The Efficiency of Equity in Organizational Decision Processes

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It is now widely accepted that *rent-seeking* (Anne Krueger, 1974) or *directly unproductive profit seeking* (Jagdish Bhagwati, 1982) may cause inefficiencies in the context of public sector decisions. The possibility that government decisions (for example, about taxes, quotas, franchises, or standards) may create or redistribute rents induces private parties to spend valuable resources to influence that distribution, even when such expenditures carry no social benefit. Moreover, the social cost of rent seeking can exceed the value of the resources spent trying to gain and protect rents, for example, because the fear of losing wealth through redistribution reduces the incentives for wealth creation.

Treating rent-seeking activities as characteristic of public sector decision processes ignores the fact that similar phenomena are to be found in firms, unions, and other private sector organizations. Our recent work (Milgrom, 1988; our 1988, 1990 papers) attempts to identify the advantages of decision processes (private or public) that permit rent seeking, and to incorporate these into a cost-benefit analysis of optimal decision processes.

Our work begins with an analysis of why rents and quasi rents arise in organizations and of the forms that the rent seeking they engender may take. Some measures to insulate the decision process from rent seeking, such as limits on the provision of information by interested parties or restrictions on the range of options considered, may degrade the quality of decisions, especially by blocking the flow of valuable information. Optimal decision processes balance the costs of rent seeking against the value of information obtained.

Several aspects of the rules affect the opportunities that members have to spend resources trying to alter the distribution of rents. To ascertain the possibilities for rent seeking, the analyst must ask questions like: Can the parties propose new initiatives at any time? Can they give volumes of testimony in a form of their own choosing? Can they appeal adverse decisions? Are decision makers obliged to respond to the parties' initiatives? Is the range of actions that they can take in response relatively broad, rather than being tightly constrained by property rights or other formal rules? More affirmative answers to these questions lead to more opportunities or greater incentives for costly rent seeking. As a kind of shorthand, we call decision processes that have more of these elements "more open" processes.

The very elements that make a process open to rent seeking may also add flexibility and responsiveness, helping to ensure that important ideas and proposals are fully considered. From this perspective, the benefits of openness can (in principle) be measured by a "value of information" calculation, in the usual manner of statistical decision theory. Weighing the costs and benefits, it follows that a more open process is more desirable when the rents available for redistribution are low, and the value of the information that might be acquired is high. Conversely, when the potential for redistribution is high and the value of information is low, the optimal decision process is less open.

This kind of reasoning helps to illuminate the variations in the decision processes that are found in many organizations. We have discussed a number of examples in our earlier work, including the characteristics of personnel departments, the contrasting patterns of decision making, employment and compensation in U.S. and Japanese firms,

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and the frequently manifested policy of limiting observable pay differentials.

As a further illustration, consider the way tenure decisions are made at Stanford University. The tenure appointment decision is one of the most important ones faced by the University, since mistakes in tenure appointments tend to remain in place for many years. For the party whose tenure is being decided, and for any untenured faculty member whose potential slot may be filled, the redistributive consequences of this decision may be very large. For the tenured faculty and those from other departments, the redistributive potential is much smaller. Accordingly, the detailed discussions of tenure decisions are mostly limited to other tenured faculty and are reviewed by a University Committee with representatives from other departments. Because of its importance, a successful tenure case will typically incorporate evidence of various kinds, the main restrictions being that sufficient information is supplied to make an accurate judgment and that outside experts in the candidate's field be consulted. For those who participate in this decision, the form of the permitted inputs are not highly structured; reports and letters can raise almost any issue that the writer deems relevant. But, for those most personally affected by the decision, an attempt is made to conceal the identities of the decision makers and to limit access to the decision process.

According to our theory, it is desirable to employ different sorts of processes for decisions with large or small redistributive consequences. It would then seem to follow that organizations will try to separate efficiency and redistributive issues, and to settle the latter issues first, so that they won't interfere with decisions about how best to create value. To some extent, this theoretical prediction is borne out in reality. At Stanford, for example, student housing priorities are fixed by lottery and then the students are permitted to choose from the housing that remains after higher priority students' choices have been filled. Similarly, airline flight attendants are given priority to bid for routes according to seniority. In both cases, the distributional issue is treated mechanically (by lottery or seniority rules), and the remaining efficiency aspect is delegated to the parties with the relevant information.

Nevertheless, in many situations, the expedient of separating the distributional and efficiency issues is not available or efficacious. For example, although some airlines employ the same process for assigning flight crews to routes as they do for cabin crews, this can be costly, as when the least-experienced pilot, copilot, and flight engineer all end up together on the same run that no one with more seniority wanted. A wage policy that provides compensating differentials to losers from a decision might also sometimes immunize value creation from distributional considerations. For several reasons, however, the policy of compensating differentials is not generally feasible. First, as we have argued elsewhere, the compensation system may be serving other important objectives, such as spreading risk, retaining key employees, motivating hard work, encouraging investment in human capital, and so on. Second, it is not generally possible to know how much compensation would make an individual neutral about a decision. Finally, the use of cash payments opens new opportunities for extortion, bribery, and other forms of costly rent seeking. For all these reasons, organizations must often manage decisions that have some significant distributional effects. Such situations are our concern here.

The theoretical model sketched below considers the process of making proposals for new activities or investments in an organization where a separation between efficiency and distributional issues cannot be achieved, and where the main providers of proposals, information, and analysis are the very same parties who are affected by the decisions. Under these circumstances, we show it is often optimal for the decision maker to commit to a policy of assessing alternatives according to their distributional impact or equity as well as to their contribution to the organization's overall objectives. The reason for this is that requiring some "fairness" in the distribution mitigates the incentives for rent seeking, and also may lead to better

overall proposals being generated. However, the decision maker must not pursue this concern with equity too far, because to do so risks destroying the incentives for those who propose projects to do their jobs well.

I. A Model of Project Proposal and Evaluation

We model an organization whose objective is to maximize the expected total (transferable) utility of its members. It is, at a minimum, controversial to assign no weight to equity concerns in discussing the organization's true objectives (Margaret Meyer and Dilip Mookherjee, 1987), but we make this assumption with an analytical point in mind. With no weight accorded to "equity" in the organization's exogenous objective, any concern for equity that emerges from the model is attributable to an endogenous concern for efficiency in the processes of generating alternatives and information and of making decisions.

We shall assume that there is a central coordinator for the organization who has the power to make decisions about project adoption, and who is chosen and compensated so that she has no personal interest in the outcome, but rather seeks the organizational goal. However, the members have better information than the coordinator about the possible projects, so it is they who generate proposals for projects that the organization might conduct.

Our main conclusions will be derived using variations of the following simple model. The organization has just two members, only one of whom generates proposals. A proposal is characterized by the utility pair (u, v) for the two members, where u is the utility accruing to the proposer, $(\bar{u}, \bar{v})$ is the default utility if no project is proposed or none is accepted, and 0 is the lower bound on each of the utilities across all possible projects. The proposer can generate projects $(u, v) \geq (0,0)$ at a personal cost $C(u, v)$ that is increasing in each argument. The central coordinator can observe any project (u, v) that is proposed, and has the power to accept or reject it. Assuming differentiability and convexity of C, the first-best is achieved when the proposer selects and the coordinator accepts a project that maximizes $(u+v)-C(u, v)$.

If the coordinator accepts all project proposals that increase the organization's performance ($u+v > \bar{u}+\bar{v}$), then the proposer will find it most profitable to generate proposals that maximize u subject to the acceptance constraint, rather than to generate proposals that maximize the organization's objective $u+v$. It is possible that this leads to no loss for the organization (if $C(u, v)$ takes the form $C(u+v)$) but, in general, u will be set too high and v too low compared to the organization's optimal levels (u^*, v^*). We shall suppose that to discourage this sort of choice, the coordinator has the power to commit herself to an acceptance policy, under which, for example, she accepts only proposals with $v \geq v^*$. In this simple model, the acceptance policy just described would lead to the first-best outcome for the organization provided that $u^* - C(u^*, v^*) \geq \bar{u}$, so that the proposer is willing to make a proposal.

A somewhat richer description of the optimal policy is obtained when we vary the model as follows. Suppose that the proposer cannot pick a project (u, v) exactly, but instead that when he aims for (u, v) and incurs costs $C(u, v)$, he gets a project $(\hat{u}, \hat{v})$, where the conditional distributions of $\hat{u}$ and $\hat{v}$ are $f_u(\hat{u}|u)$ and $f_v(\hat{v}|v)$, and where f_v exhibits the monotone likelihood ratio property, so that higher realizations of $\hat{v}$ are evidence of higher values of v. Suppose further that the proposer can conceal any project proposal, so that the only proposals that will be forthcoming are those with $\hat{u} \geq \bar{u}$. Finally, suppose that the coordinator can commit to an *acceptance policy* X according to which any proposal $(\hat{u}, \hat{v})$ that is made is accepted with probability $X(\hat{u}, \hat{v})$. With these assumptions, we reach the following basic conclusion.

PROPOSITION: (*Apparent Concern for "Equity"*) *The optimal project acceptance policy will accept or reject each project without randomization* ($X = 0$ *or* 1). *The only acceptable proposals are those with a high enough level of utility* $\hat{v}$ *for the nonproposer, where the*

requisite level may depend on $\hat{u}$. (*That is, if* $X(\hat{u}, \hat{v}) = 1$ *and* $\hat{v}' > \hat{v}$, *then* $X(\hat{u}, \hat{v}') = 1$.)[1]

This first model captures one of the efficiency-enhancing roles of equity concerns, but does not highlight the expenditure of resources in redistributive efforts that is typically labelled "rent seeking." To focus on that aspect of the decision problem, we return to the case where the proposer can choose (u, v) exactly, but we add the hypothesis that success in generating any proposal at all is not assured. The probability of generating a successful proposal may depend, in general, on the proposer's efforts p in searching out and developing the proposal and the other member's efforts q in blocking it.[2] More specifically, we assume:

(A1) The efforts of the two members to generate and block proposals are unobserved, but the actual proposal (u, v) is observed by the coordinator if it is made.

(A2) The probability that a successful proposal is made is $P(p, q)$, where p is the search effort of the proposer and q is the blocking effort of the other member. We assume that P is increasing in p and decreasing in q.

(A3) The cost functions $C(u, v, p)$ of the proposer and $K(q)$ of the other member are both smooth, increasing, and convex.

(A4) The proposer seeks to maximize his own personal utility, which is $P(p, q)u + [1 - P(p, q)]\bar{u} - C(u, v, p)$, and the other member seeks to maximize his, which is $P(p, q)v + [1 - P(p, q)]\bar{v} - K(q)$.

The central case for analysis is one in which the division of benefits from the proposal do not influence costs (i.e., $C(u, v, p) = C(u + v, p)$), so that incentive considerations alone determine how the benefits of the project ought to be shared between the two members. We call this the *cost-neutral* case. Let (u^*, v^*, p^*, q^*) be a "first-best" solution of the proposal problem, that is, a combination that maximizes $P(p, q)(u + v) + [1 - P(p, q)](\bar{u} + \bar{v}) - C(u, v, p) - K(q)$ without regard to the incentive constraints.

PROPOSITION: (*Acceptance Policy in the Cost-Neutral Case*) *Suppose that the proposer gains in moving from the status quo to the first-best* $(P(p^*, q^*)(u^* - \bar{u}) - C(u^*, v^*, p^*) \geq 0)$. *Then, in the cost-neutral case, the optimal acceptance policy achieves the first-best. The optimal policy consists of accepting just those proposals which set* $v \geq \bar{v}$.

In this cost-neutral case, the optimal acceptance policy has several effects. First, allowing the proposer to enjoy all the net benefits of the proposal aligns his interests with those of the organization and induces him to work hard at generating proposals. Indeed, with v fixed at $\bar{v}$, the proposer's choices of p and u will coincide exactly with the organization's most preferred choices, regardless of the cost function C. This makes it possible to delegate broad authority to the proposer subject only to the "equity constraint" that new proposals must not take anything away from other members. A second effect of this acceptance policy is that the other member is assured he will not be damaged by the new proposal, so that he will not resist it $(q = 0)$. The need to avoid excessive resistance to change is an important aspect of any real organizational decision system.

Using this central case as a basis, it is easy to examine related models in which some one aspect of the formulation is varied. For example, if the active cooperation of the other member can help to increase the probability P of a successful proposal, then the optimal v is larger than $\bar{v}$. In a related vein, H. Lorne Carmichael (1988) has explained the institution of tenure as an attempt to induce the active cooperation of existing faculty in selecting other outstanding new fac-

[1] This result can be proved as follows. First, solve the "relaxed optimization problem" in which it is assumed that the proposer needs only to be provided with incentives to set v high enough. Then, show that the solution to the relaxed problem has the hypothesized form. Finally, verify that the solution so obtained satisfies the other incentive constraints as well, and is therefore a solution to the original problem.

[2] The role of employees actively blocking the employer's interests is also discussed by Edward Lazear (1989), who investigates how pay equity can alleviate the problem.

ulty. He argues that without the guarantees of the tenure system, existing faculty might feel their own positions threatened, and so might prefer to hire mediocre colleagues. A second variation replaces the assumption that C depends only on p and $u+v$ with the related assumption that C is symmetric in (u, v) and *strictly* convex; the upshot is that it pays to set $u > v > \bar{v}$ in order to control costs. When the "other member" is an untenured junior faculty member, a different argument applies. Thus, suppose that C_v/C_u and K'' are large, so that it is costly to raise other member's utility v without damaging the senior faculty and the untenured member has little ability to interfere. Then it will be optimal to set v lower than $\bar{v}$, that is, to set a high standard for tenure.

An especially important variation on our model arises where the other member expends the organization's time and resources, rather than his own, in attempts to block an unfavorable decision. In terms of our formulation of the problem, this implies the $K(q)$ term remains in the organization's objective function but disappears from the other member's function. It is evident that protecting the other member becomes even more important in that case, for two reasons. First, as in the earlier model, the objections of the other member do double damage: they not only block the organization's decisions but they also add to its costs or detract from its performance. Second, because the cost of blocking is not borne personally by the other member, he is much more willing to set q high, that is, to oppose vigorously any proposed project that might damage his welfare. So, the extent of the damage done and costs borne may be greatly increased in this case.

In practice, of course, employees as members do use the organization's resources to fight personal battles: they take the organization's time to write memoranda, have them word processed by secretaries, and have them read and responded to by higher level managers. To the extent that the personal costs of these activities are much lower than the organizational costs, a failure to protect established interests with an "equity" provision in the acceptance policy can be very costly.

II. Extensions and Further Discussion

An interesting and important extension of the basic model is to the case where there are two or more proposers among the membership of the organization.[3] Some new features emerge in that analysis, and we summarize them here.

In terms of the model just studied, the main change is that the utility associated with a failed proposal is no longer specified exogenously as some $(\bar{u}, \bar{v})$, but is instead endogenous, being determined as a function of the proposals and efforts of others. In a cost-neutral model with competing proposers, it is still true that a first-best outcome can be achieved by setting the other member's utility sufficiently high, but in this case the correct level is the expected utility of the other member if the proposal were to fail. With that standard set for each proposer, one can again show that each proposer's objective corresponds exactly to the organization's objective, and that no other member has an incentive to expend personal resources to block or defeat another's proposal.

Here our formal models deal only with the proposing of projects, but the same general logic applies to their evaluation and implementation. Interested parties will tend to develop positive information and enhancements to support the projects that serve their own interests, neglecting projects that serve the larger interests of the organization. By favoring "equitable" projects, the coordinator can remove some of the bias that naturally afflicts project evaluations. A related but different point can be made concerning the implementation of projects and changes. If, as is often the case, the cooperation of many affected parties is important to make a new project a success, then there is a danger of some of the parties resisting the current project in the hopes of implementing an alternative that is more in accord with their interests. A policy that emphasizes equity

[3]Our 1986 paper showed in a somewhat different context how competition between proposers could be used to overcome severe informational disadvantages.

tends to limit this kind of resistance. Also, by allowing those responsible for successful implementation to get a larger share of the benefits, the coordinator can encourage active cooperation with the proposed projects.

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