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Introduction: The property rights model

In the slave societies of the American South and of the West Indies, slaves persistently – albeit rarely – bought their contracts from their owners in order to redeem themselves from slavery. In these societies, as in others, the law afforded owners nearly absolute rights over their slaves and granted the slaves themselves no legal rights; consequently slaves were not legally entitled to own the property necessary for self-purchase. There was no legal barrier or authority to stand in the way of owners' owning both slave *and* freedom money. Nevertheless, self-purchase whereby slaves acquired property rights to their own labor did occur.

Because transacting is costly, as an economic matter property rights are never fully delineated. In the case of slaves, even though they were legally their owners' property, owners had to spend resources to induce their slaves to produce, and even then slaves seldom produced to their ultimate capacity. Thus slave ownership itself was never absolute, despite the slaves' lack of legal protection. Owners were able to enhance the value of their property through *granting* slaves some ownership rights in exchange for services the owners valued even more. Hence slaves were owners too, and could on occasion buy their freedom. As elaborated upon in Chapter 6, the study of property rights and of the costs of transacting can yield an explanation of why slaves were able to buy their freedom; such explanations may be tested against the facts. The property rights model I develop in this book can provide explanations of an array of such arrangements, which standard economic theory cannot successfully address, from identifying the reasons behind the choice between wage and piece-rate contracts to pinpointing the conditions under which charity is more efficient than profit-seeking behavior.

In the remainder of this chapter I shall define "property rights" and sketch the framework to be used in this book. In Chapter 2 the examination of the gasoline shortage in the 1970s illustrates the usefulness and importance of the property rights framework and familiarizes the reader

with its mechanics. Chapters 3 and 4 present the property rights model and its main organizational implications. Chapters 5 through 9 expand the model and apply it to various problems including rights formation, slavery, and resource allocation in non-market settings, and Chapter 10 recapitulates.

THE INHERENT DIFFICULTY OF DELINEATING RIGHTS FULLY

Property rights of individuals over assets consist of the rights, or the powers, to consume, obtain income from, and alienate these assets. Obtaining income from and alienating assets require exchange; exchange is the mutual ceding of rights. Legal rights, as a rule, enhance economic rights, but the former are neither necessary nor sufficient for the existence of the latter. The rights people have over assets (including themselves and other people) are not constant; they are a function of their own direct efforts at protection, of other people's capture attempts, and of government protection. The last condition is effected primarily through the police and the courts.[1] Squatters' rights to the land they occupy are less secure than those of legal owners not because they lack deeds but because less police protection is expected for such holdings. As defined here, property rights are not absolute and can be changed by individuals' actions; such a definition, then, is useful in the analysis of resource allocation. Economists' past failure to exploit the property rights notion in the analysis of behavior probably stems from their tendency to consider rights as absolute.

The concept of property rights is closely related to that of transaction costs. I define transaction costs as the costs associated with the transfer, capture, and protection of rights. If it is assumed that for any asset each of these costs is rising and that both the full protection and the full transfer of rights are prohibitively costly, then it follows that rights are never complete, because people will never find it worthwhile to gain the entire potential of "their" assets. In order that the rights to an asset be complete, or be perfectly delineated, both its owner and other individuals potentially interested in the asset must possess full knowledge of all its valued properties. With full knowledge, the transfer of rights to an asset can be readily effected. Conversely, when rights are perfectly delineated, product information must be costless to obtain, and the (relevant) costs of transacting must then be zero.

[1]The distinction sometimes made between property rights and human rights is spurious. Human rights are simply part of people's property rights. Human rights may be difficult to protect or to exchange, but so are rights to many other assets. See Alchian and Allen (1977, p. 114).

When transaction costs are positive, rights to assets cannot be perfectly delineated. The attributes of such assets are not fully known to prospective owners and are often not known to the current owner either. The transfer of assets entails costs resulting from both parties' attempts to determine what the valued attributes of these assets are and from the attempt by each to capture those attributes that, because of the prohibitive costs, remain poorly delineated.[2] Exchanges that otherwise would be attractive may be forsaken because of such exchange costs.

An illustration of the costliness of exchanging rights and their effect on resource allocation stems from the draft of college football players by the National Football League (NFL). Drafting is the acquisition by one team of the exclusive negotiation rights for the services of a player, inclusive of the right to transfer to any NFL team. Every year, the twenty-eight NFL teams select eligible college players in a predetermined sequence. It would seem that the team with the right to, say, the twentieth selection would select the player among those not yet drafted who is most valuable to any of the teams. Given the diversity of both players and teams, the probability that the team with the right to the twentieth selection will also be the one placing its highest value on any of the remaining players is the same as any other team's, that is, one in twenty-eight. Were the costs of exchange among teams low, the probability of that player's being traded would then be twenty-seven in twenty-eight. The observed trading frequency of newly drafted players, however, is much lower than a low transaction cost model predicts. This cost of transacting, at least, does seem to be considerable.

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

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

[2]Similar considerations, not elaborated on here, apply to the protection of assets.

exchanged. Customers must spend resources in order to determine whether a store's cherries are worth buying and in order to determine which particular cherries to buy. Store owners who allow customers to pick and choose cannot easily prevent them from eating cherries after they have already decided whether or not to buy them, nor can they prevent customers' careless handling of cherries. Indeed, the process of picking and choosing itself allows wealth capture in the form of excess choosing.[3] Some of the cherries' attributes, then, are placed in the public domain. The high cost of information results in transaction costs: costs that would not arise were the owner and the consumer of cherries the same person. If information about the cherries were costless, their initial owner would not have to relinquish any rights; and pilfering, damage, and excess choosing would be avoided. In reality, such public domain problems are unavoidable; people can take steps, however, to reduce the associated losses.

DIVIDED OWNERSHIP OF COMMODITIES

Net gains from exchange can often be increased if the original owners of commodities transfer only subsets of the commodities' attributes and retain the rest. Exchange that takes this form results in divided property rights for single commodities: Two or more individuals may own distinct attributes of the same commodity. As elaborated in Chapters 4 and 7, restrictions on the owners' behavior may be imposed in order to enhance the separation of their individual rights. Incomplete separation makes attributes common property, relinquishing them to the public domain; if they are in the public domain, resources are spent on their capture.

Not only is ownership of commodities often divided; ownership of organizations may be divided as well.[4] Physical operations within, and on the fringe of, an organization such as a firm usually involve many commodities and correspondingly many attributes. Several individuals share in ownership of the attributes, each owning alone, or with others, some subset of these. Stockholders own some of these attributes, but definitely not all of them. For instance, a firm (or, more accurately, its stockholders) that has a service contract for a copier to which it has the title does not fully own the copier. The firm is not the only party that gains when the copier performs well and loses when it does not. The service supplier is the residual claimant from the servicing operation, gaining if it provides good service and losing if the service is poor, and is thus part owner of the

[3]Barzel (1982).

[4]Alchian (1965) recognizes that ownership of commodities and of organizations may be divided. Posner (1986) discusses property rights and notes that ownership can be divided.

copier. In addition, the copier manufacturer is liable for certain damages caused by the copier, and employees who are able to use the copier privately without charge are also part owners, since, in practice, they have a claim on some of the copier's output. Here, too, restrictions may serve to separate rights and prevent free rides. In Chapter 7 it is shown that such restrictions do not necessarily attenuate rights; instead, they may enhance them.

FACTORS THAT AFFECT THE ALLOCATION OF OWNERSHIP

The rights to receive the income flow generated by an asset are a part of the property rights over that asset. The greater is others' inclination to affect the income flow from someone's asset without bearing the full costs of their actions, the lower is the value of the asset. The maximization of the net value of an asset, then, involves that ownership or ownership pattern that can most effectively constrain uncompensated exploitation. The kind of ownership pattern to emerge depends on the variability of such assets.

The rights to an asset generating a flow of service are relatively easy to ensure when the flow can be readily ascertained, because it is easy to impose a charge commensurate with the level of service exchanged. Therefore, when the flow is *known* and *constant*, it is easiest to ensure that rights are also certain. If the flow is *variable* but is fully *predictable*, rights are still easy to ensure, as they are if the flow is not certain but is *unalterable*. It is evident, then, that, given the mean outcome, variability and uncertainty may reduce the value of the asset but need not affect the certainty of ownership.

When the flow of income from an asset may be affected by the exchange parties, ensuring ownership over it is problematic. When the income stream is variable and not fully predictable, it is costly to determine whether the flow is what it should have been in any particular case. Consequently it is also costly to determine whether part of the income stream has been captured by the exchange parties. The exchange parties will engage in wealth-consuming capture activities because they expect to gain from them. The delineation of ownership is problematic, then, when the income stream from the exchanged property is subject to random fluctuations and when both parties can gain by affecting that income stream.

A special case of great importance to understanding the circumstances under which ownership can be ensured arises when only one of two exchange parties can affect the income flow. Making the person who can affect the flow bear full responsibility for her or his actions ensures that

ownership becomes secure. Such a person, being the "residual claimant" to an outcome that only she or he can influence, is the full-fledged owner of the asset.

As a rule, both exchange parties can affect the service flow generated by exchanged assets, a fact that prevents ownership from being fully secure. For instance, the income stream generated by a rented car depends, in part, on how smoothly the car operates. Since used and even new cars are not identical to one another, they are not expected to run equally smoothly. A smooth ride is an attribute that both the owner and the renter can affect. A renter will find it expensive to determine to what extent the smooth ride of the rental car results from its character and to what extent it results from the care given to servicing it; similarly, the owner cannot tell how much the smoothness of the renter car's ride has deteriorated because of the way it has been driven and how much it has deteriorated because of its character. As a result, the owner may get away from skimping on servicing rental cars – doing less of it than owner-drivers would – and renters may be less careful with rented cars than they would be with their own. Each party expects such behavior of the other. Therefore, the demand function for rented cars adjusts for the effects of inadequate servicing, and the supply function adjusts for the effects of careless driving. The net gain in using the rental market, then, is less than it would be were the two parties to exercise greater care. If the smoothness of operations were costlessly measurable, the effect of each transactor on that attribute could be easily determined and accurately charged for. In reality, assessing such marginal charges accurately is prohibitively expensive, and (maximizing) owners will not choose to exercise their rights fully. Some of the income stream, then, is left in the public domain and is partly recaptured by the exchanging parties, who act differently than owner-users would. Whereas rights cannot economically be fully defined when both exchange parties are able to affect the outcome, only one pattern of ownership does maximize the net income from the asset (and thus its value to its original owner). The general principle determining the maximizing allocation of ownership is that the greater a party's inclination to affect the mean income an asset can generate, the greater is the share of the residual that party assumes.

The nominal owner of an asset may seem to have the right to the income the asset can generate. When the highest income the asset can generate requires exchange, some of the income potential will be used up in the process of effecting the exchange. The net income an asset will generate, then, *depends* on the delineation of rights, that is, on how secure rights are over it. In the case described earlier where only one person can affect the income from an asset, it is only when that person

becomes owner of the asset that rights are perfectly well defined, and it is only then that the income is maximized. To say that when rights are well defined income is maximized regardless of who has these rights is meaningless, because, as discussed in Chapter 4, only that assignment of rights that is consistent with maximum income delineates rights perfectly clearly.

THE RELATIONSHIP BETWEEN INDIVIDUALS' RIGHTS AND ECONOMIC ORGANIZATIONS

Contracts govern the exchange of property rights and are central to the study of such rights. Some contracting parties consist of individuals acting on their own behalf. Others consist of pairs of organizations such as firms, governments, clubs, and families. In addition, there are contracts between individuals and such organizations. Because individuals' objectives are relatively clear, it is useful to define *all* property rights as rights possessed by individuals. Ultimately, individuals always interact with other individuals, regardless of whether one or both interacting parties represent organizations in some capacity. The payments supermarket shoppers make for merchandise can be viewed as exchanges between individuals and an organization – between customers and the store. Such relationships, however, can always be reduced to the individual level. Here, we consider the relationship between the cashier and the customers, on the one hand, and between the cashier and the store manager, on the other. A cashier in a store has the right to collect money from customers who buy in the store. The cashier, of course, does not usually retain customers' payments; rather, in exchange for an hourly wage, the cashier cedes to the store manager rights over her or his time as well as rights over the cash received from customers. The manager's relationships with other individuals such as the store owners involve, in turn, other sets of exchanged rights. The functioning of any organization can be similarly reduced to the ceding of various rights from one individual associated with it to another.

The assumption of individual maximization, and in particular the assumption that individuals maximize the value of their rights, is useful not only directly in the analysis of individuals' behavior but also indirectly as the assumption underlying the functioning of organizations. The study of private property rights, then, can be applied to all organizations – indeed, to all societies. Individual maximization implies that whenever individuals perceive that certain actions will enhance the value of their rights, they undertake such actions. This always applies, whether the individuals

operate in markets, in firms, in families, in tribes, in government, or in any other organization.

OPERATIONAL FEATURES OF THE PROPERTY RIGHTS MODEL

The exchange value of an asset is a function of the gross income it can generate and of the costs of measuring and policing its exchange. These costs also determine the pattern and the degree of ownership. The ownership of assets' attributes is expected to gravitate into the hands of those people who are most inclined to affect the income flows the attributes can generate. The gross income stream (the market value of the flow of services) an asset can generate, the value of the contributions of different individuals, and the costs of policing and measuring the attributes of the asset determine both how strictly rights to it will be delineated and what its ownership pattern will be. Since these and similar magnitudes are measurable, the ingredients necessary for an operational theory of property rights are available. These operational features also apply to the analysis of constraints.

Because of the costliness of delineating and policing rights, opportunities arise for some people to capture others' wealth. As demonstrated in Chapter 3, these opportunities arise from people's ability to overuse and to underprovide unpriced attributes when exchanging with each other. Exchange partners may impose restrictions on each other in order to reduce the level of undesired behavior. Consequently, property rights, particularly the right to consume (what appears to be) one's property, are often subjected to constraint. The character and incidence of the constraints are predictable. Analysis of the constraints on property rights, therefore, can help make the study of these rights operational.

THE PROPERTY RIGHTS APPROACH VERSUS THE WALRASIAN MODEL

The significance of the study of property rights results from the fact of positive transaction costs. On the other hand, in the Walrasian, perfectly competitive, model, rights are perfectly delineated and transaction costs are zero. It is useful, then, briefly to contrast the models of the positive costs of transaction with the Walrasian model. A fundamental difference between the two concerns the role of prices. In the Walrasian model, costlessly determined prices suffice for all allocation problems; but costly transacting requires non-price allocation methods and corresponding organizations.

When equilibrium is disturbed in the Walrasian model, a new equilibrium is instantaneously attained because, given zero transaction costs, the cost of adjustment is zero. In that model, a commodity is made up of strictly identical specimens, people are fully informed regarding the exchanged commodities, the terms of trade are always perfectly clear, and trade is instantaneous. As a result, no effort is required to effect exchange other than that to dispense the appropriate amount of cash. Prices alone always *suffice* to allocate resources to their highest-value uses.

In the Walrasian model, where prices are sufficient for efficient allocation, institutions are superfluous; firms, clubs, tribes, or families cannot enhance efficiency. Yet for a long time economists attempted to address questions of organization by what amounted to ad hoc tinkering with the Walrasian model. Only recently have people begun to take notice of the inevitable inconsistencies in such an approach. The transaction cost model used here explicitly explores the effects of positive information cost on behavior and on organization.

When equilibrium is disturbed in a positive transaction cost world, price adjustment is not expected to be instantaneous. As long as prices are not fully adjusted to new conditions, the quantities demanded are not, in general, equal to those supplied. Nevertheless, it is possible to determine how equilibrium will be attained. Where transaction costs are positive, a whole array of activities is required to effect exchange; cash with which to pay the pecuniary price is helpful but definitely not sufficient. Because of the complexity of exchange, the parties have many opportunities to alter their behavior from one transaction to another. To illustrate, consider first some of the activities required to effect purchases in stores. Buyers must decide, among other things, whether to shop during the busiest hours or at off-peak times; they must identify the location of the desired merchandise; see, by themselves or with the help of the sellers, if the items they seek are available; and determine if they are of the appropriate quality. They must select the specimens they think are best; ascertain the price, sometimes after haggling; and pay (not necessarily in cash). In addition, they may have to take care of warranties and, on occasion, exchange the merchandise. Effecting purchases, then, involves an elaborate set of operations. More important, the costs and valuations of most of these operations can be altered. For instance, at any particular time a seller may be out of an item that is usually in plentiful supply, or the seller may unexpectedly help carry the merchandise to customers' cars. When the market-clearing price changes but the nominal price does not, buyers and sellers have many margins with regard to which they may still adjust. They can gain from such adjustments, and wealth maximization implies that adjustments will be forthcoming.

Sellers can adjust to a price that is lower than the market-clearing level along various margins. A seller who is in control of the quality of the

merchandise or of the number of cashiers per customer will adjust along such margins. Thus supermarkets tend to reduce the speed of service at rush hours. In general, sellers who choose not to adjust prices or who are prevented from adjusting them may still adjust along other margins. Given wealth maximization, the margins along which they will adjust and the corresponding effects on resource allocation are predictable.

The analysis of non-price adjustments or of property rights need not be restricted to the market sector in an economy or to market economies; on the contrary, the results of such analysis apply everywhere. They are as applicable to China during the Red Guard era as they are to Hong Kong or to tribes entirely without a market system. Application, of course, requires knowledge of the underlying constraints, and such knowledge may be harder to come by in some systems than in others. Property rights notions are usually applied to the capitalist market system only; actually, the property rights approach is at its most useful (and the Walrasian model is at its least useful) in systems in which market prices are least used and least allowed to adjust. In Chapter 8 I will discuss briefly the applicability of property rights tools to a non-price economy.

Virtually all governments play a major role with regard to property rights; they also own properties and participate directly in economic activities. In addition, governments are heavily involved with adjudicating and enforcing contracts. A comprehensive analysis of the roles of government is beyond the scope of the present project. These roles of government will be touched upon in Chapter 8, but largely in the process of analyzing the behavior of individuals and enterprises. Customs and mores seem to be additional non-price factors that affect the allocation of resources. However, the effects of these factors on behavior and on the enforcement of contracts will be ignored: Although the factors to be considered are allowed to change, customs and mores, like tastes, are assumed to be stable, and accordingly have no effect on the margin.

THE DISTINCTIVENESS OF THE PROPERTY RIGHTS APPROACH

An enormous amount of literature written in the last quarter century departs from the Walrasian, costless transacting, model. This literature, in which the costs of information play a major role, is diverse, and thus far no single model has stood out as the most useful one. Different approaches with a bewildering array of names proliferate: "agency theory," or the "principal-agent model"; "market signaling"; "rent seeking"; "bounded rationality"; "asymmetric information"; and "contract theory." It is difficult to determine the precise differences between, and sometimes within, these approaches, because as a rule many assumptions

are only implicit. Moreover, the empirical work in the area is too meager to help distinguish among them.

I shall make no attempt to sort out these models. I shall offer, however, a few highly stylized suggestions as to why I find models such as these that do not focus on property rights to be less appealing than the property rights model. It should be made clear, though, that the differences among the models often seem more a matter of emphasis than a reflection of different fundamental assumptions.

The "agency theory" starting point is that principals' maximizing attempts are frustrated by agents whose objectives do not coincide with their own.[5] The asserted asymmetry between the two parties is likely to divert attention from the reciprocity of, and perhaps even from the gains from, exchange. The "rent seeking" approach tends to ignore almost to a fault gains from exchange; it concentrates on people's efforts to capture wealth from each other and neglects opportunities to gain through avoiding waste.[6]

The problems inherent in the models based on asset specificity and on the opportunistic capture of quasi rent are very different.[7] Such models usually deal with variables that are exceedingly difficult to observe and to measure. The proxies required to make such models operational are even farther removed from the desired variables than is usually the case in economics. Thus it is particularly difficult to determine precisely what it is that empirical tests confirm or refute. "Market signaling," like rent seeking, emphasizes exploitation rather than maximization;[8] and as with the asset specificity model, it is difficult to formulate empirical counterparts to the variables the theory suggests.

In contrast, contracts that delineate and reassign ownership are central to the property rights approach. The study of contracts formed by maximizing individuals, and of the performance such contracts induce, tends to maintain a close correspondence between theoretical variables and their empirical counterparts. Knight (1924) was apparently the first to point out explicitly the economic role of property rights, and Gordon's (1954) thrust is similar. Coase (1960), Alchian (1965), and Cheung (1969) bring operational elements to the analysis. The relative ease of rendering the property rights model operational is made clear in the following chapters.

The property rights model developed in Chapters 3 and 4 is used in

[5]Ross (1973) and Jensen and Meckling (1976) are early proponents of agency theory.

[6]Tullock (1967) and Krueger (1974) started the rent-seeking literature.

[7]Williamson (1975) and Klein, Crawford, and Alchian (1978) initiated the notion of the capture of quasi rent.

[8]This approach had been initiated by Arrow (1973) and Spence (1973).

Chapter 5 to follow through on Demsetz's (1967) and Umbeck's (1977) embryonic contributions on rights formation. In Chapter 5 I attempt to show that the property rights model is useful in predicting when new rights will be created and when existing rights will be placed in the public domain. I also argue that such changes pervade economic activity.[9]

[9]Another distinction of my study, although this need not be unique to the property rights approach, is that I take no account of problems of risk aversion; all my attempts to explain behavior proceed under the assumption of risk neutrality. As is shown in Chapter 3, there is much to be gained and little to be lost by assuming people to be risk-neutral.

2

The public domain: rationing by waiting and price controls

This chapter consists primarily of an elaborate example – the 1970s price controls on gasoline – that illustrates the usefulness and power of the property rights framework. Chapter 1 contains a property rights proposition central to this book: Unless property rights are perfectly delineated, which, given positive transaction costs, they never are, some valued properties will always be in the public domain. In this chapter the nature of maximization as affected by properties in the public domain is examined and the actual resolutions of several public domain issues are analyzed. Because an analysis of rationing by waiting offers a convenient introduction to the subject of property rights, I will initially concentrate, though briefly, on such an analysis; I will subsequently present the more detailed analysis of maximization under price controls, which brings out major features of the substance and the mechanics of property rights.

RATIONING BY WAITING

The rationing by waiting model used here, which is stripped of many real-world features, is most elementary. Using this model makes it easy to concentrate on the public domain issue and ignore peripheral problems. I will use the results of this basic analysis in the subsequent analysis of the 1973–75 price controls on gasoline.

When the government provides commodities at a zero pecuniary price and makes them available on a first-come first-served basis, commodities are allocated strictly by the order in which individuals join the queue, and ultimately by the amount of time individuals spend waiting in line. Even though orderly queues are often encountered, they should not be taken for granted, as the following example illustrates. Suppose it is publicly announced that a package containing $1 million is to be given to the first in line at a particular place. It might seem that the first person to hear the announcement would rush to the site and wait for the package to arrive.