PROPERTY RIGHTS AND SOCIAL MICROECONOMICS*

ALAN RANDALL**

Economics as a discipline, having its roots in moral philosophy, has been characterized by a continuing inquiry into the relationships among institutions, economic actors, and socioeconomic well-being. This focus has at times been intense among members of some schools of economic thought, while at other times and among other schools it has all but faded away. Currently this continuing inquiry is perhaps most clearly manifested among that growing group of economists who are using an analytical framework which may loosely be called "the property rights approach."

These economists, many of whom have been drawn from the fields of micro and welfare economics, are now focusing on an area of inquiry which may usefully be called *social microeconomics.* They have come to see property rights as a very substantial component of the structure of incentives which guide economic decisions and, hence, perhaps the key to the study of interactions between institutions and resource allocation and income distribution.

A rather substantial and rapidly growing body of literature is emerging from the efforts of the property rights scholars. It is the intent of this article briefly and selectively to review this literature, indicating its general thrust and revealing some sharp differences in orientation and emphasis among its various contributors. While there is general agreement that the property rights approach has led to important advances in economic thinking about institutions, there remains substantial disagreement, even among the *cognoscenti,* when it comes to the generation of normative principles for the design of institutions.

NEOCLASSICAL AND INSTITUTIONAL APPROACHES

It is useful to consider two longer established streams of economic thought, both of which contributed to the development of the new

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**Associate Professor of Agricultural Economics, Univ. of Kentucky.

social microeconomics: neoclassical microeconomics and institutional economics.[1]

Neoclassical microeconomics provided an optimizing framework which, when used with the simple motivational assumptions of profit or utility maximization, allowed prediction of the responses of quantity supplied and demanded to prices, and vice versa. Microeconomics was also useful in prediction of the responses of price and quantity to policy variables such as taxes, tariffs and import quotas. However, it is fair to say that neoclassical microeconomic analysis, for the most part, either abstracted from institutional considerations or optimized within the given institutional framework. Since the primary focus was seldom explicitly on institutional questions, the given institutional framework and institutional alternatives (if considered at all) were often specified naively and incompletely, rather than analyzed. This methodology had the virtue of simplicity, which allowed the analytical progress which can be achieved through the process of abstraction. Yet its simplistic approach to institutions came to be recognized as inadequate for the solution of many policy problems.

In response to this lacuna in neoclassical microeconomics an institutionalist school appeared early in this century. Members of this school were motivated by a deep concern for the importance of institutional-economic interactions. Institutional givens and alternatives were described in excruciating detail. The failure of the institutionalist school to make massive inroads among economic theorists[2] may be attributed to its substantial failure to derive useful abstractions. Thus, the institutionalists were more effective in providing a critique of the neoclassical approach than in developing an alternative theory from which to derive testable hypotheses.

THE PROPERTY RIGHTS APPROACH

The property rights approach to social microeconomics represents a marriage, thus far quite promising, of the neoclassical and institutional approaches. It is by no means an equal marriage; in fact many property rights scholars (PRs) would regard the PR approach as a vastly superior *substitute* for institutionalist economics. The concern with institutions is retained, as is an understanding of the need to specify the institutional framework with precision. However, the economic methodology employed is wholly consistent with the neo-

1. The following two paragraphs will do justice to neither the neoclassical nor the institutionalist school of thought.

2. The institutionalist school has made some inroads among applied economists. Some land economists and natural resource economists may be counted among its adherents.

classical framework and is, in fact, simply a logical extension of that framework.[3] Perhaps the property rights approach is best characterized as an application of neoclassical microeconomic methodology to institutional questions.

The analytical framework of the PR approach is predicated upon an assumption that market logic is applicable to a good many questions which were once thought to be extra-market or even non-economic. The PR approach, in its *positive* form, simply uses the assumption of constrained utility maximization to predict individual and aggregate responses to existing and alternative structures of incentives.[4] This is fundamentally a neoclassical methodology, yet it represents a genuine extension of the neoclassical paradigm. The utility function is specified with a good deal of care and the structure of incentives with a degree of precision far surpassing that found in most previous neoclassical work. Thus, the individual is seen as maximizing utility within the frameworks of rules which govern both the organization of which he is part and the broader society.

Any change in any component of the incentive structure facing the individual will tend to change the choices he will make. The PR approach focuses on the impact of changes in the structure of property rights and, more generally, collective or governmental activity in

3. "... microeconomic theory properly developed is the property rights approach." Furubotn and Pejovich, *Property Rights and Economic Theory: A Survey of Recent Literature,* 10 J. Econ. Lit. 1137, 1157 (1972).

4. It is important to clarify the relationship of (i) the structure of incentives to (ii) institutions and (iii) property rights. The structure of incentives facing an individual is, essentially, his opportunity set with penalties and rewards, i.e., prices and costs, associated with each of the alternatives in that opportunity set. The structure of incentives facing the individual is determined by (a) the technological capacity and aggregate scarcity of the society of which he is a member, (b) the abilities (both technological and in decision-making), the income, wealth, property objects, and economic and political power the individual commands, relative to others, (c) the economic activities undertaken by government, and (d) the property, civil and human rights defined by the society of which he is a member.

Institutions include items (c) and (d), which may be called governmental or collective institutions. Non-governmental institutions (which may nevertheless be partially supported or aided and abetted by government) help to determine the position of the individual relative to others in the society of which he is a member, i.e. (b).

Property rights are a subset of (d). Property rights specify the appropriate relationships among people with respect to the use of things and the penalties for violation of these proper relationships.

Thus, incentive structure is the broader, more inclusive term. Institutions is a term which defines the rules (aside from aggregate scarcity, the technological capacity of society, and innate inequality of ability among individuals) within which the individual makes decisions. Property rights are a subset and a very important subset, of institutions.

This author would prefer to describe the approach to economic institutional analyses under discussion as "the incentive structure approach." However, for the purpose of this exercise, he bows to the preferences of an apparent majority of its practitioners, and uses the less inclusive descriptive term, "the property rights approach."

all of its ramifications on the choices individuals make. By predicting the response of individuals to existing and alternative institutional structures, aggregate response can be predicted.[5]

The PR approach to the positive study of institutions is directed toward the establishment of useful and meaningful propositions about economic-institutional interactions. Thus, while much of the existing PR literature falls into the deductive category, the generation of empirically testable hypotheses is a central thrust.

The PR approach, sharing as it does many interests with welfare economics and institutional economics, also has a substantial *normative* thrust. Here, the focus is on the design of institutions and structures of rights to direct behavior into socially desirable avenues.

The difficulty of finding acceptable criteria for social policy analysis pervades all of normative economics. The Samuelson-Bergson social welfare function is a useful device for conceptualizing social optima[6] but has presented operational difficulties ranging from the possibility of indeterminacy[7] to the overwhelming difficulty of empirical specification. The PRs, or at least a substantial number of them, have discarded the concept of the social welfare function.[8] In its stead, a strongly individualistic ethic is proposed. What the individual seeks is considered a serviceable indicator of what is good. Revealed choice behavior of individuals provides the basic informational inputs for the determination of value. Consensus among individuals indicates the "rightness" of social policies, while imposition of policy upon dissenters is thoroughly undesirable.[9] Thus, the PR approach to normative economics relies heavily upon criteria such as Pareto-efficiency to evaluate institutional states and Pareto-safety to evaluate institutional changes.

These welfare criteria and their use in property rights analyses will be discussed in more detail. The criterion problem involves apparently intractable difficulties and is the focal point of vigorous controversy.

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5. Since PR models attempt to predict responses, can they be called behavioral models? No, behavioral patterns are not predicted, but rather assumed. PR models are best thought of as models of advantage which are behavioral only to the extent that human behavior is a relentless pursuit of advantage.

6. Bator, *The Simple Analytics of Welfare Maximization,* 47 Am. Econ. Rev. 22 (1957).

7. K. Arrow, Social Choice and Individual Values (1951).

8. *See* Furubotn and Pejovich, *supra* note 3, at 1157, and Tollison, *Involved Social Analysis,* in J. Buchanan and R. Tollison eds. Theory of Public Choice 4 (1972).

9. Thus, social welfare functions are not only impractical but inimical, since they are relevant only when choices are to be made by some group or agency external to the affected parties. *See* Furubotn and Pejovich, *supra* note 3, at 1157.

SOME APPLICATIONS

At this point it seems useful to consider briefly some of the applications which have been made of the property rights approach.

A. Efficient Resource Allocation

The traditional microeconomic theory of production and exchange has cast some light on the fundamental problem of scarcity and resource allocation. Welfare theorists[10] have established, under some quite restrictive conditions, the precise relationship between competitive equilibrium and Pareto-efficiency.[11] An understanding of the role of property rights adds considerable insight to this issue. Given competitive conditions and zero transactions costs,[12] efficiency will be achieved so long as the structure of rights is non-attenuated.[13]

A non-attenuated structure of rights has the following characteristics:

(a) The set of rights is completely specified. Since rights provide, among other things, an information system, a completely specified set of rights will reduce both ignorance and uncertainty.
(b) Exclusive rights must be specified, so that all rewards and penalties accruing from an action accrue to the actor. In economic parlance, all benefits and costs are internalized and private and social costs are *ipso facto* equal.
(c) The set of rights must be enforceable and enforced. The assurance of enforcement is essential for reducing uncertainty as to the outcomes of decisions and actions.
(d) Rights must be transferable so that rights like any other input may gravitate to their highest value use.[14] Transferability is essential to ensure achievement of the necessary marginal equalities.

The insight that efficient production and exchange require a non-attenuated structure of rights focused attention on an important

10. Welfare economics, too, is a logical extension of neoclassical microeconomics (*see* n. 3). The precise relationship between welfare economics and the PR approach is difficult to grasp. Much of the PR literature is entirely consistent with, and perhaps is a subset of, the welfare economics literature. But, in some of its manifestations, the PR literature seems to be groping toward an alternative to the usual welfare economics analysis.

11. Arrow and Debreu, *Existence of an Equilibrium for a Competitive Economy,* 22 Econometrica 265 (1954).

12. *See* notes 15 and 44.

13. Cheung, *The Structure of a Contract and the Theory of a Non-Exclusive Resource,* 13 J. Law and Econ. 49 (1970). The term "non-attenuated" is used by Furubotn and Pejovich, *supra* note 3.

14. Coase is credited with popularizing the concept of rights as factors of production. *See,* Coase, *The Problem of Social Cost,* 3 J. Law and Econ. 1 (1960).

issue which had conveniently been assumed away in the usual micro-economic analysis: *transactions costs.*[15] The act of specifying the necessity of transferable and enforceable systems of rights forced economists to face up to the likelihood that transfer and enforcement are expensive procedures. Not only that, but transfer and enforcement by different methods and procedures may involve dissimilar amounts of costs. Thus, the existence and amount of transactions costs becomes a crucial variable in the selection of institutional arrangements for conflict resolution.

B. Externalities, Public Goods and Common Property Resources

Externality, that pervasive and persistent source of inefficiency, has been recognized and analyzed by economists for many years.[16] Similarly, analyses of the public goods problem[17] and the problems of allocating common property resources[18] have been around for some time.

The PR approach has yielded important new insights into these problems.[19] If a non-attenuated structure of rights is sufficient, along with the other conditions for competitive equilibrium, to ensure Pareto-efficiency, then it makes excellent sense to view externality, public goods and common property resource problems as manifestations of the same phenomenon: the breakdown of the structure of rights. Cheung states the case most vigorously.[20] He would recommend even the abolition of the terms externality, public goods and common property resources, substituting the single, more general term inefficiency.

Property rights scholars, such as Cheung[21] and Demsetz,[22] have

15. Transactions costs are defined as the costs of resolving situations where involved parties have conflicting interests (a set of situations which includes, but is by no means limited to, market exchange). Transactions costs will usually include the costs to each party of gathering information and determining his position and strategy; the costs of the bargaining, negotiating, arbitration, judicial, or any other process by which an agreement is reached among the parties; and the costs of enforcing the agreement made. Transactions costs are synonymous with the "informational contractual and policing (I.C.P.) costs" to which Crocker refers (*see* Crocker, *Externalities, Property Rights and Transactions Costs: An Empirical Study,* 14 J. Law and Econ. 451 (1971).

16. A. Pigou, The Economics of Welfare (4th ed. 1932).

17. Samuelson, *The Pure Theory of Public Expenditure,* 36 Rev. Econ. and Stat. 387 (1954).

18. Gordon, *The Economic Theory of a Common-Property Resource: The Fishery,* 62 J. Polit. Econ. 124 (1954).

19. The seminal work is Coase, *supra* note 14.

20. Cheung, *supra* note 13.

21. *Id.*

22. Demsetz, *The Exchange and Enforcement of Property Rights,* 7 J. Law and Econ. 11 (1964).

argued forcefully that the solution to these problems is simple and obvious. All that is needed is the establishment of a non-attenuated structure of property rights in all relevant resources and the problems will disappear in the market, as the process of exchange continues until all gains from trade are exhausted. That solution, by definition, is efficient.

C. *Product Safety and Consumer Protection*

The PR analysis of external diseconomies concentrates, as we have seen, on the establishment of adequate structures of property rights to allow efficient operation of markets. A vital component of an adequate set of property rights is the assignment of liability for damages resulting from an external diseconomy. The seminal work of Coase[23] led to advances not only in the theory of external diseconomies but in the economics of liability rules more generally. Applications in the areas of product safety, truth in labeling and consumer protection have been published.

The work of McKean[24] is perhaps typical. Alternative assignments of liability for damages caused by unsafe products are discussed in terms of their impacts on modifying the structure of incentives facing both manufacturers and consumers. The response of manufacturers and consumers to alternative specifications of liability laws is predicted. It is suggested that rules making the manufacturer liable for damage caused by unsafe products (in contrast to rules which do not) would have the following kinds of impacts: Relatively unsafe products would become less unattractive to consumers, and the demand curve for such products would rise. However, the supply curve for relatively hazardous products would shift to the left, as manufacturers' costs would rise due to increased expenses for insurance or payment of damages. The amount of hazardous products produced and sold may or may not decrease. But the consumer would pay more for such products, essentially purchasing from the manufacturer insurance against harm. The opportunity for consumer self-insurance would be denied, which might make some people (perhaps from the lower income strata) worse off.

D. *The Economics of Large Corporations, Non-profit Firms and Bureaucracies*

Here, the fundamental insight offered by the PR school of thought is that employees, at all levels, will respond to the incentives set up

23. Coase, *supra* note 14.

24. McKean, *Products Liability: Implications of Some Changing Property Rights*, 84 Quart. J. Econ. 611 (1970).

by the working rules governing relationships within the organization, relationships between the organization and other organizations and individuals, and relationships in the broader society. The organization is not a monolith which has one objective function, the maximization of which provides the driving force for all its members and employees. Rather, it is populated by individuals, each of whom maximizes his personal utility as best he can within the structure of incentives facing him. Thus, the existing incentive structure may encourage individuals within an organization to work at cross-purposes with each other, and the public welfare, however defined.

Alchian and Demsetz[25] express concern that in large firms the total product of several inputs may be non-separable. In such cases, the discovery of the marginal productivity of cooperating inputs is expensive if not impossible. Yet, if employees are not rewarded according to marginal productivity, the incentive structure generates inefficiency or, in the none too value-free term of Alchian and Demsetz, shirking on the part of employees. The efficient solution is to specify a structure of rights which allows one individual to (i) receive the residual after all other inputs have been paid contractual amounts (and therefore to have the incentive manage and reward his inputs so as to maximize that residual), (ii) to promote, demote and in the extreme to terminate employees, and (iii) to sell the rights specified under (i) and (ii). This individual would have exactly that set of rights which accompany ownership of the classical capitalist firm.

If problems exist in structuring incentives for efficiency in large capitalist corporations, these problems are magnified in the cases of regulated firms,[26] non-profit firms[27] and bureaucracies.[28] Existing incentive structures in such organizations tend to make it difficult if not impossible for the organization to act in the social good, however defined, and managers of such organizations to appropriate the rewards of "good" decisionmaking. The PR approach, for the most part, offers an analysis which suggests that efficiency is best served by establishing incentive structures which simulate as closely as possible those found in the classical capitalist private sector of a laissez-faire economy.

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25. Alchian and Demsetz, *Production, Information Costs and Economic Organization,* 62 Am. Econ. Rev. 777 (1972).

26. Sherman, *The Design of Public Utility Institutions,* 46 Land Econ. 51 (1970).

27. E.g., J. Buchanan & N. Devletoglou, Academia in Anarchy: An Economic Diagnosis (1970).

28. R. McKean, *Property Rights, Appropriability and Externalities in Government,* in Perspectives of Property 32 (Wunderlich and Givson eds. 1972).

E. The Theory of Collective Action

The brilliant, original contributions of Downs,[29] Buchanan and Tullock,[30] and Olson,[31] using the PR approach have laid the groundwork for a different and promising attack on the development of a theory of politics, collective action and the state. Again, the take-off point has been the application of maximizing principles in the marginalist framework to subject matter traditionally analyzed with other types of models. Thus, Olson throws light on the relative success or those types of organizations which must compete for members, by observing that the self-interested utility maximizer will devote his resources to an organization only so long as the marginal, appropriable benefits to him exceed the marginal costs of his participation. Organizations are well advised, then, to offer their members private benefits in excess of the private costs of membership.

Tullock[32] used utility maximization principles not only to explain the existence of the phenomena of vote trading and logrolling, but even to provide some respectability for these practices, which have long been considered reprehensible in the eyes of the Jack Anderson[33] school of political science. If the utility of elected politicians is maximized when they accurately reflect the wants and attitudes of their constituencies (which is a rather uncertain proposition), vote trading and logrolling can only be socially beneficial, since voluntary exchange makes at least some of its participants better off while leaving none worse off. Kneese and Haefele[34] have accepted this proposition and set about designing local and regional government institutions in which opportunities for vote trading are maximized.

It should be noted that the concept of transactions costs, which plays an important role in almost all applications of the PR approach, is central to much of the PR scholarship on theories of the state. The existence of transactions costs in amounts which vary among alternative institutional designs is useful in explaining the outcomes of these alternative structures of institutions. The concept of transactions costs throws light on questions such as optimal voting rules, the choice of conflict resolution mechanisms (e.g., the market, legislative and quasi-legislative processes, administrative processes, judicial processes, and/or some combination thereof) and the choice of institutional details within these broad categories (e.g., who, and

29. A. Downs, An Economic Theory of Democracy (1957).
30. J. Buchanan and G. Tullock, The Calculus of Consent (1962).
31. M. Olson, The Logic of Collective Action (1965).
32. Tullock, *Problems of Majority Voting*, 67 J. Polit. Econ. 571 (1959).
33. Syndicated columnist, The Washington Post.
34. A. Kneese & E. Haefele, Environmental Quality and Optimal Jurisdiction (1972).

under what circumstances, shall have access to judicial or administrative appeals procedures).

The application of maximizing principles to the theory of the state perhaps reached some kind of high-water mark in Buchanan's recent paper,[35] which suggested that optimal political decisions may be obtained by maximizing the bribery of politicians and bureaucrats (voluntary exchange!).

F. A Comment

This brief and selective overview of some applications of the PR approach is perhaps sufficient to indicate some of the general thrusts of the PR literature or, at least, the literature of what has been called the Buchanan wing of the PR school.[37] Much of this literature is normative in character; it is often difficult to be sure whether the authors intended particular passages to be normative or positive. Since the basic approach is that of applying market logic to a broader range of institutional questions, it is scarcely surprising that many of these analyses concentrate on efficiency as a goal and reach conclusions that market or market-like institutional forms are preferable to other organizational structures, at least in efficiency terms.

However, not all of those economists who use the PR approach and, surely, not all social microeconomists subscribe to the view that most of society's allocation and distribution problems are best solved by expanding the domain of market institutions.

EFFICIENCY AND THE DISTRIBUTION OF RIGHTS

The relationship between economic efficiency, the structure of rights, and the distribution of income, wealth, property objects and power must be understood in order to understand the full meaning of efficiency and Pareto-safety as criteria for nomrative social microeconomics.

It has long been a basic tenet of conventional welfare economics that the empirical specifics of an efficient general equilibrium are unique to the initial distribution of income: change the initial distribution of income and the new efficient solution will involve different prices, a different allocation of resources and a different distribution

35. Buchanan, *The Coase Theorem and the Theory of the State,* 13 Natural Resources J. 579 (1973).

36. This is a fine example of what Samuels calls "presumptive efficiency reasoning" in *The Coase Theorem and the Study of Law and Economics,* 14 Nat. Res. J. 1 (1974). The maximum bribery solution is optimal only because the outcome of market exchange is presumed optimal.

37. Goldberg, *Public Choice–Property Rights,* 8 J. Econ. Issues 555 (1974).

of the product.[38] The debate which developed around the Coase theorem allowed the generalization of that principle. In the particular example of laws concerning liability for the damages caused by external diseconomies, it was seen that alternative assignments of liability are equally conducive to efficiency (given competitive market conditions and non-attenuated structures of rights). However, different specifications of liability rules lead to efficient solutions which are different in all empirical details.[39]

The import of the Coasian literature, then, is not that any structure of rights consistent with efficiency will yield *the* efficient solution, but rather that different structures of rights yield solutions which are different in every respect. For each different structure of rights conducive to efficiency, the efficient solution will differ in respect to allocation, distribution, relative prices and the whole range of macroeconomic variables.

This finding has important implications for the use of efficiency as a criterion in economic analysis of the structure of rights. "Efficiency" cannot be seen as some specific point, perhaps a shining light in the wide blue younder, toward which economies with the help of wise economists must strive. Rather, efficiency is non-unique; for any set of non-attenuated rights there is an efficient solution and, except for the most unlikely coincidences, for no two sets of such rights will the efficient solution be the same. Thus, efficiency as a criterion enables us to choose between attenuated and non-attenuated sets of rights, the latter resulting in efficiency while the former do not.[40] This type of analysis can be performed using deductive logic alone. Empirical analysis is useful in this type of study only to determine the extent of the losses resulting from attentuation. Efficiency is not a helpful criterion in evaluating alternative sets of non-attenuated rights. In such analyses, the pertinent criteria may be distributional and macroeconomic.

Positive empirical efficiency analysis of alternative structures of rights suffers an almost intractable difficulty. If prices generated under an existing structure of rights are used to evaluate the output expected under an alternative structure of rights, an inexorable bias

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38. *See* Bator, *supra* note 6.

39. *See* Randall, *Coasian Externality Theory in a Policy Context,* 14 Nat. Res. J. 35 (1974).

40. The theory of the second best, as modified by Davis and Whinston, provides a pertinent warning about the difficulties inherent in applying this type of analysis to a world where inefficiency is pervasive. *See* Lipsey and Lancaster, *The General Theory of Second Best,* 24 Rev. Econ. Stud. 11 (1956-57) and Davis and Whinston, *Welfare Economics and the Theory of Second Best,* 32 Rev. Econ. Stud. 1 (1965).

in favor of the status quo is introduced into the analysis. This principle is best grasped when considering two alternative sets of non-attenuated rights. Each set maximizes the value of output when the value of output is determined according to prices generated by itself. Each is efficient on its own terms. Each set is sub-optimal, in terms of the value of output generated, when evaluated according to prices generated by the other set of rights. Thus, an efficiency analysis comparing two sets of non-attenuated rights, one of which is the status quo, will always favor the status quo set.

This principle of conservative reinforcement may be generalized to sets of rights, non-attenuated or attenuated: a conservative bias is introduced into any empirical efficiency analysis comparing the existing structure of rights with alternative sets which are distributionally different.[41]

The general validity of this principle seems unchallengable. Yet the skeptic is entitled to wonder about its empirical importance. Will every small change in rights have redistributional impacts large enough to significantly change prices? Probably not. However, the applied economist would be unwise to underestimate the conservative bias resulting from the cumulative impact of large numbers of empirical efficiency analyses, all evaluating proposed changes in rights using prices generated by the status quo structure of rights.

Clearly, an important task of the analytical institutional economist is to develop methods for the simultaneous analysis of output and distribution.

SOME CURRENT ISSUES IN THE ECONOMICS OF RIGHTS

A. The Efficiency of Market-like Institutional Forms

Previously reference was made to the work of Demsetz,[42] Cheung[43] and others who argue that, since the externality, public goods, and common property resource problems result from attenuated structures of property rights, these problems are best handled by the establishment of non-attenuated structures of rights which would allow attainment of efficiency through voluntary exchange. This approach does not command the assent of all social microeconomists. The counter-argument involves the concept of transactions costs.

Under perfect competition and in the absence of transactions

41. The existence of this conservative bias does not mean that the status quo set of rights (even if attenuated) will always be preferred in such efficiency analyses; just that the dice are loaded in favor of the status quo set and sets which are distributionally similar.

42. Demsetz, *supra,* note 22.

43. Cheung, *supra,* note 13.

costs, the market mechanism is readily proven to be a Pareto-efficient method of conflict resolution. The existence of positive transactions costs opens up the possibility that some non-market mechanism may be preferable, in efficiency terms, to use of the market. All that is needed is that the savings in transactions costs from the use of the non-market mechanism exceed the gains (ignoring transactions costs) from using the market. The use of the non-market mechanism would be the more efficient solution, though usually a second best solution.[44] In general, the most efficient (but not necessarily Pareto-efficient) solution in a conflict situation will be that solution which maximizes net social product, or which minimizes the sum of (1) the "losses" due to deviating from the (imaginary) transaction-costs-free optimum, and (2) transactions costs.

Kneese,[45] Mishan[46] and the author,[47] have pointed out the possibility that for certain empirically substantial classes of externalities, etc., the transactions costs associated with market solutions may be so high that administrative (or other non-market) solutions may be more efficient, or less inefficient. This is most likely where large numbers of individual parties are legitimately involved, perhaps in an externality situation arising from the disposal of wastes into common property resources. Where the number of parties involved is small, and the physical boundaries of the problem manageable, the transactions costs associated with market solutions may be so low as to ensure the preferability, in efficiency terms, of that approach.

The conclusion to be drawn from all of this is that the prefer-

44. At this point, let me emphasize that the existence of transactions costs *per se* does not necessitate a second-best solution. Furubotn and Pejovich (*supra* note 3, at 1144) state, "Transactions costs are found to contribute to . . . prices that diverge from the social values of the goods exchange," which seems to imply that positive transactions costs result inexorably in inefficiency. Yet Randall, and, I am sure, others have shown that the mere existence of positive transactions costs is not inconsistent with efficiency. *See* Randall, *On the Theory of Market Solutions to Externality Problems* (Oregon Agricultural Experiment Station Special Report No. 351, 1972). If all conditions for efficiency including, obviously, pure competition in the transactions industry are met, efficiency will be achieved in a situation with positive transactions costs. Surely, prices will be different from what they would be in a transactions costs-free fairyland, but that alone does not imply inefficiency.

This insight enables clarification of an issue glossed over above (see text following n. 13). Specification, enforcement and transfer of rights are expensive procedures. Pareto-efficiency in a world with positive transactions costs cannot, then, require complete specification, perfect enforcement and cost-free transfer. If the transactions industry behaves in a competitive manner, it is sufficient that inputs be used in specification, enforcement and transfer, to the extent that the well-known marginal equalities are satisfied.

45. Kneese, *Environmental Pollution: Economics and Policy,* 61 Am. Econ. Rev. Papers and Proceedings 153 (1971).

46. Mishan, *The Post-War Literature on Externality: An Interpretive Essay,* 9 J. Econ. Lit. 1 (1971).

47. Randall, *supra* note 39.

ability, in efficiency terms, of market-like institutional forms cannot be concluded on *a priori* grounds. Rather, it is an empirical question which can be answered only after consideration of, among other things, the relative amounts of transactions costs associated with the various market-like and non-market institutional forms.

B. Criteria for Welfare Improvements

Where existing structures of rights are not conducive to efficiency, there seems broad general agreement, notwithstanding the theory of the second best,[48] that efficiency is at least one appropriate criterion for the evaluation of alternative structures of rights. There are those, however, who would argue that efficiency ought to be the sole or, at least, the overriding criterion.[49] This author would reject efficiency as a sole criterion on several grounds: (1) When rights are variable, efficiency is non-unique. Thus, efficiency alone cannot be an adequate criterion for evaluating alternative structures of rights. (2) The usual empirical efficiency analysis uses prices generated under the status quo structure of rights to evaluate alternatives in efficiency terms. This procedure is inexorably biased in favor of the status quo. (3) Efficiency is not all that is important. Distributional considerations are important, too.

The PR economist involved in normative work, that is, in the design and evaluation of institutions, faces a severe criterion problem. The rejection of concepts such as the social welfare function[50] and majority voting[51] seems to leave only efficiency and Pareto-safety as viable criteria.[52]

Pareto-safety (let us say, allowing actual compensation as a device to expand the rather small set of Pareto-safe changes) is an extremely conservative criterion for improvements in economic welfare: welfare is improved only when the "size of the pie" is increased and literally no one gets a smaller "slice" than he got last time around. Under such a criterion, no new injury is permitted to anyone, but past

48. Lipsey and Lancaster; and Davis and Whinston, *supra* note 40.

49. *See,* e.g., Harberger, *Three Basic Postulates for Applied Welfare Economics: An Interpretive Essay,* 9 J. Econ. Lit. 785 (1971), and Seagraves, *On Appraising Environmental Institutions,* 55 Am. J. Agr. Econ. 617 (1973).

50. Buchanan, *What Kind of Redistribution Do We Want?* 35 Economica 185, 188 (1968); *also* Furubotn and Pejovich, and Tollison, *supra* note 8.

51. Buchanan and Tullock, *supra* note 30.

52. As Peacock and Rowely (*Pareto Optimality and the Political Economy of Liberalism,* 80 J. Polit. Econ. 476 (1972) and Goldberg (*supra* note 37) point out, these two criteria are themselves inconsistent in the economy as it now exists. Efficiency requires non-attenuated structures of rights, but it would not be Pareto-safe to move to non-attenuated structures of rights; attenuation has its beneficiaries, who would be made worse off by such a change.

injury is legitimized and carried forward.[53] While limited relative redistribution of income, wealth, property, power and rights within the set of Pareto-safe possibilities is perhaps permissible, no absolute redistribution is tolerable under this criterion. A criterion so conservative is unacceptable to many. Surely, at the very least, the burden of proof lies with those who claim that current distributional patterns are so obviously just as to deserve the permanent guarantee of Pareto-safety.

C. Institutional Change and Compensation

The view that decisionmakers have the right to expect the rules of the game, as set by collective action, to remain unchanged is associated with Locke and, in this century, Buchanan.[54] The recognition of such a right would imply Pareto-safety as a criterion for institutional change in general, as well as for changes in property rights. Institutional change could proceed only after compensation of those who are made worse off.

The issue of compensation for institutional change has tremendous import for the management of natural resources. Government has the power to intervene in the market for natural resources in many ways, including direct investment, taxation, regulation using the police power for the protection of public health, welfare safety and morals, and condemnation of property for the public purpose, using the power of eminent domain. The use of any or all of these powers of government is likely to injure some while providing "unearned" increments in income or wealth for others. The application of these powers by government is unlikely to be Pareto-safe, and hence is often the subject of controversy and adversary proceedings of various kinds. Perhaps the most intense of these controversies is that currently surrounding the "taking" issue associated with the use of the police power.

The police power is quite different from the power of eminent domain. In the case of eminent domain, property is taken for a public purpose and just compensation, as determined by a jury,[55] is paid. In the case of the police power, regulation may tend to reduce the value or earning potential of a piece of property, but that property object is not taken and compensation is not paid.

While the use of the police power to protect the public health, welfare, safety and morals is clearly legitimate, the taking of prop-

53. As Warren Samuels has pointed out repeatedly.

54. Buchanan, *Before Public Choice,* in Explorations in the Theory of Anarchy (G. Tullock ed. 1972).

55. "Just compensation" is usually some amount less than Pareto-safe compensation.

erty without just compensation is constitutionally proscribed. The problem is that the distinction between a legitimate use of the police power and a "taking" is not well delineated.[5 6] Yet it is a crucial issue in natural resource management, given the widespread use of the police power in areas such as land use control and environmental quality regulation.

The PR school of economists is engaged in controversy among themselves and with legal theorists on the "taking" issue. Perhaps typically, the economists and legal theorists do not use the same terms of reference: the legal scholars define the issue in terms derived from constitutional law and legal precedent, and the economists generalize it beyond the strict legal definition to cover the whole area of compensation for changes in laws and institutions. The Buchanan wing of the PR school of economists accepts the broad Lockean contention that all changes in the rules of the game ought to be compensated. This is a conservative and absolutist view.

Samuels[5 7] adopts an even broader definition of the compensation problem, observing that the opportunity set of the individual is changed by "outside" influences without his consent in many ways by government action and by non-governmental influences (most commonly other economic actors pursuing their self-interest). New inventions, resource discovery, the vagaries of nature and of human preferences may all expand the opportunity sets of some and contract those of others. Given that economic injury is ubiquitous, Samuels sees the compensation problem as ubiquitous. He rejects as artificial the distinction between government induced injury and "other" injury.

Universal compensation is difficult for this author to defend. First, it assumes that the status quo ante is definable (which it is not, in a dynamic society) and legitimate, while changes from that status quo is not. Second, the transactions costs to effect universal compensation would be incredibly expensive. Third, who would finance the costs of the compensation itself, a cost which would be astronomical? The only reasonable answer seems that compensation for injury would be funded by confiscation of the "unearned" gains to those who are benefited (in the process of creating the injury, for a change which creates losses for some will usually create gains for others), a position which would seem unlikely to garner the support of the Buchanan wing of the PR school.

56. Sax, *Takings and the Police Power,* 74 Yale Law Journal 37 (1964); and Michelman, *Property, Utility and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law,* 80 Harvard Law Review 1165 (1967).

57. Samuels, *Commentary: An Economic Perspective on the Compensation Problem,* 21 Wayne Law Review 113 (1974).

The Samuels relativist position on compensation, while intellectually unsatisfying, as is usually the case with relativist positions, is the only position which makes much sense. Society must determine which injuries are compensable and which are not, guided by some set of moral precepts. This, incidentally, is what our body of law does. It remains possible, nevertheless, to argue that our current body of law provides a rather imperfect relativist solution to the compensation problem. However, the PR school has proven no more able than other branches of economics to provide adequate welfare criteria.

D. Resource Allocation Over Time

Natural resource economists have long recognized that the allocation of resources over time, and in particular those resources which are non-renewable, is fraught with problems at the conceptual and practical levels of analysis. While it is widely assumed that capital markets are adequate to handle the allocation of capital over relatively brief periods of time (say, from overnight to periods of several years), there is no such complacency about the ability of markets efficiently to allocate depletable resources between generations or to ensure that irreversible changes in non-renewable resources are made only in an efficient manner and at an efficient time.[58]

The PR scholars have, for the most part, maintained a deafening silence on this issue. If it is fair to extend their general preference for market-like institutional forms to the solution of these types of problems, then one must wonder how unborn generations (and even today's children) can effectively bid in such markets. For without representation in such markets, unborn generations will surely lose out.[59]

At the very least, one must conclude that the PR literature is, as yet, quite unhelpful on this issue.

E. Theories of the State

It has been observed that a theory of property rights is incomplete without an adequate theory of the state.[60] Furubotn and Pejovich, who are sympathetic reviewers of the PR school of thought, willingly concede that the efforts of the PRs thus far have resulted in some

58. Krutilla, *Conservation Reconsidered,* 57 Amer. Econ. Rev. 777, 1967.

59. For present generations, the welfare of unborn generations is surely a collective good. Olson, *supra* note 31, provides ample reason to expect that, in markets populated only by the presently living and economically mature, such a good will be underprovided.

60. Furubotn and Pejovich, *supra* note 3.

interesting departures, but no coherent theory of the state.[61] The PR analysis of constitutional choice seems directed toward solution of the fundamental problem of defining the legitimate scope of governmental direction of the processes of voluntary exchange and the accumulation of wealth. This is an extremely ambitious undertaking, and one which may perhaps be impeded rather than aided by the tendency of some of the scholars involved to cling to Pareto-safety as an inviolable criterion.

At the positive level of analysis, a recent advance has been the realization that the individual will attempt not only to maximize his utility within the constraints imposed by the organization(s) of which he is a member and the broader society, but also to invest according to the principles of constrained utility maximization in efforts to create institutional change to his benefit.[62]

CONCLUDING COMMENTS

The property rights approach to social microeconomics has used the marginalist methodology of neoclassical economics to mount a new and fundamentally different kind of attack on the questions which have absorbed the institutionalist school of economists. Since natural resource economics is simply one, and a very important, application of social microeconomics, the PR approach has generated a number of very substantial insights for natural resource economics and has opened up new avenues of attack, if not as yet with resounding success, on other important questions.

Its successes include providing academic respectability for the study of economic-institutional interactions, a field of inquiry which fell into general disrepute following the failure of the institutionalists to legitimize their approach in the eyes of mainstream economists. Very substantial insights into the relationship between efficiency (and conversely inefficiency in its various forms, including externality and the public goods and common property resource problems) and the structure of rights were generated. Attention was directed toward transactions costs and their influence on the efficiency of institutional alternatives. Significant advances were made in explaining the behavior of large corporations, non-profit firms, regulated firms, bureaucracies and legislative bodies. This achievement is difficult to belittle, given the relative failure of prior streams of economic scholarship to say much meaningful about such phenomena.

The achievements of the unambiguously normative element of PR

61. *Id.*
62. See, *inter alia,* Buchanan, *supra* note 35.

scholarship (i.e., that directed toward the design of institutional systems to provide the incentives for the optimal direction of economic activity) are perhaps less spectacular. The search for value-free welfare criteria has been unusccessful, as one would have expected. The attempt to popularize or at least legitimize Pareto-safety as a welfare criterion has gained only a small number of converts. Few are willing to concede the status quo the position of sanctity implicit in the criterion of Pareto-safety. The normative efforts of the PR school have, nevertheless, not been without benefit. New ways of looking at the criterion problem and the issue of compensation for economic injury have been developed. Even if definite answers have not been presented, the natural resource policy analyst has, at the very least, been offered new and sometimes illuminating ways of conceiving old problems.