



Winter 1974

Coase Externality Theory in a Policy Context

Alan Randall

Recommended Citation

Alan Randall, *Coase Externality Theory in a Policy Context*, 14 NAT. RES. J. 35 (1974).
Available at: <https://digitalrepository.unm.edu/nrj/vol14/iss1/3>

This Article is brought to you for free and open access by the Law Journals at UNM Digital Repository. It has been accepted for inclusion in Natural Resources Journal by an authorized editor of UNM Digital Repository. For more information, please contact disc@unm.edu.

COASIAN EXTERNALITY THEORY IN A POLICY CONTEXT

ALAN RANDALL*

Coasian externality theory must be discussed on at least two levels, as an intellectual exercise and as a formula for policy. Coase developed his ideas as he wrestled with policy issues.¹ In his later article,² in which he attempted to develop a general theory of social cost, his policy orientation is quite clear:

It is my belief that economists, and policy makers generally, have tended to overestimate the advantages which come from government regulation.³

The policy orientation of Demsetz, perhaps Coase's most fervent disciple, is equally clear: the role of central planning should be minimized. Toward this end, he labors to show that the absence of an observable market in certain services does not mean that these services are extra-market,⁴ and that imperfect market institutions should not be compared with the mirage of idealized government institutions,⁵ taking time out to lavish his contempt upon such heretics as Galbraith.⁶

On the other side of the fence, it seems that many of those who have worked so hard to prick the Coasian balloon have invested that effort mainly because they found the policy implications of the Coase Theorem rather offensive. While Mishan's journal articles⁷ have hinted at his ideological orientation, his book,⁸ written for more popular consumption, exhibits no such coyness. He blames free enterprise run wild for a goodly share of society's contemporary problems. Samuels, viewing the economy as a system of coercive power relationships, sees the Coase Theorem as an attempt to maintain the prerogatives of the powerful, "to make it (welfare economics) safe for capitalism."⁹

*Assistant Professor, Agricultural Economics, New Mexico State University.

1. Coase, *The Federal Communications Commission*, 2 J. Law & Econ. 1 (1959).

2. Coase, *The Problem of Social Cost*, 3 J. Law & Econ. 1 (1960).

3. *Id.*, at 22. See also *Id.*, at 27.

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

5. Demsetz, *Information and Efficiency: Another Viewpoint*, 12 J. Law & Econ. 1 (1969).

6. Demsetz, *Economics of the New Industrial State: Discussion*, 60 Am. Econ. Rev. 2:481 (May, 1970).

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

8. E. Mishan, *The Costs of Economic Growth* (1967).

9. W. Samuels, *Welfare Economics, Power and Property*, in *Perspectives of Property* 146 (Inst. for Research on Land and Water Resources, Pennsylvania State University, G. Wunderlich & W. Gibson ed., 1972).

At almost every stage in the debate which sprang up around "The Problem of Social Cost," it is unclear whether theory fathered policy viewpoints, or vice-versa. That surely accounts for the fascination which the Coasian debate has held for a sizeable number of academic economists. It has the stuff of which great scholarly debates are made—opportunity for high powered theorizing possibly leading to, or justifying, radical suggestions for policy re-orientation.

In Parts I, II and III of this article, I attempt to examine the development of Coasian externality theory, at each point paying some attention to the policy generalizations which seem to arise from the theoretical results. It is concluded that the assignment of liability is not neutral in its impact on resource allocation. Armed with that insight, the operation of market solutions to the problem of industrial pollution is considered, in Part IV. The relevance of Coasian theory to policy for externality situations is evaluated in Part V, and, somewhat presumptuously, some advice is offered to Coasians on the direction of their future efforts.

I THE COASE THEOREM

Since Coase presented his theory of social cost as an antidote to "the Pigovian Tradition," it seems worthwhile to briefly review that tradition. Ever since Marshall firmly established modern micro-economics, proofs of the efficiency of perfect competition have required the assumption that externalities are absent. Pigou¹⁰ made the first notable attempt to resolve the externality problem. The national dividend is maximized, he said, when private and social marginal net products are equal in all uses. Where this equality is violated, inefficiency exists.

Pigou visualized the problem as one of providing incentives to guide firms producing externalities to the ideal output which maximizes national dividend. He proposed modifications to prices, taxes if output is too high, and subsidies if output is too low. While calculation of optimum taxes and subsidies was to be centralized (*i.e.*, performed by governments), decisions on output were to be decentralized (*i.e.*, made by individual producers).

The Pigovian approach maintained a substantial degree of decentralization of decisions, when compared with systems of standards or legal changes which would criminalize creation of certain externalities. Nevertheless, the degree of central decision making suggested by the Pigovian scheme was too much for Coase.

In his classic,¹¹ Coase set out to purge the literature on externalities

10. Pigou, *The Economics of Welfare* (4th ed. 1932).

11. Coase, *supra* note 2.

of what he saw as its two major faults: a tendency to view external diseconomies, particularly, as a moral issue, and the resultant Pigovian urge to solve the problem by having duly constituted authority (the government) punish the offender. Pigou sought a means of returning the aberrant system to efficiency. Yet, to Coase his method of solution, focusing upon taxation of the producer of the diseconomy, seemed to reek of moral absolutism.

The Coasian argument went something like this. First, the stage was set by an assertion of the reciprocal nature of externalities, presumably for the purpose of amoralizing the question, particularly, of external diseconomies. Second, the concept of transferable¹² liability rules was introduced. If property rights with respect to liability for damages are clearly specified, transferable and rigidly enforced upon appeal, under any given liability rule,¹³ one or the other party will have an incentive to attempt to modify the externality by offering inducement to the other party to behave differently. Negotiations for exchange of property rights in the externality will continue until all gains from trade have been exhausted. Given perfect competition, an efficient solution will be achieved. Coase argued that, since marginal cost is unaffected, all gains from trade will be exhausted at the same Pareto-efficient outcome, regardless of which liability rule is in operation. In other words, the market solution to a particular externality problem is allocatively neutral with respect to the assignment of liability.

It is understandable that Coase's approach to externalities would be attractive to academic economists of *laissez-faire* persuasion. It would seem that (a) externalities could no longer be considered an impediment to efficiency, and (b) a completely decentralized approach to solution of externality problems had been proposed. In spite of his efforts to promote a relatively decentralized decision framework for externality problems, Pigou was now cast as an enemy of *laissez-faire*. Coase and his supporters had proposed the perfectly decentralized solution. The price as well as the quantity of externality would be established entirely by market forces. The role of the government would be reduced to allocative impotence (as it should be, they might

12. Transferable liability rules are enforced by government only on appeal by one of the involved parties, thus providing the possibility of exchange between the parties.

13. Two extreme examples of transferable liability laws are the zero liability law, L^Z , and the full liability law, L^F . An infinite number of intermediate laws could be conceived. L^Z specifies that external diseconomies in any amount may be created with impunity; under such a rule, the affected party would have an incentive to offer a bribe to induce the acting party to reduce his output of external diseconomy. L^F specifies that absolutely no externality may be created without the consent of the affected party; under such a rule, the acting party would have an incentive to offer compensation to induce the affected party to accept a positive amount of externality.

say). Government could establish a system of liability rules, but resource allocation would be unaffected by the specific choice, since any rule will result in the same equilibrium solution, and that solution would be efficient. The market solution method, removing the allocative significance of specific government decisions about externality problems, minimizes both the need of government for information and the likelihood of bureaucratic mistakes.

Individuals who support the status quo would be sorely tempted to use the doctrine of allocative neutrality to justify continuation of the general use of zero liability (L^Z) for environmental externalities. After all, if liability rules have no allocative impact, what use would it be to change to full liability (L^f)?

I have attempted to lay out the bare bones of the Coasian argument in such a manner that its appeal to laissez-faire economists would be immediately obvious. Actually, the argument is of necessity more complex. Now, I will briefly consider these complications, which are conceded without argument by all Coasians.

(a) Income distribution is clearly influenced by the assignment of liability for damages.

(b) Exchange involves costs which may often be substantial. Each involved party must gather information and decide what his bargaining position is to be. The bargaining process itself takes time and money. The decisions made must be enforced. Costs of negotiation and enforcing exchange decisions are commonly called transactions costs. Coase was keenly aware of the existence of transactions costs.¹⁴ He understood that transactions costs may impede exchange which, in the absence of transactions costs, would lead to greater efficiency.

(c) It is necessary to specify the range over which market solutions could be expected to modify externalities. Buchanan and Stubblebine¹⁵ define a Pareto-relevant externality as one which is characterized by the existence of potential gains from trade between acting and affected parties. Exchange will take place until potential gains from trade have been exhausted. From such a definition, it follows tautologically that Pareto-relevant externalities are amenable to market solution. All other externalities are presumably Pareto-irrelevant: inframarginal externalities, externalities which offend no one and externalities which offend one party, who for reasons of utility function or budget constraint, is unable to make an offer large enough to induce trade.

II COASIANS AND HYPER-COASIANS

Coase in "The Problem of Social Cost" offered his readers (1) an

14. Coase, *The Nature of the Firm*, 4 *Economica* 386 (1937).

15. Buchanan & Stubblebine, *Externality*, 29 *Economica* 371 (1962).

attack on Pigou for proposing unnecessary and inefficient central control of allocation, (2) a proposal for market solution of externality problems, based on a system of transferable property rights specifying liability for damage, (3) a view of rights as factors of production, and vice-versa, and (4) the suggestion that economic analysis of institutional choice proceed by comparison of net social benefits under feasible alternative institutional structures. The four points are closely related, and together they make an impressive contribution to the literature. Points (3) and (4) are insights, now widely accepted, which have already had major influence on research in pure and applied welfare economics. Here, I concentrate upon (1) and (2), because they are issues of vigorous debate with crucial policy implications.

The Coasian argument was quickly embraced by many academic economists and lawyers. Summarized here are a few of the many contributions which affirmed the Coasian argument and, in some cases, extended it beyond the limits of Coase's seminal article. As mentioned above, Buchanan and Stubblebine¹⁶ proposed a terminology which made Pareto-relevant externalities amenable to market solution. The Pareto-relevant tautology serves the ideological function of making all other kinds of externalities seem less relevant or irrelevant. As a further contribution toward a Pigovian debacle, in the same paper they offered a proof that efficient tax-subsidy solutions to externality problems require that the amount of money collected from one party be paid to the other, which is not quite what Pigou had in mind. It is, however, a kind of market solution with the government as an intermediary.

While Coase had worked in a production framework, Davis and Whinston explicitly extended the doctrine of allocative neutrality of liability laws to the consumption case: "The law, which determines the status quo point, affects only the final distribution of income."¹⁷

Demsetz,¹⁸ in an imaginative use of the transactions costs argument, suggested that the absence of an observable market in any commodity, discommodity or bundle of rights does not indicate market failure. Rather, exchange is not observed because the transactions costs of arranging and enforcing exchange exceed the gains from trade. The absence of an observable market is, in itself, an efficient market solution. This type of argument, in the hands of partisan proponents of laissez-faire, can be made to imply that the appearance of what has traditionally been called market failure is really an

16. *Id.*

17. Davis & Whinston, *Some Notes on Equating Private and Social Cost*, 32 Southern Econ. J. 113, 123 (1965).

18. Demsetz, *supra* note 4.

optimal market solution. Thus, market failure is a wholly inadequate excuse for legislative or administrative intervention in an externality situation.

The euphoria of the Coasians is best summarized by the following quotations:

. . . all externalities can be internalized, and all misallocations (even those created by legal structures) can be remedied by the market, except to the extent that transactions cost money, and the structure itself creates some impediments to bargaining.¹⁹

and

. . . under perfect competition, private and social costs will be equal.²⁰

Cheung²¹ proposed elimination of the use of the many specific names which had developed to characterize various externality situations. He went so far as to propose the abolition of the term externality, itself.

. . . the mushrooming of alleged "externality" is attributable to either (1) the absence of the right to contract, (2) the presence of a contract, but with incomplete stipulations, or (3) the presence of stipulations which are somehow inconsistent with marginal equalities.²²

In other words, the problems which others have called externalities are amenable to automatic solution by the market, provided a complete and non-attenuated²³ structure of rights is established.

The tenor of these and many other contributions is to promote policies which would preserve and extend the allocative role of the market. It will be shown below that some of the above arguments are incorrect, while others are tenable only if the allocative neutrality of liability rules is granted.

III THE COUNTER ATTACK

It is noticeable that, while some academics were deeply impressed by the Coasian market solution approach to policy for externalities, politicians, administrators and the general public have largely ignored this approach. A number of applied economists, led by Allen Kneese,

19. Calabresi, *Transactions Costs, Resource Allocation and Liability Rules*. 11 J. Law & Econ. 66, 68 (1968).

20. G. Stigler, *The Theory of Price*, 113 (3d. ed., 1966).

21. Cheung, *The Structure of a Contract and the Theory of a Non-Exclusive Resource*, 13 J. Law & Econ. 49 (1970).

22. *Id.*, at 51.

23. The term is used by Furubotn & Pejovich, *Property Rights and Economic Theory: A Survey of Recent Literature*, 10 J. Econ. Lit. 1137 (1972).

have always resisted the lure of a simplistic "just leave it to the market" answer. Why, then, have the practitioners of economics and public policy remained unimpressed by the Coasian argument? Is it just an information gap which will close with time? Rather, I submit that Coasian externality theory has several significant problems which limit the applicability of market solutions. The remainder of this article is devoted to exploration of these problems and a re-evaluation of the role of market solutions.

Right from the start, it seems, there were some theoretical and applied economists who had vague feelings that something was wrong. This intellectual unease centered around the doctrine of allocative neutrality of liability rules and the amoralization of externality policy which that doctrine seemed to license. The argument that since liability rules are allocatively neutral it does not matter which particular rule is used was attacked on two fronts: (1) it was claimed that, on distributional, moral and ethical grounds, it *did* matter which rule was chosen, while (2) allocative neutrality, as a theoretical conclusion, was itself challenged. Let us first consider the ethical arguments.

A. *Distributional, Moral and Ethical Consideration*

The choice of liability rule affects the distribution of income between acting and affected parties or, in the case of environmental pollution, between emitters and receptors. The economist who considers distributional effects irrelevant would not be concerned by this. However, people, who, in spite of Coase's strictures, consider pollution a moral issue perhaps similar to negligent or even criminal property damage, are offended by the moral position associated with L^z . Even if L^z and L^f were to result in equal amounts of pollution, there is something offensive to some people about the suggestion that the victim buy off the polluter. Are there no moral precepts to guide the resolution of conflicts where two parties have opposing interests?

People, who, as a general philosophy, believe that income distribution should be more nearly equal, focus upon the likely relative income and wealth of acting and affected parties in externality situations. In the case of industrial pollution affecting citizens in the neighborhood, it seems likely that emitters (industrialists and their stockholders) may be more wealthy than the ordinary citizens who are the receptors. If so, people who prefer a more equal distribution of income would prefer L^f in externality situations where the acting party is clearly the wealthier.

If political rhetoric reflects anything about the beliefs of ordinary citizens, morality and equity are important issues to them. I believe

the relative lack of success of the Coasian literature, viewed as a polemic, among the general public and its elected representatives is largely attributable to the fact that its ethical and distributional implications can be interpreted to run counter to widely accepted moral precepts. But, value neutral economic theorists have not been much impressed by equity arguments. To impress one's fellow economists, one needs to marshal arguments stronger than equity *per se*.

B. Allocative Neutrality?

Kamien *et al.*²⁴ and Tybout²⁵ have attacked the doctrine of allocative neutrality on the grounds that relaxation of some of Coase's production economics assumptions allows development of more realistic models yielding different results. Kamien *et al.* demonstrate that, in a dynamic case with changing cost functions and imperfect information, market solutions through a government intermediary are not allocatively neutral with respect to liability rules; there is asymmetry between bribes and charges.

While Coase and the Coasians had implicitly assumed that, for example, pollution and commodity output are joint products, Tybout assumes they are substitute products. This latter assumption rather realistically allows the possibility that by varying the input mix the output mix of pollution and commodity can be varied. Under this assumption, bribes and charges have asymmetrical results. Not only that, but under certain assumptions, moving from the status quo by bribery is impossible.

Dolbear,²⁶ Mishan²⁷ and Randall,²⁸ focusing attention on the effects of the transfer of income between the involved parties and on transactions costs, have made varying degrees of progress in circumscribing the generality of the allocative neutrality doctrine.

Income transfer effects: In the case of externality in consumption, a change in liability rules changes the budget constraints of both acting and affected parties, resulting in an income transfer effect, which can be demonstrated by Slutsky equation analysis.²⁹ In all cases, except for the very special case where the income elasticities of demand for abatement of, say, an external diseconomy and for the commodity associated with the diseconomy are zero, the income transfer effect is

24. Kamien *et al.*, *Asymmetry between Bribes and Charges*, 2 Water Resources Research 147 (1966).

25. Tybout, *Pricing Pollution and Other Negative Externalities*, 3 Bell J. Econ. Mgt. Sci. 252 (1972).

26. Dolbear, *On the Theory of Optimum Externality*, 57 Am. Econ. Rev. 90 (1967).

27. Mishan, *supra* note 7.

28. A. Randall, *On the Theory of Market Solutions to Externality Problems*, Oregon Agricultural Experiment Station Special Report No. 351 (1972).

29. *Id.*, at 14-20.

sufficient to induce shifts in the supply and demand curves for abatement of the diseconomy. When these income elasticities are positive, as we would expect them to be, the L^f rule results in a greater level of abatement of an external diseconomy than does the L^z rule. More generally, where *any* consumers are involved in an externality situation, the demand or supply curves associated with those consumers will shift with a change in liability rules, resulting in different equilibrium levels of abatement.³⁰

Whenever capital is scarce, a change in liability rules will result in a change in resource allocation and output of externality, even where all involved parties are producers. The analysis is similar to that for externality in consumption: a change in liability rules changes the capital constraints affecting both parties. Again, a L^f rule will result in a greater level of abatement than a L^z rule.

Transactions costs: Where transactions costs are greater than zero, the disparity between equilibrium solutions under L^z and L^f is increased. Under any liability rule, the party less favored by the rule makes an offer. However, the existence of positive transactions costs reduces the effective value of any offer. When the affected party must pay, the existence of positive transactions costs shifts the demand curve for abatement downward (and to the left). When the acting party pays, the existence of positive transactions costs shifts the supply curve for abatement downward (and to the right). As a change in liability rules from L^z to L^f results in the former payer becoming the receiver of payment and vice versa, the assignment of liability affects the equilibrium output of externality, when transactions costs are positive.

The disparity between the equilibrium solutions under different liability rules increases as unit transactions costs increase. It is conceivable, that transactions costs may be so great that movements away from the starting point defined by the liability law may be impossible. In such cases, a L^z law results in zero abatement while a L^f law results in complete abatement of an external diseconomy. An educated guess would suggest that transactions costs of this magnitude may not be unusual in practice.

To this point, we have implicitly assumed that transactions costs to bring about exchange in a particular externality situation are the same under L^z and L^f . However, good arguments can be made that this is not so. Buchanan and Tullock,³¹ Crocker³² and Olson³³ have argued that transactions costs are likely to be larger when an offer of

30. This finding is at variance with Davis & Whinston, *supra* note 17.

31. J. Buchanan & G. Tullock, *The Calculus of Consent* (1962).

32. Crocker, *Externalities, Property Rights and Transactions Costs: An Empirical Study*, 14 J. Law & Econ. 451 (1971).

33. M. Olson, *The Logic of Collective Action* (1965).

payment must be made by a large and diffuse group of individuals, rather than by a much smaller group of individuals who are more vitally interested in this particular issue. This hypothesis is relevant to cases of environmental pollution from industrial sources, where the affected party is usually a diffuse group of citizens and the acting party is a much smaller group of entrepreneurs whose incomes are directly related to pollution levels. It follows, then, that in cases of industrial pollution a L^2 rule is more likely to result in transactions costs too high for the achievement of a solution other than the status quo than is a L^f rule. Significantly, the only detailed empirical study of market solutions to external diseconomies currently available, that by Crocker,³⁴ is entirely consistent with this theoretical work.

The current situation in the theory of market solutions to externality problems can be briefly summarized. A Pareto-relevant externality, being characterized by potential gains from trade, will generate incentives for one or the other of the involved parties to initiate negotiations aimed at modifying that externality. A solution different from the status quo situation may be achieved, and if perfect competition prevails in all relevant industries including the transactions industry, that solution may be Pareto-efficient.

While the possibility of efficient solutions under different liability rules is granted, what about allocative neutrality? Liability rules are neutral with respect to resource allocation if: (a) all consumers involved in the externality situation have income elasticities of demand for modification of the externality and for the commodity associated with the externality equal to zero, (b) the use of capital is a free good; (c) transactions costs are zero; (d) the externality and the commodity associated with it are joint products, rather than substitute products; (e) information is perfect in both static and dynamic contexts; and (f) perfect competition exists in all the industries involved.

Frankly, an economist would be hard put to find any situation where the assignment of liability has an absolutely neutral effect on resource allocation. The differences between equilibrium market solutions under L^2 and L^f may be quite small in some relatively unimportant externality situations involving a very small number of parties. As the complexity of the situation increases and the number of involved parties expands, deviations from allocative neutrality can be expected to become greater. For the kind of large-scale externality situations which become social problems, different liability rules will result in quite different solutions. For example, in cases of industrial

34. Crocker, *supra* note 32.

pollution a L^Z rule is more likely than any positive liability rule to result in zero or low levels of abatement. This accords with our observations. When laws with respect to pollution are seldom and ineffectively enforced, market solutions leading to reductions in emissions are seldom observed.

In comparison with a L^Z rule, a L^f rule will result in (1) a higher degree of abatement of an external diseconomy such as pollution;³⁵ (2) a reallocation of resources toward pollution control and production of commodities which can be produced by low pollution processes; (3) production of fewer, higher priced commodities; and (4) an initial redistribution of income in favor of the affected party.

This may be an appropriate place to re-evaluate the claims of some of Coase's supporters, as presented in Part II. A few can be disposed of expeditiously. It is not tenable, despite the contention of Davis and Whinston,³⁶ to extend the claim of allocative neutrality to externality in consumption. Except for a very special case, changes in liability rules produce income transfer effects which lead to allocative differences. The generalizations of Calabresi³⁷ and Stigler³⁸ were somewhat extravagant. Even if the whole Coasian argument were granted, it applies only to Pareto-relevant externalities, not all externalities or even all important externalities.

The argument of Demsetz³⁹ is more complex. It is true that the absence of an observable market may itself be an efficient market solution. The problem is that efficiency has been robbed of much of its meaning. A different liability rule, a different distribution of rights, will lead to a different solution, but given perfect competition, both the old and the new solutions will be efficient. Under different liability rules, the production functions for transactions may be different. Not all "efficient" solutions will maximize net social product. We are forced to select from among different efficient solutions. The more aggressively laissez-faire version of Demsetz' argument, that the subliminal (unobserved) market is the *best* solution, is insupportable. A change in liability rule may cause a market in rights to spring to life, observable to all. Further, the possibility that some type of non-market solution may involve transactions costs lower than market solutions under any liability law

35. Some exceptions to this generalization can be envisaged. Ralph d'Arge suggests the case of a fugitive polluter, who would hide in an L^f situation but would come forward to identify himself and receive a bribe under L^Z . Under L^f , the phantom polluter would pollute more heavily (that is, until apprehended) than under L^Z .

36. Davis & Whinston, *supra* note 17.

37. Calabresi, *supra* note 19.

38. Stigler, *supra* note 20.

39. Demsetz, *supra* note 4.

must be considered. Then, social net product may be maximized by some non-market approach.

Cheung's⁴⁰ suggestion that a "so-called externality" can always be eliminated by a complete specification of rights in contractual arrangements can also be seen to beg the important questions raised in the previous paragraph. If different assignments of rights will lead to different contractual arrangements involving different transactions production functions and resulting in different resource allocations, then some assignments of rights must be "better" than others, and a "best" assignment may exist. Cheung offers little help in making the choice.

The implicit suggestion of the Coasians that the doctrine of allocative neutrality of liability rules provides a mechanism (market solution) which eliminates the allocative role of the government fall flat with the demise of allocative neutrality. Rather, complete and careful analysis of the allocative impact of liability rules indicates that, even if market solutions are used, the choice of a liability rule involves the government in manipulating resource allocation and, ultimately, the whole range of macroeconomic variables.

A section entitled "The Counter Attack" can hardly dare close without some mention of what the Pigovians are doing. Kneese and Bower⁴¹ had proposed and resolutely defended a Pigovian system of taxes on water pollutants at a time when the Coasians had forced the Pigovians into an eclipse at the academic level. Now, the beginnings of a neo-Pigovian resurgence in externality theory can be seen. Whitcomb⁴² and Baumol⁴³ have offered various proofs that Pigovian taxes will work as Pigou had intended. It is not my purpose here to evaluate this very recent literature, but I would be remiss if I failed to draw to the reader's attention both the emergence of this trend in the literature and the possibilities it presents. The legitimizations of Pigovian taxes at the theoretical level could provide a stimulus to a movement which already has many backers among the practitioners. Presumably, Coasians would prefer Pigovian taxes to rigid standards, if that were the choice.

IV MAKING MARKET SOLUTIONS WORK

In this section the operation of market solutions to externality problems is considered. It is concluded that, given the demolition of the doctrine of allocative neutrality, the policy implications of the

40. Cheung, *supra* note 21.

41. A. Kneese and B. Bower, *Managing Water Quality: Economics, Technology and Institutions* (1962).

42. D. Whitcomb, *Externalities and Welfare* (1972).

43. W. Baumol, *On Taxation and Control of Externalities*, 62 *Am. Econ. Rev.* 307 (1972).

study of property rights are quite different from those suggested by the Coasians and hyper-Coasians.

My remarks will be focused around an example which I have already used briefly in several places in this article: pollution in populated areas resulting from industrial sources. When laws with respect to pollution are lenient and/or seldom and ineffectively enforced, the liability situation can be said to approach L^Z . Market solutions to this type of externality problem are seldom, if ever, observed. The material presented in Section III provides ample reason to predict such a result. Industrial pollution problems arise from disposal of wastes into common property resources. One, or a relatively small number of acting parties, dumps wastes into a common property resource (e.g., air or water), reducing the welfare of many affected parties.⁴⁴ Clearly, a L^Z rule would minimize the likelihood of pollution abatement in such cases. Given that organization of an affected party consisting of many users of a common property resource may involve prohibitive transactions costs, the equilibrium under L^Z may well remain at the status quo. The "solution" may be to continue emissions at the maximum level (that level which maximizes the firm's profits when environmental services for waste disposal are priced at zero).

Nevertheless, market solutions cannot be so easily dismissed. The demolition of the doctrine of allocative neutrality suggests a way out. We know that the conversion of liability rules from L^Z to L^f can be expected to increase the level of pollution abatement achieved. Let us consider the operation of market solutions to industrial pollution problems under a full liability law.

There are three major steps in the process of negotiating and enforcing market solutions. First, recognition of the new status quo established by the L^f rule must be enforced. Firms polluting without having obtained the permission of the affected parties must be made to either cease or obtain that permission. Second, the acting party now has an incentive to initiate negotiations to induce the affected parties to accept a certain amount of emissions in exchange for compensation. Acting and affected parties must organize themselves to gather information, decide on their bargaining positions, and carry out negotiations aimed at achieving agreement on acceptable levels of pollution and compensation. Third, the agreement achieved must be policed and enforced. Compensation payments must be made as

44. Since L^Z requires the affected parties to pay, the common property nature of the resources polluted gives rise to the freeloader problem. In the absence of compulsion (anathema, one preumes, to Coasians), many affected citizens would rationally refuse to invest anything in the improvement of a common property resource.

agreed, and the agreed emissions limit must not be exceeded. The judicial and enforcement functions of society must stand ready to uphold the agreement.

There are a number of alternative ways in which these steps may be carried out. It seems reasonable that different organizational methods for achieving exchange may involve different production functions for transactions. Under some organizational systems, movement from the status quo may be impossible; under others, exchange may take place. The next few pages will be devoted to some speculation about how the organization of the involved parties may affect the operation of market solutions under L^f .

We must start by assuming that the legal system stands ready to enforce the L^f rule and to enforce strictly any agreements made between acting and affected parties. Such an assumption is hardly radical; without enforcement of the law of business agreements, our way of life would collapse.

The first and third steps in negotiating and enforcing market solutions involve approaches to the judicial and policing systems established by government. For the moment, let us concentrate on the second step, the negotiation of exchange, assuming simply that the first and third steps have been taken care of. We will return to the first and third steps later. For negotiations, consider three basic methods of organization of the affected parties: individual action, collective action and action facilitated by a public agency. Organization of the acting parties is a simple matter. Their intense economic interest in the outcome will be sufficient to ensure their participation in decision making. And, since we are dealing with industrial pollution, their small numbers will greatly facilitate their organization, if co-operative action is necessary.⁴⁵ So, here we concentrate on the affected parties.

a) Individual action by affected parties.

If all members of the affected party were in unanimous agreement about all facets of the exchange and enforcement of rights, there would be no problem. Agreement within the affected party would be reached speedily and inexpensively. However, such fortuitous unanimity would hardly be expected. The affected party is made up of many citizens with varying tastes, preferences and wealth. Because the resource into which the waste products are dumped is a common property resource, it is essential that an agreement be reached as to the unique amount of pollution

45. Buchanan & Tullock, *supra* note 31; Crocker, *supra* note 32; and Olson, *supra* note 33. This type of argument would be invalid for externality situations where the acting party is made up of very many members with diverse interests, e.g., pollution from automobiles.

allowed to exist in any one place at any one time. The result of individual bargains would probably be a series of individual agreements calling for different amounts of abatement, hardly a viable solution. So, extensive contracting and recontracting might be required to arrive at agreements with all parties allowing the same amount of emission.

If the law allowed any one affected individual to demand adherence to the L^f law, acting parties would be obliged to conclude individual agreements with all affected parties. The "holdout problem" familiar to urbanologists may assume significant proportions. One or more affected citizens may steadfastly refuse to conclude bargains, hoping to obtain exorbitant compensation (i.e., to obtain a large proportion of the total economic surplus for themselves).

Everything considered, the prospect is for extremely high transactions costs and possible failure to obtain any solution other than the starting point defined by the L^f law. The problem then would be not one of too little abatement but rather of too much. Complete abatement of pollution may disrupt the production of commodities, employment, wages and prices to an extent intolerable to citizens of an affluent society.

b) Action by the affected party voluntarily organized.

Since we are dealing with management of common property resources, collective decision making seems a reasonable approach. A single agreement could be concluded between the acting party and the affected parties operating as a group. If action of the affected parties as a group required unanimous approval of all affected persons, exchange may be very difficult to arrange. Buchanan and Tullock⁴⁶ and Olson⁴⁷ caution us that procedures requiring unanimity may result in high transactions costs. Transactions costs in achieving unanimity probably increase quite rapidly as the number of people involved in the decision increases. If a requirement of unanimity resulted in transactions costs too high to allow movement from the status quo, the result would again be complete pollution abatement, which may result in extreme economic and social disruption.

Alternatively, it would be possible to set up collective organizations which could take action with less than unanimous agreement of all affected persons. This alternative would seem to involve lower transactions costs than the other procedures which rely on direct bargaining among the involved parties.

c) Public agencies to bargain for the affected parties.

A public agency could be set up to represent the affected

46. Buchanan & Tullock, *supra* note 31.

47. Olson, *supra* note 33.

parties. If the agency would have the power to make decisions binding on the affected parties, transactions costs would be relatively low. A well-designed public agency would operate on a local level, handling units of problem-shed size (e.g., an airshed or a watershed). The citizens of the problem-shed would be represented in the agency's decision making councils. Compensation received would be distributed among affected persons, after the agency's operating expenses are subtracted. Transactions costs would be kept relatively low, which would allow the achievement of exchange in many cases. Such a system is clearly a variant of the market solution approach.

This procedure is similar to the system of emission charges advocated by Kneese. A system of charges operated on a pollution-shed basis, allowing local public agencies to bargain with polluters to determine the local unit compensation price (*i.e.*, unit charge) and to distribute the income from charges among the affected citizens, would closely approximate a market solution. Increasing bureaucratization would tend to increase the disparity between market solutions and charge systems. For example, the similarity of market solutions and charge systems becomes more tenuous as we move from problem-shed charges to state or nationwide charges, or from distribution of charge income among affected parties to spending it on their behalf (*e.g.*, in environmental projects), or simply using it as government income to meet general government expenses.

It seems that the two types of decision making procedures which are most likely to work effectively are the use of a public agency or the use of collectives of affected persons operating with less than unanimous consent. These can be expected to be most effective, because they will tend to keep transactions costs as low as possible and maximize the occurrence of exchange in externality situations. For a given liability rule, net social product is maximized when the frequency of voluntary exchange is maximized, which requires that transactions costs per unit of exchange be minimized.⁴⁸

These two types of procedures differ from each other and from Kneese's system of Pigovian taxes only in degree. In this section, we have attacked a major social problem (industrial pollution) from a Coasian standpoint, seeking a market solution. Yet, the practicalities of getting the job done forced us to move very close to a Pigovian solution. In practice, the Coasian and Pigovian solutions converged at a point very near the position held by Kneese.

Nevertheless, within the set of solutions facilitated by collective or

48. Reduction of both the fixed and the variable costs of transacting is desirable. Reduction of average total costs (which may be achieved through reduction of fixed and/or variable costs) allows more frequent movement away from the status quo determined by the operative liability rule. Reduction of variable costs allows the exchange of more units.

public decision making, important choices can be made as to the optimal level of bureaucratization. Where pollution-sheds can be easily defined on the basis of physical criteria and where there are relatively few sources of pollution, I suspect that market solutions negotiated by local committees may be appropriate. In cases of industrial pollution in urban areas where there are many sources of pollution, each affecting different but overlapping geographical areas, reliance on local committees may require a huge number of committees to be set up, each dealing with a single polluter. The difficulties inherent in that approach would be substantial. Alternatively, one committee could bargain with all polluters. If this alternative were chosen, the amount of expertise required of committee members and the amount of their time used would tend to grow so large that the committee would take on the characteristics of a public agency.

The desirability of distributing compensation or charge income among the affected parties must be considered. As the size and diversity of the group of affected parties grows, the transactions costs of identifying damaged parties and the extent of the damage suffered will increase. The alternatives to direct distribution are (1) expenditure of the charge income by the collective or agency on specific projects to benefit the affected parties, and (2) transfer of the charge income into the local, state or federal treasury. These latter alternatives represent reduced transactions costs but increasing bureaucratization.

Decisions must also be made about the desirable degree of participation of the affected parties in the decision making of the collective or agency which represents them. This can range from a referendum on each issue to imposition of an agency directly responsible to the federal government, and only indirectly responsible to the affected citizens.

These decisions about the optimal level of bureaucratization are important. They can vastly affect the efficiency and effectiveness of the institutions which facilitate market solutions. Yet, it seems that effective market solution of, say, pollution problems requires some institutional arrangements in the interface between Coasian and Pigovian methods. It seems to me that Coasians may be most effective by working on questions such as the optimal degree of bureaucratization of institutions, rather than fighting Pigovians.

Our discussion of the second step in achieving market solution to industrial pollution problems greatly facilitates discussion of the first and third steps. These steps involve appeal to the judicial and policing system set up by the state which will enforce recognition of the L^f rule and the particular market solution agreed upon. Assuming

effective enforcement, the important question is, who shall have the right to appeal to the courts to demand such enforcement? Operation of the preferred procedures of negotiating, collectives or public agencies working with less than unanimous consent, would be negated, if any affected citizen was recognized by the courts and could effectively demand adherence to the status quo specified by L^f . This problem could be circumvented, if only the collective or the public agency was recognized by the courts. However, in this case, some citizens may feel that the collective or agency is not acting with enough vigor on behalf of the affected parties. To avoid this, the collective or agency could be made subject to the approval of the affected parties, possibly expressed in referenda. Procedures for referenda would need to be set. Should referenda be automatically held on each issue, presumably at substantial expense; or should referenda be held either at regular intervals for re-election of committee members or on specific issues after petitions bearing the names of a certain percentage of members of the affected party have been presented? Either way some members of the affected party may feel that their positions had been inadequately represented. In such cases, it may be desirable to allow disgruntled members of the affected party to have individual access to the courts, not to sue the acting party directly, but to complain that the collective or agency has not acted appropriately.⁴⁹ This latter alternative may serve to both protect the integrity of the principle of collective action and allow unsatisfied affected parties to challenge the actions of the collective. Here again, intellectual activity is sorely needed to tackle important questions of detail in the organization of non-regulatory solutions to externality problems.

In summary, market solutions will solve many of our serious social problems caused by externalities, only if liability laws are converted to L^f or something approaching it, and collective or public agencies are established to facilitate exchange and appeal to state authorities for enforcement.

V COASIAN EXTERNALITY THEORY AS A GUIDE FOR POLICY

Coasian externality theory was introduced and commended by its proponents to policy makers as providing a rationale and a method for minimizing government intrusion in externality situations. As such, does it stand up?

First, I must pay tribute to the tremendous contribution of Coase's

49. Ralph d'Arge draws my attention to one example of this kind of legal action, on a national scale. Currently the cities of Riverside and San Bernadino are suing the Environmental Protection Agency in order to force the agency to enforce its ambient air standards in the city of Los Angeles. This approach was chosen in preference to directly suing the city of Los Angeles.

"The Problem of Social Cost." It is a truly seminal article, which has stimulated voluminous research and writing on externalities, liability laws and the economic nature of property and rights. Most of Coase's insights have proven to be correct. The view of rights as factors of production has stimulated much useful research.

But as a practical matter, allocative neutrality of liability laws has been demolished. Can the Coasian laissez-faire policy conclusion survive the demolition of allocative neutrality?

First let us note that its survival of the morality issue was only partial. The laissez-faire economists held firm, but many economists and most everyone else bailed out. In a society founded by Puritans and possessing to this day a strong sense of right and wrong, Coase's amoralization of the externality issue faced an uphill battle for acceptance. In essence, Coase seemed to be saying that in cases where two parties have conflicting interests there are no moral precepts to guide the resolution of the conflict. Visions of criminals being bribed to desist and of little children being regarded as "hitting" automobiles in pedestrian crossings, with Coasians failing to be morally offended, were evoked, *e.g.*, in Weld.⁵⁰ Mishan⁵¹ scored points with the issue of income distribution. Surely decent people could see a moral problem in poor citizens bribing an affluent producer of effluents, or accepting pollution in defenseless silence, while Coasians looked on benignly.

But, to hard-headed economists the claim of the Coasians and hyper-Coasians that Coase had proposed a perfectly decentralized method of solving externality problems suffers its most severe loss of credibility with the demolition of the doctrine of allocative neutrality. Allocative neutrality was the clincher for the Coasian argument. Its demise is disastrous to the laissez-faire people. Governments must choose between alternative liability rules, not in an atmosphere of allocative impotency, but rather in the knowledge that the allocative effects of their choice will be substantial. They must choose between a myriad of different solutions, each efficient given perfect competition. Control of liability implies manipulation of resource allocation throughout the whole economy, and therefore, of macro-economic variables like aggregate supply and demand, employment, interest rates and inflation. The choice of liability involves the government in real economic planning.

The policy significance of the Coasian study of property rights is just the opposite of what some proponents of laissez-faire would have us believe. The fact that different configurations of property rights

50. Paper by John Weld, *The Social Cost of the Coase Theorem*, presented at the Symposium on Environmental Economics and the Law, University of California, Riverside, Feb. 24-5, 1972.

51. Mishan, *supra* 7; *Pangloss on Pollution*, 73 Swedish J. Econ. 113 (1971).

have different impacts on both allocation and distribution illustrates the need for understanding the impacts of specific configurations of rights. Collective decision making procedures must select appropriate configurations of rights, not only specifying rights in complete and non-attenuated form,⁵² but also selecting that particular bundle of rights which will provide precisely the correct incentive structure to achieve the collective goal.

The Coasian, assuming he is a laissez-faire economist who seeks to minimize the role of government in the economy, is now faced with a cruel dilemma. He can insist that market solutions under L^Z , the zero liability rule, are an adequate approach to externality problems. But, he must know by now that liability rules are not allocatively neutral, and L^Z can be expected to minimize abatement of, say, industrial pollution. Can he support such a position without appearing to be blatantly anti-environment? Even if he has no strong feelings one way or the other about the environment, he cannot be at all sure that L^Z will result in maximization of net social product.

He can give his approval to the establishment of L^f , but he insists that market solutions be obtained without the help of any governmental or pseudo-governmental agency. The discussion in Section IV makes it clear that such an approach to industrial pollution problems may create a monster threatening the very capitalist system whose salvation is the goal of Coasians; not only threatening it, but threatening it more than any Pigovian system ever could. Under L^f , whenever transactions costs are sufficiently high to preclude exchange, the status quo preserved is one of zero pollution, complete abatement. That could really put firms out of business and people out of work!

His final and most reasonable alternative is to join the neo-Pigovians, and accept conversion to L^f and the creation of collective or public agencies to facilitate exchange. Such a system preserves many of the advantages of decentralized market decision making. Working with the neo-Pigovians, the Coasians can put their influence behind institutional designs which would minimize transactions costs, restrain the growth of the agency to problem-shed size, and maximize the opportunities for participation of affected citizens in agency decision making. In so doing, they can contribute vitally to the development of viable programs which would modify externalities like pollution, while retaining many of the attributes of the market.

52. As Cheung, *supra* note 22, would have us believe.