X-Inefficiency and Nonpecuniary Rewards in a Rent-Seeking Society: a Neglected Issue in the Property Rights Theory of the Firm

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Several recent papers have stressed that opportunities to obtain monopoly profits will attract resources into efforts to obtain monopolies (see Gordon Tullock; Anne Krueger; Richard Posner). The major message of this literature is that traditional analysis and empirical estimates of the welfare losses from monopoly (see Arnold Harberger; David Schwartzman, 1960; David Kamerschen) may very substantially understate the total magnitude of these losses. However, the behavior underlying the tendency for monopoly rents to be transformed into genuine social costs—"rent-seeking activity"—has additional relevance for analysis of public vs. private enterprise. The presence of rent-seeking behavior results in predictable and important differences in the conduct and performance of public vs. private enterprise that are unexplained by the present property rights theory of the firm. While distinctions between public and private enterprise have been raised in the property rights literature, there remains no unambiguous prediction that privately owned firms will perform differently than public firms in a number of industries. Indeed, there are at least two often-cited arguments which predict (particularly for utilities) that the conduct of firms in these two respective ownership categories will be similar. In this paper we argue that the bases of these apparent similarities between public and private enterprise are inapplicable in a rent-seeking environment, and that the introduction of this framework enhances the explanatory power of the property rights approach.

In Section I we briefly review the key arguments and offer in Section II an alternative characterization of public vs. private firm behavior in a world of rent seeking. In light of the implications of our analysis, Section III offers two types of empirical evidence on the contrasting incentives in public vs. private utilities. Specifically, we first compare the respective rewards structures for managers in publicly and privately owned water utilities in the United States. Second, we examine the impact of efficiency in private utility operation on rates of return subsequently allowed in formal rate hearings, under differing rent-seeking environments. Finally, Section IV offers some concluding remarks and discusses the relevance of our analysis for the welfare costs of monopoly.

I. The Managers of Utilities and the Utility of Managers

Modern treatments of enterprise operation and efficiency have given special emphasis to the internal cost-reward arrangements facing decision makers. While important conceptual differences pervade this literature, there are two basic lines of analysis which imply that managerial choices in publicly owned and privately owned utilities will not be much (if any) different. The first stresses the notion that all utilities—whether publicly or privately owned—generally operate in noncompetitive product
markets. The second stresses that the institutional structure of utilities (for example, rate of return regulation) constrains owner access to, or personal use of, the pecuniary wealth of the enterprise. We briefly summarize these two arguments.

A. X-Inefficiency

The analytical tendency to treat all utility firms uniformly because of product market similarities traces to a seminal (although controversial) paper by Harvey Leibenstein (1966). The well-known X-inefficiency literature stresses the role of competitively organized product markets as an important source of disciplinary pressure on firm conduct and performance. First, competition tends to eliminate high-cost producers, while the existence of monopoly power allows less efficient firms to remain in business. Second, competitive pressure squeezes profit to normal levels. This tends to bestir management and employees to put forth more effort and to motivate managers to combine inputs more efficiently. The Leibenstein analytical heritage therefore emphasizes the implication that utilities, irrespective of ownership form, are uniformly afflicted with X-inefficiency (higher operating costs) due to the general lack of pervasive pressure from competition in the product market.

B. Constraints on Pecuniary Wealth

Property right arrangements that attenuate owner access to the wealth of their enterprise (for example rate of return constraints) lower the cost of non-wealth-maximizing behavior on the part of managers. Gary Becker and Armen Alchian and Reuben Kessel offered the earliest formulations of this now familiar argument. In brief, this approach emphasizes that in institutional settings where "wealth cannot be taken out of an organization in salaries or in other forms of personal pecuniary property, the terms of trade between pecuniary wealth and nonpecuniary business-associated forms of satisfaction turn against the former" (Alchian and Kessel, p. 586). Predictable differences should thus arise between competitive vs. monopolistic (or profit constrained) firms. However, since owner access to firm wealth is generally attenuated for all utilities (regardless of ownership form), this argument also implies that non-wealth-maximizing (non-cost-minimizing) conduct should pervade regulated privately owned, as well as publicly owned, utilities.

In sum, while the utility-maximization approach differs in important conceptual respects from the approach taken in the X-inefficiency literature, an important observable implication of the two frameworks does not. Namely, all utilities, whether regulated private monopolies or publicly owned, have reduced incentives to minimize their cost of operation. Enterprise performance should predictably stray away from cost minimization because, (i) in the utility-maximization approach, cost-increasing production decisions do not come at the expense of owner-

3Other papers which are pertinent to the development of the inefficiency argument include William Comanor and Leibenstein, Schwartzman (1973), Leibenstein (1973, 1975), and Walter Primeaux.

4A recent paper by George Stigler (1976) on the existence of X-inefficiency illustrates the conceptual gap. Stigler’s message is essentially to stress the futility of the X-inefficiency concept for deriving welfare inferences. Managerial conduct which does not maximize the present value of an enterprise is not inefficient per se, but rather the efficient maximization of something else. (Robinson Crusoe, for instance, could never produce "inefficiently.") Stigler’s objections, however, do not seem to be over the existence of non-wealth-maximizing behavior, but with the conceptual norm that such behavior is inefficient, since it is implausible that managers are inefficient in maximizing their utility.
shareholder wealth, and (ii) in the X-inefficiency context, such decisions are not disciplined by pressures from alternative suppliers.

II. The Relevance of Ownership Form in a Rent-Seeking Society

Rent-seeking activity adds another analytical dimension to the choice problem facing managerial decision makers. Where potential monopolies (regulated or otherwise) are available to privately owned firms, resources devoted to appropriating these property rights are simply a form of “investing” or bidding to acquire the monopoly rights. This bidding behavior would be affected, of course, by the expected payoff to the owners if such rights are obtained. Moreover, even where the current profits of a monopolist are explicitly regulated, for example, in private utilities, resources will be devoted to rate cases in seeking to influence the allowable rates of return. In effect, non-cost-minimizing behavior in regulated private utilities does come at the expense of owner wealth—or more precisely, at the expense of the expected wealth of owners. Non-cost minimization reduces the amount of resources that private firms have to expend in efforts to acquire, protect, or improve their present monopoly status. Therefore, the much-cited Alchian-Kessel postulate is not appropriate in a rent-seeking context; “[I]f regulated monopolists are able to earn more than the permissible pecuniary rate of return, then ‘inefficiency’ is a free good, because the alternative to inefficiency is the same pecuniary income and no ‘inefficiency’ ” (p. 586). The opportunity cost of inefficiency is not zero, simply because the presence of potential monopoly profits creates an incentive to earn in excess of currently “permissible” pecuniary rates of return. Hence, nonpecuniary emoluments that enhance managerial utility will involve a tradeoff of owners’ wealth. Owners of private utilities therefore have an incentive to monitor and to enforce cost-minimizing behavior on the part of managers even when constraints on current pecuniary profits are imposed.

With respect to the X-inefficiency argument, the rivalry to obtain monopoly production rights or efforts to raise regulated rates of return will exert competitive pressures—even in settings where there is only a single supplier during the actual production period. Indeed, in the limit, only those firms which can (and do) operate at minimum cost will achieve monopoly power in the rent-seeking context. Potential or present suppliers who suffer from X-inefficiency would be at a comparative disadvantage in the rivalry to acquire or maintain monopoly status. X-inefficiency could therefore not survive long in a rent-seeking society.

The potential to acquire, to protect, or to improve monopoly status thus gives importance to all pecuniary returns of privately owned enterprise, regulated or otherwise. On the other hand, the absence of rent-seeking opportunities in publicly owned firms means that the opportunity cost of inefficiency is comparatively lower. And while we have thus far developed this inference in the context of public vs. private utilities, it has broader applicability. For example, Alchian and Kessel argue that all monopolies are subject to constraints on pecuniary returns and, hence, that the distinction between explicitly regulated monopolies and unregulated private monopolies is a false one. If the profits in a private monopoly are large, it faces the threat of public policy sanctions or antitrust action. Alchian and Kessel argue that the potential for profit “regulation” of the antitrust variety creates roughly the same incentive structure in “unregulated” private monopolies as in monopolies (such as utilities) with explicit rate of return limitations.

Our analysis also suggests that privately owned monopolies, regulated or otherwise, will have roughly the same incentives, that is, rent-seeking activity is not unique to explicitly regulated private enterprise. For example, unregulated private monopolies can expend resources to influence public policy by supporting political candidates sympathetic to their company’s interests, by swaying the determinants or outcomes of antitrust activity, or by influencing passage of legislation which protects their monopoly from potential entrants. Thus, in all privately
owned monopolistic enterprises there is a potential return on resources expended to obtain or to protect monopoly profits, and this return represents the opportunity value of non-cost-minimizing operations.

In sum, the existence of rent-seeking provides an additional analytical basis for predicting differences in the behavior of public vs. private enterprise, even when both types of firms face similar product market conditions and/or restraints on “permissible” pecuniary profits. Rent-seeking activity provides a mechanism whereby monopoly rights will be allocated to those privately owned firms that can (and do) use them most “profitably,” even where pecuniary constraints on owner wealth are ostensibly imposed during a current production period. This implies that the most productively efficient (least-cost) firms will acquire control of private monopoly rights through the allocative mechanism of rent seeking. While this mechanism tends to insure least-cost producers in the private sector—regulated or otherwise—the gain in production efficiency is offset by the welfare costs due to resources expended in the rent-seeking process, as stressed by Tullock, Krueger, and Posner. We return to this discussion of the net impact of rent seeking on the social costs of monopoly in the concluding section, but it is first appropriate to offer some evidence on our basic point—that rent-seeking activity is an important source of distinction between public and private enterprise.

III. Empirical Evidence

Differences in public and private enterprise have been observed empirically in several prior studies, although in many cases the theoretical underpinnings of these differences have been incorrectly specified. We offer some additional evidence on the differential incentive structures in privately regulated vs. publicly owned firms that is implied by our analytical framework. Specifically, we first examine the hypothesis that owners in private firms (even though subject to state regulation) have greater incentives to induce cost minimization by managers than their counterparts in public firms. Second, we compare the relationship between private firm efficiency and subsequently allowed rates of return under two different legal settings which would affect the feasibility (i.e. costs) of rent-seeking behavior.

A.

One type of incentive mechanism which has observable merit is the extent to which managers are residual claimants to efficient (present-value-maximizing) performance of the enterprise (see Alchian and Harold Demsetz). In settings where owners have strong incentives to generate cost-minimizing managerial conduct, we would expect the reward structure to be such that managers can capture or internalize directly portions of the gains of achieving this objective. Thus, we would predict that where there are strong pressures from owners to minimize operating costs, managerial compensation would be tied to the performance of this goal.

A model to examine and compare the residual claimant mechanism in private vs. public firms is specified as follows:

\[
\ln \left( \frac{Y_i}{A_i} \right) = B_1 \ln \left( \frac{1}{A_i} \right) + B_2 \ln \left( \frac{C_i}{A_i} \right) + B_3 \ln \left( \frac{R_i}{A_i} \right) + \mu_i
\]

where \( Y_i \) is a proxy for total managerial compensation.

5For examples and discussion of the theoretical mis-specification in previous empirical tests, see our paper, Crain and Robert Tollison, (1978); Louis DeAlessi, David Davies (1971; 1977), and Edwin Fugii and John Trapani.

6Data are not directly available on decision makers’ incomes in our sample of water utilities. We chose administration cost in each firm as a proxy for managerial compensation. Administration cost for water utilities in the United States consists of approximately 70 percent managerial salary and about 30 percent office expenses such as secretarial salary and fringe benefits to managers such as travel expenses, etc. (The information was obtained from Mr. Craft of the American Water Works Association, Denver, Colorado.) Since managerial compensation could vary...
\[ A_i = \text{total book value of the assets of firm } i, \text{ net of depreciation}^7 \]

\[ C_i = \text{average total operating costs of firm } i, \text{ including maintenance, wages, and depreciation}^8 \]

\[ R_i = \text{total sales revenues of firm } i^9 \]

\[ \mu_i = \text{a random disturbance term} \]

This is the basic form of the model that we employ to examine the determinants of managerial compensation within a given type of enterprise. It follows the statistical procedure used by Wilbur Lewellen and Blaine Huntsman.\(^{10}\) In order to make a statistical comparison of the incentive structures between public vs. private firms, we introduce a dummy variable, \( D_i \), into equation (1) which is equal to unity if firm \( i \) is privately owned, and equal to zero if firm \( i \) is publicly owned. The \( D_i \) is used to check for both shifts and qualitative interaction effects with the other exogenous variables as specified in

\[ \ln \left( \frac{Y_i}{A_i} \right) = B_1 \ln \left( \frac{1}{A_i} \right) + B_2 \ln \left( \frac{C_i}{A_i} \right) \]

\[ + B_3 \ln \left( \frac{R_i}{A_i} \right) + B_4 D_i \ln \left( \frac{C_i}{A_i} \right) \]

\[ + B_5 D_i \ln \left( \frac{R_i}{A_i} \right) + D_i + \mu_i \]

The results of estimating equation (2) using 1976 data on sixty public and fifty private water utilities are presented in equation (3). The \( T \)-ratios are in parentheses.

\[ \ln \left( \frac{Y_i}{A_i} \right) = 0.29 \left( \frac{1}{A_i} \right) \]

\[ - 0.01 \ln \left( \frac{C_i}{A_i} \right) + 0.78 \ln \left( \frac{R_i}{A_i} \right) \]

\[ (-0.11) \quad (9.85) \]

\[ - 0.13 D_i \left[ \ln \left( \frac{C_i}{A_i} \right) \right] \]

\[ (-2.33) \]

\[ - 0.03 D_i \left[ \ln \left( \frac{R_i}{A_i} \right) \right] - 1.53 D_i \]

\[ (-0.23) \quad (-2.70) \]

No. observed = 110; \( R^2 = 0.974; \ F(6,104) = 662.23 \). The findings presented in equation (3) indicate that in the privately owned firms managerial compensation is negatively and significantly related to operating costs. The estimated coefficient on \( C_i/A_i \) for the sample of private water utilities is significant at the .01 level. On the other hand, we observe no statistically significant relationship between operating costs and compensation for publicly owned firms. Managerial renumeration in both types of water utilities does appear to be affected systematically by firm revenues. The estimated coefficient for \( R_i/A_i \) is positive and significant at the .01 level. There does not appear to be any difference in this relationship across the two firms for reasons such as differences in the cost of living in each city, we weight the compensation variable for each firm by the cost-of-living index for the area in which the firm is located. The weighting factor for each firm was derived using total expenditures (budget) of a “high-income” family of four on a “typical” market-basket of goods in the cost of living in each area where a firm is located. The data on the cost of living were obtained from U.S. Department of Labor, Table 30, pp. 276–77.\(^8\) Net book value was obtained from American Water Works Association.\(^7\)

Average operating cost was determined by dividing total cost (including operating maintenance and depreciation costs) by the amount of water served to residential, commercial and industrial users. (See American Water Works Association.) Since a big portion of total cost is wages, and wages conceivably vary with the cost-of-living index, we weight the average cost by the cost-of-living index as explained in fn. 6 above.

Total sales revenues are the total receipts of each utility weighted by the cost-of-living index, as discussed in fn. 6. (See American Water Works Association.) Following Lewellen and Huntsman we divide each of the variables in equation (1) by assets \( A_i \) (the proxy for firm size) in order to eliminate problems of multicollinearity and heteroskedasticity. While Lewellen and Huntsman included measures of firm profitability in their empirical model of the determinants of managerial compensation, profitability is obviously not a useful parameter in our examination of publicly owned firms. Thus, our measure of operating costs \( C_i \) is substituted for profitability measures in order to check for the cost-minimizing determinant of managerial compensation.
types of firms, since the coefficient on $D_i[ln(R_i/A_i)]$ is not significant.\footnote{The relationship between a manager's compensation and the value of the wealth affected by his decisions is discussed in Alchian and William Allen (pp. 400, 795) and Crain and Tollison.}

This set of empirical results offers additional evidence on the different underlying conduct in public vs. private enterprise, even in an institutional setting where pecuniary profits in the private firms are constrained. The observable incentive structure facing managers in the private water utilities is one that rewards cost-minimizing behavior with higher managerial compensation packages. This is precisely the opposite type of incentive mechanism we would expect if owners did not want their enterprise to appear "too" profitable. Reward structures that induce cost-minimizing managerial behavior suggest that owners are indeed concerned about maximizing pecuniary returns, even though their access to current period profits are attenuated. Such returns in excess of current permissible rates may be useful in protecting or subsequently raising the permissible rates.

B.

The second type of empirical evidence that we offer concerns the relationship between operating efficiency in privately owned utilities and rates of return subsequently allowed by regulatory commissions in formal rate hearings. More specifically, we seek to examine further the pay off to regulated private firms (in terms of increases in allowed rates of return) from efficient performance. Our analysis suggests that private firms will have an incentive to operate efficiently in order to have more resources to devote to rent-seeking activity if these resources have a positive impact on future profits. In the specific context of rate-of-return regulatory settings, this implies that we should observe greater firm efficiency to be related positively to increases in allowed rates of return.\footnote{In his study of regulation of gas and electric industries in New York, Paul Joskow finds tentative support for the hypothesis that "highly efficient firms are treated somewhat better by the commission once they enter the formal hearing process" (p. 641). Joskow, however, does not elaborate on the rationale underlying this observation. Moreover, his empirical measure of efficiency takes the form of an all-or-none dichotomy which is determined by the regulatory commission's subjective commendation of a particular utility's service.}

We offer some additional evidence on the connection between firm efficiency and subsequent increases in allowed rates of return under two different policy settings. In some states the regulatory commissions permit regulated firms to make political contributions, to pay dues to trade associations for lobbying purposes, and/or to make expenditures for public relations in the rate-making process. In other states, however, the commissions have adopted policies that strictly disallow such activities directed at influencing the rate-making process by regulated firms (see U.S. Congress, p. 33).

We would thus expect the link between operating efficiency and the outcome of rate hearings to be more pronounced in those states where such expenditures are an accepted policy of regulatory commissions. This is not to say that rent-seeking expenditures will be eliminated in states where the commission does not legally allow regulated firms to devote resources for the purpose of influencing rate making. However, when these expenditures are illegal their prevalence should be deterred simply because of the added risk of sanctions or punishment.

The empirical model employed to examine these relationships is specified as follows:

$$ln(\Delta R_i) = b_0 + b_1 \ln(E_i) + b_2 D_i \ln(E_i) + b_3 \ln(PC_i) + b_4 D_i + \mu_i$$

where $\Delta R_i =$ the difference between the old rate (i.e. for the test year) and the new allowed rate of return granted by the regulatory commission to firm $i$; $E_i =$ proxy for efficiency in firm $i$ during the test year, defined as the amount of net revenue, weighted by the permissible rates of return in effect during the test year, per dollar value of firm assets; $PC_i =$ a proxy for projected cost in firm $i$, defined as the projected...
operating cost per dollar of "weighted" projected revenue. The weights are in terms of the new allowed rate of return. This weighting scheme is used because projected revenue in firm i is affected by the new allowed rate. The variable is used to control for the effect of expected differential increases in costs across firms; Di = a binary variable which is equal to unity if firm i is allowed to make political expenditures in the rate making process and equal to zero otherwise; and μi = a random disturbance term.

We estimate the coefficients in equation (4) using data on thirty-four rate cases heard by State Regulatory Commissions for the two types of regulated water utilities in 1974. The results of this estimation are presented as follows, t-ratios are in parentheses:

(5) \( \ln(\Delta R_i) = -19.81 - 3.91 \ln(E_i) \)  
\( + 4.18 D_i \ln(E_i) \)  
\( + 0.94 \ln(PC_i) + 20.5(D_i) \)

No. observed = 34; \( R^2 = 0.365; F(4,30) = 4.17 \).

The regression is significant at the .01 level, and the model "explains" roughly 36 percent of the variation in rates of return increases for the cross section of water utilities in 1974. The coefficient for the binary variable \( D_i \) is positive and significant at the .05 level, which supports the hypothesis that utilities experience greater increases in their allowed rates of return when rent-seeking expenditures are permitted by the State Regulatory Commissions. The coefficient on efficiency in states where utilities are allowed to make political expenditures in the rate-making process is positive and significant at the .05 level. This finding also offers evidence that greater operating efficiency increases the amount of funds which may be used to influence the outcome of formal rate hearings. For example, such funds could simply be used to hire better lawyers or more expert consultants. Finally, the coefficient on the variable controlling for expected cost increases \( PC_i \) is positive and significant at the .02 level.

As a final type of evidence on this point, we compare the mean of the differences between old rates of return (in the test year) and the rates of return granted by State Regulatory Commissions in 1974. The mean increase granted to utilities in states where the commissions's policy facilitates rent-seeking expenditures (i.e., where utilities are allowed to make political expenditures in the rate-making process) is 4.19 percent, and the mean increase in states that have adopted policies that inhibit rent-seeking expenditures is 2.53 percent. We can reject the hypothesis that these two means are equal at the .05 level in favor of the alternative hypothesis that rate increases are higher in those states with the former type of policy setting. This result offers additional support for our argument that inefficiency is not a "free good" even in rate-of-return regulated private utilities, because non-cost-minimizing behavior will predictably reduce the expected increases in rates of return. Moreover, in policy settings that more openly permit rent-seeking expenditures by firms, the relationship between operating efficiency and subsequently allowed profits is of a greater magnitude.

IV. Concluding Remarks: The Social Costs of Monopoly

The major purpose of this paper has been to stress the relevance of rent-seeking activity in expanding the predictive power of the property rights theory of the firm. The potential for private firms to influence their expected future profitability with rent-seeking expenditures means that observable differences should arise between public and private enterprise behavior even under apparently similar product market conditions. We note, however, that there is additional relevance for evaluating the social costs of
monopoly and regulation. First, we can predict that what managers may lose in terms of less work effort (i.e., X-inefficiency) or nonpecuniary returns (i.e., utility maximization), political entrepreneurs may gain through rent-seeking activity. That is, one consequence of rent seeking is that owners have incentives to redistribute wealth toward those individuals with political power to grant monopoly status. At one level this effect only represents a redistribution of wealth from managers in the private sector to those in the political sector. At a secondary level, however, it trades one sort of inefficiency for another, which tends to reinforce the case put forward by Tullock, Krueger, and Posner that rent-seeking activity represents a welfare cost from monopoly which exceeds the deadweight losses due to monopoly quantity restriction. Specifically, the incentive that we have described would tend to keep down production or "standard" operating costs in monopoly, which would consequently raise the level of rent-seeking expenditures above what they would be in the presence of X-inefficiency or non-pecuniary rewards.

REFERENCES


W. G. Lewellen and B. Huntsman, "Managerial..."


