BEIJER *Discussion Papers*

Beijer International Institute of Ecological Economics
The Royal Swedish Academy of Sciences

Beijer Discussion Paper Series No. 40

Economic Perspectives on Property Rights and the Economics of institutions

Thràinn Eggertsson

Box 50005, 104 05 Stockholm, Sweden
Tel: +46-8-673 95 00, Fax: +46-8-15 24 64

Beijer Discussion Paper Series No. 40

Economic Perspectives on Property Rights and the Economics of Institutions

Thrainn Eggertsson

This publication is a part of the Beijer Institute research programme on "Property Rights and the Performance of Natural Systems", mainly funded by the John D. and Catherine T. MacArthur Foundation

Beijer International Institute of Ecological Economics, 1993
The Royal Swedish Academy of Sciences
Box 50005, S-104 05 Stockholm, Sweden
Telephone +46(0)8-673 95 00, Telefax +48(0)8-15 24 64
E-mail: BEIJER @ BEIJER.KVA.SE

ISSN 1102-4941

Property Rights and The Performance of Natural Resource Systems
Background Paper prepared for the September 1993 Workshop

Economic Perspectives on Property Rights and the Economics of Institutions

Thrainn Eggertsson

The Beijer International Institute of Ecological Economics
The Royal Swedish Academy of Sciences
Box 50005, S-104 05 Stockholm, Sweden
Telephone: +46-8-673 95 00, Telefax: +46-8-15 24 64
E-mail: beijer@beijerJcva.se

July 1993

Economic Perspectives on Property Rights And the Economics of Institutions

Thráinn Eggertsson

University of Iceland
Indiana University

Address during the academic year 1993-94:

Workshop in Political Theory and Policy Analysis
Indiana University
513 N. Park Avenue
Bloomington, Indiana 47408-3895
U.S.A.
Telephone: (812) 855 04 41
Fax: (812)855 3150

Thráinn Eggertsson
July, 1993

ECONOMIC PERSPECTIVES ON PROPERTY RIGHTS AND THE ECONOMICS OF INSTITUTIONS

The new economics of institutions is a Tower of Babel, a field in search of a common language.[1] A standard definition is lacking even for common terms such as institutions and organizations (often used interchangeably) or transaction costs. Studies of common pool resources frequently open with a lament about the confusion over the exact meaning of the term common property. Many critics of the economics of institutions appear to be confounded by the approach, which they often see as assuming (or concluding) that all institutional change enhances wealth, and that all actors contract on an equal basis — which leaves no room for power, exploitation and discrimination. It is claimed also that the economics of institutions ignores culture, ideology and history. Below we take a small step toward order by attempting to integrate the central concepts of institutional economics and putting them in a behavioral context. We conduct the exercise in an appropriate mood of humility, realizing that one-user standards have little value.[2]

The approach that we advocate is based on the rational choice model, a theoretical tool which shares with democracy the status of both being roundly criticized and lacking any superior alternative (Cook & Levi 1990; Bell, Raiffa & Tversky 1988). The rational choice approach is more general than often is recognized; it only involves the assumption that actors act consistently with their preferences when faced with alternative opportunity sets. Social factors, such as norms and customs, can be introduced either by adjusting the actors' preferences or their choice sets, although scholars must be careful as always to avoid trivializing their theories. The main reason for retaining a generalized version of the rational choice model is the lack of a good alternative for building a theory for explaining economic and social outcomes on the basis of individual behavior. The rational choice approach is a relatively effective way to analyze the ever present conflict between individual and group rationality, the potential role of institutions in easing the conflict, and the pervasiveness of institutional failure. The reliance of rational choice is not a denial of the importance of ideology or mental models (North 1989). We realize that frequently major institutional change is associated with changes in the actors' views or models of the moral and physical worlds.

---

[1] We are concerned only with theories of institutions that are grounded in the behavior of individual actors and rely on the concepts of transaction costs and property rights. The transaction cost/property rights approach was pioneered by Ronald Coase (1937; 1960); economists of the LA-Seattle School, especially Alchian (1977), Barzel (1989), Cheung (1969; 1970), North (1981). Also see Demsetz (1988); a number of scholars in economic history (Libecap 1989); law and economics (Goldberg 1979a; 1976b); and the economics of organization (Williamson 1985; 1993). For a survey of the state of the art by several key scholars in the field, see Furubotn & Richter, eds. (1991; 1993).

[2] We realize that confusion over theoretical terms is not the sole cause of poor communication and understanding between various groups of scholars. See Eggertsson (1993a).

These issues are briefly discussed in the paper's last section.

The outline of the paper is as follows: The first section provides simple definitions of some of the fundamental concepts in the economics of institutions. The definitions are related to the control of assets with multiple valuable margins by rational actors, who optimize subject to constraints. The second section presents non-exclusivity (or lack of control) as a universal phenomenon characteristic of all systems of property rights. We briefly discuss the dissipation of non-exclusive income and measures, including contractual arrangements, for minimizing the dissipation. The third section makes the case for tolerance and flexibility within the new institionalism by emphasizing different levels of analysis, each requiring different research tools. Finally, the fourth section offers some conclusions.[3]

i. The economics of control

The utilization of valuable resources or assets (we use the terms interchangeably) in a community depends on how control over the resources is partitioned among the various actors, including those who represent the state, and how securely the actors control their assets (Alchian 1965). In a fundamental sense, economics is about the distribution of power. Traditional economic analysis does not focus on the question of control; there is an implicit assumption of an ideal control structure that does not interfere with the functioning of markets. The emergence of the economics of property rights and the economics of institutions (we use the terms interchangeably) is an attempt to bring the issue of control directly into economics analysis. The new institutionalism has a twofold purpose: a) to explain how a particular structure of control emerges, is maintained, and decays; and b) to examine the implications of a particular control structure for both the *organization* of economic activity (various contractual arrangements) and *economic results* (such as growth).

It is obvious that the nature of control matters for economic actors: short-term control shortens the time horizon; uncertain control discourages potentially profitable projects; lack of control incites costly races for possession; restricted control allocates assets to inferior uses. As control is rooted in the actors' social and political environment, institutional analysis calls for an interdisciplinary approach: the scholar must roam across the borders of several adjacent disciplines, such as economics, the social sciences, psychology, history and law. We suggest the following framework for incorporating the elements that make up the structure of control. The initial viewpoint is that of a single actor (or a group of actors) in the short run.

An actor's control of resources has an *internal* and *external* element. The external element is determined by the actor's institutional environment. *Institutions* are formal (laws, regulations) and informal (norms, customs) rules and their enforcement characteristics, which constrain the actor's behavior (North 1989). The institutional environment of an actor varies with her status in the community and is outside the actor's sphere of influence. The internal element in control is determined by the actor herself and comparable to an investment

[3] The discussion is based in part on my 1990 survey of the economics of institutions, but the framework there has been extended and clarified. Eggertsson (1990).

decision: control is exerted until costs and benefits are equal at the margin. The cost to an actor of achieving any given degree of control over valuable assets depends on the prevailing institutional structure.

An actor can lose control of several valuable margins of an asset or of the asset as a whole in two ways: a) involuntarily through forceful expropriation or theft; and b) in voluntary exchange through lack of information which creates, for the other side, opportunities for misrepresentation and other malpractice. We refer to the cost to an actor of enforcing control over resources as *transaction costs.* Transaction costs are associated directly with the internal element and indirectly with the external element of control. In a given institutional environment, an actor's transaction costs depend on the measurability of the assets, which in turn is related both to the assets's physical characteristics and the technology of measurement. The actor's transaction costs are also related to the nature of (voluntary) transactions, such as the actor's social relationship with her trading partners, and the duration, frequency and synchronization of the exchange (for instance, whether both sides deliver simultaneously). The transaction costs of securing control in exchange are particularly high, when assets are specific to or dependent on particular relationships and have less value in alternative uses (Williamson 1971; 1985. Klein, Crawford & Alchian 1978).

Given their constraints, actors have an incentive to finds ways to lower the cost of establishing and partitioning control because they stand to gain both from lower transaction costs and from an opportunity to put their resources to more valuable uses. The various internal rules governing exchange are embodied in *contracts,* but in each community the structure of contracts also is shaped directly and indirectly by the institutional environment which specifies the legitimate forms of exchange.

Finally, the term *organization* refers to a set of actors who cooperate or act jointly in production and also to the rules they play by (North 1989). The output of organizations ranges from commodities (firms) to statutes (legislatures). The rules and the boundaries of organizations are defined in a network of contracts.[4] In the *long run,* economic, political and social organizations often seek to change parts of their *short run* institutional environment; for instance, firms lobby to change laws that regulate their behavior. In modeling their institutional environment, a scholar must consider not only the location in the social structure of particular actors or organizations but also their time frame and goals.

ii. **Dissipation and distribution**

In the real world, actors and their organizations confront institutions of bewildering complexity. To identify aspects of institutions that are critical for economic behavior, without being overwhelmed by detail, scholars have attempted to define and analyze ideal-type institutional systems or *systems of property rights.* In the literature the following fourfold

[4] As used in the economics of institutions, contracts are essentially a theoretical fiction. The view of exchange relationships as being embodied in a network of contracts, and the recognition that the structure of contracts involves informal rules, open a bridge to the economic sociology of Granovetter (1992) and others.

classification of control regimes is the most common: i. *open access,* ii. *communal property,* iii. *private property,* iv. *government property.*

Open access refers to the absence of controls; valuable assets are in the *public domain. Communal property* are arrangements where a community of actors jointly control a resource.[5] *Private property* is the control of assets by private individuals. The line between private property and communal property is not clear when an asset is controlled by more than one private individual. For instance, consider communal mountain pastures and a large law firm organized as a partnership. As we are concerned with actual rather than formal control of resources, *government property* is a confusing category. Assets formally labeled government property may in fact have control characteristics that resemble open access, communal property or even private property. However, it may be useful to designate the control of assets by formal political bodies and their agents as government property.

The traditional fourfold classification of property rights frequently draws ideological reactions and is liable to fit scholars with blinders. Although there is no way to escape simplification in modeling institutional regimes, it is important to go beyond the traditional classification of property rights and, depending on the purpose at hand, consider control structures with dimensions that may not correspond directly to any one of the classical categories.

Assets usually have several valuable margins, and control structures have several dimensions that need to be considered when we specify the choice sets of actors. Schlager and Ostrom, (1993) in an empirical study of control structures in 44 coastal fisheries around the world, identified for their purposes four dimensions of control: access and withdrawal, management, exclusion, and alienation. Schlager and Ostrom examined their case studies to see how many of these dimensions were controlled by each subgroup of fishers and found that the number varied from only one to all four dimensions. Further they found that differences in control structures affected behavior systematically and predictably.

The Schlager-Ostrom study was concerned with dimensions of control in coastal fisheries, but a resource usually has several valuable margins. In addition to fishing, the waters of a coastal fishery have several and often conflicting uses — for instance, the waters can be used for boating, to receive sewage or as a harbor. The partitioning of control at these margins and the structure of the control have implications for behavior and economic results. For several reasons, actors typically have no more than *residual control* of valuable dimensions of assets: First, actors frequently find it in their interest to transfer certain dimensions of control to others, either temporarily or permanently. In many instances, the most useful approach for the scholar is to focus on the structure of control for a *bundle of resources* that are joined in production by contractual arrangements. Second, the state not only provides actors with a critical component of external control; it also restricts control

[5] We prefer to use the term communal property rather than the more popular *common property* because the latter frequently is confused with open access. The confusion is due partly to the fact that arrangements for sharing a resource by a community frequently break down, for instance in response to exogenous shocks, and degenerate into *de facto* open access.

along certain margins — for instance, the state may determine that a building can be used only as a residential unit and (because building is an historical landmark) that demolition or major reconstruction is not allowed. The extended debate concerning the (de)regulation of industry, going back to the Industrial Revolution, is another reminder of how the state gives and takes various margins of control. Finally, residual control is also limited by informal rules — informal local standards and sanctions may compel you to paint your house in a different color than you desire and charge less for food during a famine than the market can bear.

The notion of the *dissipation of non-exclusive income* has a central role in the economics of institutions. The analytics of dissipation were established first in the case of open access in natural resources, such as a fishery (Warming 1911; Gordon 1954). The core of the argument is well known and centers on the failure of actors, whose behavior is guided by marginal cost-benefit calculations, to allow in their calculations for the appropriate costs and benefits that their actions entail: In the jargon of economics, the actors do not internalize all the technical externalities which they cause.[6] Note that the waste associated with a non-exclusive.resource involves more than the excessive utilization or depletion of a resource; the very method of utilization is likely to be wasteful. In an open access fishery, fishers often race to the grounds in boats with inefficiently large engines and engage in other practices which raise production costs.[7] Also with non-exclusivity, actors do not have an incentive to invest in improving the quality of the resource, for instance by applying fertilizers to land, because the yield is a non-exclusive income. Non-exclusivity even affects the choice of outputs; farmers, responding to the lack of control, are more likely to use non-exclusive land for grazing than for growing orchards, even when orchards are preferred on comparable exclusive plots.

The early studies of open access showed that external effects would disappear if a single decision maker controlled a continguous natural resource. Coase (1960) demonstrated that dissipation would be absent, and resources find their most valued uses, if there were no impediments to negations and side-payments among the various actors.[8] However, such impediments (transaction costs) are the rule rather than the exception. The impediments to negotiations and side-payments may be due to high costs of measurement and enforcement or institutional rules that outright restrict transactions.

In fact, the notion that non-exclusive income is not limited to the open-access category, but a universal phenomenon shared in some measure by all major systems of

---

[6] In a well-known paper, Demsetz (1967) argues that exclusive rights develop when the gains of internalizing the externalities exceed the cost.

[7] Races to appropriate non-exclusive income are usually motivated by *me rule of capture* which states that oil in a reservoir or fish in the ocean becomes exclusive property once it has been captured by individual actors.

[8] Coase (1960) generated a sub-literature that is based on the first half of his article. The literature debates what a world of zero transaction costs would be like (Cooler & Ulen 1988). The debate is a classic case of disagreement caused by unrecognized differences in definitions (of transaction costs) and has value as such.

property rights, is a major insight of the modern economics of institutions (Barzel 1989). According to this viewpoint, measurement and enforcement costs ensure that control of assets and contracts are never complete, whatever the institutional regime. Incomplete control at some margin invites the dissipating behavior recognized in the early literature and lowers the value of the assets involved. For instance, tenants with a short-term fixed rental contract on private agricultural land may find it in their interest to maximize the short-run output from the fields at the cost of a serious depletion of soil nutrients — provided that high transaction costs make it impractical for the landlords to monitor their tenants and enforce 'proper' treatment of the soil.

The prevalence of non-exclusivity has major implications for focusing research in the economics of institutions. The prospect of non-exclusivity constitutes a challenge to actors (at various levels in the hierarchy of control) to design institutions and contractual arrangements for limiting uncertainty, strengthening control, and increasing the value of their assets. The study of endogenous responses to uncertain control of resources is a flourishing research program, which increasingly uses the tools of game theory.[9] In addition to measures such as legal and regulatory restraints and monitoring systems, these responses include contracts that attempt to align conflicting interests of actors. Much attention has been paid to *asymmetric information* that enables one side in contractual relations to hide quality (*adverse selection)* or hide behavior *(moral hazard).* In the landlord-tenant example above, a landlord might design *incentive contracts* with her farmers entitling them to fertilizers at a subsidized (even zero) price. Note that traditional economic analysis, which takes complete control as given, views such a subsidy as economically irrational.

The economic rationality of establishing exclusivity depends on the technology of measurement and enforcement, known forms of contractual arrangements, and the actors' institutional framework. No matter what the institutional regime, a certain amount of non-exclusivity will always exist and be economically rational (consider the practice of not pricing salt and pepper in a restaurant or having one price for all seats in a movie theater). Below we outline a simple model of (aggregate) wealth maximization by an *autonomous* group of actors who harvest the yield of a contiguous resource such as pastures (Field 1986; 1989; Eggertsson 1993b). The model is then used to illustrate various issues, including the role of distributional issues in shaping structures of control.

In the present context, exclusivity requires control on two margins. If two or more individuals share the use of an exclusive plot, the arrangement contains the seeds of non-exclusivity, and the potential for dissipating behavior must be controlled. We refer to such internal control as *governance.* It is reasonable to assume that governance problems increase monotonically with the number of actors sharing a plot and reach maximum when the group shares the entire resource. Governance costs depend on the structure of the contracts used to constrain the actors, the system of enforcement, and informal institutions. The contractual

[9] For an excellent recent survey of the modern economics of organization see Milgrom and Roberts (1992).

arrangements best suited for maximizing joint values depend in each case on the nature of the measurement and enforcement problems (Lueck 1993).

The other margin of control relates to the prevention of intrusion by actors outside the group and, when the resource is divided into several plots, transgressions by neighbors. We refer to the act of protecting borders as *exclusion.* It is reasonable to expect that the cost of exclusion increases monotonically as the number of private plots goes up and reaches maximum when each actor has his or her private plot (and the length of borders to defend reaches maximum). We are now able to use this simple model to draw several lessons.

First, the maximization of joint values for the group involves cost-benefit calculations at *several* margins. In traditional economics, producers optimize by minimizing the cost of production for each level of output, but in our case optimization involves the joint minimization of production and control costs, with control costs involving both governance and exclusion costs.

The second point is that there is no general solution to the maximization problem: open access, communal property, intermediate plots or exclusive individual plots, the answer in each case depends on the cost functions of production, exclusion and governance. For instance, prohibitive exclusion costs can make any form of exclusive control impractical and leave open aceess as the optimal solution. In other instances, relatively low internal governance costs and high exclusion costs may suggest that communal property maximizes wealth, and so on.

The third lesson is that governance and exclusion costs depend on a host of factors, including physical characteristics of the resource, production methods, the state of technology, political and social organizations, relative prices, and natural barriers to entry by outsiders (such as distance).

The fourth point is that cultural factors (norms and customs) appear to have an important independent impact on the cost of governance and exclusion, but their role is not well understood. Most scholars agree that cultural factors evolve relatively slowly and not as the product of purposive action by a polity; they cannot be a direct policy instrument, yet a thorough knowledge of informal institutions will help policy makers design effective formal rules by taking into consideration the interaction between new formal rules and existing informal ones.[10] Furthermore, work by game theorists gives rise to the speculation that establishing cooperation is a more delicate and time consuming process than defection. For instance, cooperation in games for which the prisoners' dilemma is paradigmatic requires more stringent assumptions (such as repeated play) than defection. Policy makers may perhaps have some role in influencing the evolution of norms by modifying changes in the environment of actors that would lead to defection. In the long run cooperation based on self-interest may reinforce independent norms of cooperation through learning. The issue of

[10] It is not reasonable to assume that all norms and customs have infinite values — for instance, many situations involve a choice between breaching one norm or another. If the principle of substitution applies to norms and customs, an increasing number of actors will renege on their norms as the opportunity cost of abeyance increases.

cooperation in using common pool resources is explored extensively with theoretical, applied and experimental game theory by Ostrom et al. (1993a, 1993b).

Our fifth point is the arbitrariness of the assumption in the model above that the actors of the group are able to agree on whatever control arrangements will maximize the *joint* wealth of its members. To illustrate the point, assume that maximization of aggregate wealth requires that an unexpected exogenous shift in the governance and exclusion functions be met with reorganization away from communalism to smaller exclusive plots. Although the change will make the group as a whole better off, some actors will benefit, others will lose absolutely or relatively. In a world of transaction costs we cannot generalize about the outcome. Much depends on the group's system of decision making, the distribution of power, cultural traits, and the practicality of contracting for side payments. In fact, the possibility exists that a subgroup, primarily motivated by a shift in the balance of power, may initiate reorganization and set up a new control structure that increases their share of the pie but shrinks its size.

The sixth and final point is that the rules of the game may be set, not by the group of users (as the model assumes), but by a higher and distant authority, such as a central government. The objective function of such a polity may include wider national interests (and personal interests of the rulers and their agents) which coincide only partly with the interests of the group in question. Also, pure information problems will multiply the further authority is removed from the users of the resource (Ostrom 1990).

ill. Levels of analysis

The economics of institutions is an attempt to integrate recent research in various subfields of economics and the social sciences in order to present a coherent research program to explore the link between institutions and wealth and develop a general theory of economic systems, both static and dynamic. The word theory is used not in the sense of a grand theory of social systems but rather as representing a set of theoretical tools suitable for analyzing a whole range of questions at various analytical levels. The conceptual model involves three components: a) the institutional environment of the individual actors and their organizations; b) the response of individual actors and their organizations to the environment; c) the collective outcome of individual responses.![1]

The research program takes advantage of an extended version of neoclassical economics in order to maintain continuity in economic and social analysis and lower the cost of transacting in scholarship. At its current stage, the approach is relative weak when attempting to explain certain aspects of the institutional background and the long-term dynamics of institutional change. Therefore, we argue that at the frontier of research there is need for experimental work with alternative paradigms, for instance drawing on the cognitive sciences (North 1993). However, we insist on keeping the field separate from studies that,

[11] In his important study of the foundations of social theory, Coleman (1990:1-23) argues that a theory of social systems should have a macro-to-micro component, an individual-action component, and a micro-to-macro component.

operating only at a macro-social level, personify social forces and laws of history (Coleman 1990).

Our argument concerning the different theoretical requirements of the several levels of analysis in the economics of institutions is best explained by examples from the empirical literature. First consider Cheung's (1974; 1975; 1979) well-known studies of rent control in twentieth-century Hong Kong. For his purposes, Cheung treats the institutional environment as exogenous and concentrates on the response of individual actors and the micro-to-macro transition, using applied price theory, a detailed specification of the legal constraints, and the notion of transaction costs. The analysis provides a powerful and convincing explanation of the market response but also makes clear that the response depends on local circumstances and particular legal constraints, which are not available to the scholar *a priori*. Another finding in these and comparable studies is that actors may respond to changes in their (legal and regulatory) constraints by adjustments on any of several margins. The studies show that changing rules to successfully bring about specific results, without undesirable side-effects (such as the premature demolition and restructuring of tenements in order to escape rent control), frequently is highly information-intensive. Often satisfactory results require trial and error and iteration, which suggests the initial use of small scale experiments for avoiding large scale costly errors.

Next consider studies that attempt to explain how actors, *operating within a particular institutional environment*, design contractual arrangements for limiting dissipation and increasing the value of their assets. Included here are Williamson's (1985; 1993) studies of capitalistic organizations, Barzel's studies of market practices (1982), Goldberg's (1976a; 1976b) work on relational contracting, McCloskey's (1989) studies of the English open-field system, Ostrom (1990) on common-pool resources and many others. [12] Again price theory and game theory augmented by institutional constraints and transaction costs work reasonably well.

At yet another level are studies which seek to explain how political organizations make *marginal changes* in the formal institutional environment of economic actors. Scholars working in this area have used the rational choice model and the information and transaction costs perspective to model the structure of political organizations, political decisions, and the interaction between political and economics organizations. A sample of these studies is found in Alt and Shepsle (eds. 1990). Weingast's (1984) application of the principal-agent perspective in a study of the congressional-bureaucratic system and the Weingast and Marshall (1986) study of the industrial organization of Congress fall into this category, and so do various studies in the Economics of Regulation and Public Choice. One lesson we have learned in this line of investigation is that the pure-market analogy is *not* appropriate for analyzing political processes and decisions, but agency theory, the theory of contracts and

[12] Milgrom and Roberts (1992) provide a user-friendly survey of the available analytical methods and results. Also see Werin & Wijkander (1992) for a collection of papers on contract economics by leading scholars.

other elements of the new theory of organization are useful for analyzing both economic and political organizations (Bates 1991). For certain topics, however, behavioral models based on actors solely motivated by narrow self-interest appear to be inappropriate.

Finally, we mention ambitious studies that attempt to explain structural changes in political and economic systems - major institutional change that has been analyzed, for instance, by North (1981;1989) and Ensminger (1992). The evolution of political foundations of secure markets is a critical research question in this area. The attention focuses on the incentive for individual actors to make long-term specialized investments, a necessary condition for the development of a modern decentralized economy. The incentive is seen as depending on the ability of the state to make credible commitments to potential investors to honor long-term contracts, and the ability of individual actors to make such commitments to each other (North and Weingast 1989; Weingast 1993). Although these studies have identified political developments which facilitate the development of secure markets, such as a balance of power between the crown and parliament or a federalism which combines local autonomy in economic affairs with the free flow of resources between local governmental units, they tend to agree that a credible commitment must be supported by appropriate social norms or cultural traits (Weingast 1993; North 1993). Arrow (1990) uses the term *commercial morality* in this context. Many students of the economics of institutions believe that a theory of commercial morality is critical for a better understanding of long-term institutional change, such as the transition to secure markets in the Third World or in the former Soviet Union and Eastern Europe, but a sound theory of the formation of culture still evades these investigators (Eggertsson 1993c)

iv. Conclusions

We have emphasized secure control of assets as the critical component of a sound economic system. A critic might argue that secure control is not enough, it also matters how control is divided among various categories of actors. The critic is both right and wrong. With *full* control of their assets, both in the short run and the long run, rational actors have an incentive to negotiate partitions of control and exchange of control which maximizes their joint wealth. The law and economics literature has debated long and unfruitfully what conditions are required for such a world to exist, but the point is that full control is an ideal concept, a state of affairs that has never existed and never will. In the real world, the structure of control is generated by actors, who, constrained by cultural factors, ignorance, transaction costs, contracts and institutions, seek to maximize their wealth. The resulting division of control reflects the interests of powerful actors and organizations rather than arrangements designed to maximize the joint wealth of the community.

Critics often argue that inherent in the economics of institutions is a notion that institutions evolve to increase efficiency in some general sense — implying that the practitioners of the approach absurdly believe that the institutions of Tropical Africa, Eastern Europe, Iceland, the United States and Cuba all rate at the top of some general scale of

(economic) efficiency. Our explanation of marginal changes in institutions involves a response by actors and organizations to their institutional environment. The individual responses, modeled as constrained optimization, are aggregated in a micro-to-macro transition which can generate a variety of outcomes, depending on the transition process, some of which may wash out individual attempts to optimize. Only in specific circumstances can we agree with Becker's (1993: 67-68) statement of the weak efficiency hypothesis that "institutions evolve for various reasons, but whatever their intent including 'exploitation' of weak groups, they accomplish their goal efficiently; that is to minimize 'transaction costs.'"

In the discussion above, I have substituted the word *control* for *(property) rights* in order to avoid the confusion associated with multiple definitions of the concept of (property) rights in the literature. Property rights have a specific meaning in law, a much narrower one than used in the economics of property rights. Similarly, in social science the concept of rights, and corresponding duties, has a narrower meaning than in economics. Finally, I want to avoid ethical connotations, which the term has in political philosophy; the relative advantage of the economics of institutions is in the study of ethics as a force that affects behavior "rather than in evaluating the inherent merits of alternative ethical systems.

We end with a note on the need to experiment with new models of behavior. The information revolution in economics and the social sciences has yet to be taken to its logical conclusions. Research so far has concentrated on measurement and enforcement problems in transactions and on the brain's limited capacity to process large batches of data. However, costly information also implies that actors use a variety of models of reality to process (however slowly) the data they receive (North 1993; Eggertsson 1993d). In order to understand learning and the paths of the human mind, we must shift to a *new level* of scholarship and study man (rather than society) as a system. The topic is an important frontier of research and of great interest to social scientists. It is conceivable that future scholars studying the economics of institutions will use models of man of varying sophistication depending on the nature of their work. For some purposes the narrow neoclassical rational choice model might be appropriate, for other uses the bounded rationality/transaction cost model, and in yet other situations models involving learning.

References

Alchian, Armen A. (1965). "Some Economics of Property Rights." // *Politico 30:* 816-829. (Originally published in 1961 by the Rand Corporation), Reprinted in Alchian, 1977.

Alchian. Armen A. (1977). *Economic Forces at Work.* Indianapolis: Liberty Press.

Alt, James E. & Shepsle, Kenneth A. eds. (1990). *Perspectives on Positive Political Economy.* Cambridge: Cambridge University Press.

Anderson, Terry L. & Simmons, Randy T. (1993). *The Political Economy of Customs and Culture. Informal Solutions to the Commons Problem.* Landham, MD: Rowman & Littlefield.

Arrow, Kenneth J. (1990). "Kenneth J. Arrow." In Swedberg (1990): 133-151.

Barzel, Yoram (1982). "Measurement Costs and the Organization of Markets." *Journal of Law and Economics 25* (April): 27-48.

Barzel, Yoram (1989). *Economic Analysis of Property Rights.* Cambridge: Cambridge University Press.

Bates, Robert H. (1991). "Perspectives on the New Political Economy. A Critique." In Meier ed, (1991): 261-272.

Becker, Gary S. (1992). "Comments." In Werin & Wijkander (1992): 66-71.

Bell, David E., Raiffa, Howard & Tversky, Amos (1988). *Decision Making. Descriptive. Normative and Prescriptive Interactions.* Cambridge: Cambridge University Press.

Cheung, Steven N.S. (1969). "Transaction Costs, Risk Aversion, and the Choice of Contractual Arrangements." *Journal of Law and Economics 12:* 23-42.

Cheung, Steven N.S. (1970). 'The Structure of a Contract and the Theory of Nonexclusive Resources. *Journal of Law and Economics 13:* 49-70

Cheung, Steven N.S. (1974). "A Theory of Price Control." *Journal of Law and Economics 17* (1): 53-71.

Cheung, Steven N.S. (1975). "Roofs or Stars: The Stated Intents and Actual Effects of A Rent Ordinance." *Economic Inquiry 13* (March): 1-21.

Cheung, Steven N.S. (1979). "Rent Control and Housing Reconstruction: The Postwar Experience of Prewar Premises in Hong Kong." *Journal of Law and Economics 22* (1): 27-53.

Coase, Ronald H. (1937). 'The Nature of the Firm." *Economica 4* (November): 386-405.

Coase, Ronald H. (1960). "The Problem of Social Cost." *Journal of Law and Economics 3* (1): 1-44.

Coleman, James S. (1990). *Foundations of Social Theory.* Cambridge: Belknap, Harvard University Press.

Cook, Karen S. & Levi, Margaret (1990). *The Limits of Rationality.* Chicago: Chicago University Press.

Cooter, Robert D. & Ulen, Thomas (1988). *Law and Economics.* New York: Harper, Collins.

Demsetz, Harold (1967). "Toward a Theory of Property Rights." *American Economic Review 51* (May): 347-359.

Demsetz, Harold (1988). *The Organization of Economic Activity* (2 vols.). Oxford: Basil Blackwell.

Eggertsson, Thráinn (1990). *Economic Behavior and Institutions.* Cambridge: Cambridge University Press.

Eggertsson. Thráinn (1993a). 'The Economics of Institutions: Avoiding the Open-Field Syndrome and the Perils of Path Dependence." *Acta Sociologica,* forthcoming.

Eggertsson, Thráinn (1993b). 'The Economic Rationale of Communal Resources. Working Paper.

Eggertsson, Thráinn (1993c). 'The Economics of Institutions and the Transition in Eastern Europe and in the former Soviet Republic." In Salvatore Schiavo-Campo, ed. *Institutional Change and the Public Sector in Eastern Europe and the Former Soviet Union.* Washington D.C.: The World Bank. Forthcoming.

Eggertsson, Thráinn (1993d). "Mental Models and Social Values: North's Institutions and Credible Commitment. *Journal of Institutional and Theoretical Economics 149:* 24-28.

Ensminger, Jean (1992). Making a Market. The Institutional Transformation of an African Society. Cambridge: Cambridge University Press.

Field, Barry C. (1986). "Induced Changes in Property Rights Institutions." Research Paper. Amherst: University of Massachusettes, Department of Agriculture.

Field, Barry C. (1989). "The Evolution of Property Rights." *Kyklos 42* (3): 319-345.

Furubotn, Eirik G. & Richter, Rudolf, eds. (1991). *The New Institutional Economics.* Tübingen: J.C. Mohr.

Furubotn, Eirik G. & Richter, Rudolf, eds. (1993). *The New Institutional Economics. Recent Progress; Expanding Frontiers.* Special Issue: *Journal of Institutional and Theoretical Economics 149.*

Galenson, David W. (1989). *Markets in History. Economic Studies of the Past.* Cambridge: Cambridge University Press.

Goldberg, Victor P. (1976a). 'Toward an Expanded Theory of Contract." *Journal of Economic Issues 10* (1): 45-61.

Goldberg, Victor P. (1976b). "Regulation and Administered Contracts." Bell Journal of Economics 7 (2): 426-441.

Gordon, H. Scott (1954). 'The Economic Theory of a Common Property Resource: The Fishery." Journal of Political Economy 62 (April): 124-142.

Granovetter, Mark (1992). "Economic Institutions as Social Constructions: A Framework for Analysis." *Acta Sociologica 35:* 3-12.

Klein. Benjamin, Crawford, Robert G. & Alchian, Armen A. (1978). "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process." Journal of Law and Economics 21 (2): 297-326.

Libecap. Gary D. (1989). *Contracting for Property Rights.* Cambridge: Cambridge University Press.

Lueck, Dean (1993). "Contracting Into the Commons." In Anderson & Simmons (1993): 43-60.

McCloskey, Donald N. (1989). 'The Open Fields of England: Rent, Risk, and the Rate of Interest, 1300-1815." In Galenson ed. (1989): 5-51.

Meier, Gerald M., ed.(1991). *Politics and Policy Making in Developing Countries.* San

Francisco: ICS Press.

Milgrom, Paul & Roberts, John (1992). *Economics, Organization and Management.* New Jersey: Prentice Hall.

North, Douglas C. (1981). *Structure and Change in Economic History.* Cambridge: Cambridge University Press.

North, Douglass C. & Weingast, Barry R. (1989). "Constitutions and Credible Commitments: The Evolution of the Institutions of Public Choice in 17th Century England." *Journal of Economic History 49:* 803-832.

North, Douglass C. (1989). *Institutions, Institutional Change and Economic Performance.* Cambridge: Cambridge University Press.

North, Douglass C. (1993). "Institutions and Credible Commitment." *Journal of Institutional and Theoretical Economics 149:* 11-23.

Ostrom, Elinor (1990). *Governing the Commons: The Evolution of Institutions for Collective Actions.* Cambridge: Cambridge University Press.

Ostrom, Elinor, Walker, James & Gardner, Roy (1993a). "Covenants With and Without a Sword: Self-Governance is Possible." In Anderson and Simmons (1993): 127-156.

Ostrom, Elinor, Walker, James & Garnder, Roy (1993b). *Rules, Games, and Common-Pool Resources.* Ann Arbor: University of Michigan Press, forthcoming.

Schlager, Edella & Ostrom, Elinor (1993). "Property Rights Regimes and Coastal Fisheries: An Empirical Analysis." In Terry L. Anderson & Randy T. Simmons (1993): 13-42.

Swedberg, Richard (1990). *Economics and Sociology. Redefining their Boundaries: Conversations with Economists and Sociologists.* Princeton: Princeton University Press.

Warming, Jens (1911). "Om 'Grundrente' af Fiskegrunde." Nationaløkonomisk Tidsskrift: 495-506. See also Andersen, P. (1983). "On Rent of Fishing Grounds': A Translation of Jens Warming's 1911 Article, with an Introduction." *History of Political Economy* 15 (3): 391-96.

Weingast, Barry R. & Marshall, William J. (1988). 'The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets." *Journal of Political Economy* 96 (1): 132-163.

Weingast, Barry R. (1984). 'The Congressional-Bureaucratic System: A Principal-Agent Perspective." *Public Choice 44* (1): 147-192.

Weingast, Barry R. (1993). "Constitutions as Governance Structures: The Political Foundations of Secure Markets." *Journal of Institutional and Theoretical Economics 149:* 286-311.

Werin. Lars & Wijkander, Hans , eds. (1992). *Contract Economics.* Oxford: Basil Blackwell.

Williamson, Oliver E. (1971). 'The Vertical Integration of Production: Market Failure Consideration." *American Economic Review 61* (May): 112-123.

Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism.* New York: Free Press.

Williamson, Oliver E. (1993). "The Evolving Science of Organization." In Furubotn & Richter (1993): 36-63.

Beijer Discussion Papers 1991-1994

February 1994

1. **The Ecology and Economics of Biodiversity Conservation: Elements of a Research Agenda**
   Charles Perrings, Carl Folke and Karl-Goran Maler. 1991.

2. **Towards an Ecological Economics of Sustainability**
   Mich Common and Charles Perrings. 1992

3. **Aspects Stratégiques des Négotiations Internationales sur les Pollutions Transfrontières et du Partage des Côuts de l'Épuration**
   Parkash Chander and Henry Tulkens. 1992.

4. **Multiple Use of Environmental Resources: The Household-Production-Function Approach**
   Karl-Göran Mäler. 1992.

5. **Nested Living Systems**
   Folke Giinther and Carl Folke. 1992

6. **The Tragedy of the Commons and the Theory of Social Overhead Capital**
   Hirofumi Uzawa. 1992.

7. **Harvesting Semelparous Populations and Variability in the Life History of Salmon**
   Veijo Kaitala and Wayne M. Getz. 1992.

8. **Cultural Capital and Natural Capital Interrelations**
   Carl Folke and Fikret Berkes. 1992

9. **Imputed Prices of Greenhouse Gases and Land Forests**
   Hirofumi Uzawa. 1992

10. **Regulating the Farmers' Use of Pesticides in Sweden**
    Ing-Marie Andréasson-Gren. 1992

11. **The Population Problem**
    Partha Dasgupta. 1992

12. **An Ecological Economy: Notes on Harvest and Growth**
    Gardner Brown and Jonathan Roughgarden. 1992

13. **Towards a General Theory of Social Overhead Capital**
    Hirofumi Uzawa. 1992

14. **Benefits from Restoring Wetlands for Nitrogen Abatement: A Case Study of Gotland**
    Ing-Marie Gren. 1992

15. **Trade, Tropical Deforestation and Policy Interventions**
    Edward B. Barbier and Michael Rauscher. 1992

16. **Foreign Trade and Renewable Resources**
    Michael Rauscher. 1992

17. **Sensitivity of Willingness-to-Pay Estimates to Bid Design in Dichotomous Choice Contingent Valuation Models: A Comment**
Barbara J. Kanninen and Bengt Kristrom. 1992

18. **Debt-for-Environment Swaps: The Institutional Dimension**
Tomasz Zylicz. 1992

19. **Modeling Complex Ecological Economic Systems: Toward an Evolutionary, Dynamic Understanding of Humans and Nature**
Robert Costanza, Lisa Wainger, Carl Folke and Karl-Göran Mäler. 1992

20. **Welfare Benefit Estimation and the Income Distribution**
Barbara J. Kanninen and Bengt Kristrőm. 1992

21. **Internalizing Environmental Costs of Salmon Farming**
Carl Folke,, Nils Kautsky and Max Troell. 1992

22. **Resource leasing and optimal periodic capital investments**
Andy Nowak, Veijo Kaitala and Gustav Feichtinger. 1993

23. **Improving Environment through Permit Trading: The Limits to Market Approach**
Tomasz Zylicz. 1993

24. **Cost-Effectiveness of the Baltic Sea Clean-Up: Will Wetlands Reconcile Efficiency with Biodiversity?**
Tomasz Zylicz, Ing-Marie Gren. 1993

25. **Economic Growth and the Environment**
Karl-Göran Mäler. 1993

26. **Environmental Impact of Government Policies and External Shocks in Botswana,** Lena Unemo. 1993

27. **Poverty, Institutions, and the Environmental-Resource Base**
Partha Dasgupta and Karl-Goran Maler. 1993

28. **The acid rain game as a resource allocation process with an application to the international cooperation among Finland, Russia, and Estonia**
Veijo Kaitala, Karl-Göran Mäler, and Henry Tulkens. 1993

29. **Ecological limitations and appropriation of ecosystem support by shrimp farming in Columbia,** Jonas Larsson, Carl Folke and Nils Kautsky. 1993

30. **Wetland Valuation: Three Case Studies**
R.K. Turner, C.Folke, I-M. Gren and IJ. Bateman. 1993

31. **Traditional Ecological Knowledge, Biodiversity, Resilience and Sustainability**
Fikret Berkes, Carl Folke and Madhav Gadgil. 1993

32. **The Acid game II**
Karl-Göran Mäler, 1993

33. **Investing in Natural Capital: Why, What, and How?**
Carl Folke, Monica Hammer, Robert Costanza and AnnMari Jansson, 1993

34. **The Economic Management of High Seas Fishery Resources: Some Game Theoretic Aspects**
Veijo Kaitala and Gordon Munro, 1993

35. **Discontinuous Change in Multilevel Hierarchical Systems**
J. Barkley Rosser, Jr., Carl Folke, Folke Günther, Heikki Isomäki, Charles Perrings, Garry Peterson and Tõnu Puu. 1993

36. **Comparing Ecological and Social Systems**
C.S. Holling, Lance Gunderson and Garry Peterson, 1993

37. **The Interface Between Natural and Social Systems**
Fikret Berkes, 1993

38. **Management Regimes**
Bonnie J. McCay, 1993

39. **The Evolution of Norms, Rules, and Rights**
Elinor Ostrom, 1993