Information, access, and contributions: A signaling model of lobbying*

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Abstract. Interest groups pay monetary contributions to gain access and provide information to a policymaker. If their interests are aligned with those of the policymaker's constituency, they have costless access and report their private information truthfully. If their interests conflict, they are forced to pay a strictly positive contribution in order to enhance the credibility of their reports. The policymaker bases her policy decision on the competing reports and the size of the contributions accompanying these reports. The interest groups' contribution decisions are plagued by a free rider problem. I derive the implications of this problem for the size and pattern of contributions and for the degree of information aggregation.

1. Introduction

Traditional models of rent-seeking view lobbying activities as a straightforward quid-pro-quo exchange of money for favorable political decisions (Krueger, 1974; Tullock, 1967, 1980; Becker, 1983; Snyder, 1990, 1991). A currently emerging literature complements this view, arguing that interest group lobbying plays an important informational role (Austen-Smith and Wright, 1991; Potters and van Winden, 1992; Austen-Smith, 1993; Ball, 1993; Heitshusen, 1993; Rasmusen, 1993). Policymakers are often imperfectly informed about the consequences of various policy alternatives for the wealth and well-being of their constituencies. In this situation, lobbying activities may have an impact on political decisions because of their information content, and not primarily because of the contributions made by interest groups to policymakers. According to Austen-Smith (1993), the currently dominant view of political contributions is that they buy access for interest groups who then attempt to convince policymakers that the desired policy decision would benefit the policymakers' constituencies. This view is also reflected in popular descriptions of lobbying activities directed at the U.S. Congress (Smith, 1988: Ch. 9; Birnbaum, 1992).

The informational role of contributions is formally analyzed by a number of scholars (Potters and van Winden, 1992; Ball, 1993; Austen-Smith, 1993). A representative model developed by Potters and van Winden can be summarized as follows. A policymaker can take one of two actions. The resulting payoffs for the policymaker and for an interest group depend on which of two states of the world is realized. The interest group is privately and perfectly informed about the state of the world. It can send a costly message to the policymaker to inform her decision. If the conflict of interest between the policymaker and the interest group and the cost of sending a message are not too large, the interest group's information can be fully revealed prior to the policymaker's decision. In an extension of the model, the cost is endogenized in the sense that the interest group can now determine the size of the cost that is to accompany its message. The cost is then chosen to ensure that the interest group's message is credible. As a result, the group's private information is fully revealed in equilibrium.

This literature analyzes the interaction between a policymaker and a single interest group. In many cases, however, the policymaker's decision is concerned with the provision of a differentiated-benefits collective good and thus affects the welfare of many different political constituencies, some of which are represented by active interest groups. In this situation, the lobbying activities of multiple heterogeneous interest groups – some of whose interests coincide, while others have conflicting interests – are plagued by a free rider problem (Olson, 1965). Informative political contributions can be thought of as voluntary and costly contributions to a public good: information.

This paper analyzes the free rider problem that arises in this setting. The model and its main implications can be sketched as follows. Both favorable and unfavorable information about the status quo is dispersed among heterogeneous interest groups. Any one group is very imperfectly informed; in the aggregate, the interest groups are well informed. Their private information is pertinent to the decision made by a policymaker who may overturn the status quo in favor of a policy alternative. Interest groups pay a contribution to gain access and provide information to the policymaker. If their interests are aligned with those of the policymaker's constituency, they have costless access and report their private information truthfully. If they have conflicting interests, they are forced to pay a strictly positive contribution in order to enhance the credibility of their reports.[1]

The policymaker extracts information from the competing groups' reports and the size of their contributions. She does not react mechanistically to the contributions made by the interest groups on each side of the issue. Instead, she uses the contributions to form an inference on the credibility of the groups' reports, taking into account the groups' incentives to inform or manipulate her decision. The status quo is overturned in favor of the policy alternative if the

number of *credible* reports made by the anti status quo forces relative to the corresponding number on the pro status quo side exceeds a critical threshold.

In this setting, contributions are not part of a quid-pro-quo exchange. Their only function is to enhance the credibility of the message they accompany. Given the public-good character of information, the interest groups' contribution decisions are subject to a free rider problem. Each group's incentives to contribute are determined by the marginal effect of its contribution on the policymaker's decision. For each group, the probability that its information (made credible by an appropriately chosen contribution) will be *decisive* for the policymaker's decision is small. As a consequence, the size of its contribution is small relative to the benefits it expects to derive from the policymaker's decision. Thus, the analysis implies that the contributions paid by interest groups will be small relative to the contributions that might be expected in a pure quid-pro-quo exchange of money for favorable policy decisions.

Perhaps surprisingly, the information dispersed among interest groups is fully aggregated in equilibrium despite the presence of the free rider problem. This informational gain is achieved at a deadweight loss, namely the total contributions paid by extremist interest groups.

The remainder of the paper is organized as follows. A formal model is developed in Section 2. Section 3 characterizes the interest groups' equilibrium lobbying strategies and beliefs and the policymaker's equilibrium decision rule and beliefs. Section 4 examines the implications of the free rider problem for the size and pattern of contributions and for the degree of information aggregation. I also discuss some normative implications of the analysis. In Section 5, I assess whether the traditional rent-seeking model of interest group competition can be thought of as a "reduced-form" description of the process by which interest group contributions influence political decision making.

2. The model

There are n interest groups, indexed $i = 1, \ldots, n$, where n is an odd number. Interest group i has the utility function

$$U_i = \begin{cases} -(1/2)(Q - s_i)^2 + q_i - c_i & \text{if the status quo Q is maintained,} \\ -(1/2)(A - s_i)^2 + a_i - c_i & \text{if the policy alternative A is implemented,} \end{cases} \quad (1)$$

where $0 \le Q < A \le 1$; s_i is a group-specific shock; q_i and a_i are additional benefits group i derives from the status quo and the policy alternative, respectively; and c_i is a contribution paid by interest group i, $c_i \in [0, \infty)$.[2] The shocks $s_1, \ldots, s_n$ are independently drawn from a uniform distribution $\beta(.)$
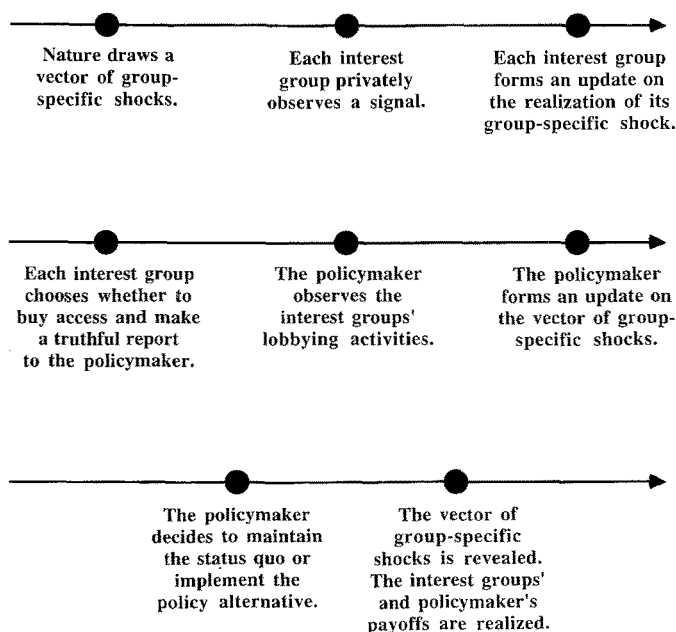
Figure 1. Time line.

over the unit interval. The interest groups' benefit parameters $p_1, \ldots, p_n$ are uniformly distributed between $-\bar{p}$ and $\bar{p}$, $\bar{p} > 0$, where $p_i \equiv a_i - q_i$.

The decision to maintain the status quo or to implement the policy alternative is made by a policymaker with aggregate welfare objectives.[3]

$$U_P = \sum_{i=1}^{n} U_i. \tag{2}$$

The time line is graphed in Figure 1. At the beginning of period 1, Nature draws a vector of n group-specific shocks, $[s_1, \ldots, s_n]$. Then each group i privately observes an independent realization of a binary signal σ. The probability that group i observes the realization $\sigma = 1$ is equal to s_i, while the probability of the realization $\sigma = 0$ is given by $1 - s_i$. Based on its realization of σ, each group i forms an inference on its shock s_i.

At the lobbying stage of the game, the interest groups are differentiated with respect to their benefit parameters $p_1, \ldots, p_n$ and their realizations of the signal σ. Formally, interest group i's lobbying strategy is given by two numbers, $r_i(\sigma) \in \{0,1,\emptyset\}$ and $c_i(\sigma) \in [0, \infty)$.[4] The reports $r_i = 0$ and $r_i = 1$ are understood to stand for "interest group i observed $\sigma = 0$" and "interest group i observed $\sigma = 1$," respectively, and these reports are accompanied by the con-

tribution c_i. If interest group i chooses not to buy access and report its observation ($r_i = \emptyset$), it pays a zero contribution.

The policymaker observes the access and contribution decisions made by each group and, if they bought access, their reports, $\{r_i, c_i\}_{i=1,\ldots,n}$. Based on this information, she forms an inference on the vector of shocks, $[s_1, \ldots, s_n]$. Formally, the policymaker's policy decision rule is given by $d(\{r_i, c_i\}_{i=1,\ldots,n})$ $\in \{0,1\}$.[5] She chooses whether to maintain the status quo ($d = 0$) or to overturn the status quo in favor of the policy alternative ($d = 1$).

After the policymaker's decision is made, the realized vector of shocks $[s_i, \ldots, s_n]$ is revealed. The players' payoffs are realized as a function of the policymaker's decision and the shock realizations.

A sequential equilibrium of the game is given by the interest group's lobbying strategies, $\{r_i(\sigma), c_i(\sigma)\}_{i=1,\ldots,n}$; their beliefs at the lobbying stage, $\{\beta(s_i | \sigma)\}$; the policymaker's decision rule, $d(\{r_i, c_i\}_{i=1,\ldots,n})$; and her beliefs at the policy decision stage, $\{\beta(s_i | \{r_i, c_i\})\}_{i=1,\ldots,n}$. These best responses and beliefs are consistent with each other and fulfill the following conditions:

(E1) Interest group i's lobbying strategy $\{r_i(\sigma), c_i(\sigma)\}$ maximizes its expected utility at the lobbying stage, $E(U_i | \sigma)$, where E is an expectations operator.

(E2) Interest group i uses Bayes' Rule to update that $\beta(s_i | \sigma)$ is the posterior density of the shock s_i conditional on the information σ.

(E3) The policymaker's decision rule $d(\{r_i, c_i\}_{i=1,\ldots,n})$ maximizes her expected utility at the policy decision stage, $E(U_P | \{r_i, c_i\}_{i=1,\ldots,n})$.

(E4) The policymaker uses Bayes' Rule to update that $\beta(s_i | \{r_i, c_i\})$ is the posterior density of the shock s_i conditional on the information $\{r_i, c_i\}$.

The equilibrium concept employed is a refinement of sequential equilibrium (Kreps and Wilson, 1982). The concept of sequential equilibrium restricts each interest group to use Bayes' Rule to update on its group-specific shock s_i after being privately informed of its type σ. Similarly, the policymaker is restricted to form an Bayesian update on the vector of shocks $[s_1, \ldots, s_n]$ upon observing the interest groups' lobbying activities, $\{r_i, c_i\}_{i=1,\ldots,n}$. The interest groups' and the policymaker's updates are based on their common knowledge about the interest groups' lobbying strategies and beliefs, the policymaker's decision rule and beliefs, and their common priors on Nature's actions.

One characteristic of an equilibrium is that players do not have incentives to deviate from their equilibrium strategies. In some cases, the deviation of an interest group from its equilibrium lobbying strategy is observed with probability zero in equilibrium. The group's incentives to deviate will depend on its expectations about the policymaker's response to such an out-of-equilibrium

observation. However, the assumption of Bayesian rationality does not place restrictions on the policymaker's out-of-equilibrium inferences.

To close the model, I refine the equilibrium concept. The motivation underlying the refinement is that interest groups make random mistakes (Selten, 1975); that is, some interest groups might mistakenly not follow their equilibrium prescriptions. The following restrictions are imposed on the policymaker's out-of-equilibrium beliefs. If the equilibrium prescription for group i is to send a pro (anti) status quo report after buying access to the policymaker, and group i instead sends an anti (pro) status quo message, the policymaker's inferences are formed as if the group had sent a pro (anti) status quo report. If group i is known to buy access and send either a pro or an anti status quo report, but it fails to buy access and make a report, then the policymaker updates as if the group had made a pro status quo report. (It makes no difference for the results of the analysis if the policymaker is assumed to update as if the group had made an anti status quo report.) If the equilibrium prescription for group i is to make a zero contribution to the policymaker, and it instead makes a strictly positive contribution, then the policymaker forms her inferences as if that group had made a zero contribution. Finally, if group i is known to make either a zero contribution or the positive contribution $\tilde{c}_i$ in equilibrium, and it instead pays $c_i \in (0, \tilde{c}_i)$ or $c_i \in (\tilde{c}_i, \infty)$, then the policymaker updates as if the group had made a zero contribution or the contribution $\tilde{c}_i$, respectively.

3. Characterization of equilibrium

The following proposition characterizes the interest groups' equilibrium lobbying strategies and beliefs at the lobbying stage, as well as the policymaker's equilibrium decision rule and beliefs at the policy stage.

Proposition

$$r_i(\sigma) = \begin{cases} 0 & \text{if } p_i \in [-\bar{p}, \bar{p}] \text{ and } \sigma = 0, \\ 1 & \text{if } p_i \in [\underline{p}, \bar{p}] \text{ and } \sigma = 1, \\ \emptyset & \text{if } p_i \in [-\bar{p}, \underline{p}) \text{ and } \sigma = 1, \text{ or if } p_i \in (\bar{p}, \bar{p}] \text{ and } \sigma = 0; \end{cases} \tag{3}$$

$$c_i(\sigma) = \begin{cases} 0 & \text{if } p_i \in [\underline{p}, \bar{p}], \\ \tilde{c}_0 & \text{if } p_i \in [-\bar{p}, \underline{p}) \text{ and } \sigma = 0, \\ \tilde{c}_1 & \text{if } p_i \in (\bar{p}, \bar{p}] \text{ and } \sigma = 1; \end{cases} \tag{4}$$

$$\beta(s_i \mid \sigma) = \begin{cases} 2(1 - s_i) & \text{if } \sigma = 0, \\ 2 s_i & \text{if } \sigma = 1; \end{cases} \tag{5}$$

$$d(\{r_i, c_i\}_{i=1,\ldots,n}) = d(N) = \begin{cases} 0 & \text{if } N < \tilde{N}, \\ 1 & \text{if } N \geq \tilde{N}; \end{cases} \tag{6}$$

$$\beta(s_i \mid \{r_i, c_i\}) = \begin{cases} 2\,(1-s_i) & \text{if } p_i \in [-\bar{p}, \underline{p}) \text{ and } r_i = 0 \text{ and } c_i = \tilde{c}_0, \\ & \text{or if } p_i \in [\underline{p}, \tilde{p}] \text{ and } r_i = 0 \text{ and } c_i = 0, \\ & \text{or if } p_i \in (\tilde{p}, \bar{p}] \text{ and } r_i = \emptyset \text{ and } c_i = 0, \\ 2\,s_i & \text{if } p_i \in [-\bar{p}, \underline{p}) \text{ and } r_i = \emptyset \text{ and } c_i = 0, \\ & \text{or if } p_i \in [\underline{p}, \tilde{p}] \text{ and } r_i = 1 \text{ and } c_i = 0, \\ & \text{or if } p_i \in (\tilde{p}, \bar{p}] \text{ and } r_i = 1 \text{ and } c_i = \tilde{c}_1; \end{cases} \tag{7}$$

where $\underline{p}$, $\tilde{p}$, $\tilde{c}_0$ and $\tilde{c}_1$ are given by

$$\tilde{p} = (Q - A)\,[(1/3) - (Q + A)/2], \tag{8}$$
$$\underline{p} = (Q - A)\,[(2/3) - (Q + A)/2], \tag{9}$$
$$\tilde{c}_0 = 1/3\,(A - Q)\,b(n - \tilde{N};\, n - 1,\, 1/2), \tag{10}$$
$$\tilde{c}_1 = 1/3\,(A - Q)\,b(\tilde{N} - 1;\, n - 1,\, 1/2), \tag{11}$$

$b(b_1;\, b_2,\, b_3)$ is the binomial probability that b_2 Bernoulli trials will result in b_1 successes when the probability of a success is given by b_3; N is the number of interest groups that satisfy either $p_i \in [-\bar{p}, \underline{p})$ and $r_i = \emptyset$ and $c_i = 0$, or $p_i \in [\underline{p}, \tilde{p}]$ and $r_i = 1$ and $c_i = 0$, or $p_i \in (\tilde{p}, \bar{p}]$ and $r_i = 1$ and $c_i = \tilde{c}_i$; and $\tilde{N}$ is the natural number that solves

$$\tilde{N} \geq n\,(Q + A)/2, \tag{12}$$
$$\tilde{N} - 1 < n\,(Q + A)/2. \tag{13}$$

Proof

Bayes' Rule implies that the interest groups' beliefs at the lobbying stage are given by equation (5). Interest groups of type $\sigma = 1$ tend to be more favorably disposed towards the status quo than are groups of type $\sigma = 0$. Moreover, interest groups with high benefit parameters tend to prefer the policy alternative, while groups with low benefit parameters tend to favor the status quo. Thus, the policy preferences of group i depend both on its private information σ and on its benefit parameter p_i.

The interest groups' policy preferences determine their decisions whether to buy access and provide truthful information to the policymaker. They rationally anticipate the policymaker's decision rule at the policy decision stage: the status quo will be overturned in favor of the policy alternative if the number
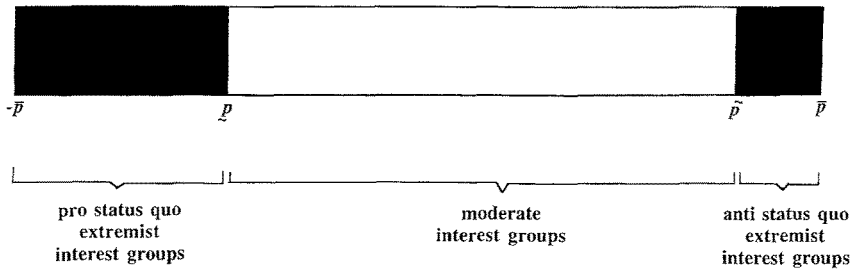
Figure 2. The pattern of access, contributions and reports.

of credible reports made by the anti status quo forces relative to the corresponding number on the pro status quo side exceeds a critical level.

The equilibrium at the lobbying stage is characterized by two political action cutpoints, $\tilde{p}$ and p, that separate moderate and extremist interest groups on each side (see Figure 2).

An interest group of type $\sigma = 0$ whose benefit parameter is exactly equal to $\tilde{p}$ is indifferent between the status quo and the policy alternative. The cutpoint $\tilde{p}$ solves the indifference condition (9). Similarly, an interest group of type $\sigma = 1$ whose benefit parameter is exactly equal to p is indifferent between the status quo and the policy alternative. The cutpoint p solves the indifference condition (9). Interest groups whose benefit parameters lie in the interval $(p,\tilde{p})$ have a strict preference for the status quo if they are of type $\sigma = 0$ and strictly prefer the policy alternative if they are of type $\sigma = 1$. I will refer to groups of type $i \in [p,\tilde{p}]$ as moderates.[6] Interest groups whose benefit parameters lie in the interval $[p,p)$ have a strict preference for the status quo independently of their private information, while all those whose benefit parameters lie in the interval $(\tilde{p},\bar{p}]$ strictly favor the policy alternative. These groups will be classified as extremists.

Once moderates gain access to the policymaker, they have incentives to report their private information truthfully; that is, a moderate interest group whose benefit parameter is given by p_i reports $r_i = 0$ if it is of type $\sigma = 0$ and $r_i = 1$ if it is of type $\sigma = 1$. Since the policymaker is aware of the moderates' incentives to send truthful messages, their reports are credible independent of the contribution they paid to gain access, and the policymaker is willing to grant them access at zero cost. Moderates thus gain costless access and make truthful reports.

Pro status quo extremists who gain access to the policymaker have incentives to report $r_i = 0$ independently of their private information in the hopes of increasing the likelihood that the status quo is maintained. However, the policymaker is aware of their incentives to manipulate her decision. In the absence of costly contributions, extremists' reports are uninformative. To

enhance the credibility of its report, a pro status quo extremist group whose benefit parameter is given by p_i and who is truly of type $\sigma = 0$ must buy access with a contribution of size $\tilde{c}_0$. The size of this contribution is sufficiently high to ensure that group i would not have incentives to make this payment if it is in fact of type $\sigma = 1$. On the other hand, group i has no incentives to pay more than the minimum contribution that will convince the policymaker that it is of type $\sigma = 0$. Thus, the size of contribution is exactly equal to the difference between the expected utility that group i expects to derive from a favorable policy decision, multiplied by the expected probability that its report is decisive for the policymaker's decision, if it is truly of type $\sigma = 0$, on the one hand, and the corresponding expected utility expression if it is in fact of type $\sigma = 1$, on the other hand.[7]

For a pro status quo extremist of type σ, the expected benefits from a favorable policy decision are given by

$$(Q-A) \left[\int s_i \, \beta(s_i|\sigma) \, ds_i - (1/2)(Q+A) \right] - p_i, \tag{14}$$

and her estimated probability that a credible report $r_i = 0$ will be decisive is given by

$$b(n-\tilde{N}; n-1, 1/2), \tag{15}$$

where $\tilde{N}$, the critical number of interest groups revealed to be of type $\sigma = 1$, solves equations (12) and (13). It follows that the equilibrium contribution $\tilde{c}_0$ paid by a group of type $\sigma = 0$ whose benefit parameter p_i lies in the interval $[\underline{p}, p)$ solves the indifference condition (10).

All pro status quo extremists of type $\sigma = 1$ are better off not buying access to the policymaker. They do not find it worthwhile to pay $\tilde{c}_0$ for the privilege of making a report, and if they pay less than this amount, their reports have no more impact on the policymaker's decisions than if they abstained from buying access and making a report.

Anti status quo extremists who gain access to the policymaker have incentives to report $r_i = 1$ independently of their private information in the hopes of increasing the likelihood that the status quo is overturned. To enhance the credibility of its report, an anti status quo extremist group whose benefit parameter is given by p_i and who is truly of type $\sigma = 1$ must buy access with a contribution of size $\tilde{c}_1$. The size of this contribution is exactly equal to the difference between the expected utility that group i expects to derive from a favorable policy decision, multiplied by the expected probability that its report is decisive for the policymaker's decision, if it is truly of type $\sigma = 1$, on the one hand, and the corresponding expected utility expression if it is in fact of type $\sigma = 0$, on the other hand.[8]

For an anti status quo extremist of type σ, the expected benefits from a favorable policy decision are given by

$$(A - Q) \left[\int s_i \ \beta(s_i \vert \sigma) \ ds_i - (1/2)(Q + A) \right] + p_i, \tag{16}$$

and her estimated probability that a credible report $r_i = 1$ will be decisive is given by

$$b(\tilde{N} - 1; n - 1, 1/2). \tag{17}$$

It follows that the equilibrium contribution $\tilde{c}_1$ paid by a group of type $\sigma = 1$ whose benefit parameter p_i lies in the interval $(\tilde{p}, \bar{p}]$ solves the indifference condition (11). All anti status quo extremists of type $\sigma = 0$ prefer not to buy access to the policymaker. They do not find it worthwhile to pay $\tilde{c}_1$ to make a report, and if they pay less than this amount, their reports have no more impact on the policymaker's decisions than if they abstained from buying access and making a report.

Thus, the interest groups' lobbying strategies are summarized by the cut-point rules given in equations (3) and (4).

It is worthwhile noting that the contributions that will be observed in equilibrium, $\tilde{c}_0$ and $\tilde{c}_1$, are small relative to the benefits expected from a favorable decision [compare equations (10) and (14), (11) and (16)]. This is due to the free rider problem that arises in this setting. The contribution decision made by an extremist group takes into account not only the benefits expected from a favorable decision, but also the probability that its report (made credible by an appropriately chosen contribution) will be decisive for the policymaker's decision.

At the policy decision stage, the policymaker observes the access and contribution decisions made by each group, as well as the messages sent by the groups who bought access. Since moderate groups choose to gain access at zero cost and make truthful reports, the policymaker perfectly infers how many of the moderates are of type $\sigma = 0$ and $\sigma = 1$. Moreover, the policymaker knows that any pro status quo extremist i who bought access at cost $\tilde{c}_0$ is of type $\sigma = 0$, while all other pro status quo extremists are of type $\sigma = 1$. Similarly, any anti status quo extremist i who bought access at cost $\tilde{c}_1$ is of type $\sigma = 1$, while all other anti status quo extremists are of type $\sigma = 0$. It follows that the policymaker's beliefs are summarized by equation (7).

The policymaker forms a perfect inference on the vector of group-specific shocks $[s_1, \dots, s_n]$ based on the number of pro and anti status quo reports and on the contributions accompanying these reports. The information held by moderates is fully revealed. Perhaps more surprisingly, the information dispersed among extremist interest groups is also fully aggregated despite the free

rider problem. Different informational types are able to differentiate themselves and thus transmit their information by making monetary payments.

Given the policymaker's aggregate welfare objectives, her policy decision depends on the total number of interest groups who are revealed to be of type $\sigma = 1$, N. If this number exceeds the critical threshold $\tilde{N}$, then the policymaker updates that she is better off overturning the status quo in favor of the policy alternative. Similarly, if the number of interest groups who are revealed to be of type $\sigma = 0$ is strictly greater than $n - \tilde{N}$, the policymaker prefers to maintain the status quo. It follows that the status quo will be overturned in favor of the policy alternative if the number of interest groups who are revealed to be of type $\sigma = 1$ is sufficiently high; otherwise the status quo will be maintained. The policymaker's decision rule is thus summarized by the cutpoint rule in equation (6).

4. Implications of the analysis

In this section I first discuss the positive implications of the analysis, summarized in three corollaries, for the size and pattern of contributions and the degree of information aggregation. I then address some normative implications of the analysis.

Corollary 1. The contribution made by an interest group is small relative to the benefits it expects to derive from the policymaker's decision.

The monetary payments made by extremists can be thought of as voluntary and costly contributions to a public good: information. The interest groups' contribution decisions are plagued by a free rider problem. Each group's incentives to contribute are determined by the marginal effect of its contribution on the policymaker's decision. The size of the contribution is determined by credibility considerations only. An extremist group that wishes to make a credible report must accompany its report with a monetary payment that is sufficiently high to ensure that it would not find it worthwhile to pay that contribution if its informational type was different from the one it claims to be. The probability that any one group's information (made credible by an appropriately chosen contribution) will be decisive for the policymaker's decision is small. As a consequence, the equilibrium contribution is small relative to the benefits the group expects to derive from the policymaker's decision.

The analysis thus motivates why interest groups often appear to receive valuable political prizes in exchange for relatively small contributions.[9] Two examples might serve to illustrate this result. In 1985 individual insurance companies contributed a total of $129,326 to Senator Robert Packwood of Oregon, the

chairman of the tax-writing Finance Committee in the Congress (Smith, 1988: 260). For these companies, the tax-exempt status of fringe benefits such as health insurance, life insurance and pensions is worth millions. In the same year Japanese firms and agencies spent $23.5 million to lobby the U.S. government (Smith, 1988: 270). While this number may be considered shockingly high by the general public and the media, it is surprisingly low given the huge stakes Japanese firms and their government have in U.S. trade policy decisions, arguably in the order of hundreds of millions of dollars.[10]

Corollary 2. Moderate interest groups have costless access, while extremists pay a strictly positive contribution to gain access.

The pattern of contributions is determined by the degree to which the policy preferences of the interest groups coincide with the policymaker's. Interest groups whose policy preferences are aligned with those of the policymaker's constituency have incentives to make truthful reports and thus have costless access. Interest groups with conflicting preferences have incentives to manipulate the policymaker's decision. They are forced to pay strictly positive contributions to ensure that their reports are credible.

An example might serve to illustrate this result. Tobacco interests have easy access to senators from tobacco states like North Carolina or Kentucky. In contrast, the American Tobacco Growers Association must pay a contribution to gain access to and influence the vote of a senator from Missouri that has only one county with about eight tobacco farms (Smith, 1988: 258).

A rigorous empirical assessment of this result exceeds the compass of this paper, but some considerations that would have to be taken into account in an empirical test are briefly discussed.

Conceptually, two types of contributions can be distinguished. This paper is concerned with informative contributions that enhance the credibility of a message with the objective of influencing the policy decision made by an incumbent. In many cases, contributions fulfill a different purpose, namely to affect the electoral chances of political candidates whose policy positions are taken as given (see Morton and Cameron, 1992, for a survey). In the latter case, we would expect to observe a positive correlation between the policy preferences of contributors and the candidates they support. For example, labor political action committees (PACs) typically support pro labor members of Congress, while pro business PACs gravitate towards pro business types (Smith, 1988: 259). In contrast, if contributions play primarily an informational role, my analysis implies a negative correlation between the policy preferences of contributors and the incumbent recipients of their contributions. For example, in the 1986 senatorial election campaigns, 150 PACs contributed to seven incumbent Republican senators who subsequently lost their seats. These PACs

subsequently donated $268,700 to the Democratic challengers who won (Smith, 1988: 262). PACs commonly help winning candidates reduce their campaign debts, even if they supported the other side during the election campaign.

The situation is further complicated if contributions driven by electoral and access considerations are partial substitutes (McCarty and Rothenberg, 1993). My analysis suggests that an interest group pays a low price of access if her policy preferences are closely aligned with those of the incumbent policymaker, and a high price otherwise. Thus, the interest group may have incentives to contribute to the election campaign of a candidate with similar policy preferences in order to increase the candidate's electoral chances and gain low-cost access in the event that the candidate wins.

Moreover, due to a timing assumption made in the model, my analysis applies only to a fraction of total contributions made to political incumbents. I assume that contributions are given prior to a policy decision but *after* private information is acquired. Arguably, this kind of situation may arise at any time during a Congressional term. In contrast, the timing of Congressional elections implies that electorally motivated contributions will be concentrated in the second half of even-numbered years. Thus, my signaling hypothesis might be tested by examining the correlation between the policy preferences of contributors and incumbent policymakers for contributions that are made in odd-numbered years and in the first half of even-numbered years.

Corollary 3. The information dispersed among the interest groups is fully revealed.

The analysis implies that the interest groups' private information is fully aggregated in equilibrium despite the free rider problem. This result is sensitive to a number of assumptions.

First, the degree of information aggregation is affected by the dimensionality of the message space relative to the complexity of the information that is to be transmitted. In my model, the interest groups' private information is binary in nature, and it is transmitted via reports and costly contributions. Since monetary payments are part of the "message space," different informational types can differentiate themselves and credibly transmit their private information. In general, dispersed information will not be revealed or only be partially aggregated if the message space is too low-dimensional to allow for different informational types to separate themselves through their actions.

The implication of full information aggregation derived in this paper contrasts with Lohmann's (1993a, 1993b, 1994) conclusion that information will be trapped among extremists. These papers analyze the aggregation of information through anonymous "grassroots" political action. Activists reveal their opposition to the status quo by being counted as part of a protest move-

ment; by assumption, they cannot express the intensity of their opposition through monetary payments. In contrast, the model developed here assumes that the policymaker is informed about whether any one interest group is an extremist or moderate, and that the groups transmit their private information through reports and monetary contributions.

Finally, the result of full information aggregation depends on the assumption that the group-specific shocks $s_1, \ldots, s_n$ are independently drawn. If the shocks are correlated, then the signal privately observed by any one group will be informative about the shocks experienced by other groups. In this situation, each interest group will have incentives to condition her lobbying strategy on the information revealed by her report being decisive.[11] The report and contribution made by a pro status quo group i will depend on her expectation of the shock s_i that is based on exactly $n - \tilde{N}$ other groups being of type $\sigma = 0$. Similarly, the lobbying strategy of an anti status quo interest group j will depend on her expectation of the shock s_j that is based on exactly $\tilde{N} - 1$ other groups being of type $\sigma = 1$.[12]

From a normative point of view, it is interesting to consider the effect of a cap on political contributions. The model could easily be modified by restricting the payment c_i to be chosen from the interval $[0, \bar{c})$, where $\bar{c}$ is the maximum possible contribution that can be made by group i, $0 < \bar{c} < \infty$. The results of the analysis would not change if this constraint is not binding in equilibrium. This could plausibly be the case, given the implication that the size of the contributions will be "small" in equilibrium. On the other hand, if the constraint is binding, then extremist groups will be unable to credibly transmit any information, and aggregate welfare will be lower.

In my setting, legal restrictions on political contributions are counterproductive because contributions play a purely informational role that is socially beneficial. This informational gain dominates the associated deadweight loss, namely the total contributions paid by extremist interest groups.

My analysis can be usefully contrasted with a model developed by Ball (1993). He assumes that the policymaker's utility function is a weighted sum of social welfare and of the transfers (cash or political support) provided by an interest group. The policymaker is incompletely informed about the preferences of the interest group that is given some weight in the social welfare term. The interest group announces a schedule of transfers that will be made to the policymaker contingent on the policymaker's policy decision. The policymaker then selects a policy and receives the promised transfer. The announced transfer scheme is informative about the interest group's preferences. By informing the policy decision, the interest group's lobbying activities increase social welfare. On the other hand, the policymaker's decision is distorted away from the social optimum, favoring the interest group at the expense of society at large. Ball's welfare analysis trades off the positive informational role of contri-

butions against the negative effects of the resulting policy distortions.

The policy distortion result is driven by the assumption that the policymaker is "self-interested" in the sense that she derives utility not only from social welfare, and thus from the information conveyed by the announced transfer scheme, but also from the transfers per se. It is often postulated that office motivated politicians derive utility from contributions because they can use these funds to advertise their candidacy to uninformed voters in a future election campaign (Magee, Brock and Young, 1989; Baron, 1991). A complete welfare analysis would also take into account the social losses due to policy distortions and the social gains generated by the informational role of contributions in election campaigns and political decision making.

5. A reassessment of the standard rent-seeking model

My analysis allows me to reexamine the assumptions underlying the standard rent-seeking model of interest group competition. This model is based on Tullock's (1980) influential analogy of a lottery. In his setting, n competing groups, indexed $i = 1, \ldots, n$, each spend some resources on rent-seeking, R_i. The probability P_i that interest group i is successful in gaining a favorable policy decision depends on the size of the resources it spends relative to its competitors, as specified by the following rent-seeking success function:

$$P_i = \alpha_i R_i / \sum_{j=1}^{n} \alpha_j R_j, \tag{18}$$

where α_i is a relative weight on the resources of interest group i that allows for the possibility that the impact of the resources spent differs across groups, $0 < \alpha_i < 1, \sum_{j=1}^{n} \alpha_j = 1$.

A number of scholars have argued that this rent-seeking success function "black boxes" the object of study: the channels by which the resources spent by competing interest groups affect political decision making (Nelson, 1988; Potters and van Winden, 1992; Riezman and Wilson, 1992). Moreover, the lottery analogy suggests that the political prize in question is a private good. In many cases, however, the prize is more accurately characterized as a differentiated-benefits collective good. A political decision typically has differential effects on the wealth and well-being of multiple political constituencies, some of which are represented by active interest groups. In this situation, the rent-seeking activities of interest groups will be plagued by the standard free rider problem.

This paper provides an informational microfoundation for competitive lob-

bying directed at the provision of a differentiated-benefits collective good. I explicitly model the lobbying incentives of interest groups and the incentives of a policymaker to respond to their lobbying activities, thereby allowing for an analysis of the free rider problem. The model can be used to examine whether the standard rent-seeking success function can be thought of as a "reduced-form" description of the process by which interest group contributions influence political decision making.

My analysis suggests that the policymaker does not simply respond mechanistically to the contributions paid by competing interest groups. Instead, the policymaker takes into account the incentives of different interest groups to inform or manipulate her decision. Moderate groups do not have to pay a contribution to influence the policymaker's decision, while extremist interest groups must buy access at a cost. As a crude approximation, differences in the mapping of contributions into political influence across groups might be captured by appropriately chosen relative weights α_i in equation (18).

Notes

1. The idea that individuals may choose to take costly actions to differentiate themselves from other "types" was originally expressed by Spence (1973).
2. The model could easily be modified by allowing for a wealth constraint such as $c_i \in [0, \bar{c})$, where $\bar{c}$ is the maximum possible contribution that can be made by group i, $0 < \bar{c} < \infty$. The effect of such a constraint is discussed in Section 4.
3. The interest groups can be thought of as organized, well-informed and active members of a society. The qualitative results of the analysis would not be affected if the policymaker also placed some weight on the utilities of individuals who are unorganized, ill-informed or inactive. It is also worthwhile noting that the analysis does not depend on the contributions entering the policymaker's utility function, since these are sunk costs at the time of the policy decision. In Section 4 I will discuss the possibility that the policymaker derives positive utility from the interest group's contributions, perhaps because she can use the contributions to advertise her candidacy in a future election campaign.
4. In the equilibrium characterized in Section 3, mixed strategies are dominated except in knife-edge cases.
5. See note 4.
6. Without loss of generality, the knife-edge indifferent groups of type $\underline{p}$ and $\bar{p}$ will be counted as moderates.
7. I assume that an interest group chooses to buy access if it is exactly indifferent between making this contribution in order to gain access to the policymaker and not doing so.
8. See note 7.
9. An alternative explanation is provided in Rasmusen and Ramseyer (1994). The intuition underlying their analysis is as follows. Consider a legislature that passes legislation by simple majority rule. If the members of the legislature expect a bill to pass by more than a simple majority, then no single legislator is decisive for the outcome. Thus, a legislator whose utility function is defined over legislative outcomes and monetary contributions would be willing to accept an infinitesimally small bribe to vote one way or the other.
10. Snyder's (1990) work suggests that the rate of return on monetary contributions given in elec-

tion campaigns for the U.S. House of Representatives is fairly low. However, his analysis is based on the assumption that campaign contributions are given to a candidate in exchange for private benefits (such as special tax exemptions) that are realized if the candidate is elected. Once contributors take into account the effect of their contributions on the election probabilities of competing candidates, a free rider problem arises that will tend to dampen electorally motivated contributions (McCarty and Rothenberg, 1993).

11. This insight is due to Austen-Smith (1990) and Feddersen and Pesendorfer (1993).

12. A solution procedure for the case of perfectly correlated shocks is provided in Lohmann (1994), albeit for a slightly different setting.

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