscalculate the other party’s resolve, each will be surprised to find that the other does not concede, and as a result, negotiations may fail. Miscalculations are likely when the parties do not know each other, when cultural differences obscure communication, or when the parties are committed to conflicting moral positions about fairness.

Enforcement costs, the third and final element of transaction costs, arise when an agreement takes time to fulfill. An agreement that takes no time to fulfill has no enforcement costs. An example is simultaneous exchange, in which I give you a dollar and you give me a watermelon. For complex transactions, monitoring behavior and punishing violations of the agreement can be costly. To illustrate, consider the example from the beginning of this chapter of Bloggs’s desire to drain a wetlands on his property in order to develop it as a residential area. Suppose that the city permits him to build on a small part of the wetlands, provided that he does not harm the rest. Officials must watch him to be sure that he keeps his promise. Furthermore, officials may require Bloggs to post bond, which will be confiscated if he harms the rest of the wetlands and returned to him if he completes construction without doing harm. In general, enforcement costs are low when violations of the agreement are easy to observe and punishment is cheap to administer.

Let us summarize what we have learned about transaction costs. Transactions have three stages, each of which has a special type of cost—search costs, bargaining costs, and enforcement costs. These costs vary along a spectrum from zero to indefinitely large, depending on the transaction. Characteristics of transactions that affect their costs are summarized in Table 4.3.

QUESTION 4.9: Rank the following six transactions from lowest to highest transaction costs. Explain your ranking by reference to the costs of search, bargaining, and enforcement. (There is no uniquely correct answer.)

- a. Getting married.
- b. Buying an artichoke.
- c. Acquiring an easement to run a gas line across your neighbor’s property.
- d. Selling a Burger King franchise.
- e. Going to college.
- f. Purchasing a warranty for a new car.

TABLE 4.3
Factors Affecting Transaction Costs

Lower Transaction Costs	Higher Transaction Costs
1. Standardized good or service	1. Unique good or service
2. Clear, simple rights	2. Uncertain, complex rights
3. Few parties	3. Many parties
4. Friendly parties	4. Hostile parties
5. Familiar parties	5. Unfamiliar parties
6. Reasonable behavior	6. Unreasonable behavior
7. Instantaneous exchange	7. Delayed exchange
8. No contingencies	8. Numerous contingencies
9. Low costs of monitoring	9. High costs of monitoring
10. Cheap punishments	10. Costly punishments

QUESTION 4.10: Consider the right to smoke or to be free from smoke in the following situations. In which situations do you think that transaction costs are so high that they preclude private bargains, and in which cases do you think that transaction costs are low enough for private bargains to occur? Explain your answer.

- Smoking in a private residence.
- Smoking in a public area, such as a shopping mall, an indoor arena or concert hall, or an outdoor stadium.
- Smoking in hotel rooms.
- Smoking on commercial airline flights.

What sorts of arguments might be made for and against a bargaining or more interventionist means of dealing with each issue? To what extent are social norms, not law, determinative of the outcome?

C. The Normative Coase and Hobbes Theorems

We have been speaking thus far as if the Coase Theorem's only lesson for property law is that the law should determine the level of transaction costs and react accordingly. But we can go further.

Thus far, we have spoken of transaction costs as if they are exogenous to the legal system—that is, as if they are determined solely by objective characteristics of bargaining situations outside the domain of the law. This is not always the case. Some transaction costs are *endogenous* to the legal system in the sense that legal rules can lower obstacles to private bargaining. The Coase Theorem suggests that the law can encourage bargaining by lowering transaction costs.

To illustrate numerically, if the surplus from exchange is \$25 and transaction costs are \$30, then the parties can obtain a net benefit of $\$25 - \$30 = -\$5$ from a private

agreement. In other words, at least one of the parties will lose from private exchange. A rational person will not voluntarily trade at a loss. So, private exchange will not occur among rational people when the net benefit is negative. If, however, law lowers transaction costs to \$10, then the net benefit of exchange is $\$25 - \$10 = \$15$. When the surplus exceeds transaction costs, the net benefit from private exchange is positive, so both parties can gain from private exchange. Private exchange will ordinarily occur among rational people when the net benefit is positive.

Lowering transaction costs “lubricates” bargaining. An important legal objective is to lubricate private bargains by lowering transaction costs. One important way for the law to do this is by defining simple and clear property rights. It is easier to bargain when legal rights are simple and clear than when they are complicated and uncertain. To illustrate, the rule “first in time, first in right” is a simple and clear way to determine ownership claims. Similarly, requiring public recording of property claims makes determining ownership easier. Further, making those records searchable on the Internet may lower transaction costs even more. You will encounter many examples throughout this book of other ways that law lubricates bargaining. By lubricating bargaining, the law enables the private parties to exchange legal rights, thus relieving lawmakers of the difficult task of allocating legal rights efficiently.¹³

We can formalize this principle as the *Normative Coase Theorem*:

Structure the law so as to remove the impediments to private agreements.

The principle is *normative* because it offers prescriptive guidance to lawmakers. The principle is inspired by the Coase Theorem because it assumes that private exchange, in the appropriate circumstances, can allocate legal rights efficiently. To illustrate the principle’s application, the dramatic worldwide trend toward privatization in the 1990s removed many regulatory impediments to private agreements.

Besides encouraging bargaining, a legal system tries to minimize disagreements and failures to cooperate, which are costly to society. The importance of minimizing the losses from disagreements was especially appreciated by the seventeenth-century English philosopher Thomas Hobbes. Hobbes thought that people would seldom be rational enough to agree on a division of the cooperative surplus, even when there were no serious impediments to bargaining.¹⁴ Their natural cupidity would lead them to quarrel unless a third, stronger party forced them to agree. These considerations suggest the following principle of property law, which we may call the *Normative Hobbes Theorem*:

Structure the law so as to minimize the harm caused by failures in private agreements.¹⁵

¹³ As we shall see in Chapter 8, contract law may be seen as an application of the Normative Coase Theorem in that much of that area of the law may be seen as an attempt to lower the transaction costs of concluding consensual agreements.

¹⁴ Because Hobbes wrote in the seventeenth century, he did not express himself in quite these terms, but this kind of argument is pervasive in his classic work, *LEVIATHAN* (1651). The modern idea underlying the pessimism of Hobbes concerning distribution is the fact that game theory has no generally accepted way to choose among core allocations.

¹⁵ This idea is developed at length in Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1 (1982).

According to this principle, the law should be designed to prevent coercive threats and to eliminate the destructiveness of disagreement.

When the parties fail to reach a private agreement where one is, in fact, possible, they lose the surplus from exchange. To minimize the resulting harm, the law should *allocate property rights to the party who values them the most*. By allocating property rights to the party who values them the most, the law makes exchange of rights unnecessary and thus saves the cost of a transaction. To illustrate, the Normative Hobbes Theorem requires the law to create “open range” (ranchers’ rights), rather than “closed range” (farmers’ rights) in situations corresponding to our previous example.

These two normative principles of property law—minimize the harm caused by private disagreements over resource allocation (the Normative Hobbes Theorem), and minimize the obstacles to private agreements over resource allocation (the Normative Coase Theorem)—have wide application in law. In combination with the Coase Theorem discussed earlier and its corollary, these principles will form the heart of our economic analysis of property law in the remainder of this and the following chapter.

D. Lubricate or Allocate? Coase versus Hobbes

The Coase and Hobbes Theorems characterize two ways that law can increase efficiency when transaction costs are positive. First, law can *lubricate* private exchange by lowering transaction costs. Second, law can *allocate* rights to the party who values them the most.

Now we consider how a lawmaker might choose between lubricating and allocating. Return to our example of the farmer and the rancher, where fencing costs the rancher \$75 and the farmer \$50. Assume that law assigns the obligation to fence to the rancher (farmers’ rights). Given these facts, a surplus of \$25 could be achieved by transferring the obligation to fence from the rancher to the farmer (ranchers’ rights). Assume, however, that transaction costs of private exchange equal \$35, so the transfer is blocked. What is to be done? If law can lower the transaction costs of exchange from \$35 to \$10, transaction costs will no longer block private exchange. When private exchange is not blocked, the obligation of the rancher to build the fence can be transferred to the farmer, thus creating a net benefit of \$15.

Alternatively, assume that the law cannot lower the transaction costs of exchange. The other possible remedy is to change the law and assign the obligation to fence to the farmer (ranchers’ rights), not the rancher (farmers’ rights). If the farmer has the obligation to fence, the legal rights are allocated efficiently. When the right is already allocated efficiently, exchange of the right would produce a negative surplus. Exchange is unnecessary and will not occur.

Unfortunately, however, lawmakers often do not know who values rights the most, and finding out can be difficult. To illustrate, consider the problem of finding out the cost of fencing the farmer’s crops. When testifying in court, the farmer has an incentive to exaggerate these costs. Knowing this fact, the judge and the jury are not sure whether to believe the farmer.

Lawmakers with limited information face a trade-off between transaction costs and information costs. On one hand, by strictly following precedent, courts avoid the

information costs of determining who values a right the most. With strict adherence to precedent by courts, the parties must bear the transaction costs of correcting inefficient legal allocations of rights. On the other hand, the courts can attempt to determine who values a legal right the most and adjust the law accordingly. With legal reallocation of rights, the courts or other lawmakers must bear the information costs of determining who values a right the most. Efficiency requires the courts to do whichever is cheaper.

To formalize this claim, let IC denote the information costs to a court of determining who values a legal right the most. Let TC indicate the transaction costs of trading legal rights. Efficient courts would follow this rule:

$IC < TC \Rightarrow$ allocate the legal right initially to the person who values it the most;
 $TC < IC \Rightarrow$ strictly follow precedent.

To illustrate the application of this principle, as population increases and land use intensifies, areas in the western United States convert from open to closed range. Assume that a judge or panel of legal experts must consider whether to leave some range in the country open or to close it. In approaching the question, the judge or commission should balance the transaction costs of private bargains between ranchers and farmers, and the cost to lawmakers of trying to determine the fencing costs of ranchers and farmers.

QUESTION 4.11:

- a. When transaction costs are low enough, efficient resource allocation will follow regardless of the particular assignment of property rights. When transaction costs are high enough, efficient resource allocation requires assigning property rights to the party who values them the most. Give an example of each case.
- b. Can you use the Normative Hobbes Theorem to justify legislation regulating the collective bargaining process between employers and employee unions?
- c. When people strongly disagree, they may try to harm each other, or they may walk away from a potentially profitable exchange. What does the Normative Hobbes Theorem suggest the response of the law should be to these two possibilities?

V. How Are Property Rights Protected?

Now we have the tools to answer another of the four fundamental questions of property law that we posed at the beginning of this chapter: “What are the remedies for the violation of property rights?” This question concerns how a court should respond when a private person or the government interferes with someone’s property rights. Our discussion in this chapter will focus on interference by a private person. We consider government interference in the next chapter.

A. Damages and Injunctions

First, we need some background. The remedies available to a common law court are either *legal* or *equitable*. The principal *legal* remedy is the payment of *compensatory*

money damages by the defendant to the plaintiff. These damages are a sum of money that compensates the plaintiff for the wrongs inflicted on her by the defendant. The court determines the appropriate amount of money that will, as the saying goes, “make the plaintiff whole.” The measurement of this sum is a complex subject itself, which we discuss later.¹⁶ *Equitable* relief consists of an order by the court directing the defendant to perform an act or to refrain from acting in a particular manner. This order is frequently in the form of an *injunction*, which is said to “enjoin” the defendant to do or to refrain from doing a specific act.¹⁷

Notice that legal relief is “backward-looking” in the sense that it compensates a plaintiff for a harm already suffered, whereas equitable relief is “forward-looking” in the sense that it prevents a defendant from inflicting a harm on the plaintiff in the future. Thus, a court may combine the two forms of relief, awarding money damages for past harms and enjoining acts that could cause future harm.

Damages are the usual remedy for broken promises and accidents, whereas injunction is the usual remedy for appropriating, trespassing, or interfering with another’s property. In other words, damages are the usual remedy in the law of contracts and torts, whereas injunction is the usual remedy in the law of property. For these reasons, damages are often referred to in the legal literature as a “liability rule,” while equitable relief is typically called a “property rule.” To illustrate, the farmer will have to pay damages to the rancher for breach of a contract to deliver hay or for accidentally shooting the rancher’s cow while hunting. But if the cattle trespass on the farmer’s crops (and if farmers have a right to be free from the depredations of stray cattle), then the court will probably award damages for past harm and enjoin the rancher to constrain her cattle in the future.

B. Laundry and Electric Company: An Example

An injunction may appear to be an absolute proscription on an act. For example, if the court were to enjoin the future invasion of the farmer’s cornfields by the rancher’s cattle, one might interpret that as meaning that the rancher will have to erect a fence. This is a mistake. The injunctive remedy does not prevent the invasion of the farmer’s property by the rancher’s cattle from ever occurring, only from its occurring without the consent of the farmer. The farmer is free to make a contract promising *not* to enforce the

¹⁶ There are two more things you should be aware of. First, if a defendant fails to pay a judgment that a court has awarded against him or her, the defendant’s property may be seized and sold in order to raise the judgment amount. Second, compensatory damages are to be distinguished from punitive damages, which are money damages over and above compensatory damages assessed against the defendant. The purpose of punitive damages is to punish the defendant, not to compensate the plaintiff. We discuss punitive damages in Chapter 7.

¹⁷ The consequences to a defendant of violating an equitable decree are far more serious than the consequences of failing to pay a monetary judgment. A defendant’s failure to abide by an injunction not only leaves the plaintiff at a loss, but it also constitutes an insult to the authority of the court. A defendant who ignores an equitable order may be held in contempt of court and imprisoned until she agrees to abide by the order.

injunction. To illustrate, the farmer might agree not to enforce the injunction in exchange for payment of a sum of money by the rancher.¹⁸

Given these facts, the right to an injunction should be regarded as a clear assignment of a property right. Once the property right is clearly assigned, its owner may strike a bargain to sell it. Thus, if the court enjoined the rancher from allowing future invasion by her cattle, this could be viewed as a declaration that the farmer has the legally enforceable right to be free from invasion by cattle. If the rancher's value on being allowed to invade the farmer's property is greater than the farmer's value on being free from invasion, there is scope for a bargain in which the rancher buys the right from the farmer.

Most legal disputes are settled by bargaining between the parties without going to trial, but the terms of the bargain are affected by the remedy that would be available at trial.¹⁹ Specifically, the terms of the bargain are different depending on whether the remedy is damages or injunction. An example from Chapter 1 will help you to understand the relationship between remedies and bargains.

FACTS: The *E* Electric Company emits smoke, which dirties the wash at the *L* Laundry. No one else is affected because *E* and *L* are near each other and far from anyone else. *E* can abate this external cost by installing scrubbers on its stacks, and *L* can reduce the damage by installing filters on its ventilation system. The installation of scrubbers by *E* or filters by *L* completely eliminates the damage from pollution. Table 4.4 shows the profits of each company, depending on what action is taken to reduce the pollution. (The profits that are shown in the matrix exclude any compensation that might be paid or received as a consequence of a legal dispute.)

The numbers in Table 4.4 can be explained as follows. When *E* does not install scrubbers, its profits are \$1000 (regardless of what the laundry does). When *L* does not install filters and does not suffer pollution damages (because *E* has installed scrubbers), *L*'s profits are \$300. Pollution destroys \$200 of *L*'s profits. *L* can avoid this by installing filters at a cost of \$100, or *E* can avoid it by installing scrubbers at a cost of \$500. Check to see that you can use these facts to explain the numbers in the table.

The most efficient outcome is, by definition, a situation in which the total profits for the two parties, called the "joint profits," are greatest. The joint profits are found by adding the two numbers in each cell of the table. Joint profits are maximized in the northeast cell, where \$1200 is attained when *E* does not install scrubbers and *L* installs filters.

The harm caused by pollution represents a source of contention between *E* and *L*. They may be able to settle their disagreement and cooperate with each other, or they may fail to cooperate and litigate their dispute. What we are interested in determining here is how the remedy available from a court may induce the parties to achieve the efficient solution and thus to minimize the harm of pollution.

¹⁸ This inducement to bargain may be more theoretical than real. For a discussion of research by Ward Farnsworth about post-injunction bargains, see the material at Web Note 4.2 on our website.

¹⁹ This is referred to as "bargaining in the shadow of the law."

TABLE 4.4
Profits Before Legal Action[‡]

		LAUNDRY			
		No Filter		Filter	
ELECTRIC COMPANY	No Scrubbers	1000	100	1000	200
	Scrubbers	500	300	500	200

[‡]The electric company's profits are given first in the lower-left corner of each cell; the laundry's profits are given in the upper-right corner of each cell.

Suppose that *E* and *L* litigate their disagreement. Three alternative rules of law could be applied in the event of a trial:

1. *Polluter's Right*: *E* is free to pollute.
2. *Pollutee's Right to Damages*: *L* is entitled to compensatory damages from *E*. (Compensatory damages are a sum of money that *E* pays to *L* to make up for *L*'s reduced profits due to *E*'s pollution.)
3. *Pollutee's Right to Injunction*: *L* is entitled to an injunction forbidding *E* to pollute. (An injunction is a court order requiring *E* to stop polluting.)

Let us determine the value of the noncooperative solution under each of these rules as depicted in Table 4.5.

Beginning with rule 1, if *E* is free to pollute, the most profitable action for *E* is not to install scrubbers and to enjoy profits of \$1000. The most profitable response for *L* is to install filters and enjoy profits of \$200. Thus, the noncooperative value of the rule of free pollution is \$1200. This is the efficient solution, which is in the northeast cell of the table.

TABLE 4.5
Profits from Bargaining Under Three Legal Rules

	Noncooperation		Surplus	Cooperation	
	E	L		E	L
Rule 1 <i>Polluter's Right</i>	1000	200	0	1000	200
Rule 2 <i>Damages</i>	800	300	100	850	350
Rule 3 <i>Injunction</i>	500	300	400	700	500

Turning to rule 2, assume that *E* must pay damages to *L* and also assume that *L* has no legal duty to install filters (no duty to “mitigate”). If *E* must pay damages to *L* for polluting, then *L* will not bother to install filters. *E* will have to pay damages to *L* equal to the difference between the profits *L* enjoys when there is no pollution, \$300, and the profits *L* enjoys with pollution, \$100. *E* has a choice between installing the scrubbers and paying damages of \$200 to *L*. The more profitable alternative is for *E* not to install the scrubbers: It initially realizes \$1000 in profits, from which \$200 must be subtracted to pay damages, leaving *E* with net profits of \$800. *L* enjoys net profits of \$300 (\$100 from its operations plus \$200 from *E*). The noncooperative value under rule 2 (a rule of liability for compensatory damages) is then $\$1100 = \$300 + \$800$. This is the value in the northwest cell in the table.

Turning to rule 3, if *E* is enjoined from polluting and responds by installing scrubbers, *E*'s profits equal \$500. When *E* installs scrubbers, *L* will not bother to install filters, so *L*'s profits will be \$300. Thus, the noncooperative value under the rule of enjoining pollution is $\$800 = \$500 + \$300$, which corresponds to the southwest cell of the table.

Under the pessimistic assumption that *E* and *L* cannot cooperate, only one of the legal rules produces an efficient outcome—namely, rule 1. Instead of making the pessimistic assumption that the parties will be unable to cooperate, suppose we make the optimistic assumption that the parties can settle their disagreement cooperatively. (We are assuming that transaction costs are very low.) When *E* and *L* cooperate, their best strategy is to maximize the joint profits of the two enterprises. The profits are maximized when they take the efficient course of action, which, in this case, is for *L* to install filters and *E* not to install scrubbers, yielding joint profits of \$1200. This is the efficient solution in the northeast cell.

There are, thus, two ways to achieve the efficient solution. One way is for the law to adopt the rule for which the noncooperative solution is efficient. This solution is commended by the Normative Hobbes Theorem. In our example (but not necessarily other pollution examples), the noncooperative solution is efficient under rule 1, which gives *E* the freedom to pollute. The other way to achieve efficiency is for the parties to cooperate. The cooperative solution is efficient under all three of the possible laws. According to the Coase Theorem, inefficient allocations of legal rights by laws such as rules 2 and 3 will be cured by private agreements, provided that bargaining is successful.

If transaction costs equal zero and successful bargaining can cure inefficient laws, what difference does the law make? One answer is that the law affects the distribution of the cooperative product, which affects bargaining. To illustrate this point about distribution, recall how the structure of the law—such as rules 1, 2, and 3—affects the threat values of the parties. A reasonable bargaining solution is for each party to receive his or her threat value plus an equal share of the cooperative surplus. Each party to a bargain would prefer the rule of law that provides him or her with the largest threat value. Specifically, the threat value of the plaintiff in a property dispute is at least as great when the remedy for future harm is injunctive relief as when the remedy is damages. The plaintiff, consequently, prefers the remedy of injunctive relief for future harm, or, better yet, injunctive relief for future harm and damages for past harm.

In contrast, the defendant prefers the damage remedy for future harm or, better yet, no remedy.

The effect of the rule of law on the distribution of the cooperative product can be computed precisely for E and L . Imagine that E and L enter into negotiations, and, to keep the arithmetic simple, assume that negotiating a settlement or going to trial is costless for the parties (swallow hard!). The noncooperative payoffs—that is, the profits the parties can get on their own if negotiations fail—are shown in Table 4.5 under each of the three rules. The cooperative surplus, which equals the difference between the joint profits from cooperation and the threat values, is shown in the middle column. A reasonable bargaining solution is for each party to receive his or her threat value plus half the surplus from cooperation. The payoffs to the two parties from cooperation are given in the two columns on the right side of the table. Notice that in each case the cooperative payoffs sum \$1200, but that L receives the largest share under the injunctive rule (rule 3), an intermediate share under damages (rule 2), and the smallest share when E is free to pollute (rule 1).

QUESTION 4.12: In the preceding example, implementing an injunction to end future interference costs the defendant more than damages for future interference. Is this fact generally true or just a special feature of this example?

C. Efficient Remedies

We mentioned that injunction is the usual remedy for breach of a property right. We would like to explain this generalization, as well as exceptions to it, in terms of efficiency. The preceding example showed that damages and injunctions are equally efficient remedies when transaction costs equal zero. Consequently, differences in efficiency must depend on transaction costs. If transaction costs are so high as to preclude bargaining, then the more efficient remedy is damages, not injunctions.

The reason that damages are more efficient than injunctions when transaction costs preclude bargaining is easy to see from the example of the laundry and electric company. If damages perfectly compensate the laundry, its profits remain the same (specifically, \$300) regardless of whether the electric company pollutes. So, the laundry is indifferent between the damage and injunction remedies (assuming no bargaining). Under the damage remedy, the electric company can pollute and pay damages, or it can abate and not pay damages. Its profits increase from \$500 to \$800 when it pollutes and pays damages, rather than abating. In contrast, an injunction (with no bargaining) removes this choice. Specifically, the injunction forces the electric company to abate, in which case its profits are \$500. In general, when transaction costs preclude bargaining, a switch in remedy from injunction to compensatory damages makes the victim no worse off, whereas the injurer may be better off and cannot be worse off. In the example of the laundry and electric company, a switch makes the electric company strictly better off. According to Table 4.5, the noncooperative solution yields \$800 to the electric company under a damage remedy and \$500 under an injunction, whereas the laundry enjoys \$300 in either case.

We have explained the superiority of the damages remedy when transaction costs are high. What about the converse proposition? Are injunctions the superior remedy

when transaction costs are low? The traditional answer, which we will explain, is “Yes.” Earlier we noted that bargaining tends to succeed when the legal rights of the parties are clear and simple. Injunction is traditionally regarded as clearer and simpler than damages, because the determination of damages by courts can be unpredictable. To illustrate, it is difficult for a court to assign monetary value to the damage caused by the Windsong satellite’s straying into the orbit of Orbitcom’s satellite in Example 2. Similarly, it is difficult for a court to assign monetary value to the damage caused by the intrusion of Potatoes’s house onto 2 feet of Parsley’s land in Example 5. In contrast, the right to an injunction gives the parties a clear position from which to bargain. In the course of bargaining, they may establish the value of the damage themselves. Thus, the traditional argument concludes that the injunctive remedy is more efficient than damages when the parties can bargain with each other.

We have reached the conclusion of a famous article by Judge (then Professor) Guido Calabresi and A. Douglas Melamed,²⁰ who proposed the following rules for determining the best remedy for violating a legal right:

Where there are few obstacles to cooperation (that is, low transaction costs), the more efficient remedy is to enjoin the defendant’s interference with the plaintiff’s property.

Where there are obstacles to cooperation (that is, high transaction costs), the more efficient remedy is to award compensatory money damages.

Most property disputes involve small numbers of contiguous landowners. Communication costs are low; the parties can monitor conformity to their agreements; and neighbors take a long-run view towards each other, which limits opportunism and strategic behavior. Bargaining is likely to be successful in these circumstances. According to the preceding prescription, the usual remedy in property disputes ought to be injunctive relief, and that is the law in fact.

Some property disputes, however, involve large numbers of people. As the numbers increase, communication costs rise, monitoring becomes difficult, and short-sighted behavior increases. Private bargaining is unlikely to succeed in disputes involving a large number of geographically dispersed strangers, such as disputes over nuisances like air pollution and the stench from the feedlot in Example 3. According to the preceding prescription, the usual remedy in nuisance suits with large numbers of people should be damages. Chapter 5 explains that some courts have followed this principle and others have not.

The two preceding rules constitute the “traditional prescription” in law and economics to choose between damages and injunctive remedies. In most circumstances, the traditional prescription suffices, but more careful thinking about information has refined it. When a person’s activity spills over and affects other property owners, the

²⁰ Calabresi & Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972). As the title indicates, the authors consider a third method of encouraging the efficient use of property—inalienability, the forbidding of a bargaining solution to the use of a property right. We discuss the efficiency of that method briefly in the next chapter.

court needs different information depending on whether its remedy is damages or injunction. When transaction costs obstruct bargaining, creating efficient incentives by awarding damages requires the court to measure the harm correctly. If the court mismeasures the harm, damages will be set too high or too low, which will distort the injurer's incentives. Chapter 6 explains this point in detail.

Alternatively, when transaction costs obstruct bargaining, creating efficient incentives requires the court to know which party values the right the most in order to decide between an injunction and no injunction.²¹ If the electric company values the right to pollute more than the laundry values the right to be free from pollution, then the court should allow the electric company to pollute and refuse the laundry's request for an injunction. Conversely, if the laundry values the right to be free from pollution more than the electric company values the right to pollute, then the court should grant the laundry's request for an injunction against the electric company's pollution.

In sum, when transaction costs obstruct bargaining, what the court should do depends on what it knows. The court must know the absolute value of the harm caused by a spillover in order to provide efficient incentives by a damage remedy. The court needs to know the relative value of the spillover in order to achieve efficiency by the injunctive remedy. Now we can restate the first prescription's refinement:

When transaction costs preclude bargaining, the court should protect a right by an injunctive remedy if it knows which party values the right relatively more (even if it does not know how much either party values the right absolutely). Conversely, the court should protect a right by a damage remedy if it knows how much one of the parties values the right absolutely (even if it does not know which party values the right relatively more).

The second prescription—award an injunction when low transaction costs permit bargaining—also requires qualification in light of problems of information. This prescription assumes that voluntary exchange of a right occurs more easily when it is protected by an injunction, because the injunctions are simpler and clearer than damages. While this is usually true, it is not always so. In bargaining, what matters is costs, not physics. No matter how clear the injunction, the cost of complying with it may be unclear. To lubricate bargaining, each party needs to know the other's threat value or go-it-alone value. Injunctions do not solve the problem that private information about costs and values inhibits bargaining. To illustrate, the injunction for the electric company to stop polluting is clear, but the cost to the electric company of complying, which may or may not be clear to the electric company, is unclear to the laundry.

The truth is more equivocal than the traditional analysis suggests. With the injunctive remedy, the obstacle to private agreement includes the plaintiff's uncertainty about

²¹ The court knows the relative values of the entitlement if the unobservable elements of individual valuations correlates positively with the observable elements. See Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 715 (1996). But see Ian Ayres & Paul Goldbart, *Correlated Values in the Theory of Property and Liability Rules*, 32 J. LEGAL STUD. 121 (2003) (rejecting the correlated values claim—that “liability rules cannot harness private information when the disputants’ values are correlated”).

the defendant's costs of complying with a court order. Conversely, with the damage remedy, the obstacle to private agreement includes the defendant's uncertainty about the money value of the plaintiff's harm.²²

QUESTION 4.13: Use the theory of transaction costs to justify protecting the following rights by injunction or damages:

- a. A landowner's right to exclude from his property a neighbor's gas line.
- b. A new car owner's right to have her car's defective transmission replaced by the seller.
- c. A homeowner's right to be free from air pollution by a nearby factory.
- d. A spouse's right to half the house on divorce.

QUESTION 4.14: Suppose that two people choose to litigate a dispute. Should the law presume that if two parties are prepared to litigate, transaction costs must be high, and therefore the court should choose damages as the remedy, not an injunction?



Web Note 4.2

There has been a surprising amount of recent scholarship on the Calabresi-Melamed contention about the efficiency of remedies. We discuss much of that literature on our website, including looking at the empirical literature on whether the issuing of injunctions is typically followed by bargaining.

VI. What Can Be Privately Owned?—Public and Private Goods²³

In this section we turn to another fundamental question of property law: should property rights be privately or collectively held? First, we use the economic distinction between public and private goods (developed in Chapter 2) to differentiate those resources that will be most efficiently used if privately owned from those that will be most efficiently used if publicly owned.

Most examples of property that we have discussed thus far in this book are what economists call “private goods.” Goods that economists describe as purely private have the characteristic that one person's use precludes another's: For example, when one person eats an apple, others cannot eat it; a pair of pants can be worn only by one person at

²² Taking these arguments into account leads to a more convincing version of the second rule:

Where there are few obstacles to cooperation (i.e., low transaction costs), the more efficient remedy is the award of an injunction when the plaintiff can estimate the defendant's compliance costs more readily than the defendant can estimate the plaintiff's damages.

²³ Before reading this section, you may find it helpful to review the material on public goods in Chapter 2.

a time; a car cannot go two different directions simultaneously; and so forth. These facts are sometimes summarized by saying that there is rivalry in the consumption of private goods.

The polar opposite is a purely public good, for which there is no rivalry in consumption. A conventional example of a public good is military security in the nuclear age. Supplying one citizen with protection from nuclear attack does not diminish the amount of protection supplied to other citizens.

There is also another attribute that distinguishes private and public goods. Once property rights are defined over private goods, they are (relatively) cheap to enforce. Specifically, the owner can exclude others from using them at low cost. For example, a farm can be fenced at relatively low cost to exclude trespassing cattle. With public goods, however, it is costly to exclude anyone from enjoying them. To illustrate, it is virtually impossible to supply different amounts of protection against nuclear attack to different citizens.

Having explained the private-public distinction in economics and law, we can now relate them to each other. The relationship is very simple: Efficiency requires that private goods should be privately owned and that public goods should be publicly owned. In other words, efficiency requires that rivalrous and excludable goods should be controlled by individuals or small groups of people, whereas nonrivalrous and nonexcludable goods should be controlled by a large group of people such as the state. Thus, the distinction between private and public goods should guide the development of property rules to answer the question, “What can be privately owned?”

We can explain the central idea, not the details, for this prescription. Being rivalrous, private goods must be used and consumed by individuals, not enjoyed equally by everyone. Efficiency requires the use and consumption of each private good by the party who values it the most. In a free market, exchanges occur until each good is held by the party who values it the most. Thus, the law can achieve the efficient allocation of private goods by, for example, lowering bargaining costs by assigning clear and simple ownership rights. Once the state recognizes private property rights, the owner of a private good can exclude others from using or consuming that right, except by the owner’s consent. The owner’s power to exclude channels the use or consumption of private goods into voluntary exchange, which fosters the efficient use of those goods. This is an example of “lubricating bargaining.”

In contrast, the technical character of public goods obstructs the use of bargaining to achieve efficiency. To illustrate, suppose that a particular city block is plagued by crime and some residents propose hiring a private guard. Many residents will voluntarily contribute to the guard’s salary, but suppose that some refuse. The paying residents may instruct the guard not to aid nonpayers in the event of a mugging. Even so, the presence of the guard on the street will make it safer for everyone, because muggers are unlikely to know who has and who has not paid for the guard’s services. Given these facts, there is not much that the payers can do to compel nonpayers to contribute.

Those people who do not pay for their consumption of a public good are called “free riders.” To appreciate this concept, imagine that a street car has an electric meter in it and, in order to make the street car move, the riders must put money into the meter.

The riders will realize that anyone who pays provides a free ride for everyone else. Perhaps some riders will, nonetheless, put their full fare into the meter; some will put some money in but not their full fare; and some will not put anything in at all. Because of “free riders,” not enough money will be put in the meter, so the street car company will provide fewer street cars than efficiency requires. In general, markets supply too little of a public good because the private supplier cannot exclude users of it who do not pay their share of the costs.

We have explained that private goods, which exhibit rivalry and exclusion, ought to be privately owned, and that public goods, which exhibit nonrivalry and nonexclusion, ought to be publicly owned. We illustrate this proposition as applied to land. Some efficient uses of land involve a small area and affect a small group of people, such as building a house or growing corn. “Housing” and “corn” are rivalrous goods with low exclusion costs, so markets easily form for housing and corn. Other efficient uses of land involve a large area and affect a large group of people. For example, the use of an uncongested airspace by airplanes or the use of the high seas for shipping are not rivalrous and exclusion is costly. Thus, airspace and the high seas are public goods. As congestion increases from more planes and ships, governments impose rules on the use of the air and seas.

These are examples in which private goods are privately owned and public goods are publicly owned, as required for efficiency. There are, however, many examples of private goods that are publicly owned. Public ownership of a private good typically results in its misallocation, by which we mean that it is used or consumed by someone other than the person who values it the most. For example, leases for grazing cattle on public lands may be granted to the friends of politicians. Similarly, the officials who administer the leases may not monitor compliance to prevent overgrazing, and the ranchers who overgraze the land may cause it to erode. Much of the impetus for “deregulation,” which was a worldwide movement in the 1990s, came from the realization that much government activity concerns private goods where markets should be lubricated, rather than government intruding directly in the process of allocation. For example, the realization that transportation by railroad, airplane, and barge are private services that should be supplied by free markets has led to the dismantling of the Interstate Commerce Commission, the Civil Aeronautics Board, and other regulatory agencies in the United States.

One way to contrast private and public ownership is in terms of transaction costs. Private ownership imposes various transaction costs of private enforcement and exchange. Public ownership imposes transaction costs in terms of public administration and collective decision making. To illustrate the difference, consider two possible ways to control air pollution from a factory. The private property approach is to grant each property owner the right to clean air, protected by the remedy of compensatory damages. This method will result in many landowners suing for damages or bargaining to settle out of court. Alternatively, the public property approach would declare that clean air is a public good, and assign the task of air quality control to a government agency. This method will result in political bargaining and regulations. From this perspective, the choice between private and public ownership should depend on whether the costs

of private enforcement and exchange are more or less than the costs of public administration and political bargaining.

In the next chapter we will continue developing these themes by discussing two important questions: For what specific resources is private ownership more efficient than public or communal ownership and vice versa? And under what circumstances should government be allowed to take private property from citizens?²⁴

QUESTION 4.15: If everyone has free access to a public beach, who, if anyone, has the power to control the use of this resource?

QUESTION 4.16: Discuss how to adjust private and public property rights to promote ecotourism in Africa.

VII. What May Owners Do with Their Property?

We used the theory of private and public goods to answer the question, “What can be privately owned?” Closely related to the theory of public goods is the theory of externalities, which we discussed in Chapter 2. Now we return to that theory in order to answer the question, “What may owners do with their property?”

Legislation imposes many restrictions on what a person may do with his or her property. But at common law there are relatively few restrictions, with the general rule being that any use is allowed that does not interfere with other peoples’ property or other rights. Indeed, we could say that common law approximates a legal system of *maximum liberty*, which allows owners to do anything with their property that does not interfere with other people’s property or other rights. The restriction of noninterference finds justification in the economic concept of *external cost*. Recall that external costs are those costs involuntarily imposed on one person by another. Because market transactions are voluntary, externalities are outside the market system of exchange—hence their name. For example, a factory that emits thick, cloying smoke into a residential neighborhood is generating an externality. In Example 3 at the beginning of this chapter, the stench from the cattle feedlot is an externality that interferes with Foster’s enjoyment of her house. In Example 4, the development of Bloggs’s wetlands will interfere with the town’s enjoyment of its rivers and streams. Notice that these types of interference are like a public good in that they affect many property owners. There is, as it were, no rivalry or exclusion from smelling the feedlot’s stench among Foster and her neighbors. These forms of interference are thus like a public good, except they are bad rather than good.

²⁴ We are not, of course, suggesting that the current division of responsibility between public and private providers of goods and services necessarily follows the rules we have just set down. That is, there are current instances of the government provision or subsidization of private goods and of the private (under-) provision of public goods. The extent to which these anomalies exist and why they persist are two of the central concerns of the branch of microeconomic theory called “public choice theory.”

We have already explained why markets cannot arise to supply public goods efficiently. The same set of considerations explains why private bargaining cannot solve the problem of externalities, or, as we called them in a previous section, public bads. To illustrate, suppose that Foster had enough money to pay the feedlot to stop emitting its stench. If she made this private deal with the feedlot, all of her neighbors would also benefit but without having to pay for that benefit. This fact suggests that Foster will not pay the feedlot to stop its malodorous activities. More generally, the free-rider problem prevents private bargaining solutions to the problem of externalities or public bads. Some form of legal intervention is called for. One possibility is a rule forbidding involuntary invasion, supported by provisions for remedies if that invasion takes place. We have already noted how bargaining theory can help to design the form that remedy should take, namely, the payment of compensatory money damages. An alternative remedy that we will consider in the following chapter is regulation of the public bad or external-cost-generating activity by an administrative agency.

By contrast, *private* bads may be self-correcting through private agreements (recall the rancher-farmer example), so that there may be no need for an intrusive legal solution. Instead, the courts can stand prepared to issue an injunction in the confident expectation that they will seldom be required to do so.

VIII. On Distribution

We have developed an economic theory of property based on efficient ownership. However, some critics of economics believe that property law should be based on distribution, not efficiency.

Some people think that government should redistribute wealth from rich to poor for the sake of social justice, whereas other people think that government should avoid redistributing wealth, allowing individuals to receive all the rewards of their hard work, inventiveness, risk-taking, and astute choice of parents. Like the rest of the population, economists disagree among themselves about redistributive *ends*. However, economists often agree about redistributive *means*.

Given the end of redistribution, economists generally prefer to pursue it by the most efficient means. For each dollar of value transferred from one group to another, a fraction of a dollar is typically used up, as, for example, in administrative costs. The most efficient means of redistribution uses up the least value to accomplish the transfer. Chapter 1 illustrated this fact by the example of ice cream melting during its transfer across the desert from one oasis to another. Another example is the percentage of donations that a charity spends on administrative costs. Many economists believe that redistributive goals can be accomplished more efficiently in modern states by progressive taxation than by reshuffling property rights. Besides avoiding waste, more efficient redistribution generates more support from the people who must pay for it. If the economists are right, redistribution for social justice should focus mostly on taxation and expenditure, not property rights.

Progressive taxation and expenditure is usually more efficient than reshuffling property rights to achieve redistribution for a variety of reasons. The most wasteful

way to redistribute wealth is for courts to tilt trials in favor of the plaintiff or defendant depending on who is poorer. If courts favor the poorer party in legal disputes, each person prefers to avoid interacting with relatively poorer people whenever a lawsuit could arise. Thus, a person would want to avoid owning real estate in a neighborhood occupied by people who are poorer than he is. Similarly, favoring the poorer party in a contract dispute makes a person reluctant to do business with anyone who is poorer than he is.

Several other reasons also make taxation superior to property law as a means of redistribution. First, the income tax precisely targets inequality, whereas property law relies on crude averages. To illustrate, suppose that the rule of law in a particular county in Montana is “ranchers’ rights.” If ranchers are richer than farmers on average in this county, then changing the rule to “farmers’ rights” would redistribute wealth toward greater equality. However, although ranchers are richer than farmers *on average*, some farmers are undoubtedly richer than some ranchers. Changing the property rights to favor farmers over ranchers will aggravate the inequality between the rich farmers and poor ranchers. In contrast, progressive taxation will ameliorate unequal incomes.

A second objection is that reshuffling property rights may not really have the distributive effects anticipated. To illustrate, suppose that both farmers and ranchers rent their land from absentee owners. If property law shifts the cost of fencing from farmers to ranchers, competition among landlords may cause them to adjust rents to offset the change in costs. Specifically, the landlords who own farm land may increase the rent charged to farmers, and the landlords who own ranch land may decrease the rent charged to ranchers. Consequently, the reshuffling of property rights may not affect the distribution of wealth between farmers and ranchers. Instead, the landlords who own farms may gain and the landlords who own ranches may lose. In general, any change in the value of land gets “capitalized” into rent. Consequently, the wealth effects of reshuffling property rights in a world with zero transaction costs tend to fall on the owners of land, not its users.²⁵

In addition, there is another reason for the relative inefficiency of redistribution by property law. Redistribution by property law distorts the economy more in the long run than does progressive taxation. For example, if property law favors farmers over ranchers, some rich ranchers may switch to farming to gain valuable legal rights. In contrast, a comprehensive income tax precludes people from reducing their tax liability by changing the source of their income.²⁶ For these reasons and more, economists who favor redistribution and economists who oppose it can agree that property law is usually

²⁵ Professor Coase made this argument in “Notes on the Problem of Social Cost” in *THE FIRM, THE MARKET, AND THE LAW* (1988). In general, taxes and other government impositions finally fall on factors in relatively fixed supply, such as land.

²⁶ A fundamental principle in public finance is that taxes distort less when applied to a broad base rather than to a narrow base. Distortion decreases with the breadth of the base because demand becomes less elastic. To illustrate, the demand for food is less elastic than the demand for vegetables, and the demand for vegetables is less elastic than the demand for carrots. Income is a very broad base.

the wrong way to pursue distributive justice. Unfortunately, these facts are not appreciated by many lawyers who have not studied economics.²⁷

We have presented several reasons against basing property law on redistributive goals. Specifically, we discussed imprecise targeting, unpredictable consequences, high transaction costs, and large distortions in incentives. While the general principles of property law cannot rest on wealth redistribution, special kinds of redistributive laws can ameliorate these objections and blunt this criticism. An example is laws requiring employers to construct buildings that provide access to people in wheelchairs. If properly designed, these laws can precisely target handicapped people in a predictable way, enforcement by private legal action can be inexpensive, and the distortion in incentives can be modest. Designing such laws to produce these desirable outcomes, however, requires more careful attention to the underlying economics than regulators typically show.

Conclusion

Property is a bundle of rights with incentive effects. Efficient property rights create incentives to maximize a nation's wealth in two different ways. First, property rights are the legal basis of voluntary exchange, which achieves *allocative efficiency* by moving goods from people who value them less to people who value them more. Second, property rights are part of the law that makes owners internalize the social costs and benefits of alternative uses of the goods that they own. Owners achieve *productive efficiency* by balancing the social costs and benefits of what they do with what they own.

Suggested Readings

Bell, Abraham, & Gideon Parchomovsky, *A Theory of Property*, 90 CORNELL L. REV. 531 (2005).

Calabresi, Guido, *The Pointlessness of Pareto: Carrying Coase Further*, 100 YALE L. J. 1043 (1991).

Cooter, Robert, *The Cost of Coase*, 11 J. LEGAL STUD. 1 (1982).

Ellickson, Robert D., *Property in Land*, 102 YALE L.J. 1315 (1993).

ELICKSON, ROBERT, *ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES* (1991).

Lueck, Dean, & Thomas Miceli, *Property*, in A. MITCHELL POLINSKY & STEVEN SHAVELL, EDs., *HANDBOOK OF LAW AND ECONOMICS*, vol. 1 (2007).

Merrill, Thomas W., & Henry E. Smith, *Optimal Standardization in the Law of Property: The Numerus Clausus Principle*, 110 YALE L.J. 1 (2000).

Merrill, Thomas W., & Henry E. Smith, *What Happened to Property in Law and Economics?*, 111 YALE L.J. 357 (2001).

Polinsky, A. Mitchell, *Resolving Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies*, 32 STAN. L. REV. 1075 (1980).

²⁷ An important technical conclusion in formal welfare economics (the Second Fundamental Theorem of Welfare Economics) reinforces the general point made in the text—namely, that efficiency and equity are separable. With specific reference to property law, that conclusion can be read to say that property law should seek to allocate and enforce entitlements so that a society uses resources efficiently and should then use the tax-and-transfer system to achieve distributive equity. See, for example, Steven Shavell, *A Note on Efficiency v. Distributional Equity in Legal Rulemaking: Should Distributional Equity Matter Given Optimal Income Taxation?*, 71 AM. ECON. REV. 414 (1981), and Louis Kaplow & Steven Shavell, *Why the Legal System Is Less Efficient Than the Income Tax in Redistributing Income*, 23 J. LEGAL STUD. 667 (1994).