

Forestry and the New Institutional Economics

An Application of Contract Theory to Forest Silvicultural
Investment

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Economics is concerned with the study of human choices and the efficient allocation of scarce resources. Economics also has to do with “the institution of the market, the price mechanism as a market-regulating process, and marginal analysis as a means of calculation” (Simon 1962, pp.1-2). In recent decades, economists have given increasing attention to the interrelations between institutional structures and economic behavior.

There is no standardized definition of the term “institutions”. Institutions are commonly understood to refer to formal or informal social devices that constrain human behavior. Generally speaking, institutions fall into three basic categories: constitutional order, institutional arrangements, and normative behavioral codes (Feder and Feeny 1991). Constitutional order refers to the fundamental rules about how society is organized – it is the rule for making rules, or a nation’s Constitution. In modern society, institutional arrangements emerge organically and spontaneously from among the forces underlying the social fabric, or are artificially created within the rules of the Constitution (usually via legislation or as a result of a court decision).¹ These arrangements include laws, regulations, property rights, contracts, and so forth. At the fundamental level, cultural values influence and shape all institutional arrangements and play a role in constraining human behavior (Fukuyama 1999).

In this chapter, we examine the role of institutions in economics, and particularly that of property rights. In this regard, it is important to consider the New Institutional Economics, or the NIE, which has its origins both in traditional institutionalism and neoclassical or mainstream economics. However, we begin by defining what property rights mean.

¹ Constitutional choice refers to the study of how society chooses the rules for making the rules under which the social system operates, procedures for making selections among alternative constraints. Buchanan and Tullock (1962) are representatives of the public choice literature.

2.1 The Notion of Property Rights

Property rights are important to institutional arrangements, but there is much confusion about what property rights entail and their role. Property rights are an important class of institutional arrangements. The development of the theory of property rights is attributable to generations of philosophers and scholars. The section of David Hume's *A Treatise of Human Nature* (1739) entitled "Of property and riches" is often cited as the fountainhead of studies of property (Bracewell-Milnes 1982). What has come to be known as the property rights (PR) approach was first developed by Alchian (1965a, 1965b), Demsetz (1966, 1967), and Alchian and Demsetz (1973). The PR approach is concerned with three basic and interrelated questions (Alchian and Demsetz 1973, p.17):

- What is the structure of property rights in a society at any point of time?
- What consequences for social interaction arise from a particular structure of property rights?
- How has this property right structure come into being?

2.1.1 Characterizing property rights

According to Carmichael (1975), property is "a constellation of highly complex adjustments of entitlements and expectations" (p.749). Property is considered to be a bundle of recognized relations (rights, obligations, claims, powers, privileges or immunities) between people in regard to some good, service or "thing" that has economic value (Pryor 1972, p.407). Property rights define relations among human beings and specify the norm of behavior with respect to scarce resources (Pejovich 1990). Most importantly, property rights define the relationship between individuals with respect to the right to a resource. It is not the resource itself that is owned, but, rather, a property right constitutes a bundle, or a portion, of rights to use a resource that is owned. In other words, to own something is really to own the rights to use resources. In essence, property rights are defined not as relations between people and things, but, rather, as the behavioral relations among people that arise from the existence of things and pertain to their use. Structured property rights ensure that people observe the prevailing behavioral norms respecting property and that they are penalized for non-compliance (Pejovich 1990).

In addition to being perceived as a bundle of quantitative or numerical claims and obligations, property rights are also described as a

bundle of more abstract characteristics or attributes. In order to facilitate free exchange of assets for all transactions and contingencies, a well-defined system of property rights must have the following four characteristics (Randall 1975; Bromley 1989; Feder and Feeny 1991).

1. *Comprehensive*. Ownership to all assets must be assigned to a specified economic agent (individual, firm, state, other legal entity) with all entitlements to use or dispose of property known in advance. Comprehensiveness implies that the property right is secure from involuntary seizure or encroachment by other economic agents, including the state. Of course, this is subject to some risk, but this risk must be known a priori, as must the course to restitution or compensation in the event that property rights are taken, either through the taking of title or through a regulation that affects what one can do with property (see van Kooten and Bulte 2000).
2. *Exclusive*. All benefits and costs pertaining to the use and/or disposal of property accrue to the owner. Exclusiveness tightens the relationship between the welfare of the owner and the consequences of her actions, creating incentives for putting resources to the highest-valued uses. Of course, property rights can hardly be expected to convey totally exclusive and unrestricted use – there will always exist various social constraints to the use of property.
3. *Transferable*. The rights to property must be transferable to another agent in a voluntary exchange.
4. *Enforceable*. No property rights, regardless of their degree of comprehensiveness, transferability and exclusiveness, can be held without some assurance that there is proper enforcement of those rights by the state. That is, in a complex society, property rights only exist because the state permits them to exist. Without adequate enforcement, *de jure* private property rights become *de facto* open access, a scramble for the benefits from property that is open to all.

Property rights can be said to be complete if they are comprehensive, exclusive and transferable. When property rights are complete this diminishes uncertainty, and thereby provides adequate information for guiding behavior. Complete property rights are established in law. That is, *de jure* rights exist if property rights are given lawful approbation by formal, legal institutions – they are protected by law that is upheld by the state. Such *de jure* rights form the predominant system governing land use in developed nations. In many developing nations, *de*

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jure rights either do not exist or are not upheld by the state. Thus, there is greater reliance on *de facto* rights, on what is not opposed and thus possible, although not necessarily legal or explicitly recognized by government. An example is where loggers harvest trees without rights, or peasants grow and harvest crops on land as squatters rather than rightful owners. In these cases, land is often needlessly degraded because the user does not take into account the future value of the resource, or its user cost.

The ability to transfer property or rights over property encourages resources to gravitate from less productive owners to more productive ones. Land transactions generally increase efficiency in resource allocation, as agents with high potential marginal productivity of land are induced to acquire land from agents with low marginal productivity (Feder and Feeny 1991).

2.1.2 Types of property rights

There are four forms that property rights take: private property, state ownership, communal ownership and open access. These are summarized in Table 2.1, along with their main characteristics. Exclusivity is generally considered the most important characteristic of property rights (Alchian and Demsetz 1973), and private ownership grants the highest degree of exclusivity. Private property is likely the most understood form of property right, granting almost exclusive say over use and disposal to the owner. Yet, rights only exist because they are bestowed and protected by the state, *de jure* and *de facto*, with the state specifying the conditions under which use (exploitation) can occur.

With state ownership, it is the state that either directly manages the property or resource, or grants usufructuary rights to economic agents (e.g., individuals, firms, community groups, cooperatives, and so on) to use the resource for a specified period of time. Failure by government to exercise proper control over the resource, via management and enforcement, can and often does lead to open access exploitation, and its attendant problems.

Communal property represents private property at the group, community or cooperative level. In some respects, it is another form of state ownership, except that the “commune” or community can exclude others who may or may not be citizens of the state. It is the fact that the community of owners is readily identifiable while some can be excluded that is the main distinguishing feature of this type of ownership. Certain rights and duties respecting use and maintenance of the common property resource bind the individual members of the ownership group. Such rights and duties may be

de jure or *de facto*, although the latter are more prevalent. For example, custom often dictates how many animal units a member of a group can graze in the common pasture, and/or how much time or expense the member must devote to (invest in) improving the commons. However, as a result of Hardin's (1968) paper on "The Tragedy of the Commons", common property is often confused with open access.

Table 2.1: Classification and Characteristics of Property Rights

Type	Characteristics	Implications for economic incentives
Private property	Exclusive rights assigned to individuals	Strong incentives for conservation of resources and for investment as well
State ownership	Rights held in collectivity with control exercised by authority or designated agency	Creating opportunities for attenuation of rights; managers have incentives for personal gains
Communal ownership	Exclusive rights assigned to all members of a community; approaching private property	Creating free-riders problem and low incentives for conservation
Open access	Rights unassigned; lack of exclusivity	Lack of incentives to conserve; often resulting in resource degradation

Open access is a situation where neither *de jure* nor *de facto* rights exist for a specified resource. In essence, property rights are absent. As a result, users fail to take into account the user cost of exploiting the resource; they neglect the benefits from leaving some units of the resource unexploited today because they yield a higher benefit in the future. This is the true "tragedy of the commons". The problem of open access is that "everybody's property is nobody's property" (Ciriacy-Wantrup and Bishop 1975, p.713; Pejovich 1972). When a resource is physically and legally accessible to anyone, what one user gets comes at the expense of another, with no one having the incentive to conserve the resource for possible future use. In the case of a nonrenewable resource, such as an oil reserve, this might imply pumping at too rapid a rate to permit extraction of all of the resource. For renewable resources, irreversibility is a likely outcome (e.g., a forest is converted to agriculture, thereby depleting all nutrients and

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preventing future re-establishment of tree cover), often implying extinction (say, of a species or fishery).²

Apart from the adverse effect of accelerated exploitation of the resource stock, open access results in a lack of incentives for conservation (as already noted) and investment. The reason is twofold. First, the investor is uncertain that she will be able to capture the expected future benefit of her investment decision. This would shorten her time horizon, raise the discount rate and, consequently, investment activity will stop short of what it would otherwise be. Indeed, open access exploitation is similar to private or communal exploitation if the discount rate is infinite (van Kooten and Bulte 2000). Short-lived property rights offer less flexibility of resource use than more permanent ones, so short-lived property rights are correspondingly less valuable.

Second, the absence of property rights in a resource is also likely to affect the form of investment activity. Only if property rights are completely specified is it possible for the resource user, for example, to defer resource use to a future date, thereby choosing in favor of conservation. Conservation is a form of investment.

In conclusion, from the social point of view, the establishment of property rights is a powerful and necessary condition for more efficient allocation and use of resources. From the individual's point of view, the complete specification of property rights, and their enforcement, is associated with an ability to employ property in a way that best enhances well being or utility (Pejovich 1972). The same is true for other economic agents that have entitlement to property rights.

2.2 The New Institutional Economics

Institutional economics goes back to Thorstein B. Veblen (1857-1929) who is widely regarded as the founder of American institutionalism. Representing an extreme in the institutionalist thinking, Veblen viewed institutions as "habits of thought which prevail in a given period" (Hutchison 1984). Institutionalism signifies "a concern with economic institutions, or organizations, such as industrial, labor, or monetary institutions, or with the property framework and legal institutions, together, in some cases, with an emphasis on collectivism, and group institutions, or

² The problem of open access in the fishery has been extensively examined, beginning with Gordon (1954) and Scott (1955).

organizations, rather than individuals, as the main economic agents or actors” (p.20).

The publication of John R. Commons’ *Institutional Economics* in 1934 marked the formation of institutional economics as a distinct school of thought. However, institutional economics did not make significant headway until after the 1940s, thanks to the contributions of Clarence E. Ayers, who ushered in the era of neo-institutional economics (Gruchy 1972). In contrast to neoclassical economics, which emphasizes the profit motive, the desire for monetary gains, and maximization of individual and social utility (utilitarianism), institutional economics pays greater attention to the role of technology.³ Institutional economists believe that the basic dynamic force in economics is technology, or the accumulation of technical knowledge (Gordon 1980). Historical and comparative analytical approaches are employed to investigate institutional dynamics. It is historical in its attempt to explore the role of history in institutional emergence, perpetuation and change, and it is comparative in its attempt to gain insights through comparative studies over time and space (Greif 1998).

Stressing the importance of habits and customs, the earlier institutional approach is sharply critical of neoclassical theorizing and its fundamental assumptions about rationality and knowledge. Persistently critical of the excessive abstractions of classical and neoclassical theorizing, institutionalists focus on “descriptive realism” (Dugger 1979, p.902). However, in spite of some fundamental differences in ideologies and philosophies between the old institutional economics approach and neoclassical economics, the positions of institutionalists have softened recently.⁴ Dugger (1977) admits that institutional economics is not really a substitute for neoclassical economics. Instead, it is an effective complement because the domains and explanations of the two schools are complementary. “Where one leaves off, the other begins” (Dugger 1977, p.449). More recently, the objection of the old institutionalist approach to theorizing is found to have weakened the power of this approach for analytical purposes (Coase 1998).

³ Neoclassical economics refers to the rejuvenation of the classical economics of Smith and Ricardo by marginalists, such as Jevon, Menger and Walras, and to the theoretical framework developed in Alfred Marshall’s *Principles* and Paul Samuelson’s *Foundations* (Dugger 1977). However, some economists feel uncomfortable with the term ‘neoclassical’ (Dahlman 1980, p.219).

⁴ Hamilton (1970) suggests that the institutional economics is based on a Darwinian conception of the world, while neoclassical economics is based on a Newtonian conception.

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The “New Institutional Economics”, a term coined by Oliver Williamson to distinguish it from “old” institutional economics (Coase 1998, p.72), descends from both the earlier institutional economics and neoclassical economics. In the remainder of this section, we provide a brief background to the NIE.

Institutions are defined as “humanly devised constraints that structure human interaction. They are either formal or informal: formal institutions consist of formal constraints, e.g., policy rules, regulations, laws, constitutions, contracts, property rights, bargaining agreements, [while] informal institutions concern informal constraints, e.g., norms of behavior, conventions, self-imposed codes of conduct” (CPB 1997, p.42; also North 1990, 1994). Included in the definition of institutions are “a set of moral, ethical behavioral norms which define the contours that constrain the way in which the rules and regulations are specified and enforcement is carried out” (North 1984, p.8). The new institutional economics evolved in response to the fundamental need to include explicitly institutions into economic analysis. However, while descending out of the institutional economics associated with Veblen and Commons, the NIE was as much a response by neoclassical economists to perceived weaknesses in the assumptions underlying mainstream economics (Eggertsson 1990; Acheson 1994; Pejovich 1995; Furubotn and Richter 1997). While the NIE is “a science of institutions,” its practitioners emphasize that economics is still a “science of choices.”

Mainstream or neoclassical economics assumes that decision-makers are rational economizers who have perfect knowledge; markets are perfectly competitive, homogeneous goods are traded and prices contain all of the important information; transaction costs are ignored as is market failure more generally. The NIE differs from neoclassical economics in some fundamental ways (Acheson 1994).

1. The NIE takes the position that economic agents are rationally bounded, while information is costly to obtain. As Williamson (1985) points out, agents do not have perfect information but are often opportunistic, acting in their own self interest with guile. That is, people are only weakly rational and weakly moral, often withholding information when it is in their interests to do so (Acheson 1994, p.8). Bounded rationality and opportunism *cause* transaction costs (CPB 1997, p.46). Transactions take place even though information is incomplete or distorted. Further, people do not always have exclusive rights to what is traded. This then leads to a great deal of uncertainty and incomplete contracting.

2. There are costs to using markets because of market imperfections and outright market failure.
3. It is the case in many transactions (including ones that deal with provision of nature) that price is not the sole consideration. There exists a range of social and legal ties among people; and non-market (or beyond market) transactions also occur, especially within the same organization.
4. Finally, a key assumption of the NIE is that institutions have a strong impact on the economic system and that institutions are often the result of political processes.

In essence, the NIE is concerned with the evolution of institutions or history (North 1990, 1991, 1994), property rights (Alchian 1961, 1965a, 1965b; Demsetz 1967; Alchian and Demsetz 1973), transaction costs (Williamson 1979, 1985, 1996), and uncertainty (a form of market failure). As Coase (1937, 1960) has pointed out, without transaction costs the firm and law have no role to play.

2.2.1 Coordination mechanisms: Public versus private provision

Economists have applied insights from the NIE to question whether public or private provision of goods and services is preferred. Shleifer (1998) and Hart et al. (1997) make the case for private provision of health care, schools and other services that are usually associated with government provision. The reasons for private provision are that it leads to incentives for innovation and cost minimization, but possibly at the expense of quality. Where cost of provision is important and quality is less important, the case for private provision is strongest. However, even where quality is important, the ability of government to use contracts to get what it wants could mitigate the need for public provision. While private firms providing a service have an incentive to innovate in order to reduce costs, contracts can be written in ways that prevent deterioration of quality related to cost minimizing efforts or encourage innovation to improve quality (e.g., via performance incentives). Public ownership or provision may be preferred when the adverse effect of cost reductions on quality is large, quality improvements are unimportant, or government employees have weaker incentives to improve quality than private owners (Hart et al. 1997).

In addition to the quality-cost of provision trade-off, corruption and patronage are important in deciding whether public or private provision is preferred. Corruption and patronage are opposite sides of the same coin.

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Corruption occurs when private firms are effectively able to lobby or “bribe” government officials to extend them favors (e.g., providing contracts for provision of services with weak or vague performance clauses). Patronage occurs when government (elected) officials favor particular constituents in return for their support (e.g., public service union workers are provided large pay raises, environmental groups are given freedom to protest even if they break the law). Where corruption is a severe problem, the case for in-house (public) provision is enhanced; where patronage is a problem, the case favors privatization.

2.2.2 Market failure and coordination mechanisms

Other factors enter into the supply decision in addition to the raw choice between private and public provision of a good or service. These depend on the source of market failure, of which four sources can be identified.

1. Market power can result from economies of scale and scope, or collusion by firms in oligopolist industries.
2. Interdependencies outside the price system occur because of so-called spillovers. When economic agents fail to take into account the costs (benefits) their actions have on other agents, they produce (consume) at a level where marginal social cost exceeds marginal social benefits. This is the classic case of externality. Another form of market failure occurs when there is no incentive to provide a good or service, or amenity, because the provider cannot capture enough of the social benefit of provision. This is the case of public goods; there is no incentive for a single economic agent to invest in the protection of biodiversity (provision of nature), because benefits accrue widely and cannot be captured privately.
3. Investment in relation-specific assets, or specificity, leads to what is known as the hold-up problem. By investing in specific assets, the supplier of a good or service (or nature) is subject to hold-up because what was agreed to *ex ante* is not what the demander (say government) pays *ex post*. *Ex post* could be well over 10 years in the case of nature (forest ecosystem) provision.
4. Finally, risk sharing deals with fundamental uncertainty. However, risk sharing leads to problems of moral hazard (agents take fewer precautions to avoid risk once they are part of risk sharing scheme) and adverse selection (only those with the highest need to share risk participate in the scheme).

Four economic coordination mechanisms are available for dealing with market failure:

1. competition,
2. control (or government regulation/ownership),
3. cooperative exchange (contracts), and
4. common values and norms.

Cooperative exchange, and common values and norms, are intermediary between the extremes of competition and control. Competition may be more appropriate in a heterogeneous society, while common values and norms develop more easily in a homogeneous society (CPB 1997, pp.42-44).

The ability to implement a coordination mechanism (if at all) depends crucially on the existing institutional arrangements, or governance structure, within the jurisdiction. It is not possible, for example, to implement a system of transferable development rights if private property rights are not enforceable and upheld by the courts. Where such institutions do not exist, it is not possible to have transferable rights to timber or logs on public land. If forestland ownership and forest exploitation have been in public hands, organizations within government will oppose their privatization. Indeed, such organizations might be supported by others (e.g., environmental groups) who feel that privatization of forestland (and maybe even of its exploitation) will result in a decline in the quality of forests (or nature). This may make it difficult to change tenure systems, regulations and other forest governance structures. The underlying governance structure may prevent implementation of some of the coordination mechanisms for dealing with market failure. The extent to which this is the case will vary from one jurisdiction and situation to another.

The potential strengths and weaknesses of the four coordination methods are summarized in Table 2.2. Competition is aided by such instruments as transferable development rights (e.g., to harvest trees on public lands), *ex ante* payments or subsidies, and/or insurance markets that guarantee firms protection against political whims and the possibility of default on payments. Making markets more competitive by removing such impediments as onerous government regulations can lead to a reduction in market power, as can more vigorous enforcement of anti-trust laws.

Economies of size and scope may limit competition – scope because it may be more efficient to provide two amenities, say commercial timber benefits and extra-market amenities, together rather than separately.

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Uncertainty and lack of commitment may also characterize competition, although one advantage of reliance on competition to provide certain products and services is that society gets greater diversity in the types (qualities) provided.

Table 2.2: Strengths and Weaknesses of Coordination Mechanisms for Providing Nature

Coordination Mechanism	Implementation	Potential Weaknesses	Potential Strengths
Competition	Transferable development rights, <i>ex ante</i> payments, reallocate revenues, insurance markets	Economies of scale & scope, certainty, commitment, solidarity	Diversity/variety, experimentation, external flexibility, incentives
Control	Regulation, public provision, nationalization, ownership, uniform conditions	Diversity, experimentation, flexibility, incentives	Economies of scale & scope, certainty, enforcement, solidarity
Cooperative Exchange or Contracts	Intermediary, covenants, encompass interest groups, co-determination, monitoring, restrict freedom to act, delegation	Enforcement, certainty, flexibility	Commitment, accountability, internal flexibility
Common Values & Norms	Information, reputation, private-group charity	Enforcement, privacy	Commitment, in-group solidarity

Source: Adapted from CPB (1997, pp.61-74).

Control is exercised through public ownership or regulation, with regulations usually uniform across agents even though costs and benefits vary. The advantage of control is that society is more certain that the desired good or service is supplied. State ownership is usually required to ensure provision of wilderness areas, for example, because it is a public good, although wilderness itself is a vague concept, with society unsure as to what it wants in this regard. Direct regulation or public ownership also can be used to avoid problems related to economies of size and scope, and enforcement is usually direct as it relates to regulations. Problems here are similar to those identified above. The means for implementing cooperative exchange, and common values and norms, is also provided in Table 2.2. For both, enforcement is a problem, while commitment is a strength.

In some jurisdictions forestland and even agricultural land is publicly owned. In some cases, logging may even be performed by state-owned enterprises. In others, private companies may have harvesting or other property rights that, in a civil society, require compensation if

commercial activities are no longer permitted on the land – the government cannot simply decree that the land will be protected (converted from the commercial activity to supply nature). Even where logging occurs by state-run enterprises, it is not a simple matter to induce such enterprises to focus less on logging and more on silviculture, for example.

Where land is privately held, some form of inducement is also needed to get owners to provide (more) nature (by investing in silviculture) in lieu of the current activity. The government could simply use regulations to force companies to perform silvicultural activities (create more nature), but, as noted in Table 2.2, this has its disadvantages and will generally not be permitted unless compensation is forthcoming. The state could purchase silvicultural services, or it can perform these by forming a state run agency to perform such services. Both have their own budgetary implications, with the former possibly cheaper (e.g., if private silvicultural contracts are less prone to becoming unionized compared to state-owned agencies). Clearly, government will prefer to regulate forest companies via a legislated forest practices code, for example, so that the private companies provide the desired silvicultural services at no cost to the public treasury.

Private provision of many forms of nature (especially where exclusion is not possible and private benefits are few) only occurs if the state uses broad-based incentives or contracts to obtain desired levels (supplies) of nature from private landowners. Contracts will vary by the quality of nature desired (viz., wilderness areas where little human activity is permitted versus bird nesting cover on private farmland), local institutions and the costs of providing nature, and the ability to reallocate funds from demanders of nature to suppliers. To provide wilderness it may be necessary to prohibit all commercial activities (e.g., stop logging of mature forest), while it may only be necessary to restrict the size of clearcuts and require replanting to provide desired environmental benefits on private forestland.

In some areas or jurisdictions it may simply be difficult or even impossible to provide some types of nature (such as primary wilderness). For example, it is impossible to prohibit human use of forests in Sweden (where tradition allows all citizens access for recreation purposes) or harvesting of trees in Austria (where, for example, in the Montafon Valley

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historic user rights guarantee residents can harvest timber).⁵ While the private supplier of nature will seek to minimize costs, contracts are often vague about quality. Contracts are incomplete and generally complex because all contingencies cannot be accounted for and the “thing” to be supplied (nature or the silvicultural “outcome”) is necessarily ill-defined, and sometimes even difficult to measure.

Contracts refer to the “arrangements” between the “principal” who demands the nature and the “agent” who supplies it. The principal is usually the government (acting on behalf of citizens who demand more nature), an environmental non-governmental organization (ENGO) that represents a particular constituency (e.g., The Nature Conservancy, Ducks Unlimited), or even a private company desiring to purchase silvicultural services. It does not matter, however, whether nature is publicly or privately provided. In the case of public provision, the agent responsible for carrying out the activity of supplying nature (planting or tending trees, monitoring compliance, managing wildlife populations, constructing trails and campsites for recreationists, etc.) is a government employee or someone specifically contracted to perform one or more specific activities. In the case of private provision, the agent responsible for supplying nature is the landowner. Assuming that the government is the principal, there is a significant difference between the case where the agent is an employee or a private landowner.

Provision of nature – the creation or protection of natural forest or silvicultural investment to provide forest ecosystem amenities – is not costless, but it could be made costlier by inappropriate choice of a coordination mechanism.

2.3 Market Failure and Property Rights: Further Thoughts

At a broad level, institutions are said to evolve organically and incrementally (North 1994). Property rights (PR) scholars contend that

⁵ In the Austrian case, the common property forest is managed by *Stand Montafon*, a company owned by the local municipalities. Historic user rights guarantee the citizens of the region rights to use wood for heating and construction. In recent times, to prevent exploitation, residents have been allocated a share of the allowable harvest each year for heating, while wood cannot be used for new construction but only for repair of existing structures (Linda ten Klooster, pers. com., March 3, 1999). See Glüeck et al. (1999) for additional examples.

institutions evolve in response to emerging social conflicts because humans constantly compete for limited resources and, therefore, the desire for greater incomes and wealth provides a rationale for the emergence and creation of property rights (Pejovich 1972, 1990).

Demsetz (1967) is one of the first PR scholars to have examined the origins of property rights. He analyzed the development of private property rights in land among American native Indians. Specifically, the advent of the fur trade resulted in a sharp increase in the value of furs to the Indians and, consequently, increased the scale of hunting. Traditional open access gave way to increasingly private ownership in the form of territorial hunting and trapping by individual families, eventually to the appropriation of land and exclusive hunting and trapping domains.

“New techniques, new ways of doing the same things, and doing new things – all invoke harmful and beneficial effects to which society has not been accustomed...It is my thesis...that property rights takes place in response to the desires of the interacting persons for adjustment to new benefit-cost possibilities. Property rights develop to internalize externalities when the gain from internalization becomes larger than the cost of internalization. Increased internalization, in the main, results from changes in economic values, changes that stem from the development of new technology and the opening of new markets, changes to which old property rights are poorly attuned” (Demsetz 1967, p.350).

Echoing Demsetz, North (1972, p.86) traces the development of property rights in Medieval Europe to changes in cost-benefit calculations. Pejovich (1972) and Dahlman (1980) summarize the various findings in two points. First, property rights emerge to reflect changes in social relations with respect to the allocation of scarce resources. Second, the creation and specification of property rights over scarce resources takes place in response to human desire for greater income and wealth.

The driving force for the creation of a specific property rights arrangement lies in the role played by incentives. Humans respond to economic incentives. Whenever the benefits of undertaking a certain activity exceed the costs, the economic agent desires to pursue the activity. In the case of externality, if the benefits of internalizing the externality exceed the costs of doing so, new structures or institutions emerge to bring this about (Demsetz 1967). Changes in benefits and costs occur as a result of:

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1. New technologies and the opening up of new markets (e.g., introduction of computers and the Internet) affects benefits and costs, among other things.
2. Changes in relative factor scarcities and factor prices affect economic allocations of resources. North (1972) illustrates this using the example of Western Europe's change in population relative to land availability in the 13th century.
3. The actions of the State (laws, regulations, economic incentives) affect the allocation of resources (Demsetz 1967; Pejovich 1972).

Thus, the creation and specification of property rights occurs in response to human desires, and modification of extant property rights is prompted by changes in opportunities (benefits and costs).

If property rights are completely specified, problems associated with spillovers (externalities) are easier to resolve, in many cases without government intervention (Coase 1960). This result has been codified in the so-called Coase Theorem, which states, in effect, that it is proper specification of property rights that matters, and not their assignment – assignment of property rights only affects the final distribution of income, but not the economically efficient outcome. This may well be true in the neoclassical world of zero transaction costs, but it is not true in a world where transaction costs do affect the outcome, possibly preventing attainment of a social optimum. Coase (1960, 1998) was well aware of this, but believed that many externalities could be mitigated through litigation. In this sense, he anticipated the NIE by suggesting that, while complete specification of property rights is important, other factors also need to be taken into account, including transaction costs and bounded rationality (as evident in the litigation process).

In summary, therefore, property rights are an important institution within society because they establish exclusive rights over resources so that individuals have a clear understanding as to who must pay whom in the event of disputes over the use of scarce resources. However, along with proper specification of property rights and their enforcement, norms of behavior (among other things) are important in governing interactions among individuals and the potential for efficient outcomes (Furubotn and Pejovich 1972; Fukuyama 1995, 1999; Berns et al. 1999). Thus, a major function of property rights is allocative in that they determine the distribution of gains and losses, and resolve conflicts in the course of resource use (Alchian and Demsetz 1973; Seitz and Headley 1975). Further, well-defined property rights help reduce uncertainty and promote efficiency

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in market transactions (Alchian and Demsetz 1973; Demsetz 1967). However, it is crucial to note that proper specification of property rights is only a necessary and not sufficient condition for bringing this about.