

The Coase Theorem in a Rent-Seeking Society¹

CHULHO JUNG

Assistant Professor, Economics Department, Ohio University, Athens, Ohio

KERRY KRUTILLA

*Assistant Professor, School of Public and Environmental Affairs, Indiana University,
Bloomington, Indiana*

W. KIP VISCUSI

George G. Allen Professor of Economics, Duke University, Durham, North Carolina

and

ROY BOYD

Associate Professor, Ohio University, Athens, Ohio

The Coase literature presumes that agents will passively accept a property rights assignment, and then bargain. We use a game-theoretic approach to show that rational agents may instead attempt to rent-seek over the initial rights distribution. In this additional stage to the Coase bargaining problem, the parties expend resources in an effort to influence the property rights assignment. The characterization of the equilibrium in this expanded model suggests that low transactions costs will encourage rent-seeking behavior.

I. Introduction

Since its original publication, Ronald Coase's seminal work (Coase 1960) has generated considerable controversy and a voluminous research literature. The Coase literature generally addresses some aspect of the stylized formulation that leads to the efficient decentralization outcome of the classic "Coase Theorem." In this context, numerous commentators have focused on the effects of transactions costs on the bargaining process and the efficiency of bargaining outcomes, e.g., Cooter (1991),

¹Send reprint orders to Professor W. Kip Viscusi, Department of Economics, Duke University, Box 90097, Durham, N.C. 27708-0097, phone 919-660-1833, fax 919-684-8974.

(1989).² Other literature has focused on bargaining imperfect information, e.g., Cooter and Marks (1982), Klevorick (1987). Imperfect information increases the likelihood of the bargaining context, which diminishes the probability of reaching an agreement. This necessitates costly preventive measures on the part of the pollution recipient, liability rules have also been found to influence bargaining process (Cooter 1982). If liability rules are such that a "price maker" vis-à-vis the supply of pollution abatement payment may be raised by a lower-than-optimal amount on the part of the pollution recipient.

There has also been an effort to explore how the structure of the Coase theorem can influence behavior and bargaining outcomes in a bargaining context. For example, Ayres and Talley (1994) show that the structure of the Coase theorem, endowing them with a contingent or specific behavior. Johnston (1994) finds that a clear assignment of liability is likely to lead to inefficiency. However, efficient bargaining outcomes are possible when the entitlement assignment is initially more ambiguous. A judicial decision using a general standard based on the efficiency of bargaining outcomes, and that the Coase theorem itself may be used as a policy instrument to improve the bargaining process.

There is also a literature on the property right assignment, but our framework is different than the previous literature. The standard formulation of the Coase theorem is that the standard formulation of the property rights as exogenous with respect to the bargaining process. The principal emphasis is on the efficiency of bargaining outcomes. The focus follows from the original Coase paper, in which the Coase theorem was viewed as a policy instrument to correct the missing markets.

In this paper, we extend the economic logic of the rent-seeking literature to explore the basic intuition that agents may rent-see over the property rights distribution rather than passively accept a property rights assignment as the basis for a subsequent bargaining routine. We employ a game-theoretic model in which parties can invest resources to probabilistically influence the outcome of the property rights allocation. We assume that parties operate with asymmetric and incomplete information. In this informational setting, we evaluate the behavior of parties vis-à-vis the property rights assignment as a function of rent-seeking costs and the relative power of agents to influence the property rights distribution.

As we have seen, the Coase theorem is the presumption that economic agents will bargain over the property rights assignment. However, the party with the greatest bargaining power gains an economic advantage—irrespective of the parties. Correspondingly, parties have a greater incentive to invest resources to bargain after the rights assignment. Thus distribution—issues assumed away in the standard Coase theorem—becomes the principal motivating concern of agents with an asymmetric bargaining power.

As we have seen, the Coase theorem is the presumption that economic agents will bargain over the property rights assignment. However, the party with the greatest bargaining power gains an economic advantage—irrespective of the parties. Correspondingly, parties have a greater incentive to invest resources to bargain after the rights assignment. Thus distribution—issues assumed away in the standard Coase theorem—becomes the principal motivating concern of agents with an asymmetric bargaining power.

As we have seen, the Coase theorem is the presumption that economic agents will bargain over the property rights assignment. However, the party with the greatest bargaining power gains an economic advantage—irrespective of the parties. Correspondingly, parties have a greater incentive to invest resources to bargain after the rights assignment. Thus distribution—issues assumed away in the standard Coase theorem—becomes the principal motivating concern of agents with an asymmetric bargaining power.

judges with particular political predispositions or judicial philosophies. As an alternative to government regulation, distributing property rights is itself a policy option, which, like any other, should be susceptible to the rent-seeking activities of interested parties.

An analysis of rent-seeking behavior in the missing-markets context would appear to be particularly appropriate since the absence of clearly defined property rights at least raises the possibility that the costs of influencing the rights definition will be relatively low. For example, it is not likely to cost very much to influence the smoking policy of a particular office building. However, the absence of clearly defined property rights does not logically imply low rent-seeking costs, and it is not difficult to find empirical evidence of costly rights disputes. The decades of struggle over the Law of the Sea Treaty illustrates the degree to which resources may be invested to influence rights allocations (Hollick, 1981; Oxman, 1983; Richardson, 1990 and Sebenius, 1984).

Furthermore, property rights theorists suggest that property rights may be ill defined precisely because they are difficult to defend and enforce (Demsetz, 1967; Barzel, 1989). Open-access water bodies and air spaces illustrate this set of circumstances (Bromley and Cernea, 1989). In these situations, the transactions costs of establishing and enforcing the property rights may well exceed their economic value (Fedor and Feeny, 1990). This net payoff structure would reduce both the policy rationale for better defining the property rights and the economic inducement to rent-seeking activities. Conversely, however, if assigning property rights is economically rational as a policy option, then rent-seeking activities aimed at influencing the distribution are likely to be a rational behavioral response, provided that the costs of the rent-seeking itself are not so high as to tip the net-benefit calculus.⁴

In the real world, economic agents will confront some degree of informational uncertainty. Just as informational uncertainty may lead parties to behave strategically in a bargaining situation, informational uncertainty should also lead to strategic behavior with respect to rent-seeking over the initial rights assignment. Furthermore, agents may have different degrees of political and/or legal leverage to influence the rights distribution (Schneider and Naumann, 1982; Kennelly and Murrell, 1991). The transaction costs that block the ability of large groups to strike bargains with one another—a point frequently raised in the Coase literature—should also act as a barrier for effective coalition formation for lobbying with respect to the initial property rights assignment. Dispersed agents should have weaker rent-seeking clout than coalesced "special interest" groups.

In this paper, we extend the economic logic of the rent-seeking literature to explore the basic intuition that agents may rent-see over the property rights distribution rather than passively accept a property rights assignment as the basis for a subsequent bargaining routine. We employ a game-theoretic model in which parties can invest resources to probabilistically influence the outcome of the property rights allocation. We assume that parties operate with asymmetric and incomplete information. In this informational setting, we evaluate the behavior of parties vis-à-vis the property rights assignment as a function of rent-seeking costs and the relative power of agents to influence the property rights distribution.

⁴The struggle surrounding the Law of the Sea Treaty is again a case in point. Notwithstanding the high transactions costs, the payoff of the rent-seeking was high enough for countries to spend years bickering over the terms of the treaty.

Transactions costs in his original article. After the original draft of this paper was submitted to this *Review*.

Party 1	Weak Power Party 1	
	Party 2 Influence	Party 2 Accept
2] [2-c1, 0]	[.5-c2, 1.5-c2]	[1.2-c1, .8]
[1, 1]	[0, 2-c1]	[1, 1]

(regions 3, 4, 5, and 6) involve intermediate-cost com- both parties do not always attempt to influence the However, in all regions one or more Nash equilibria are both parties attempting to influence the property rights e Nash equilibrium in region 3 were $c1 = .1$ and $c2 = .1$) for $P \leq .9$, and ($X_s = 1, X_w = 1, y = 0$) for $P \geq .5$, on 5 where $c1 = .1$ and $c2 = 1.0$ are ($X_s = 1, X_w = 1, 0, y = 1$) for all P . Table 2 displays similar results for other midcost regions (regions 4 and 6).

st region. In fact, the costs of influencing the property enough to exhaust the expected rent associated with the

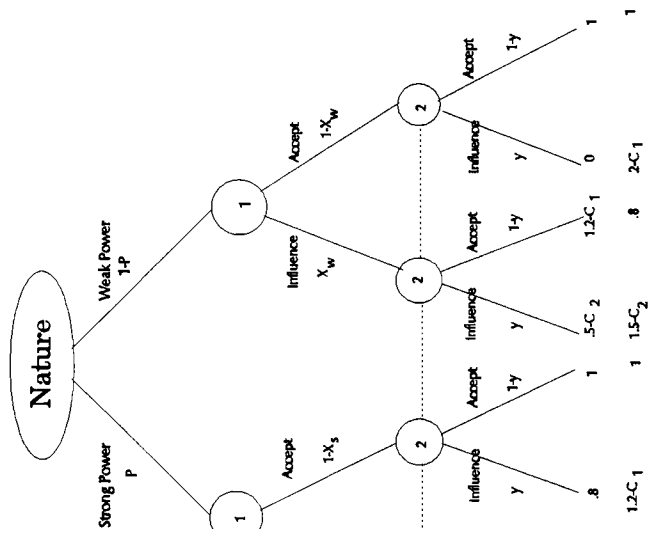


FIG. 1. Game tree.

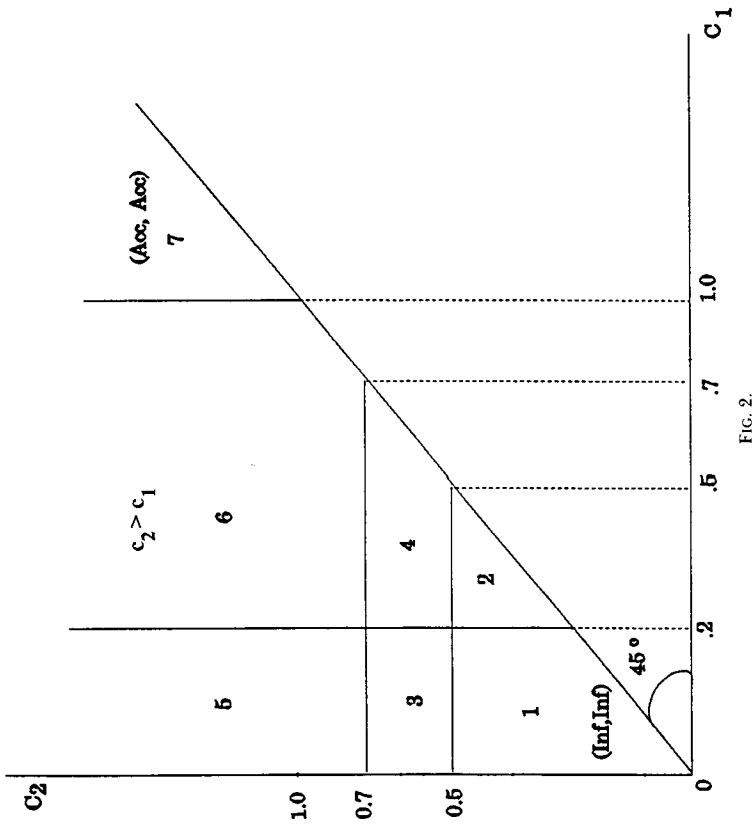


FIG. 2.

property right in this region. Both parties will accept the property rights assignment as a dominant strategy. The Nash equilibrium is ($X_s = 0, X_w = 0, y = 0$).

Region 7 most closely approximates the circumstances implicitly presumed by the Coase theorem. With property rights clearly exogenous, we would expect Coase-style bargaining to emerge—if bargaining transaction costs themselves are not prohibitively high and strategic considerations do not block negotiation. This type of situation is sometimes observed in the international diplomacy arena. For example, Norway would obviously incur excess diplomatic costs by significantly challenging Brazil's entitlement to cut its own forests. Hence, Norway may offer payments to Brazil to subsidize economic development alternatives that do not cause deforestation.

IV. Discussion and Conclusion

Analysis of parties' economic incentives to influence the property rights assignment casts doubt on the conventional conceptualization of the missing markets problem found in the Coase literature. Agents will routinely accept an exogenously-

by cost of influence (C_1, C_2)

ive	Nash Equilibria	Probability Range
	$(X_s = 1, X_w = 1, y = 1)$	All P
	$(X_s = 1, X_w = 1, y = 1)$	All P
	$(X_s = 1, X_w = 0, y = 1)$	if $P \leq 9/10$
	$(X_s = 1, X_w = 1, y = 0)$	if $P \geq 1/2$
	$(X_s = 1, X_w = 0, y = 1)$	if $P < 5/6$
	$(X_s = 1, X_w = 0, y = 0)$	if $P > 5/6$
	both	if $P = 5/6$
	$(X_s = 1, X_w = 1, y = 0)$	All P
	$(X_s = 0, X_w = 0, y = 1)$	All P
	$(X_s = 1, X_w = 0, y = 0)$	if $P \geq 1/2$
	$(X_s = 0, X_w = 0, y = 1)$	if $P \leq 5/8$
	$(X_s = 0, X_w = 0, y = 0)$	All P

assignment in only one special case, where the costs of property rights distribution are greater than the expected rents. In other cases, one or more agents will rent-seeK his distribution. Unless one assumes that the property rights are controlled by individual parties, there should be an bargaining problem in which the parties initially expect to influence the property rights assignment. It is to question the usual assumption that zero transaction costs lead to efficient bargaining outcomes. As we have pointed out, rent-seeking over the rights distribution in a zero bargaining high initial resource expenditure is obviously a bargaining point than the usual assumption in the Coase literature is received.

Legal structures and regulatory rules governing property change with great frequency; hence, they may be relevant activities. While this is an empirical question, it is the rules governing smoking rights designations in office. Even in cases where there is more stability in the types of rent-seeking activities we discussed in the introduction of judges, for example—may have a longer appointment does not capture the distinction between short-term and long-term activities. This aspect of the issue would be a fruitful area for

our paper raises is how the relationship between property costs may influence agent behavior, the efficiency properties, and allocation of existing property rights in the real world. It has been explored in the Coase literature, and our results have shown that endogenizing both stages of the Coase problem is important. It would also be useful to explore how rent-seeking incentives affect the initial rights

Party I's Expected Payoff and Best Response

APPENDIX

When Party I has strong power:

- If $X_s = 1$, then the expected payoff of Party I is $E\pi_1 = (1.5 - C_2)y + (2 - C_1)(1 - y)$.
- If $X_s = 0$, then the expected payoff of Party I is $E\pi_1 = 0.8y + 1(1 - y) = 1 - 0.2y$.
- If $E\pi_{1|X_s=1} > E\pi_{1|X_s=0}$, then $X_s = 1$ is the best response. (Otherwise, $X_s = 0$ is the best response.)

When Party I has weak power:

- If $X_w = 1$, then the expected payoff of Party I is $E\pi_1 = (0.5 - C_2)y + (1.2 - C_1)(1 - y)$.
- If $X_w = 0$, then the expected payoff of Party I is $E\pi_1 = 0y + 1(1 - y) = 1 - y$.
- If $E\pi_{1|X_w=1} > E\pi_{1|X_w=0}$, then $X_w = 1$ is the best response. (Otherwise, $X_w = 0$ is the best response.)

Party II's Expected Payoff and Best Response

If $y = 1$, then the expected payoff of Party II is

$$E\pi_{II} = P X_S (0.5 - C_2) + P (1 - X_S) (1.2 - C_1) + (1 - P) X_w (1.5 - C_2) + (1 - P) (1 - X_w) (2 - C_1)$$

If $y = 0$, then the expected payoff of Party II is

$$E\pi_{II} = P X_S (0) + P (1 - X_S) (1) + (1 - P) X_w (0.8) + (1 - P) (1 - X_w) (1)$$

$$= 1 - 0.2 X_w - P X_S + 0.2 P X_w$$

If $E\pi_{II|y=1} > E\pi_{II|y=0}$, then $y = 1$ is the best response. If $E\pi_{II|y=1} < E\pi_{II|y=0}$, then $y = 0$ is the best response.

Proposed Strategies

Our general problem then is to find the proposed strategies that are Nash Equilibria for various values of (C_1, C_2) by comparing the expected payoffs of Parties I and II computed above. These Nash Equilibria are reported in Table 2.

For example, assume that $c_1 = 0.3$ and $c_2 = 0.4$. If Party I has strong power and $X_s = 1$, then the expected payoff of Party I is $1.7 - 0.6y$ from the formula computed earlier. If $X_s = 0$, then the expected payoff of Party I is $1 - 0.2y$. Since $1.7 - 0.6y > 1 - 0.2y$ for all $y \in [0, 1]$, $X_s = 1$ is always the best response for Party I.

If Party I has weak power and $X_w = 1$, then the expected payoff of Party I is $0.9 - 0.8y$. If $X_w = 0$, then the expected payoff is $1 - y$. If $y > 0.5$, then $0.9 - 0.8y > 1 - y$ and then $X_w = 1$ is the best response for Party I. If $y < 0.5$, then $0.9 - 0.8y < 1 - y$, and then $X_w = 0$ is the best response for Party I.

If $y = 1$, then the expected payoff of Party II is $1.7 - 0.8P - 0.6X_w - 0.8PX_s + 0.6PX_w$. If $y = 0$, then his expected payoff is $1 - 0.2X_w - PX_s + 0.2PX_w$. If $1.7 - 0.8P - 0.6X_w - 0.8PX_s + 0.6PX_w > 1 - 0.2X_w - PX_s + 0.2PX_w$, then $y = 1$ is the best response for Party II. Otherwise, $y = 0$ is the best response.

We find from the above results that $(X_x = 1, X_y = 1, y = 1)$ is the only Nash Equilibrium for all $P = [0, 1]$. Our procedure is the same for all other cases reported.

References

- AUSTIN-SMITH, D. (1987). Interest groups, campaign contributions, and probabilistic voting. *Public Choice* 54:123–139.
- AYRES, I., AND E. TALLEY. (1994). Solomonic Bargaining: Dividing a legal entitlement to facilitate Coasean trade. Preliminary draft, Stanford University Law School.
- BARZEL, Y. (1989). *Economic Analysis of Property Rights*. Cambridge University Press, pp. 64–65.
- BROMLEY, D.W., AND GERNEA, M.M. (1989). The management of common property resources: some conceptual and operational fallacies. World Bank Discussion Paper #57, Washington D.C.
- COASE, R.H. (1960). The problem of social cost. *Journal of Law and Economics* 3:1–44.
- COOTER, R. (1982). The cost of Coase. *Journal of Legal Studies* 11(1):1–34.
- COOTER, R. (1991). The Coase theorem. In *The New Palgrave: The World of Economics*, eds. J. Eatwell, M. Milgate, and P. Newman, 51–57 New York: Macmillan.
- COOTER, R., AND MARKS, S. (1982). Bargaining in the shadow of the law: A testable model of strategic behavior. *Journal of Legal Studies* 11(2):225–252.
- DONSEITZ, H. (1967). Toward a theory of property rights. *American Economic Review* 57(2):347–359.
- DONOHUE, J.J. (1989). Diverting the Coasean river: Incentive schemes to reduce unemployment spells. *The Yale Law Journal* 99:549–609.
- FARREL, J. (1987). Information and the Coase theorem. *Journal of Economic Perspectives* 1(2):113–129.
- FEDOR, G., AND FEENEY, D. (1990). Land Tenure and Property Rights: Theory and Implications for Development Policy. World Bank Working Paper, Washington D.C.
- HULLMAN, A.L., AND URSPRUNG, H.W. (1988). Domestic politics, foreign interests, and international trade policy. *American Economic Review* 78:729–745.
- HOLLICK, A.L. (1981). *U.S. Foreign Policy and the Law of the Sea*. Princeton, N.J.: Princeton University Press.
- JOHNSTON, J.S. (1994). Bargaining under Rules versus Standards. Draft working paper, Vanderbilt University Law School.
- KENNELLY, B., AND MURRELL, P. (1991). Industry characteristics and interest group formation: An empirical study. *Public Choice* 70:21–40.
- KREPS, D., AND WILSON, R. (1982). Reputation and imperfect information. *Journal of Economic Theory* 27:253–279.
- KRUEGER, A.O. (1974). The political economy of the rent-seeking society. *American Economic Review* 64:291–303.
- KRUEGER, A.O. (1990). Government failures in development. *Journal of Economic Perspectives* 4(3):9–23.
- OXMAN, B., D. CARON, AND BUDERI, C. (1983). *Law of the Sea: U.S. Policy Dilemma*. San Francisco: ICS Press.
- POLINSKY, A. (1989). *An Introduction to Law and Economics*, 2nd edition. Boston: Little, Brown & Co.
- POSNER, D.Q. (1990). The Coase theorem: If pigs could fly. *The Wayne Law Review* 37(1):89–120.
- POSNER, R. (1986). *Economic Analysis of Law*, 3rd edition. Boston: Little, Brown & Co.
- RICHARDSON, E.L. (1990). Law of the sea: A reassessment of U.S. interests. *Mediterranean Quarterly: A Journal of Global Issues* 1(2):1–13.
- SAMUELSON, W. (1985). Comments on the Coase theorem. In *Game theoretic Models of Bargaining*, ed. A. Roth, 321–340. New York: Cambridge University Press.
- SCHNEIDER, F., AND NAUMANN, J. (1982). Interest groups in democracies—how influential are they?: An empirical examination for Switzerland. *Public Choice* 38:281–303.
- SEBENIUS, J.K. (1984). *Negotiating the Law of the Sea: Lessons in the Art and Science of Reaching Agreement*. Cambridge: Harvard University Press.
- VOGEL, K.R. (1987). The Coase theorem and California animal trespass law. *The Journal of Legal Studies* XVI: 149–187.