CAMPAIGN CONTRIBUTIONS AND ACCESS

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An important and pervasive view of campaign contributions is that they are given to promote access to successful candidates under circumstances when such access would not ordinarily be given. In this story, access is valuable as it offers groups the opportunity to influence legislative decisions through the provision of policy-relevant information. Under complete information regarding donors’ policy preferences, I argue that this model predicts a negative relationship between contributions and the extent to which the groups’ and the recipient legislators’ preferences are similar. However, one of the more robust empirical findings in the literature is that this relationship is positive. Relaxing the informational assumption on donors’ preferences, I reexamine the access story with a model in which campaign contributions can act as signals of policy preference and the (informational) value of access to any agent is endogenous.

The relationship between campaign contributions and access to legislators is typically seen as a close one, although exactly what it is that makes access worth “buying” is subject to some debate (Hall and Wayman 1990, 800). There are (at least) three, by no means mutually exclusive, perspectives on what access secures. From the first perspective, the one most prevalent in the formal literature, access is simply a euphemism for a donor securing the given private return on an investment of a contribution; indeed, access is typically implicit (Baron 1989, 1994; McCarty and Rothenberg 1993; Snyder 1990). A second perspective is that access is primarily symbolic, groups seeking access to signal their importance and so maintain and increase their membership. Under this view, access is granted by a legislator purely to secure contributions, and any consequent group influence over legislators is largely incidental (“Groups that pressure or antagonize policymakers may forfeit access and thus lose the symbolic benefits of being consulted and the opportunities for credit-claiming that go with it” [Hayes 1981, 86]). Finally from the third perspective, access is essential and has little to do with any more or less implicit quid pro quo model of contributor decisions or with symbolic concerns, the focus being, instead, on information (Bauer, Pool and Dexter 1963; Hansen 1992; Milbrath 1960; Rothenberg 1992; Wright 1990). And this is the dominant perspective within the descriptive literature: “PAC officials are adamant that all they get for their investment is access to congressmen—a chance to ‘tell their story’. Political analysts have long agreed that access is the principal goal of most interest groups, and lobbyists have always recognized that access is the key to persuasion” (Sabato 1985, 127). I am here concerned with the third perspective on access.

The canoncic story connecting campaign contributions to access is predicated on the premise that both time and information are valuable. When an issue arises about which a legislator is uncertain, he or she will seek information from more or less interested parties; and given that the legislator cannot see everyone with something to say about any given issue, he or she will choose whom to listen to at least in part on the basis of who provided campaign contributions (Herron 1982; Langbein 1986; Shlozman and Tierney 1986, 246). However, although intuitively plausible, there are some difficulties with the story.

Given that a legislator is uncertain about what position to adopt on some issue, the legislator will, other things being equal, seek information. Since legislators’ actions depend in part on their information regarding the consequences of actions, information provision by interested groups is inherently strategic. And if information is costly to verify, it is known that the amount of information an informed agent (lobbyist) can credibly transmit to an uninformed decision maker (legislator) is increasing in the extent to which these individuals’ preferences over final consequences are coincident. That is, the more like the legislator the lobbyist is, the more valuable that lobbyist will be to the legislator on informational grounds and the more influence that lobbyist can be expected to exert on the legislator’s decisions. Consequently, if legislators know the preferences of the prospective lobbyists, they will, ceteris paribus, choose to listen to those lobbyists whose underlying preferences most closely reflect their own; and this will be true irrespective of any campaign contributions. Moreover, if a group knows that its preferences are far enough away from those of the legislator that even granted access, it cannot be influential, then that group has no incentive to devote costly resources to securing access. In sum, if the rationale for access is informational, access will only be granted to groups whose preferences over consequences are sufficiently close to those of the legislator to permit credible information transmission and who may thus be influential (i.e., offer information that can affect the legislator’s decisions). Only those groups who fall within this category will be willing to pay for access; but given information is valuable, the legislator will be willing to grant access to such groups independent of any financial incentive.
For money to alter the preceding conclusion there must at least be some trade-off for the legislator between informational gains and dollars. But then, up to the point at which preferences are sufficiently disparate to preclude any credible information transmission, there should exist a positive correlation between campaign contributions and the degree to which contributors’ and legislators’ preferences diverge, and beyond this point contributions (for access) should be zero (see Figure 1). However, to the extent that legislators’ actions are indicators of their legislative ideologies, or preferences, empirical work has consistently estimated the relationship between contribution (conditional on this being positive) and preference disparity to be negative. Poole and McCarty (1993) test directly the proposition that a political action committee’s contributions are positively related to the extent to which its ideology matches that of the legislator (see also, e.g., Kau, Keenan, and Rubin 1982; Poole and Romer 1985; Saltzman 1987; Welch 1980). Moreover, according to at least one estimate, only one in three of those interest groups with lobbying organizations in Washington has a political action committee (Gais 1983), suggesting that contributions are by no means necessary for securing access.

Insofar as the value of access to interest groups and legislators is informational—the value for interest groups deriving from the possibility of influencing legislative decisions through the strategic provision of information and that for legislators deriving from the possibility of making more informed decisions—the preceding discussion indicates a conflict between the canonic theory and the empirical pattern of contributions. There are basically two approaches to dealing with the conflict, short of rejecting the access model of campaign contributions entirely. The first is to argue that in fact purely access-oriented contributions are negatively correlated with preference similarity but that other, positively related, motivations for contributing dominate this relationship statistically. But while such a claim might indeed be correct, the operational difficulties of disentangling the separate effects empirically seem severe, if not prohibitive. The second approach is to build on the observation that, ceteris paribus, the expected value of access is increasing with the extent to which the legislator’s and the interest group’s preferences are similar. In particular, suppose there is some uncertainty on the part of the legislator regarding the underlying preferences of the donor. Under such uncertainty campaign contributions can fulfill a role other than simply purchasing legislators’ time; specifically, they can signal the extent to which any informational lobbying by the group would be valuable to the legislator. Prima facie, the signaling role of money can be expected to yield a negative empirical relationship between preference disparity and contribution size because, as discussed, the value of access is increasing in the extent to which groups’ and legislators’ preferences are similar. However, the value of access depends at least in part on legislators’ beliefs about this preference similarity, which in turn depend on the contributions offered. In other words, given that access is sought purely to provide information and given that such information provision is strategic, the value of access to a group and the willingness of the group to contribute campaign contributions to secure access are jointly determined.

I shall consider the signaling role for campaign contributions more formally with a stylized model in which a group, with preferences known surely only by the group itself, chooses a campaign contribution to give to an incumbent legislator prior to becoming informed about an issue of concern that may or may not arise in the legislature. If the issue arises then the group alone becomes informed and the legislator chooses whether or not to grant (costly) access to the group. If access is denied, the legislator simply acts on his or her prior beliefs about what best to do with the respect to the issue, but if access is granted, the group advises the legislator about the action to take and the legislator uses this advice to update his or her beliefs and arrive at a decision. The focus of the model is then the relationship among campaign contributions, preferences, and the value of access.

The key premise of the model is that the legislator has some uncertainty about the policy preferences of the group. To the extent that this is not a reasonable approximation to the truth, the model, along with the motivating discussion, suggests that the informational perspective connecting contributions to access is suspect. However, there are circumstances under which the premise is plausible. For example, internists and specialists within the American Medical Association (AMA) frequently hold distinct views on particular health policy issues, and exactly what the "AMA position" is on such issues will reflect compromise and bargains internal to the organization as a whole; it is then reasonable to assume that these compromises and bargains are not common knowledge and therefore that the "AMA position" is sub-

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ject to uncertainty. This kind of uncertainty is reflected in the surprise of legislators at the National Rifle Association's (NRA's) neutral position on the Bork nomination (McGuigan and Weyrich 1990, 78-80). Although the NRA's general policy preferences are no secret, their stance on this particular issue was clearly subject to uncertainty for the politicians. Similarly, there is evidence of groups lobbying on issues outside their imputed interests, which almost surely induces some uncertainty about the groups' preferences over such issues (Browne 1990, 1991). Finally, and perhaps most important, is that the sheer numbers of groups involved in lobbying prohibits legislators and the staffs from possessing complete knowledge of groups' preferences. In discussing his survey results on lobbying over agricultural policy, Browne remarks, "The most striking point that these officials raised about the expanded universe of agricultural interests was about the confusion it creates; 'Who are these guys?' was the often-repeated question" (1991, 359).

Given that there is some uncertainty on the part of legislators regarding donors' basic preferences, it turns out that the expectation regarding campaign contributions and preference similarity can be fulfilled in the model subject, however, to two qualifications. First, campaign contributions are incapable of fully revealing group preferences; so when access is granted, the legislator remains under some uncertainty as to the exact preferences of the lobbyist. Second, if the equilibrium contribution schedule reveals any information at all about the donor's preferences, it cannot be monotonic. In particular, the schedule can be U-shaped, with relative extremists making the same contribution as groups whose preferences closely reflect those of the legislator; but when this occurs, the probability mass is typically on preferences "close" to the legislator, so the statistically observed relationship will be positive. Each qualification has substantive implications for the access model of contributions, and these are considered further in the concluding discussion.

I shall describe the model and develop an example to illustrate the intuition behind the principal results, then offer some caveats and implications. Formal arguments supporting all of the results are confined to an appendix.

MODEL

Agents and Preferences

There are two agents in the model: a group and a legislator. Both the group and legislator have preferences over the consequences of a particular policy issue that may or may not arise in the coming legislative session. (For example, the issue may be health insurance, and both the AMA and legislators have preferences over the final cost of health care induced by any legislation on rates.) Assume that the issue and its consequences are one-dimensional objects and assume further that at least ex ante, the consequences of any legislation are known only with uncertainty. The basic setup closely follows Gilligan and Krevis 1987. Specifically, let \( t \in [0, 1] \) be the realization of some random variable and let \( a \in \mathbb{R} \) denote the legislative action taken (if necessary) on the issue. Let \( g(t|a) \) be a probability density function (pdf) characterizing the legislator's beliefs over \( t \) conditional on any information he or she might have. Then the legislator's ex ante evaluation of the action \( a \) is given by:

\[
E[u(a, t)|\theta] = -\int_0^1 (t - a)^2 g(t|a) \, dt. \tag{1}
\]

The legislator who knew the value of \( t \) for sure, therefore, would choose the action \( a = t \in \mathbb{R} \), since this maximizes the payoff. This payoff function can reflect either the legislator's policy preferences or be induced from more primitive electoral concerns in which the likelihood of reelection depends at least in part on the policy decisions taken by the legislator.

Similarly, the group's ex ante evaluation of action \( a \) is given by:

\[
E[v(a, t; x)|\theta] = -\int_0^1 (x + t - a)^2 h(t|a) \, dt, \tag{2}
\]

where \( h(t|a) \) is the pdf describing the group's conditional beliefs regarding \( t \), and \( x \in X \subseteq (-\infty, \infty) \) is the group's most preferred consequence from any legislative action. Assume that \( X \) is an interval. For any value of \( t \), the group's most preferred legislative action is thus \( x + t \). It follows that the parameter \( x \) measures the extent to which the group and the legislator have divergent preferences: for any given value of \( t \), the group's most preferred action is strictly increasing in \( x \). So when \( x \) is positive, the group prefers higher actions than those most preferred by the legislator—and the converse when \( x \) is negative, with the difference between the two most preferred actions being given by the absolute value of \( x \). The payoffs to both legislator and group if the issue does not arise during the legislative session are strategically irrelevant; so without loss of generality, they are set equal to zero. Further, conditional on the issue arising in the legislature, assume that the status quo policy is strategically irrelevant. In other words, there are no possible circumstances (as delimited by \( t \in [0, 1] \)) under which the group or the legislator prefer to remain with the status quo. Although restrictive, the qualitative results connecting campaign contributions to group and legislator preferences seem unlikely to depend on the assumption. Relaxing it, however, greatly complicates details of the lobbying stage of the game.

Decisions

The sequence of decisions is given in Figure 2. The group moves first by giving a campaign contribution \( c \in \mathbb{R}_+ \) to the incumbent. The canonic access motiva-
tion for contributing being studied here is essentially concerned with gaining legislative access for purposes of advocacy. Consequently, I abstract from details of the electoral process.

There are two (not mutually exclusive) ways to interpret the reduced form of the electoral process implicit here. The first is to suppose that the election takes place immediately following the group’s contribution. Since any group’s contribution is small relative to total contributions, assume that the group treats the probability that the candidate will win as exogenous; assume further that (at least in equilibrium) the group gives a contribution to at most one candidate in any election. Then the candidate either wins or loses: if the candidate wins, then the game proceeds exactly as will be described; if the candidate loses, then, for our purposes, the game is over. So given this story for the electoral stage, the model described here begins after the group has made its categorical decision on which candidate to support, adding the probability of electoral success into the model adds nothing but notation.

The second way one can think of the model with respect to the electoral process is to assume the legislator is an incumbent interested, inter alia, in reelection. From this perspective, the contribution is given early in the legislative session for the next election, and the model applies without qualification. In any event, in what follows I suppress further consideration of the electoral stage and, consistent with the canonic access story, model the value of contributions to the legislator in terms of the opportunity cost of giving time to listen to the group rather than do something else.

Once the contribution is given and the legislator is in office, Nature decides with probability \( q \in (0, 1] \) whether the issue requiring legislative action arises. The idea here is that money is given before details of the legislative agenda are revealed. For example, while it may be common knowledge that the health care industry is to come under scrutiny during the next legislative session, it is less clear exactly which aspects of the industry—or what sort of policy issues falling under the health care rubric—will receive specific attention. Thus potentially interested groups give money in an effort to secure access to key legislators should the need arise (Sabato 1985).

If the issue does not arise (which occurs with probability \( 1 - q \)), then the game is over; but if it does arise (with probability \( q \)), Nature reveals the true value of the unknown parameter \( t \) privately to the group.\(^8\) (To support any access role for contributions in the model, it is important that the group not be—or, at least, not be known to be—infected at the time it chooses its campaign contribution. See the concluding discussion.) Conditional on the issue arising and the group becoming informed, the legislator decides whether or not to grant access to the group. The legislator who does not grant access simply chooses an action on the basis of prior beliefs concerning the value of \( t \), and the game ends with all players receiving their respective payoffs. On the other hand, the legislator who does grant access is lobbyed by the group, which makes a speech about its information on \( t \), following which the legislator takes an action, the game ends, and payoffs are distributed. The group’s lobbying speech is costless; in particular, it is free to say anything it wishes about the value of \( t \) or anything else, and lying is no more difficult for the group than is telling the truth (Crawford and Sobel 1982).

Assume that granting access is costly to the legislator; he or she has a positive opportunity cost of time. Consequently, access will only be granted if
the expected value of any subsequent information transmission at the resulting lobbying stage exceeds the cost of granting the time to listen to the group. Because campaign money is itself valuable and is in part a substitute resource for time, the legislator’s opportunity cost of granting access may be decreasing in campaign contributions. In sum, let \( k(c) \) denote the cost of granting access conditional on receiving a contribution \( c \geq 0 \), and assume that \( k(0) > 0 \) and \( k(c) \leq 0 \forall c \geq 0 \).

**Information**

The legislator’s preferences are common knowledge. The group’s preferences are common knowledge up to the value of its ideal point, \( x \), which is private information to the group. The legislator has common knowledge prior beliefs about \( x \) described by a differentiable and strictly increasing distribution function \( F(x) \) on \( X \). Both the group and the legislator know the probability, \( q \), that the issue of concern will become legislatively relevant. If it does become so relevant, then Nature reveals the true value of \( t \) privately to the group, which is therefore asymmetrically informed relative to the legislator; both agents share a common prior on \( t, g(t) \), given by the uniform distribution on \([0, 1]\); thus \( g(t) = 1 \) for all \( t \in [0, 1] \).

**Strategies and Equilibrium**

The group’s contribution strategy is a map \( \gamma: X \rightarrow \mathbb{R}_+ \). Thus for any group with ideal point \( x \in X \), \( \gamma(x) \geq 0 \) is the contribution donated by the group to the legislator. The restriction to pure strategies here is without loss of generality. Nature then, with probability \( q \), chooses whether the issue of concern becomes legislatively relevant and the group becomes informed. Conditional on the issue arising, the legislator decides whether to grant access to the group. The legislator’s access strategy is a map \( \alpha: \mathbb{R}_+ \rightarrow [0, 1] \), where \( \alpha(c) \) is the probability of the legislator granting access to a group that has contributed \( c \) to the campaign fund.

If access is denied, the legislator simply makes a decision about what action to take; but if access is granted, the group and the legislator play the Crawford and Sobel (1982) Sender/Receiver game. Specifically, given that access is granted (so the issue is relevant and the group is informed), the group sends a cheap talk message about its information according to a lobbying strategy \( \lambda: X \times [0, 1] \rightarrow M \), where \( M \) is some arbitrary uncountable message space. Thus \( \lambda(x, t) \) is the speech made by an informed group of type \( x \) that has observed the true value \( t \). To save on notation, write \( \lambda \equiv \emptyset \in M \) to describe the message “heard” by the legislator if the latter denies access and there is no lobbying by the group. Then the legislator’s decision strategy is a map \( \delta: \mathbb{R}_+ \times M \rightarrow \mathbb{R} \). Recall that by convention \( \lambda(\cdot) \equiv \emptyset \) if the group is denied access; therefore the dependency of \( \delta \) on the legislator’s access strategy is implicit in \( M \). Because the legislator’s preferences over consequences are quadratic, the restriction to pure decision strategies is without loss of generality.

The equilibrium concept used is sequential equilibrium—loosely, a list of strategies \( (\gamma^*, \alpha^*, \lambda^*, \delta) \) and a set of beliefs is an equilibrium if (1) at every decision stage each agent takes an expected-utility-maximizing action conditional on the other’s behavior and on the agent’s beliefs at that stage and (2) beliefs are derived from Bayes’ rule where defined. A formal definition is given in the Appendix.

If access is granted, I shall refer to the lobbying and decision strategies jointly as the lobbying subgame \((\lambda, \delta)\). It is well known that in the lobbying subgame there exists an equilibrium in which no information on \( t \) is transmitted and the legislator simply chooses an action on the basis of prior beliefs (Crawford and Sobel 1982). In such circumstances, no type of group would seek access. Consequently, I shall focus on influential equilibria (i.e., equilibria in which the legislator’s decision strategy is not constant in the message received). Thus in any influential equilibrium to the lobbying subgame, the group has at least two speeches it can make, each one of which induces the legislator to take a distinct action. If a speech does induce the legislator to take a particular action, say that the speech elicits that action. Thus an influential equilibrium is one in which at least two actions are elicited by possible speeches made under the lobbying strategy, \( \lambda \). And say that an equilibrium lobbying strategy \( \lambda \) is most influential if there is no other equilibrium lobbying strategy that elicits more actions from the legislator. Unless stated explicitly otherwise, a maintained assumption throughout the analysis is that conditional on access being granted, the most influential equilibrium lobbying strategies are always used. The main justification for the assumption here is that it is conservative: most influential equilibria are ex ante most preferred by all agents and therefore offer the best opportunity for access to be valuable.

**A NUMERICAL EXAMPLE**

Suppose, on the issue of concern, that the group is known to prefer relatively higher actions than the legislator under any circumstances. In terms of the model, this amounts to \( X = [0, x] \) for some \( x > 0 \). Then the principal result is that if campaign contributions provide any further information to the legislator about the contributor’s preferences over outcomes, then the equilibrium contribution schedule cannot be monotonic. In particular, while there is no equilibrium in which a contribution fully reveals the group’s ideal point, there can be equilibria in which the contribution schedule is stepwise U-shaped. In such an equilibrium, a group with the most extreme ideal point gives the same contribution as a group with the same ideal point as the legislator. Before presenting these results (among others) formally, it is useful to give some intuition for why they obtain with a numerical example.
Second, although there is an influential equilibrium available if the legislator grants access when receiving no contribution, the anticipated payoff is insufficient to make granting access profitable.

Now consider the intuition behind the equilibrium of example 1, beginning with the contribution schedule. If the contribution schedule $\gamma'$ fully reveals the group's ideal point, it is said to be separating; and for every distinct pair of ideal points $x$ and $y$, $\gamma'(x) = \gamma'(y)$. In the present context, if $\epsilon > .25$, then $\gamma'$ trivially cannot be separating over all of $X$. This is because, given that $\gamma'$ is separating and the group's ideal point is known for sure, there is no informational gain to the legislator of granting access when this ideal point is .25 or above (Crawford and Sobel 1982); in effect, the group's and the legislator's preferences over final outcomes are so disparate that no persuasive communication can take place. Consequently no group with an ideal point in this range will make a positive contribution that reveals its preferences unequivocally. On the other hand, $\gamma'$ might be separating over some interval of ideal points lying within .25 of the legislator's ideal point. And if $\gamma'$ could separate over $[0, .25]$, then $\gamma'$ would be separating over all of $X$ with respect to the value of access. Unfortunately, as claimed earlier, no such separation is possible in equilibrium. The reason is that to support separation over any interval, the contribution schedule must decrease in $x$ "too fast" to deter a group with an ideal point relatively close to that of the legislator from mimicking the behavior of a group with an ideal point slightly further away. In effect, the group's expected loss in the value of access from such mimicry is smaller than the gain it derives by paying less for access.10

More specifically, assume to the contrary that $\gamma'$ is separating over some interval $I \subset [0, .25]$ and let $V_1^*(\gamma'(x), x)$ denote the expected payoff (net of contribution) of access to a group with ideal point $x$ in $I$. Given that $\gamma'$ is separating, it must be differentiable almost everywhere on $I$; so let $\gamma'$ be differentiable on $(a, b) \subset I$. Let $y$ and $z$ be ideal points in $(a, b)$ with $y < z$, and consider Figure 4. The graph $V_1^*(\gamma'(x), x)$ describes how the expected value of access changes as $x$ increases over $(a, b)$, given that $\gamma'$ is separating over the interval. Since $V_1^*(\gamma'(x), x)$ is strictly decreasing in $x$, $\gamma'(x)$ must likewise be strictly decreasing in $x$. Furthermore, it turns out to be necessary that for any two ideal points like $y$ and $z$, the difference in the respective expected contributions must be exactly equal to $q$ times the difference in the respective values of access. Hence, as illustrated in the figure, $\gamma'(y) - \gamma'(z)$ has the shape drawn and, for instance, if $q = 1$ then $\gamma'(y) \neq \gamma'(z)$ must equal the difference in expected payoffs, $V_1^*(\gamma'(y), y) - V_1^*(\gamma'(z), z)$. However, if a group with ideal point $y$ makes the contribution $\gamma(z)$ and subsequently mimics the equilibrium lobbying behavior of a group with ideal point $z$, its expected payoff, say $\bar{V}(\gamma^*(z), y)$, lies strictly between $V_1^*(\gamma^*(z), z)$ and $V_1^*(\gamma'(y), y)$. Therefore, the loss in payoff incurred by the group with ideal point $y$ by mimicking the lobbying behavior of a group with

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**Figure 3**

Equilibrium Contributions in Example 1

![Graph of equilibrium contributions](image)

**Example 1.** Assume: $X = [0, 1]$; $F(x) = .2 + \frac{x}{1.25}$; $q = .9$; and $k(x) = .055 - x$. Then (to 3 decimal places), there is an equilibrium in which

i. the group gives a contribution of $\gamma'(x) = .041$ if $x = 0$ or $x \in [.526, 1]$, and the group gives nothing otherwise;

ii. that legislator grants access only who receives a contribution of at least .041 (and if the group makes no contribution it offers no speech);

iii. given access is granted and the issue is legislatively relevant, if the group has ideal point $x = 0$ and has observed a value of $t < .364$ it makes a speech $m_1$ (e.g., "the value of $t$ is low"); otherwise it makes a speech $m_2$ (e.g., "the value of $t$ is high"); on the other hand, if the group has ideal point $x \in [.526, 1]$, it makes the speech $m_2$, irrespective of the observed value of $t$; and

iv. if access is not granted and the issue is legislatively relevant, the legislator takes the action $\delta'(0.25) = .5$; if access is granted and the legislator hears the speech $m_1$, he or she takes the action $\delta'(0.041, m_1) = .182$, and if the speech $m_2$ takes the action $\delta'(0.041, m_2) = .546$.

Figure 3 illustrates the equilibrium contribution schedule (ignore the graph labeled $W(x; .041, 0)$ for the moment). The first thing to note about this equilibrium is that despite the contribution schedule being U-shaped, the conditional expectation on the ideal point of the group when the contribution is zero strictly exceeds that when the contribution is .041; specifically (to three decimal places), $E[x|c = .041] = .237 < E[x|c = 0] = .263$. So the statistical observation is that groups with ideal points closer to those of the legislator typically give more money to the legislator than do groups with more disparate ideal points.
ideal point z is strictly smaller than the gain it accrues by making the smaller contribution, γ*(z), rather than γ*(y). Consequently, the supposition that γ is separating on (a, b) is not tenable in equilibrium.

It follows that if the contribution schedule reveals anything to the legislator, then it must be some sort of step function under which the contribution given identifies a range of possible ideal points—strictly contained in X—that includes the group’s true ideal point. When x is sufficiently large (bigger than 1) is sufficient but by no means necessary) the only possible such functions that can occur in equilibrium are nonmonotonic; in example 1, the schedule is U-shaped. As illustrated by example 1, a group with the most extreme ideal point will make the same contribution as a group whose ideal point coincides with that of the legislator; on receiving the contribution, therefore, the legislator is better informed regarding the group’s preferences but still not perfectly informed. That such a semipooling contribution strategy should be stepwise decreasing over low ranges of x is intuitive; as repeatedly observed, the expected value of access to both group and legislator is decreasing in the extent to which their preferences diverge. The surprise is that the schedule must then be stepwise increasing for sufficiently high ranges of x.

To see how the U shape occurs, recall that for any observation of t, the higher x is, the higher the action the group would like to see taken by the legislator. So a group with sufficiently extreme preferences (high x) always encourages the legislator to take the largest possible action, irrespective of the true value of t. Moreover, since the group is risk-averse, the utility difference it experiences between having the largest and the second largest elicitable action taken is strictly increasing in x. Consequently, if the largest elicitable action is available only if the legislator has some particular beliefs about the group’s ideal point induced from its contribution, then, for sufficiently high values of x, the group is willing to make the relevant contribution to induce these beliefs. Finally, since a group with ideal point close to the legislator is ceteris paribus more credible for the legislator, it is such a group that has the most influence and is capable of inducing the highest actions. Hence, there is an incentive for a group with an extreme ideal point to mimic the contribution behavior of a group with an ideal point closer to that of the legislator.

For example 1, the relevant difference in expected payoffs is graphed in Figure 3 as $W(x; .041, 0) = [V^*(.041, x) - V^*(0, x)]$. The term first of $W(x)$ is the expected payoff to a group with ideal point x if that group lobbies the legislator when the legislator believes the group has ideal point $x \in [0] \cup [.526, 1]$. Thus such a group can gain access and either make speech $m_1$ to elicit an action of .182, or make speech $m_2$ and elicit the action .546. The second term of $W(x)$ is the expected payoff if no contribution is made and the legislator optimally responds by not granting access and simply choosing the action .5. When x is greater than the midpoint between .182 and .546 then, conditional on being granted access, whatever the value of t the group observes, the group’s best available lobbying strategy is to make the speech $m_2$ and elicit .546. Since this is strictly greater than the action forthcoming if there is no lobbying by the group (in which case, the legislator chooses action .5) and the group is risk-averse, the expected payoff difference $W(x; .041, 0)$ is strictly increasing in x for x sufficiently large. Therefore, whatever contribution $x = 0$ is willing to pay to secure access, there is a sufficiently extreme ideal point such that a group with this ideal point is willing to make the same contribution. As illustrated in Figure 3, then, a group with ideal point $x = .526$ is just indifferent between contributing and so gaining access (conditional on the issue becoming relevant), and not contributing.

Now assume access is granted when $c = .041$ and consider the agents’ behavior at the lobbying stage. First, let $a_1$ and $a_2$ be the two actions elicited by, respectively, speeches $m_1$ and $m_2$, with $a_1 < a_2$. Then any group with induced ideal point $x + t$ less (greater) than $(a_1 + a_2)/2$ will make the speech $m_1$ ($m_2$). This follows from the usual spatial voting logic with symmetric preferences: elicit the alternative that is closest to your ideal point. Then taking account of this lobbying behavior by the group, the legislator chooses the actions that maximize the expected payoff. In the equilibrium, the actions $a_1$ and $a_2$ so chosen must be consistent with the group’s behavior and conversely.

In example 1, the actions $a_1$ and $a_2$ are, respectively, .182 and .546; so $(a_1 + a_2)/2$ is .364. Since x is either zero or between .526 and 1, the preceding discussion implies that the only sort of group who would send $m_1$ is a group with $x = 0$; hence, the conditional expectation on $t$, given $m_1$ and this information, is
that \( t = .182 \). Since the legislator’s optimal response is to choose the action that equals the expected value of \( t \), this calculation results in precisely the action elicited by \( m_1 \). The legislator’s decision calculus is a little more complicated when he or she hears \( m_2 \). In this instance, the information on the group’s preferences is much less precise. But using this information and the group’s lobbying rule yields a conditional expectation of \( t = .546 \), again the action elicited by \( m_2 \).11

**EQUILIBRIUM**

I shall describe the formal results, discussed for the most part through example 1. The lobbying subgame, played conditional on the issue being relevant and the legislator granting access, is essentially the canonic Sender/Receiver cheap-talk game introduced by Crawford and Sobel (1982). The one difference here is that the legislator (Receiver) may be uncertain about the group’s (Sender’s) preferences over the consequences of actions. Because the willingness of the legislator to grant access depends entirely on the expected (informational) value from listening to the group’s lobbying speech, it is necessary first to identify the circumstances under which there can exist an influential equilibrium to the lobbying subgame.

Let \( X(c) \subseteq X \) denote the support of the legislator’s posterior beliefs about the parameter \( x \), given contribution \( c \geq 0 \), at the start of the lobbying subgame.

**Proposition 1.** Let \( f(x) \) denote the legislator’s posterior density function over \( X(c) \). Then there exists an influential equilibrium to the lobbying subgame

i. if \( \int_{-1/4}^{1/4} f(x) \, dx > 0 \); and

ii. only if \( \int_{-1/2}^{1/2} f(x) \, dx > 0 \).

Thus, if the legislator’s beliefs over the group’s ideal point \( x \), following the campaign contribution \( c \), put positive weight on \( x \) being within a distance of 1/4 from her own ideal point, then there surely exists an influential equilibrium to the lobbying subgame, and granting access can lead to informational gains for the legislator. Of course, these gains may not be sufficient to warrant bearing the cost, \( k(c) \), of granting access at all. Indeed, as the proof to the result makes apparent, the maximal value of access is increasing in the extent to which the weight of the legislator’s posterior beliefs, \( f(x) \), is concentrated on low values of \( |x| \). In other words, the more confident the legislator that the group’s ideal point is close to his or her own (at zero), the larger the anticipated value of access.

Let \((\lambda^*, \delta^*)\) be the lobbying subgame strategies for some specified equilibrium. Let \( U^*(\lambda^*, \delta^*; c) \) denote the legislator’s ex ante expected payoff from \((\lambda^*, \delta^*)\), given a campaign contribution \( c \) and given the legislator grants access. To save on notation, when there is no ambiguity about the structure of \((\lambda^*, \delta^*)\), I shall write \( U^*(\lambda^*, \delta^*; c) = U^*(c) \) if and only if \( \lambda^* \neq \emptyset \) and, throughout, write \( U^*(\emptyset, \delta^*; c) = U^*(c) \). Then the legislator will grant access if and only if he or she expects to benefit by so doing:

\[
\alpha^*(c) > 0 \Leftrightarrow U^*(c) - k(c) \geq U^*(0).
\]

(3)

Let \( V^*(\lambda^*, \delta^*; c, x) \) denote the type-x group’s ex ante expected payoff from the specified lobbying subgame equilibrium, given a contribution of \( c \). As for the case of the legislator, when there is no ambiguity about \((\lambda^*, \delta^*)\), I shall write \( V^*(\lambda^*, \delta^*; c) = V^*(c, x) \) if and only if \( \lambda^* \neq \emptyset \) and write \( V^*(\emptyset, \delta^*; c, x) = V^*(c, x) \) throughout. Because campaign contributions have to be made prior to Nature choosing (with probability \( q \)) whether the policy issue becomes legislatively relevant, we have

\[
\gamma^*(x) = c > 0 \Leftrightarrow q(\alpha^*(c)V^*(c, x) + (1 - \alpha^*(c))V^*(0, x) - c) \geq qV^*(0, x) \Leftrightarrow q\alpha^*(c)V^*(c, x) - c \geq 0.
\]

(4)

Evidently, no group makes an equilibrium contribution unless there is positive probability of being granted access to the legislator. The converse statement is not necessarily true. For sufficiently low cost of access, \( k(0) \), the fact that a group is informed might induce access to be granted even though no campaign contribution is made.

In equilibrium, strategies are required to be subgame perfect. Because contribution strategies are pure, this implies that if \( c > 0 \) and the legislator is indifferent between granting and not granting access, he or she must grant access with probability 1. Consequently, \( \alpha^*(c) \in \{0, 1\} \) always, and we can set \( \alpha^*(c) = 1 \) in expression 4.

The focus of concern here is on the signaling role of campaign contributions in securing access to legislators. There are three possibilities in this respect: (1) the equilibrium contribution strategy \( \gamma^*(x) \) might be pooling, in which \( \gamma^*(x) = \gamma^*(x') \) all \( x, x' \) and no information regarding \( x \) (and therefore the value of access) be transmitted; (2) the strategy might be separating over some interval, in which \( \gamma^*(x) \neq \gamma^*(x') \) all \( x \neq x' \) in the interval and the true value of \( x \) be completely revealed; and (3) the strategy might be semipooling, in which \( \gamma^*(x) \neq \gamma^*(x') \) for some but not all \( x \neq x' \), and some information be signaled. Consider these in turn.

**Pooling Equilibria**

As remarked earlier, there is always an equilibrium to the lobbying subgame in which no information is transmitted. Consequently, for all parameterizations of the model, there exists a pooling equilibrium in which no contributions are given, access is never granted, and the legislator chooses an action (if necessary) on the basis of prior beliefs alone. For pooling equilibria with a positive contribution to exist, the legislator’s prior beliefs over \( X \) must concentrate around zero sufficiently to admit a lobbying equilibrium with high expected value of access to the legislator (given these beliefs) and the group, whatever its ideal point. Unfortunately, a general charac-
campaign contributions are access to money (e.g., campaign contributions to access information) and to information, which can be informative or noninformative. The former is not generally useful in campaigns, whereas the latter is. In the remainder of this section, I concentrate on the latter type of information.

Proposition 2. Let \( Y \subseteq X \cap (0, \bar{x}) \) be a nondegenerate interval. Then there exists no equilibrium in which \( \gamma^* \) is separating on \( Y \).

By symmetry, the same result holds for any nondegenerate interval \( Y \subseteq X \cap (x, 0) \). Hence, proposition 2 implies that campaign contributions are incapable of unequivocally signaling a group’s preferences whenever the set of possible ideal points is not discrete. This result holds even when the legislator knows ex ante that the group’s ideal point is (say) strictly positive.

Semipooling Equilibria

In view of proposition 2, if there are any informative contribution strategies in equilibrium then they must be semipooling. When the group’s ideal point, \( x \), is common knowledge, the expected value of the most influential equilibrium to both group and legislator is decreasing in the distance between their respective preferences; (i.e., decreasing in \( |x| \)). This suggests that if \( \gamma^* \) is semipooling, then it will have a partition structure in which groups with ideal points closer to that of the legislator make higher contributions than those with relatively extreme ideal points. However, a necessary but not sufficient condition for this is that the support of \( F \) is not “too big.”

Proposition 3. Assume \( X = [0, \bar{x}) \) with \( \bar{x} > 1 \). If there is an equilibrium with \( \gamma^* \) semipooling then \( \gamma^* \) cannot be (stepwise) monotonic on \( X \). In particular, if exactly one equilibrium contribution induces access, then \( \gamma^* \) semipooling implies \( \gamma^* \) is (stepwise) U-shaped on \( X \).

The assumption that \( X = [0, \bar{x}) \) is not essential to the nonmonotonicity result. However, when \( X = (-\bar{x}, \bar{x}) \), say, it becomes harder for the contribution schedule to reveal any preference information. This is because pooling by the extreme types generally drives the legislator’s actions in any lobbying subgame to the action he or she would take without lobbying, which in turn lowers the expected value of access to the legislator and any group.

The intuition for proposition 3 is discussed at length in the context of example 1 and need not be rehearsed again here. And note that example 1 also demonstrates that semipooling equilibria of the sort identified in proposition 3 can exist.

Putting the propositions together, the result is that if campaign contributions promote access insofar as they signal information about the value of access, then the signal is necessarily noisy and the value of access to the legislator—and to groups close to the legislator—is accordingly depressed.

DISCUSSION

Under complete information about an interest group’s preferences over legislative decisions, the canonic information-based story connecting campaign contributions to access predicts, as illustrated in Figure 1, a positive relationship between campaign contributions and preference disparity between donor and recipient. However, one of the more robust empirical findings in the literature is that this rela-
tionship is negative. I have argued that the prediction of the canonic story is due largely to the complete information assumption on groups’ preferences. So rather than reject the access story out of hand, within the context of a simple model I reexamine the argument without this assumption. In this environment, contributions can in principle provide a signal of the value of access to the legislator, in which case the observed empirical pattern of contributions could be generated, since the expected value of access is prima facie increasing in the extent to which the legislator’s and the group’s preferences are similar.

The results suggest that when contributions do provide some information on group preferences and so induce access when none would otherwise be forthcoming, they do so only noisily. In particular, if the possible ideal points of groups are sufficiently widely dispersed, groups with preferences that very closely reflect those of the legislator will make the same contribution as groups whose preferences are very distant from those of the legislator. Consequently, while access can be induced by such contributions, the extent to which information can be transmitted through the lobbying process is attenuated and the legislator always faces the prospect of listening to a group with essentially state-independent preferences. On the other hand, the prospect of facing a group with essentially state-independent preferences is small. When contributions are informative the statistical expectation is typically that the preferences of groups granted access are close to those of the legislator. Thus, as conjectured, the model is capable of generating a positive observed relationship between preference similarity and contributions.

The preceding claims are predicated on the assumption that contributions are given before the group becomes asymmetrically informed relative to the legislator. In the model, this is motivated by the descriptive stories describing securing access as securing an option to talk to a legislator should the need arise and by the empirical fact that most details of legislative agendas only emerge over the course of the legislative session. However, it turns out that the particular sequencing of decisions is substantively important. It can be shown within the model that if groups are known to be informed prior to making any contribution, gaining access for purposes of information transmission is irrelevant; the equilibrium contribution schedule per se is capable of revealing all of the information that can be credibly revealed. In other words, for contributions to secure access purely for purposes of informational lobbying, legislators must at least be unsure about whether a donor is well informed on the particular issue of concern at the time of the contribution. If this is not the case and if granting access has substantive value for either the legislator or the group, then such value is not derived from any policy-relevant information transmission. However, whether or not this result holds when a group is known to have information on multiple issues but Nature selects, say, at most one of these as legislatively relevant in any given session, is unclear.

The model here includes electoral considerations only implicitly; most importantly, the decision concerning which candidate(s) to support is taken as given. When this decision is explicitly introduced a variety of additional issues arise (McCarty and Rohdenberg 1993). In particular, the decision to invest in securing access will be influenced by the probability of any candidate’s electoral success. Under such circumstances, it is quite possible to find money and access correlated but not directly connected in any quid pro quo sense. As argued earlier, if information is valuable, a legislator will seek data from those informed agents whose preferences most closely reflect his or her own. Knowing this, interest groups prefer legislatures consisting of more people with preferences close to their own to legislatures with fewer such people; therefore, groups give money to candidates who are relatively like themselves to increase the probability of such legislatures arising. De facto, therefore, to the extent that money influences electoral outcomes, it will appear that money buys access.

Two further caveats are worth making. First, there is only one group in the model, and it is known that in strategic information transmission models of lobbying the presence of competing groups can affect groups’ lobbying strategies (Austen-Smith and Wright 1994; Gilligan and Kreibiel 1989). Second, the model here is “one-shot,” thus precluding reputational effects. Future work should address at least these issues.

APPENDIX

Definition. A list of strategies, \( \sigma^t \equiv (\gamma^t, \alpha^t, \lambda^t, \delta^t) \), and a set of beliefs constitutes an equilibrium if

\[
\forall \, x \in X, \forall \, c,
\]

\[
E[u(\delta^t(\gamma^t(x), m), t; x) - \gamma^t(x)/\gamma^t(x), \alpha^t, \lambda^t] 
\geq E[u(\delta^t(c, m), t; x) - c | c, \alpha^t, \lambda^t] \quad (A-1a)
\]

\[
\forall \, c \in \mathbb{R}_+, \alpha^t(c) > 0 \text{ if,}
\]

\[
E[u(\delta^t(c, m), t - k(c)c, \lambda^t) \geq E[u(\delta^t(c, \emptyset), t)|c, \emptyset]
\]

\[
\forall \, (x, c, t) \in X \times \mathbb{R}_+ \times [0, 1], \forall \, \lambda,
\]

\[
v(\delta^t(c, \lambda^t(x, t)), t; x) \geq v(\delta^t(c, \alpha^t(x, t)), t; x) \quad (A-1b)
\]

\[
\forall \, (c, m) \in \mathbb{R}_+ \times M, \forall \, \delta,
\]

\[
E[u(\delta^t(c, m), t)|c, m] \geq E[u(\delta^t, t)|c, m] \quad (A-2)
\]

and if beliefs at every stage are derived from \( \sigma^t \) and the priors using Bayes Rule, where this is defined. In particular, the legislator’s beliefs over \( x \in X \) conditional on receiving a contribution \( c, f(x|c) \), and over \( t \in [0, 1] \) conditional on receiving a contribution \( c \) and hearing a message \( m, g(t|c, m) \), are defined as
follows. Let \( \gamma(c|x) = \Pr[c \text{ contributed given } x] \) and 
\( \lambda(m|x, t) = \Pr[m \text{ sent given } (x, t)] \). Then,

\[
f(x|c) = \frac{f(x)\gamma(c|x)}{\int f(x)\gamma(c|x) \, dx},
\]
when the denominator is positive.

\[
g(t|c, m) = \frac{g(t)\lambda(m|x, t)f(x|c)}{\int g(t)\lambda(m|x, t)f(x|c) \, dx \, dt},
\]
when the denominator is positive. (A-3)

**Remark 1.** Because contributions have to be given before a group learns (if it ever does) the true value of \( t \), the legislator’s beliefs over \( t \in [0, 1] \) at the start of the lobbying subgame are given by the prior over \( t \) (i.e., \( g(t) = 1 \forall t \in [0, 1] \)).

The first result, Lemma 1, characterizes influential equilibria to the lobbying subgame. Let \( X(c) \subseteq X \) be the support of \( f(c) \) and, for any message \( m \in M \) and contribution \( c \in \mathbb{R}_+ \), let \( f(c, m) \) denote the legislator’s posterior density over \( X \) conditional on \( (c, m) \).

**Lemma 1.** In any influential equilibrium \( (\lambda^*, \delta^*) \) to the lobbying subgame,

1. \( \forall x \in X(c), \lambda^*(x, \cdot) \) is characterized by a partition on \( [0, 1] \), \( \{t_i(x) \equiv 0, t_1(x), \ldots, t_{N_{(n-1)}}(x), t_{N_{(n-1)}}(x) = 1\} \) such that
   
   i. \( \forall i, \lambda^*(x, s_i) = m_i \) with \( m_i \) distinct across \( i \);
   
   ii. \( \forall i, \lambda^*(x, s_i) = 1, t_i(x) = [\delta^*(c, m_i) + \delta^*(c, m_i')]1/2 - x \).

2. \( \forall m, \lambda_{i+1}(x, s_i) = \int t g(t|c, m) \, dt \).

**Proof.** Let \( x \in X(c) \). Given \( \delta^*(\cdot) \), equation A-1b and the fact that both the group and the legislator use pure strategies in the lobbying subgame imply \( \forall t \in [0, 1]: \)

\[
\delta^*(\delta^*(c, \lambda^*(x, t)), t; x) \geq \delta^*(\delta^*(c, \lambda^*(x, s)), t; x) \quad (A-4)
\]

\[
\delta^*(\delta^*(c, \lambda^*(x, s)), s; x) \geq \delta^*(\delta^*(c, \lambda^*(x, t)), s; x). \quad (A-5)
\]

Without loss of generality, let \( t > s \); and write \( \lambda^*(x, t) = m \) and \( \lambda^*(x, s) = m' \). Using equation 2, A-4 and A-5 are then equivalent to

\[
2(t + s)[\delta^*(c, m) - \delta^*(c, m')] \geq \delta^*(c, m)^2 - \delta^*(c, m')^2.
\]

\[
2(t + s)[\delta^*(c, m) - \delta^*(c, m')] \leq \delta^*(c, m)^2 - \delta^*(c, m')^2.
\]

Hence, \( \delta^*(c, m) - \delta^*(c, m')(t - s) \geq 0 \) in which case \( \delta^*(c, m) \geq \delta^*(c, m') \). Moreover, \( \exists (x, m, m') \) such that for \( \delta^*(c, m) > \delta^*(c, m') \) we have

\[
\forall x \geq 0, t(x, m, m') = \max \{0, [\delta^*(c, m) + \delta^*(c, m')]1/2 - x\};
\]

\[
\forall x < 0, t(x, m, m') = \min \{[\delta^*(c, m) + \delta^*(c, m')]2 - x, 1\};
\]

\[
\forall s < t(x, m, m'), \delta^*(c, m'), s; x) > \delta^*(c, m), s; x)
\]

\[
\forall s > t(x, m, m'), \delta^*(c, m'), s; x) < \delta^*(c, m), s; x).
\]

Claim 1.1 follows.

Now fix \( \lambda^*(x, t) \). By equations 1 and A-2, for any 

\[
\delta^*(c, m) = \arg\max_{m \in M} \{E[s|c, m_t] - b - \operatorname{var}[s|c, m_t] \} \equiv E[s|c, m_t]
\]

\[
= \int_0^1 t g(t|c, m) \, dt.
\]

**Remark 2.** Suppose the support of the legislator’s posterior over \( X \) conditional on receiving a contribution \( c \) is singleton; that is, the contribution strategy \( \gamma \) fully reveals the group’s ideal point, say, \( X(c) = \{x\} \). Then Lemma 1 and \( g(t) = 1 \forall t \in [0, 1] \) imply

\[
E[s|c, m_t] = \int_0^1 t g(t|c, m) \, dt = \frac{[t_1(x) + t_2(x)]}{2}.
\]

**Proof of Proposition 1 (Sufficiency).** By Lemma 1.1 and 1.2, if there is any influential equilibrium to the lobbying subgame, there is an equilibrium in which exactly two actions are elicited; say, \( 0 \leq a < b \leq 1 \). Let \( \inf X(c) = x(c) \), \( \sup X(c) = x(c) \), and \( y(a, b) = [a + b]/2 \). When there is no ambiguity, the dependency of \( y \) on \( (a, b) \), and of \( z \) and \( x \) on \( c \), will be suppressed. Given \( a < b \), let \( \lambda \) be a message strategy for the lobbying subgame such that

\[
\lambda(m_1|x, t) = 1 \iff t \leq y - x
\]

\[
\lambda(m_2|x, t) = 1 \iff t > y - x.
\]

By equation A-3 and \( g(t) = 1 \forall t \in [0, 1], \) therefore, assuming for the moment that \( g(t|c, m_1) \) is well defined,

\[
E[t|c, m_1, y] = \int_0^1 t g(t|c, m_1) \, dt = \frac{[t_1(x) + t_2(x)]}{2}.
\]
where

\[ \varphi(y - t | c) = \begin{cases} F(y - t | c) & \text{if } y < t < \tilde{x} \\ 1 & \text{if } y - t \geq \tilde{x} \\ 0 & \text{if } y - t \leq \tilde{x}. \end{cases} \] (A-7)

Trivially, \( E[t | c, m_1, y] \geq 0 \). To see that \( E[t | c, m_1, y] \leq 1/2 \) also, suppose not; then

\[ \int_0^1 t \varphi(y - t | c) dt \left[ \int_0^1 \varphi(y - t | c) dt \right] > 1/2 \]

\( \iff \int_0^1 (2t - 1) \varphi(y - t | c) dt > 0 \)

\( \iff \int_{1/2}^1 (2t - 1) \varphi(y - t | c) dt \leq 0 \)

\[ \left< \int_{1/2}^1 (2t - 1) \varphi(y - t | c) dt \right. \] (A-8)

By equation A-7, \( t > t' \) implies \( \varphi(y - t | c) \leq \varphi(y - t' | c) \); moreover, there is a one-to-one and onto map \( \rho : [0, 1/2] \rightarrow [1/2, 1] \) such that \( \forall t \in [0, 1/2], 1 - 2t = 2\rho(t) - 1 \). Hence, \( \forall t \in [0, 1/2], (1 - 2t) \varphi(y - t | c) \geq (2\rho(t) - 1) \varphi(y - \rho(t) | c) \), and therefore,

\[ \int_{1/2}^1 (2t - 1) \varphi(y - t | c) dt \geq \int_0^{1/2} (2\rho(t) - 1) \varphi(y - \rho(t) | c) dt \]

\[ - \rho(t | c) dt = \int_0^{1/2} (2t - 1) \varphi(y - t | c) dt, \]

contradicting the supposition. So \( E[t | c, m_1, y] \in [0, 1/2] \) \( \forall (a, b) \in [0, 1/2] \) with \( a < b \). Similarly, derive

\[ E[t | c, m_2, y] = \int_0^1 t g(t | c, m_2) dt \]

\[ = \int_0^1 t \int_0^{1/2} \lambda(m_2 | x, t) \varphi(x | c) dx dt \]

\[ = \int_0^1 t [1 - \varphi(y - t | c)] dt / \left[ \int_0^{1/2} [1 - \varphi(y - t | c)] dt \right. \] (A-9)

and deduce \( E[t | c, m_2, y] \in [1/2, 1] \) for all \( a < b \). Now define the mapping \( h : [0, 1/2] \times [1/2, 1] \rightarrow [0, 1/2] \times [1/2, 1] \) by

\[ \forall (a, b) \in [0, 1/2] \times [1/2, 1], h(a, b) \]

\[ = (E[t | c, m_1, y], E[t | c, m_2, y]). \]

Under the assumption that \( \int_{1/4}^{1/2} f(x | c) dx > 0 \), the mapping \( h \) is continuous. To show this, it suffices to check that for \( m \in (m_1, m_2) \), \( E[t | c, m, y] \) is continuous in \( y = [a + b]/2 \). (a, b) \( \in [0, 1/2] \times [1/2, 1] \). By definition, \( y \in [1/4, 3/4] \). Now let \( \mathcal{F}(y | c) = \int_0^1 \varphi(y - t | c) dt \) and note \( \mathcal{F}(y | c) = 0 \) only if \( \varphi(y - t | c) = 0 \) \( \forall t \in [0, 1] \).

By equation A-7, this can only occur if \( y \leq 1/4 \) or since \( y \geq 1/4 \), this implies \( x = 1/4 \), which contradicts the assumption

\[ \int_{1/4}^{1/2} f(x | c) dx > 0. \]

So \( \Psi(a, b) \) in the domain of \( h \), \( E[t | c, m_1, y] \) is well defined. Moreover, by definition of \( \varphi \) and \( \rho \) continuous, \( \mathcal{F}(y | c) \) is continuous in \( y \). And since \( \varphi \) is continuous, \( E[t | c, m_1, y] \) is continuous as required. From equations A-6 and A-9,

\[ E[t | c, m_2, y] \]

\[ = \int_0^1 t [1 - \varphi(y - t | c)] dt / \left[ \int_0^{1/2} [1 - \varphi(y - t | c)] dt \right. \]

\[ = \frac{1 - 2\mathcal{F}(y | c)E[t | c, m_1, y]}{2[1 - \mathcal{F}(y | c)]}. \]

Therefore, \( E[t | c, m_2, y] \) is continuous in \( y \) so long as \( \mathcal{F}(y | c) < 1 \) \( \forall y \). If \( \mathcal{F}(y | c) = 1 \), then necessarily \( \varphi(y - t | c) = 1 \) \( \forall t \in [0, 1] \). By equation A-7, this can only occur if \( y - 1 \leq \tilde{x} \) but since \( y \leq 3/4 \) this implies \( \tilde{x} \leq -1/4 \), contradicting the assumption \( \int_{1/4}^{1/2} f(x | c) dx > 0 \). Hence \( h \) is a continuous function as claimed. It follows that \( h \) has a fixed point, say \( (a^*, b^*) \in [0, 1/2] \times [1/2, 1] \). By construction and Lemma 1, \( (a^*, b^*) \) identifies an equilibrium \( (\lambda^*, \delta^*) \) to the lobbying subgame in which

\[ \begin{cases} \lambda^*(m_1 | x, t) = 1 & \text{iff } t \leq [a^* + b^*]/2 - x; \\
\lambda^*(m_2 | x, t) = 1 & \text{iff } t > [a^* + b^*]/2 - x; \\
\delta^*(c, m_1) = a^* & \text{and } \delta^*(c, m_2) = b^*. \end{cases} \] (A-10)

By definition, \( (\lambda^*, \delta^*) \) will be influential iff \( a^* < b^* \). By construction \( a^* = b^* \) iff \( a^* = 1/2 \), implying \( y^* = [a^* + b^*]/2 = 1/2 \). By equation A-6, \( a^* = E[t | c, m_1, y^*] = 1/2 \)

\[ \int_0^{1/2} (2t - 1) \varphi(y^* - t | c) dt = 0 \]

\[ \iff \int_{1/2}^1 (2t - 1) \varphi(y^* - t | c) dt \]

\[ = \int_{1/2}^1 (2t - 1) \varphi(y^* - t | c) dt. \] (A-11)
By equation A-7, \( t > t' \) implies \( \varphi(y' - t|c) \leq \varphi(y'^* - t'|c) \), and there is a one-to-one and onto map \( \rho: [0, 1/2] \rightarrow [1/2, 1] \) such that \( \forall t \in [0, 1/2], 1 - 2t = 2p(t) - 1 \). By the same argument following equation A-8, therefore, equation A-11 is possible only if \( \varphi(y' - t|c) = \phi \forall t \in [0, 1] \). But since \( y'^* = 1/2 \) and

\[
\int_{-1/2}^{1/2} f(x) \, dx > 0
\]

by assumption, this is impossible.

**Proof of Proposition 1 (Necessity).** If there is any influential equilibrium, then there is an equilibrium with only two elicited actions. So let \((\lambda^*, \delta^*)\) be an influential equilibrium to the lobbying subgame with \( 0 \leq a^* < b^* \leq 1 \) being the only two actions elicited by \( \lambda^* \). By Lemma 1, \((\lambda^*, \delta^*)\) is defined by A-10. Now suppose, contrary to the claim, that

\[
\int_{-1/2}^{1/2} f(x) \, dx = 0
\]

By previous arguments, \( a^* \leq 1/2, b^* \geq 1/2, \) and \( y^* = [a^* + b^*]/2 \in [1/4, 3/4] \). There are three cases: (1) \( y^* = 1/2, (2) y^* > 1/2, \) and (3) \( y^* < 1/2 \). Consider these in turn.

**Case 1:** By Lemma 1.1, \( y^* = 1/2 \) implies that \( \forall t \in [0, 1] \):

\[
\lambda^*(m_1|x, t) = 1 \forall x < -1/2, \text{ and } \lambda^*(m_2|x, t) = 1 \forall x > 1/2.
\]

Therefore, since

\[
\int_{-1/2}^{1/2} f(x) \, dx = 0
\]

by assumption, Lemma 1.2 implies:

\[
a^* = E[t|c, m_1, y^*] = b^* = E[t|c, m_2, y^*] = 1/2,
\]

contradicting \( a^* < b^* \).

**Case 2:** Let \( t_1 = y^* - (1/2) \). Since \( y^* > 1/2, t_1 > 0 \). By Lemma 1.1, \( \forall t \in [0, 1) \):

\[
\lambda^*(m_1|x, t) = 1 \forall x < -1/2, \text{ and } \lambda^*(m_2|x, t) = 1 \forall x > y^*.
\]

Further, \( \forall x \in (1/2, y^*], \lambda^*(m_2|x, t) = 1 \forall t \in (y^* - x, 1] \).

Therefore, by Lemma 1.2 and

\[
\int_{-1/2}^{1/2} f(x) \, dx = 0, b^* = E[t|c, m_2, y^*] \leq [1 + t_1]/2.
\]

Substituting for \( t_1 \) and \( y^* \) and collecting terms gives \( b^* \leq [1 + a^*/3]/2 \). But since \( a^* \leq 1/2 \), this inequality implies \([a^* + b^*] \leq 1\), contradicting \( y^* > 1/2 \).

Case 3 follows from a similar argument as that for Case 2, filling in the details completes the proof.

Q.E.D.

**Remark 3.** Let \( \{a_1, \ldots, a_N\} \) be the set of actions elicited in some influential equilibrium to the lobbying subgame following a contribution \( c; 0 < a_1 < \cdots < a_N < 1 \). Let \( y_1 = [a_1 + a_2]/2 \) and \( y_N = [a_{N-1} + a_N]/2 \). Then replacing \( y \) by \( y_1 \) in equation A-6 and \( y_{N-1} \) in equation A-9 defines \( a_1 \) and \( a_N \), respectively.

**Proof of Proposition 2.** Suppose not; then \( y^* \) is separating on some interval \( Y \subseteq X \cap (0, \bar{x}) \), in which case the lobbying subgame is exactly the canonical Crawford and Sobel (1982) strategic information transmission game. In particular, the group's ideal point is common knowledge prior to the group becoming informed (if at all) about the true value of \( t \in [0, 1] \). For any \( z \in Y \), let \( \lambda^*(z) = (\lambda^*(z, \cdot), \delta^*(\cdot)) \) denote the most influential lobbying equilibrium, conditional on \( z \) being common knowledge, in which the associated partition satisfying Lemma 1.1 is of size \( N(z) \). By Lemma 1 and Remark 2, the legislator's posterior beliefs over \( [0, 1] \) conditional on any message sent under \( \lambda^*(z, \cdot) \) are uniform. By Crawford and Sobel 1982, Lemma 6, \( \forall x, y \in Y \times x = y \) implies \( N(x) \leq N(y) \).

By equation A-1a, \( V_x, y \in X \):

\[
qV^\prime(y^*(x), x) - y^*(x) \geq qV^\prime(y^*(y), x) - y^*(y)
\]

(12)

\[
qV^\prime(y^*(y), y) - y^*(y) \geq qV^\prime(y^*(y), x) - y^*(x),
\]

(13)

where \( V^\prime(y^*(x), x), x \) denote the expected payoff to the group with ideal point \( x \) from playing the equilibrium strategies for the group with ideal point \( y \); that is, \( V(y^*(y), x) = [qV^\prime(y^*(y), \lambda^*(x, y)), t, x)] \). Then by Lemma 1 and equation 2:

\[
V^\prime(y^*(x), x) - V^\prime(y^*(y), x) = \left[ \sum_{i=1}^{\text{i=N(x)}} (t_i - t_{i-1})y_3 \right] / 12.
\]

Suppose \( x > y \); then \( N(x) \leq N(y) \) and, by Crawford and Sobel 1982, 1441, \( W = 1, \ldots, N(x), t_i - t_{i-1} = (t_i - t_{i-1}(x)) - (t_i - t_{i-1}(x)) \). Furthermore, \( t_{N(x)}(x) = 1 \) and \( t_{N(x)}(y) = 0 \). Therefore, \( V^\prime(y^*(x), x) - V^\prime(y^*(x), x) < 0 \). So by definition of \( V^\prime(y^*(y), x), V^\prime(y^*(x), x) - V^\prime(y^*(y), x) < 0 \). Hence, A-12 implies \( y^*(x) < y^*(y) \). Thus \( y^* \) is strictly decreasing on \( Y \) and, therefore, \( y^* \) is differentiable almost everywhere on \( Y \) (Royden 1968): in particular, there exists an open subinterval, \( \bar{Y} \subseteq Y \), on which \( y^* \) is differentiable. Then a necessary condition for A-12 and A-13 to hold is the following local incentive compatibility condition:

\[
\forall x \in \bar{Y}, \, d[qV^\prime(y^*(x'), x) - y^*(x')] / dx |_{x=x} = 0.
\]

Therefore, for any \( x < x', \, x' \in \bar{Y} \),

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\[ q \int_x^{x'} [dV'(\gamma'(y), y')] dy = \int_x^{x'} \gamma'(y) dy \]

\[ \Rightarrow q[V'(\gamma'(x'), x') - V'(\gamma'(x), x)] = [\gamma'(x') - \gamma'(x)]. \quad (A-14) \]

With A-12 and A-13, therefore, equation A-14 implies

\[ V'(\gamma'(x), x) - V'(\gamma'(y), y) = 0. \quad (A-15) \]

Consider any \( x, y \in \tilde{Y} \) with \( x > y \). Recall that \( \tilde{V}(\gamma'(x), y) \) is the expected payoff to the group with ideal point \( y \) from playing exactly the equilibrium strategies for the group with ideal point \( x \), and \( \forall i = 1, \ldots, N(x) \), let \( i(x) = \{ i(x) + t_{i-1}(x) \} / 2 \) and \( \delta = \gamma'(x', x) \), where \( \forall i \in \{ t_i(x), i(x) \} \), \( m_i = \lambda^*(\alpha, x, t) \). Then Lemma 1 and equation 2 yield

\[ V'(\gamma'(x), y) - V'(\gamma'(y), x) = \sum_{i=1}^{N(x)} [i(x) - t_{i-1}(x)](x - \delta). \]

Since \( \gamma' \) is separating by supposition, Lemma 1 and Remark 2 imply \( \delta' = \gamma'(x', x) \). Therefore, \( \tilde{V}(\gamma'(x), y) - V'(\gamma'(y), x) = (x' - y) > 0 \). But then, since \( \tilde{V}(\gamma'(y), y) - V'(\gamma'(y), x) \leq 0 \) by definition of \( V'(\gamma(x), y) \), \( V'(\gamma'(x), x) - V'(\gamma'(y), x) \) is a contradiction of A-15.

Q.E.D.

**Lemma 2.** Let \( c_r \) be an equilibrium contribution such that the equilibrium message strategy in the tournament subgame elicits actions \( \{a_r, \ldots, a_n\} \), where \( 0 < a_r < \cdots < a_n < 1 \). Similarly define a distinct equilibrium contribution \( c_r \neq c_r \) and consecutive elicited actions \( \{b_r, \ldots, b_n\} \), where \( 0 < b_r < \cdots < b_n < 1 \). Then \( V'(c_r, x) - V'(c_r, x) \) is continuous in \( x \) on \([0, \infty)\), differentiable in \( x \) except possibly at a finite number of values. Moreover, if \( B = 1 \), then \( V'(c_r, x) \) can have at most one turning point.

**Proof.** Let \( t_i(x; c_r) = \max \{i_r \} [a_i + a_{i+1}] / 2 - x \), \( i = 1, \ldots, A - 1 \). Then by Lemma 1 and equation 2,

\[ V'(c_r, x) = \sum_{i=1}^{A} [t_i(x; c_r) - t_{i-1}(x; c_r)](x + t_i(x; c_r) - a_i)^2 + (t_i(x; c_r) - t_{i-1}(x; c_r)^2) / 12, \]

where \( t_i(x; c_r) = [t_i(x; c_r) + t_{i-1}(x; c_r)] / 2 \). Let \( a(x) \) be the action elicited by the group paying \( c_r \) if the group observes \( i = 0 \); thus, \( a(x) = a_0 \) if \( x \geq [A_{0-1} + A_0] / 2 \), and \( a(x) = \min \{a_i | i < A \} \) and \( [a_i + a_{i+1}] / 2 \geq x \) otherwise. By definition of \( t_i(x; c_r) \), \( a(x) \) is stepwise increasing in \( x \) with at most \( A - 1 \) jump discontinuities. However, since the max function is continuous, \( V'(c_r, x) \) is continuous in \( x \) on \([0, \infty)\), and save possibly at the points of discontinuity in \( a(x) \), differentiable in \( x \) on \([0, \infty)\). Specifically, ignoring the points of discontinuity in \( a(x) \), substituting for \( t_i(x; c_r) \) and differentiating,

\[ dV'(c_r, x) / dx = (1 + 2A - 2a_0) + a_1 - a(x)^2 + 2a_0 < 0. \]

Now, defining \( b(x) \) similarly to \( a(x) \), we have the difference \( W(x; c_r, c_r) \). Consequently, \( V'(c_r, x) - V'(c_r, x) \) is continuous and almost everywhere differentiable in \( x \). Assuming differentiability at \( x \),

\[ dW(x; c_r, c_r) / dx = 2[A_0 - b_0] + [a_0 - a(x)](2x + 2a_0 - a(x)). \]

Therefore, \( a_0 - a(x) \) on \([0, \infty)\). If \( a_0 - b_0 \), then, \( W(x) \) is not continuous in \( x \) on \([0, \infty)\). Consequently, \( W(x) \) is not differentiable at \( x \); in particular, \( B = 1 \), \( \cdots \), \( A - 2 \) such that \( a(x) = 0 \) and \( a(x) = 1 \) for \( 0 \) or arbitrarily small. Moreover,

\[ dW(x^2 - \gamma) / dx = 2[A_0 - b_0] + [a_0 - a(x)](2x - 2x_0 + 2(x^2 + x - x_0)). \]

Therefore, \( a_0 - a(x) \) on \([0, \infty)\). If \( a_0 - b_0 \), then, \( W(x) \) is not continuous in \( x \) on \([0, \infty)\). Therefore, \( W(x) \) is not differentiable at \( x \); in particular, \( B = 1 \), \( \cdots \), \( A - 2 \) such that \( a(x) = 0 \) and \( a(x) = 1 \) for \( 0 \) or arbitrarily small. Moreover,

\[ dW(x^2 - \gamma) / dx = 2[A_0 - b_0] + [a_0 - a(x)](2x - 2x_0 + 2(x^2 + x - x_0)). \]

Hence,

\[ a_0 - a(x) \]
Since $a_{i_1} > a_i, 1 < \text{LHS}(a_{227})$. And for $\epsilon$ sufficiently small, $(x + \epsilon) \approx (x - \epsilon)$; but then $a_{i_1} > a_i$ implies RHS$(a_{227}) < 1$; contradiction. Therefore, if $B = 1 W(x; c)$ can have at most one turning point. Q.E.D.

Proof of Proposition 3. Suppose $\gamma^*(\cdot)$ is semipooling. By proposition 2, $\gamma^*(\cdot)$ cannot involve any separating segments. To prove $\gamma^*$ nonmonotonic, therefore, it suffices to show that $\gamma^*(\cdot)$ cannot be either (1) (stepwise) increasing on $[0, \bar{x})$ or (2) (stepwise) decreasing on $(\bar{x}, 0]$, $\bar{x}$ sufficiently large. Consider these in turn. 

Case 1. Suppose $\gamma^*(\cdot) = c_i \forall x \in [x_{j-1}, x_j], j = 1, \ldots, L$, with $x_0 = 0, x_L = \bar{x}$, and $c_i < c_{i+1}$ all $j = 1, \ldots, L - 1$. Let $\{a_{i_0}, \ldots, a_{N_0}\}$ be the set of actions elicited in the (most influential) lobbying subgame consequent on the group giving a contribution $c_j; a_{i_0} < a_{i_1}$ all $i, j$. Note that $\alpha^*(c_1) = 1$. To see this, suppose not. Then by expression 4, $c_1 = 0$ and $N(1) = 1$; specifically, by Lemma 1.2, $\alpha^*(0, 2) = 1/2$. Since $c_1 > 0$, expression 4 implies $\alpha^*(c_2) = 1$ and so $N(2) > 2$. By incentive compatibility, $qW(x; c_1, 0) > c_2$. By the argument for proposition 1, $a_{i_2} < 2 < a_{N_2}$. Hence, $W(0; c_1, 0) > W(x; c_2, 0)$. But then, $qW(0; c_1, 0) > c_2$, contradicting incentive compatibility. Therefore, $\alpha^*(c_2) = 1 \forall j = 1, \ldots, L$. Now let $m_{i_0}$ be the message that elicits action $a_{i_0}$ all $i, j$, and let $T(x) = \{i \in [0, 1] \mid \lambda(x, t) = m_{N_0}\}$. By Lemma 1.1, $x > x$ implies $T(x) \subset T(x)$. Therefore, by Lemma 1.2, in a most influential equilibrium, the minimal [resp. maximal] value of $a_{N_0}$ is achieved if $F(x; c_i)$ puts probability one on $x_i$ [resp. $x_{i-1}$]. So $a_{N_0} < a_{N_0-1} \forall j = 2, \ldots, L$. Hence, equation A-16, $dW(x; c_i, c_j)/dx = 2(a_{N_0} - a_{N_0})/1 > \frac{\epsilon}{1} > 1$ and $x$ sufficiently large. But then $W(x; c_i, c_j) > c_i - c_j/q$, contradicting incentive compatibility.

Case 2. Let $\gamma^*(\cdot) = c_i \forall x \in [x_{j-1}, x_j], i = 1, \ldots, L, L \geq 2$, and $c_i < c_{i+1}$ all $i > 1$. By previous reasoning, the maximal elicited action in the lobbying subgame is elicited in the subgame consequent on the legislator receiving $c_j; a_{N_0} > a_{N_0}$ all $j > 1$. By equation A16, $dW(x; c_i, c_j)/dx = 2(a_{N_0} - a_{N_0})$ for sufficiently large $x > x_1$. Hence, for $x$ sufficiently large, $W(x; c_i, c_j) > c_i - c_j/q$, contradicting incentive compatibility. 

Now suppose that $\gamma^*$ is semipooling and that exactly one contribution induces access, say, $\gamma^*(\cdot) = c$. Then sequential rationality requires $c > 0$ and $\gamma^*(c) \neq c$ iff $\gamma^*(c) = 0$. Hence the legislator’s unique best response action conditional on $\gamma^*(t) = 0$ is to choose $E(t|\gamma^*(t) = 0, \alpha^*(\gamma^*(t)) = 0) = f_0(x) dt = 1/2$. By case 1 and 2 above, $\gamma^*$ cannot be monotonic. So to prove that it must be (stepwise) U-shaped, it suffices to exclude the possibility that $\gamma^*$ has any (stepwise) increasing segments followed by (stepwise) decreasing segments on $[0, \bar{x})$. Assume the contrary. Because $\gamma^*(\cdot) \in \{0, 0\} \forall x$, this means there exist $0 \leq x_1 < x_2 < x_3 < x_4 \leq \bar{x}$ such that $\gamma^*(\cdot) = 0 \forall x \in [x_1, x_3], \gamma^*(\cdot) = c > 0 \forall x \in [x_3, x_4], \gamma^*(\cdot) = 0 \forall x \in [x_4, x_5]$. Since $c > 0$, equation 5 implies that at least two actions are elicited in the lobbying subgame consequent upon access. By incentive compatibility, $W(x; c, 0)$ is increasing in $x$ at $x_3$ and $W(x; c, 0)$ is decreasing in $x$ at $x_3$. By Lemma 2, $W(x; c, 0)$ is strictly decreasing at $\bar{x}$.

Let $a_2$ be the largest action elicited in the lobbying subgame consequent on $\gamma^*(\cdot) = c$. Since $\bar{x} > 1, \gamma^*(\cdot) \neq c$ and Lemma 1 imply $\lambda^*(\bar{x}, t) = 0 \forall \bar{x}$ within $[0, 1]$. Hence, by $W(x; c, 0)$ strictly decreasing at $\bar{x}$, $dW(x; c, 0)/dx = 2(a_N - (1/2)) < 0$; but by the argument for proposition 1, $a_N = 1/2$; contradiction. Q.E.D.

Notes

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1. See also Drew 1983; Herndon 1982; Langbein 1986; and Schlozman and Tierney 1986,—among others.


3. See Lohmann 1993 for a formalisation of this argument.

4. The main empirical focus of models adopting the first perspective on access, is on the relationship between a candidate’s probability of electoral success, rather than any notion of policy preferences, and the level of contributions he or she can attract. Typically, the prediction is that the relationship is positive, except possibly at very high estimates of electoral success (Baron 1989; Snyder 1990).

5. In Lohmann 1993, there is no such uncertainty and contributions do not signal anything about the value of access. Instead, campaign contributions in her model signal already-acquired, issue-specific technical information. And with this formulation access is irrelevant to any group that gives a positive contribution: since group preferences are common knowledge, all of the relevant information held by such a group is revealed by its equilibrium contribution per se.

6. In earlier versions I claimed that any revealing contribution schedule must be (stepwise) U-shaped. However, my supporting argument was faulty. All I can establish at present is the (more important) claim of nonmonotonicity. So while the U-shape can occur (see example 1), it remains an open issue as to whether it always occurs.

7. But Austen-Smith 1993 presents an informational lobbying game of the sort considered here, in which the status quo plays a central strategic role and such complications are considered explicitly. However, there are no campaign contributions and access is assured by assumption. See also Gilligan and Krehbiel 1987.

8. In an earlier version, the group was allowed to choose whether or not to become informed at some cost. However, since the group becomes informed if and only if access is granted, making this decision explicit in the model added little but notation.

9. The example may not report the most influential equilibrium available here. Rather, it is chosen both because it illustrates the principles clearly and because it is relatively straightforward to calculate. (The mass point at zero, for instance, permits easier computation of the legislator’s decisions at the lobbying stage but is not essential.) Computational details available on request.

10. It is interesting to note here that unlike in most signaling games, a separating equilibrium is broken by the “good” types (i.e., those most valuable to the legislator) deviating to mimic the relatively “bad” types.

11. For further discussion of this sort of lobbying equilibrium, assuming the group’s preferences are known, see, e.g., Crawford and Sobel 1982 and, perhaps more accessible, Gilligan and Krehbiel 1987.

12. Formal details available on request.
References


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