Informational Lobbying and Political Contributions

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August 2001

Abstract
Interest groups can influence political decision-makers in two distinct ways: by offering contributions and by providing relevant information that may sway the decision in the group’s favor. We analyze the conditions under which interest groups are more inclined to use one or the other channel of influence. First, we identify an indirect cost of searching for information in the form of an information externality that increases the cost of offering contributions. We then show that an extreme interest group might find it beneficial to abandon information provision altogether and instead seek influence solely via contributions. Finally, we analyze competition among lobby groups as providers of information and contributions. We show that in this framework the information externality rewards the group that can abstain from information search and focuses its influence on contributions. Our analysis lends support to a rather cynical view of lobbying in that contributions are a more effective means of influencing the political process.

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We would like to thank Eric Maskin, Torsten Persson, Ken Shepsle, and Jim Snyder for valuable comments. The first author gratefully acknowledges financial support from the Danish Social Science Research Council and Industriens Realkreditfond.
1 Introduction

Interest groups participate directly in the political process in two distinct ways: they provide substantive information to policy makers and they offer financial incentives by contributing to politicians’ campaigns.\(^1\) In order to influence a political decision an interest group thus faces a choice between providing the decision-maker with information or lobbying via contributions, or doing both. This paper analyzes how the choices of acquiring information and providing it to the decision maker and supporting her campaign interact, and under what circumstances an interest group uses one or both of these two different strategies.

In the framework of this paper both the interest group and the decision maker are uncertain about some aspect of a policy decision. Depending on the true nature of the uncertain aspect, the decision-maker prefers either an outcome that favors the interest group or one that harms it. The interest group has the ability to gather information that may reduce the uncertainty, and it may therefore be in the position to provide the decision-maker with useful information. Obviously, the interest group will only gather and transmit the information if it is in its interest to do so. Alternatively, the interest group may take advantage of the decision-maker’s ignorance and induce her to choose the favorable outcome by offering (contingent) campaign contributions.

Collecting information and deciding not to provide it to the decision maker is information in and of itself, and a rational decision-maker will make use of it. Independently of whether the interest group’s search for information is observed by the decision-maker, the collection of information can create an informational externality, particularly when it leads the decision-maker to infer that the group is knowledgeable and is withholding its information. This information externality increases the cost of bribing the decision-maker. We show that if the lobby group has intense preferences for a particular out-

\(^1\) In addition to participating directly, there is an indirect channel of influence by providing information or cues to voters via issue ads or candidate endorsement. This aspect of interest group behavior does not concern us in this paper.
come (as most interest groups indeed have), then the information externality significantly decreases the lobby group’s incentive to search for information.

It is often argued that competition among information providers increases the incentive to provide (truthful) information (see e.g. Austen-Smith and Wright 1992 and Dewatripont and Tirole 1999). This “conventional wisdom” no longer holds without qualification when the information externality we identified is taken into account. We show that even with two interest groups vying for influence only one may search in equilibrium and that therefore no more information is provided to the decision-maker. There is, however, an expanded range of parameters in which more search may occur when lobby groups compete. Allowing for contributions, however, changes the picture somewhat. The information externality that searching provides benefits the opponent. A group will try not to search, and the group with the less powerful information technology will, on average, be more successful in influencing outcomes. This suggests that the interaction of information and incentive provision should be carefully considered in principal-agent models.

Campaign contributions as well as the strategic use of information to influence policy choice have been the subject of tremendous scholarly interest and research (see surveys by Schlozman and Tierney 1987, Persson 1998, and Grossman and Helpman, forthcoming). A growing number of formal models assess the role of campaign contributions and party or candidate competition for interest group influence on policy outcomes (Austen-Smith 1987; Baron 1989, 1994; Snyder 1990, 1991; Grossman and Helpman 1994, 1996). In these models, contributions serve as an incentive device with which interest groups induce policy choices. Ball (1995), on the other hand, considers a model in which contributions are welfare enhancing and serve as a signalling device. Extreme interest groups are willing to pay higher contributions so that a decision-maker who cares about the welfare of the interest group can in a separating equilibrium be informed about the interest group’s type.

A second strand of literature addresses the role of strategic information provision. Information originating from interested parties is biased; yet by using costly signals or sporadic verification of the information by the decision-
maker, the interest group can credibly inform the decision-maker (Calvert 1985, Gilligan and Krehbiel 1987). The influence a group has on the decision-maker provides an incentive to acquire information, even if the acquisition is costly.

Few papers have combined the motivations to provide campaign contributions and information. Austen-Smith (1995) considers a two-stage model in which in the first stage contributions serve to gain access and partially signal the group’s preference, followed by a second stage game of costless information provision. Lohmann (1995) analyzes the situation where several heterogeneous interest groups seek access and influence. Interest groups with preferences similar to the decision-maker’s obtain access at zero cost and can transmit private information credibly, while extreme lobby groups must pay positive contributions. In both models contributions serve to gain access and to enhance the credibility of the sender.

The present paper takes a different approach. It contrasts the cynical view of interest groups as influence seekers by means of contributions with the more optimistic view of interest groups as providers of useful information. By allowing interest groups to choose between the two instruments of influence (and any combination of the two) the paper demonstrates the two.

The next section lays out a simple generic decision model used in the subsequent sections. Section 3 provides the basic intuition that pertains in the subsequent following sections. In this section we make the rather simplifying assumption that the decision-maker observes the lobby group’s search activity and show that information search entails an informational externality. This assumption is dropped in the subsequent sections.

Sections 4 and 5 present the two main contributions of our analysis in the more realistic setting where the decision-maker cannot observe the interest group’s search activity. Section 4 shows that allowing an interest group to use financial incentives decreases its search activity for a large range of the parameters. In Section 5 we extend our model by introducing a competing interest groups and analyze how the competition among information providers changes a lobby group’s incentive to gather information. We show
in this model that competition increases the lobby’s search activity when contributions are not permitted, but that the benefits of the the search accrue in part to the opposing lobby group when contributions are allowed due to the information externality.

Section 6 discusses the findings and concludes.

2 The Model

A policy maker needs to choose between three alternative policies, \(d_\ell, d_r\), and a neutral choice \(d_o\). Whether \(d_\ell\) or \(d_r\) is the best choice depends on the state of the world, \(\theta \in \{\theta_\ell, \theta_r\}\), while \(d_o\) is never best nor worst. The state of the world is unknown to the decision-maker, and each state has an equal probability \(ex\ ante\).\(^2\)

The decision-maker holds preferences over the projects and, in addition, derives utility from potential contributions from an interest group.

\[
V_{dm}(d, c; \theta) = u_{dm}(d; \theta) + \alpha c.
\]

We assume that the utility is risk averse over the projects\(^3\) as well as additively separable and linear in the contributions \(c\), with \(\alpha\) measuring the (marginal) value of campaign contributions to the decision-maker.\(^4\) For simplicity of exposition we choose an explicit functional form for \(u\) as follows:

\[
u_{dm}(d; \theta) = \begin{cases} 
0 & \text{if } (d, \theta) \in \{(d_\ell, \theta_\ell), (d_r, \theta_r)\} \\
-1 & \text{if } d = d_o \\
-4 & \text{if } (d, \theta) \in \{(d_\ell, \theta_r), (d_r, \theta_\ell)\}.
\end{cases}
\]

\(^2\)The symmetry of the probability between the states is not important for what follows but provides a convenient choice for the analysis.

\(^3\)Risk averse over the projects in the sense that the decision-maker strictly prefers \(d_o\) to an even gamble \((\frac{1}{2}, \frac{1}{2})\) between \(d_\ell\) and \(d_r\).

\(^4\)This means that the decision-maker is risk neutral with respect to contributions. If the decision-maker were risk averse, contingent contributions could influence the decision-maker additionally by providing an insurance. The parameter \(\alpha\) allows the utility of a dollar to differ between the decision-maker and the lobby group, with \(\alpha = 1\) being a case of transferable utility and \(\alpha < 1\) denoting transfer losses.
There is one interest group in the basic model, and it prefers the \( d_{\ell} \) project \textit{independently} of the state of the world. We thus use \( \ell \) as subscript for the for the group’s utilities. The lobby group’s preference is additively separable in the utility from the project, the cost of gathering private information, and the contributions it pays to the decision-maker:

\[
V_{\ell}(d, s, c) = u_{\ell}(d) - sk - c,
\]

where
\[
u_{\ell}(d) = \begin{cases} 
2\beta & \text{if } d = d_{\ell} \\
1 & \text{if } d = d_{o} \\
0 & \text{if } d = d_{r}.
\end{cases}
\]

\( k \geq 0 \) is the cost incurred by the group \textit{if} it decides to search for information, \( s \in \{0, 1\} \). \( \beta \geq \frac{1}{2} \) parameterizes the lobby group’s intensity of preference between the projects. Notice that the group is risk averse (risk loving) if \( \beta < (>) 1 \). We believe that \( \beta > 1 \) is the leading case, reflecting the fact that interest groups often have a lot to gain from the choice of their most preferred outcome. We will refer to such interest groups as having \textit{intense} preferences.

The specific functional forms for the decision-maker’s and the group’s preferences are chosen for their simplicity and the flexibility they afford. The decision-maker essentially has a quadratic loss function over evenly spaced alternatives, while the interest group’s preference intensity is expressed by the parameter \( \beta \).

The contractual framework between interest group and decision-maker is incomplete. We assume that the decision-maker and the lobby group are unable to write binding \textit{ex ante} contracts that tie the decision maker’s choice to the lobby’s search activity or to the information transmitted by the group, or that require payments by the decision maker to the lobby group contingent on the chosen policy. We believe this to be a defining aspect of lobby groups. The decision-maker always retains the right to choose the \textit{ex post} optimal outcome; it would be politically infeasible and practically problematic to bind the decision-maker to the lobby group’s recommendation. If the decision-maker were to make such a commitment, the information provider becomes
a (government) agency or contractor.\footnote{In addition, we also assume that commitment to a third party, e.g. the public, is not enforceable. The consequences of contracting with third parties are analyzed in Maskin and Tirole 1999.}

The sequence of moves in the game applies both to lobbying in a democratic society through legal campaign contributions to political parties and to corruption with bribes in an autocratic regime. In the first stage of the game the lobby group decides whether it wishes to search for information about the state of the world. If the group decides to search it receives a signal $\sigma$, which with probability $q$ contains hard information about the state of the world, $\sigma = \theta$, and with probability $1 - q$ is uninformative, $\sigma = \emptyset$ (if the group does not search $\sigma = \emptyset$). Next, the interest group sends message $m$ to the decision-maker, where $m \in \{\sigma, \emptyset\}$. We assume that the group can withhold knowledge about the state of the world, but it cannot “lie”, i.e. it cannot forge information.\footnote{This simplifying assumption of “hard information” can be interpreted as the lobby group’s need to maintain the reputation of credibility to be effective in the long run. As a practical example, an interest group can commission an independent study on the impact of a certain policy in various districts. While the research institution’s scientific reputation lends the study credibility and prevents manipulation of the study’s results, the lobby group can choose to publish the results, or parts of them, only when they are supportive of its interests.} If $m = \emptyset$ it may either be that the group is uninformed or that it is not willing to provide the information it has.

In addition to sending a message, the interest group can also lobby by offering contributions, understood as non-negative payments to the decision-maker contingent on the chosen project (similar to Bernheim and Whinston 1986). Finally, given messages and contingent contributions, the decision-maker chooses the project. The time line of the game is given in Figure 1.

When the interest group searches, it receives a favorable signal $\sigma = \theta_\ell$ with probability $q/2$, and will reveal this to the decision-maker. If the lobby group receives unfavorable information ($\sigma = \theta_r$), it will try to hide this from the decision-maker and will send the same message as if its search was uninformative ($\sigma = \emptyset$). Given this message strategy the decision-maker
uses Bayes’ Rule to update his beliefs about the state of the world, and his posterior belief after receiving message \( m = \emptyset \) is: 

\[
p(\theta_r \mid m = \emptyset) = \frac{1}{2-q},
\]

and 

\[
p(\theta_\ell \mid m = \emptyset) = \frac{1-q}{2}\frac{1}{q}.
\]

Before we continue on solving the game, the following result will prove useful in the analysis. Consider a lobby group that searched and failed to find evidence in support of its preferred state of the world. If the group cares sufficiently for its preferred outcome, it can induce a favorable decisions by offering campaign contributions large enough to compensate the decision-maker for her expected utility loss. The following Lemma establishes the under which condition the lobby induces \( d_\ell \) via contributions even after it has searched (or the decision-maker believes it has searched) and failed to provide hard evidence in favor of \( \theta_\ell \).

Define

\[
\beta(q) = \begin{cases} 
\frac{1}{2} + \frac{1+\frac{1}{2}q}{(2-q)\alpha} & \text{if } q < \frac{2}{3} \\
\max \left\{ \frac{2q}{(2-q)\alpha}, \frac{1+\frac{1}{2}q}{(2-q)\alpha} \right\} & \text{otherwise.}
\end{cases}
\]

**Lemma 1.** Suppose the decision-maker knows (or believes) that the lobby has searched for information, and the group fails to provide any hard evidence. Then a lobby group induces its preferred outcome through contribution if and only if \( \beta \geq \beta(q) \).

The proof is in the appendix. Lemma 1 characterizes a lobby group who cares sufficiently about its preferred outcome so that it will induce the
outcome with contributions after the information search failed. We generally refer to such a group as an *extreme* lobby group.

The lower bound for the preference intensity of an extreme lobby group, $\underline{\beta}(q)$, is increasing in $q$: the more informative the search, the higher is the preference threshold. As will become evident in the next section, when search is more informative, inducing the preferred outcome *ex post* becomes more costly and thus the preference threshold for an extreme lobby group rises.

### 3 Observable Information Gathering

In this section we identify a Bayesian information externality associated with the lobby group’s search. For simplicity, and to provide a clear intuition, we assume that the decision-maker observes the lobby’s search activity. In the subsequent sections we analyze the more realistic situation where the decision-maker cannot monitor the interest group.

Assume first that contributions are *not feasible* (e.g. they are illegal or non-enforceable), so that the only way to influence the decision-maker’s choice is by information transmission. When the decision-maker receives message $m = \theta_j$ she chooses $d = d_j$ ($j = \ell$ or $r$), as the message is necessarily true. If the message is uninformative ($m = \emptyset$), the decision-maker updates her beliefs and chooses the project that maximizes expected utility, which is $d_\circ$ if $q < \frac{2}{3}$, and $d_r$ if $q > \frac{2}{3}$, given the updated beliefs. With this best response strategy for the decision maker, will the group search for information?

First, consider the case of $q \leq \frac{2}{3}$. The lobby group searches if the expected gain from searching exceeds the (certain) payoff from not searching, or $\frac{q}{2}(2\beta) + (1 - \frac{q}{2}) \cdot 1 - k > 1$, which simplifies to

$$\frac{q}{2}(2\beta - 1) > k.$$

Notice that if search is costless ($k = 0$) the group will search in this case.

Next, consider $q > \frac{2}{3}$, i.e. the search is likely to be informative for the group, and the decision-maker switches to $d_r$ if $m = \emptyset$. The group now
searches if \( \frac{q}{2}(2\beta) - k > 1 \), or, to compare it to the condition above,

\[
\frac{q}{2}(2\beta - 1) > k + 1 - \frac{q}{2}.
\]

The new term on the right hand side is the expected indirect search cost, or Bayesian cost, and arises since the rational decision-maker updates her beliefs whenever no information is provided by a searching lobby.

If search is costless (\( k = 0 \)), the condition simplifies to \( \beta > \frac{1}{q} \) and only a group with sufficiently intense preference for its preferred outcome finds it optimal to search. The condition is decreasing in \( q \) and reaches a lower bound of \( \beta = 1 \) when search is perfectly informative (\( q = 1 \)). Thus, the bound is strictly higher than when \( q < \frac{2}{3} \). We get the following result:

**Result 1 (Indirect search cost).** When search is observable and is sufficiently informative (\( q \geq \frac{2}{3} \)), a lobby group only searches for information if its preference for the preferred outcome is sufficiently intense. Specifically, the group searches iff \( \beta > \frac{1+k}{q} \).

When campaign contributions are permitted, the lobby group has a the dual choice of searching for information and/or to influence the decision-maker’s choice via contributions. In contrast to the previous case without contributions, even for \( q < \frac{2}{3} \) and costless search a lobby with intense preferences does not always want to search when the opportunity for contributions is available, as captured by the following result.

**Result 2 (No search, I).** Assume that search is observable, that contributions are allowed, and that the lobby group’s preferences are sufficiently intense (\( \beta > \beta(q) \)). Then in equilibrium the lobby never searches for information.

The proof is in the appendix.

Result 2 shows that the indirect search cost has a dramatic consequence on the lobby group’s choice of instruments: a group that is willing to induce its preferred outcome after an unsuccessful search will in fact never search for information, even if searching is costless. While the group could save
contributions if the search reveals the favorable state, an unsuccessful search makes contributions more costly. The Result implies that the latter effect always dominates the former.

The result highlights the difference contributions make. When contributions are not feasible, an unsuccessful search increases the likelihood of state $\theta_r$ that leads the decision-maker to choose $d_r$, the worst outcome for the group. Provided the group cares sufficiently about its most preferred outcome, it is willing to take the gamble of getting the favorable information.

When contributions are feasible, on the other hand, the indirect search cost takes on a different form: it increases the expected contributions necessary to induce the lobby groups’s favored outcome. The reason for this is the following. The group’s search—whether successful or not—increases the information available to the decision-maker at a later stage of the game. This increases the decision-maker’s \textit{ex ante} expected utility. Since the final outcome is independent of the search outcome when the group is willing to induce its preferred choice via contributions, the total surplus created by the decision is fixed. Thus, the group must be worse off \textit{ex ante}. In other words, when contributions are feasible, the provision of information transfers \textit{on average} welfare from the lobby group to the decision-maker.

Following the logic of Result 2, interest groups with intense preferences, e.g. the tobacco industry or the beneficiary from protective tariffs, will not seriously try to find evidence that supports their claims, but rather simply lobby for the outcome they prefer. Only groups with less intense preferences or limited ability to pay, who choose not to induce their most preferred decision in the absence of hard information to support their view, will gather relevant information.

4 Unobservable Information Collection

Due to the cost of monitoring interest groups and the possible lack of incentives to do so it seems more realistic that the decision-maker does not observe the group’s search activity. When information search is unobserv-
able, we must solve for a rational expectation equilibrium (REE) in which the
decision-maker correctly infers from the lobby group’s equilibrium behavior
its decision to search, and both players’ strategies maximize their expected
utilities given their beliefs.\footnote{A rational expectations equilibrium of this game is a Perfect Bayesian equilibrium: actors behave sequentially rational, and beliefs about the group’s search activity are determined by Bayes’ rule along the equilibrium path; out-of-equilibrium beliefs are updated correctly whenever hard information is provided.}

We begin the analysis again by assuming contributions are not feasible. We first show the existence of rational expectation equilibria in which the
lobby group does not search.

Suppose the decision-maker expects the lobby group not to search. If
the lobby group provides no information ($m = \emptyset$), the decision-maker does
not update her beliefs and chooses the neutral outcome. The lobby group’s
net benefit from searching given that the decision-maker expects no search is
$q_2(2\beta) + (1 - q_2) \cdot 1 - k - 1$. The equilibrium condition is that, given the
beliefs, the lobby group prefers not to search, i.e. that the expression above
is negative, which can be written as

$$\frac{q_2}{2}(2\beta - 1) < k,$$

or

$$\beta < \frac{1}{2} + \frac{k}{q}.$$  \hspace{1cm} (1)

Thus, provided the lobby group’s preference is not too intense there exists a
rational expectation equilibrium in which the group does not search whenever
the search cost is positive. The higher the search cost and the lower the
informational value of the search ($q$), the easier it is to sustain a no-search
equilibrium. However, if search is costless ($k = 0$), then the lobby group will
always search and no REE without search can be supported.

The condition for searching is the same as in the observable case with
$q < \frac{2}{3}$; neither situation implies an indirect search cost since the decision-
maker does not alter her policy choice, as she is not believe the group to be searching. Thus, the condition just states that for the group to search the
benefit of searching must exceed the effective direct search cost.
Next we solve for equilibria in which the group searches. Thus, suppose the decision-maker expects the lobby group to search. We need to consider two cases, depending on the size of $q$.

If $q < \frac{2}{3}$ the decision-maker chooses the neutral outcome in the absence of any information. The lobby group’s incentive to search is therefore precisely as above, and there exists a rational expectation equilibrium with search if and only if $\beta > \frac{1}{2} + \frac{k}{q}$.

If $q > \frac{2}{3}$ the decision-maker chooses $d_r$ unless the lobby group offers hard information for $\theta^e$. The condition for searching now becomes $\frac{q}{2} (2\beta) - k > 0$, or

$$\beta > \frac{k}{q}. \quad (2)$$

By comparing equations (1) and (2) we notice several things: first, if the lobby group’s preference is extreme or if the direct cost of searching is small enough, there is a unique REE in which the group searches for information; second, if the preference is not extreme or the direct search cost is very high, there is a unique REE without search; and finally, in between there exists a range of preferences and search costs $\beta \in \left[\frac{k}{q}, \frac{1}{2} + \frac{k}{q}\right]$ with multiple rational expectation equilibria.

Figure 2 illustrates the result and compares the incentives to provide information when search is observable versus non-observable and contributions are not feasible for $q > \frac{2}{3}$. Comparing the two cases we see that in the range $[\frac{1}{2} + \frac{k}{q}, \frac{k+1}{q}]$ the group does not gather any information when search is observable, while it must do so in a rational expectations equilibrium when search is non-observable. Furthermore, when $\beta$ is in the range $[\frac{k}{q}, \frac{1}{2} + \frac{k}{q}]$ there is a REE where the decision-maker expects the lobby group to search and the lobby group has an incentive to do so, and one where the decision-maker expects no search and the lobby group has no incentive to deviate. Notice that the group prefers not to search, as becomes clear by looking at the case where the group can commit not to search, i.e. when search is observable.

We can make some further observations: if $k < \frac{1}{3}$ searching is always a possible REE, and as the cost for searching vanishes ($k = 0$), searching
Figure 2: Equilibria when no contributions are permitted, $q > 2/3$.

becomes the unique REE in the game with non-observable search. The latter is not true when search is observable.

To summarize: there is clearly more search and information provision in equilibrium when the search activity is not observable, as the group has an incentive to search if the decision-maker cannot directly observe it, and a group with intense preferences is more likely to search.

Let us now introduce contributions into the analysis. Again, assume that the lobby group is extreme so that it always wishes to induce its preferred policy through either information provision or contributions, i.e. that $\beta > \underline{\beta}(q)$. Which means will such an extreme lobby group employ in order to achieve its favored outcome?

**Result 3.** Assume that search is unobservable, that contributions are allowed, and that the lobby group is extreme ($\beta > \underline{\beta}(q)$). Let

\[ \bar{k} = \frac{q}{2\alpha}, \quad \text{and} \quad \bar{\bar{k}} = \begin{cases} \frac{q}{2\alpha} \left( \frac{2+q}{2-q} \right) & \text{if } q < \frac{2}{3} \\ \frac{q}{2\alpha} \left( \frac{4q}{2-q} \right) & \text{otherwise.} \end{cases} \]
i) If the direct search cost is lower than \( \bar{k} \), there is a unique rational expectation equilibrium (REE) in which the lobby group searches for information and provides this information if it is in its favor, otherwise offers contribution as given in equation (8).

ii) If the direct search cost is higher than \( \bar{k} \), there is a unique REE in which the group does not search and offers contributions \( c = \frac{1}{\alpha} \) ex ante.

iii) If the direct search cost is between \( \bar{k} \) and \( \bar{k} \), there is a search and a no-search REE, together with contribution offers as in (i) and (ii), respectively. There also exists a mixed strategy equilibrium, characterized in the appendix.

The proof of Result 3 is given in the appendix. The result describes in what situation the lobby group chooses to provide information and when it uses contributions to induce its preferred outcome, assuming that the group’s search is a private activity. \( \bar{k} \) is the lowest direct search cost consistent with the existence of an equilibrium in which the lobby group does not search for information. \( \bar{k} \) is the highest direct search cost consistent with the existence of an equilibrium in which the lobby group searches for information.

Comparing Result 3 with the analysis in Section 3, more information is gathered and provided when search is not observable than when it is publicly observable. The group has a greater incentive to search when it cannot be monitored, and the decision-maker takes this into account. She expects the group to search as long as the search cost is not too high (\( k < \bar{k} \)), and multiple equilibria can be supported for an intermediate range of search costs (\( \bar{k} < k < \bar{k} \)) depending on the decision-maker’s belief about the group’s behavior.

How does the use of contributions affect the lobby group’s incentives to collect information when the decision-maker cannot observe the groups’ search activity? Figure 3 compares the sets of equilibria for the two cases.

The figure assumes an extreme lobby group (\( \beta > \beta(q) \)). Panel A depicts the case where \( q < \frac{2}{3} \) and Panel B the case of \( q > \frac{2}{3} \). The difference is that
in the absence of hard evidence for $\theta_\ell$ the decision-maker chooses $d_\circ$ in Panel A while she chooses $d_r$ in Panel B.

Suppose first that contributions are not feasible. Above we proved that when $q < \frac{2}{3}$ then the lobby searches if and only if $\beta > \frac{1}{2} + \frac{k}{q}$, which is the area above the upward sloping line in in Panel A. In Panel B both search and non-search can be sustained in a rational expectation equilibrium if $\beta \in \left[\frac{k}{q}, \frac{1}{2} + \frac{k}{q}\right]$. Notice that when the lobby cannot make contributions, it searches whenever the preferences are intense enough relative to the effective search cost. Since information provision is the only way to induce the decision-maker to choose the lobby’s preferred outcome, it is natural that an intense lobby group is willing to pay high search costs, whereas a lobby with less intense preferences is not.

Next, suppose the lobby group can make contributions. As shown in Result 3, if the direct search cost is lower than $\bar{k}$ (higher than $\tilde{k}$), there is a unique search (no-search) equilibrium, and in between these bounds there are multiple equilibria, where both search and no-search can be sustained in
equilibrium. These areas are drawn in Panel A and B. Notice that when the
lobby has both instruments to induce its preferred outcome, it engages in
information provision whenever the direct search cost is relatively small and
abstains from it whenever this cost is large.

In the area above the $\beta = \frac{1}{2} + \frac{k}{q}$ line and to the right of $\tilde{k}$, allowing
campaign contributions strictly decreases the lobby group’s provision of in-
formation. In this area the lobby has intense preferences and is willing to
incur high search cost in order to affect the decision-maker’s choice if this
is the only means of influence. However, when the lobby group can choose
between contribution and information provision, it prefers to use contribu-
tions only. This is credible even though search is unobservable because the
search cost is sufficiently high. Notice that for a given search cost $k$ above $\tilde{k}$,
if preferences are sufficiently extreme then the introduction of the contribu-
tion instrument always decreases the amount information provision. Hence,
Result 2 essentially holds in the case of unobservable search when search is
sufficiently costly:

Result 4 (No Search II). Assume that search is unobservable, that the
lobby group’s preferences are sufficiently intense \( (\beta > \max\{\beta(q), \frac{1}{2} + \frac{k}{q}\}) \),
and that search is sufficiently costly \( (k > \tilde{k}) \). Then the possibility of offering
contributions strictly reduces the interest group’s search activity in a rational
expectation equilibrium.

The result supports the main insight of this paper: extreme lobby groups
may lack incentives to provide information if they have alternative ways to
induce the decision-maker to chose the lobby’s favored outcome. When con-
tributions are not allowed, an intense lobby group is willing to incur higher
direct search cost because they gain more from successful information pro-
vision. However, this argument hinges crucially on the absence of the possi-
bility of making contributions and, therefore, on the absence of any indirect
cost of collecting information on the required contributions. When contribu-
tions are allowed, the indirect costs caused by the decision-maker’s updating
of beliefs when the information collection is unsuccessful, dominates the gain
from inducing the lobby’s favored outcome through successful information collection.

Notice in Panel A that the intersection between $\beta = \bar{\beta}(q)$ and the $\beta = \frac{1}{2} + \frac{k}{q}$ line is to the right of $\bar{k}$. This implies that allowing contributions cannot increase search when $q < \frac{2}{3}$. Similarly in Panel B, the intersection between $\beta = \bar{\beta}(q)$ and the $\beta = \frac{1}{2} + \frac{k}{q}$ line is to the right of $\bar{k}$ and the intersection between $\beta = \bar{\beta}(q)$ and $\beta = \frac{k}{q}$ is to the right of $\bar{k}$. This implies that whenever interest groups want to induce their preferred outcome ($\beta > \bar{\beta}(q)$), if no-search is the unique equilibrium when contributions are not permitted, then search cannot be an equilibrium when contributions are allowed. Similarly, if no-search is an equilibrium without contributions, then it is also an equilibrium when contributions are feasible. Lemma 2 in the Appendix demonstrates that these relations hold.

5 Competition Among Lobby Groups

A standard result in the information based lobbying literature holds that competition among information providers increases the incentive for each lobby to provide information (see e.g. Austen-Smith and Wright (1992) and Dewatripont and Tirole (1999)). The following section shows how this result holds in our model without contributions, but has unexpected consequences once contributions are allowed.

We observe that the search activity of a second, competing lobby group (whose interest is opposed to lobby group’s) mitigates the lobby’s indirect search cost and thus provides a greater incentive to search. The indirect search cost reflected in the decision-maker’s updated beliefs is partly offset when the competing information provider also fails to provide evidence, and thus the final outcome may not be adversely affected.

The twist occurs when interest groups can induce decisions via monetary contributions. When contributions are an option, a lobby group’s unsuccessful search raises the amount of contributions necessary to induce the desired outcome. The opponent’s search, on the other hand, lowers the contribu-
tions necessary to achieve the same outcome. In addition, the efficient choice, which prevails in equilibrium, may also change in the group’s favor. Our result shows that the opponent benefits more than the information provider.

To understand the result the following observation may be adequate. A successful search conveys a lot of information to the decision-maker; in this way the benefit of the search is shared with the decision-maker. An unsuccessful search, on the other hand, shifts uncertainty from one decision to the other, mainly benefiting the opponent. Our result indicates benefiting from the opponent’s information externality is more lucrative than counting on the shared benefit of one’s own search effort.

In this model two lobby groups with conflicting (and state independent) interests simultaneously try to influence the decision-maker in a model of common agency. As before, we first allow the groups to only use information to affect the decision-maker; then we allow contributions to be offered. The models are identical in all other aspects to the ones presented in the previous sections: each interest group may withhold information it learned but may not fabricate information. The decision-maker cannot monitor the interest groups’ search activity but has correct equilibrium beliefs about the group’s behavior.

We denote the lobby groups L and R. L prefers the outcome $d_\ell$ and R prefers $d_r$. To rule out the case where one group simply outbids the other, assume that both groups’ preference for their preferred outcome is the same, $2\beta$ and that they face the same search cost $k$. However, the groups’ search technology may be differently informative: the signal $\sigma_i$ are independent, and each reveals the true state $\theta$ with probability $q_i$, for $i = \ell, r$.

The decision-maker’s choice

If group $i$ searches, it benefits from revealing the state that favors its preferred outcome; thus, group $i$’s message strategy is $m_i = \sigma_i$ if $\sigma_i = \theta_i$ and $m_i = \emptyset$ whenever it is uninformed or knows that $\theta \neq \theta_i$.

If both groups search, each follows the above message strategy. No informative message is sent only if neither group’s search is successful, which
occurs with probability \( \Pr\{m_\ell=m_r=\emptyset\} = 1 - \frac{q_\ell}{2} - \frac{q_r}{2} \). The decision-maker’s updated beliefs are

\[
\begin{align*}
p(\theta_\ell \mid m_\ell = m_r = \emptyset) &= \frac{1 - q_\ell}{2 - q_\ell - q_r} \\
\text{and} \quad p(\theta_r \mid m_\ell = m_r = \emptyset) &= \frac{1 - q_r}{2 - q_\ell - q_r}.
\end{align*}
\]

Given these beliefs the decision-maker’s best response is

\[
d^*(m_\ell = m_r = \emptyset) = \begin{cases} 
  d_\ell & \text{if } q_\ell \leq 3q_r - 2 \\
  d_o & \text{if } 3q_r - 2 \leq q_\ell \leq \frac{2 + q_r}{3} \\
  d_r & \text{if } q_\ell \geq \frac{2 + q_r}{3}.
\end{cases}
\]  

(3)

The optimal choice thus depends on how informative each group’s search is. This best response (3) divides the \( q_\ell-q_r \)-space into three regions, where the optimal choice “switches” when one of the group’s searches is sufficiently more informative than the other’s. Figure 4 depicts the regions of \( d^* \) in the parameter space.

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8This follows from \( u_{dm}(d_o) = -1, u_{dm}(d_\ell \mid m) = p(\theta_r)(-4), u_{dm}(d_r \mid m) = p(\theta_\ell)(-4) \).
No contributions

We first characterize the informational equilibria in the absence of contributions. The results replicate the “conventional wisdom” of information economics, which holds that competition among information providers increases information provision. To rule out trivial search equilibria we always assume positive search cost, $k > 0$.

In the first type of search equilibria only one group is expected to search. For concreteness assume $R$ is expected to search. If $R$ is the only group searching, it has the same incentive to search as derived in Section 4, i.e.,

$$ k \leq \begin{cases} q_r(\beta - \frac{1}{2}) & \text{if } q_r \leq \frac{2}{3} \\ q_r \beta & \text{if } q_r > \frac{2}{3} \end{cases}. $$

(4)

To support this type of equilibrium $L$ must not have an incentive to search. The gain for searching is the payoff for switching the outcome from $d_o$ to $d_r$ whenever the favorable state is found, i.e. $(\frac{q_r}{2})(2\beta - 1)$. Thus, for $L$ not to search search cost must be sufficiently high, specifically,

$$ k > \begin{cases} q_\ell(\beta - \frac{1}{2}) & \text{if } q_\ell \leq \frac{2}{3} \\ 0 & \text{if } q_\ell > \frac{2}{3} \end{cases}. $$

(5)

Hence, if $k$ satisfies (4) and (5) (or with $q_\ell$ and $q_r$ interchanged), there exists an asymmetric equilibrium in which one group searches while the other one does not.

A second type of equilibria has both lobby groups searching. Notice however that in region 1 of Figure 4 $L$ cannot gain anything by searching: even if its message is $m_\ell = \emptyset$, the decision-maker chooses $d_\ell$; thus, if searching is at all costly, $L$ will never search if $(q_\ell, q_r)$ is in region 1. A similar argument holds for $R$ in region 3 of the figure. Equilibria with both groups searching can therefore only occur in region 2.

Provided that $(q_\ell, q_r)$ lies in region 2, each lobby group has an incentive to search if $(\frac{q_r}{2})(2\beta - 1) > k$. Thus, equilibria in which both groups search

---

9 Notice that for $q_r < 2/3$ the conditions require that $q_\ell < q_r$. 

20
occur if

\[ k \leq \min_i \left\{ q_i (\beta - \frac{1}{2}) \right\}. \]

(6)

Comparing the range of search equilibria with the ones found in Section 4, we see that the conditions for equilibria in which one of two interest groups searches exist are the same as those for search of a single interest group. Thus, two independent and opposing lobby groups provide at least as much information a single lobby group case. However, even with two groups only one may be searching for information in equilibrium. It is straightforward to show that the group that is lobbying is in expectation better off that the one which does not, if \( q_i < 2/3 \).

Figure 5: Range of search by both lobby groups

In addition, in the range of \( q_i \in \left[ \frac{2}{3}, \frac{2 + q_j}{3} \right] \) and \( k \leq \min_i \left\{ q_i (\beta - \frac{1}{2}) \right\} \) competing lobby groups may both search. In this range the decision-maker chooses the neutral policy \( d_o \) when neither groups provides hard evidence, while in the presence of only one group the decision-maker would choose the most unfavorable outcome if the group searches unsuccessfully. The group whose search technology is more informative is better off that its opponent in these symmetric search equilibria. Both groups are providing the information externality to the decision-maker, causing her to be much better informed than when only one group searches. In the limit, as \( q_\ell, q_r \to 1 \), uncertainty for the decision-maker entirely disappears.
The relevant range of search parameters is depicted in Figure 5.

**Allowing for Contributions**

The contribution game in which two lobby groups simultaneously offer contributions contingent on the decision-maker’s choice can usefully be modeled as a common agency game (Bernheim and Whinston 1986). L and R each offer a contribution schedule \( c^L = (c^L_\ell, c^L_o, c^L_r) \) and \( c^R = (c^R_\ell, c^R_o, c^R_r) \), respectively, where \( j \) promises to pay the contribution \( c^j_k \) if decision \( d_k \) is taken.

The common agency framework provides that the following properties\(^{10}\) characterize the equilibrium choice and schedules:

1. The equilibrium decision maximizes joint welfare, where the lobby groups’ welfare is discounted by \( \alpha \) due to the limited transfer technology between lobby group and decision-maker.

   Define \( W(d) = u_{dm}(d) + \alpha u_\ell(d) + \alpha u_r(d) \). If \( \hat{d} \) is the decision-maker’s equilibrium choice, then \( \hat{d} \) maximizes \( W(d) \).

2. Contribution schedules are *truthful*, i.e., \( u_i(d_k) - c^j_k = u_i(d_h) - c^j_h \), provided that \( c^j_k, c^j_h > 0 \).

3. Each lobby group contributes 0 to the policy choice that maximizes the joint welfare of the decision-maker and the other lobby group, and lowers its payments uniformly until the decision-maker is indifferent between that choice and \( \hat{d} \), if this is possible.

We make use of these facts subsequently. The following benchmark case without search will illustrate the nature of this equilibrium for the contributions subgame.

Suppose w.l.o.g. \( p \geq 1/2 \), where \( p \) is the decision-maker’s posterior belief. Then, by (1.), \( \hat{d} = d_o \) or \( \hat{d} = d_\ell \). Specifically, \( \hat{d} = d_o \) if \( \beta \leq 1 + \frac{3-4p}{2\alpha} \), \( d_\ell \) otherwise.

\(^{10}\) See Lemma 2 in Bernheim and Whinston 1986. Adapted to the discrete choice space and non-transferable utility of this model.
Suppose $\hat{d} = d_\ell$. R offers contribution $c^r_\ell = 0$, as this would be chosen without R’s contributions (following 3.), and $c^r_\circ = 1$, $c^r_r = 2\beta$ by (2.). Along this contribution schedule R’s net utility remains constant: $u_r(d_\ell) - c^r_\ell = 0$.

L’s contributions are as follows. Clearly, $c^\ell_\ell = 0$. If $d_r$ is the outcome induced by L’s abstinence, the group offers just enough contributions for each choice so that $\hat{d}$ is chosen (3.). If $\hat{d} = d_\ell$ this requires $(1-p)(-4) + \alpha c^\ell_\ell = p(-4) + \alpha(2\beta)$, or $c^\ell_\ell = 2\beta - \frac{4(2p-1)}{\alpha}$. Similarly, if $\hat{d} = d_\circ$, $c^\ell_\circ = (2\beta - 1) - \frac{4p-1}{\alpha}$.

Notice that L is advantaged by the decision-maker’s belief and therefore receives a positive net utility in equilibrium, while R’s net utility in equilibrium is of zero.

We now turn to the full game in which the lobby groups can search and use contributions. As was the case in the previous section, in the first type of search equilibria only one group is expected to search. The second type of equilibria is symmetric in that both groups search. We treat the symmetric type first this time.

Suppose both groups are expected to search. Without loss of generality we assume $q_r > q_\ell$. To reduce the number of cases we have to consider we further assume that if both searches fail, the efficient solution induced in equilibrium is $d_\ell$.\footnote{$d_r$ is induced in L’s absence if $p(-4) + \alpha(2\beta) > -1 + \alpha$, or $\beta > \frac{1}{2} + \frac{3p}{2\alpha}$. We denote by $\hat{d}_r$ the choice induced by R alone.}

If either group searches successfully, its preferred outcome becomes the efficient choice, as the decision-maker now prefers this outcome. Suppose R finds $\theta_r$; then L’s truthful contribution schedule is $c^\ell = (2\beta, 1, 0)$. With this, the decision-maker needs no further inducement to choose $d_r$ unless $\alpha(2\beta) > 4$; thus, after potential contributions R’s “rent” (net utility) in this case is $\min\{2\beta, 4/\alpha\}$.

If neither group searches successfully, the decision-maker updates beliefs\footnote{$\hat{d} = d_\ell$ and $\hat{d}_r = d_r$ are the efficient choices if the lobby groups care intensely enough, specifically, if $\beta \geq \max\{\frac{1}{2} + \frac{1}{2\alpha} + \frac{q_\circ - q_\ell}{\alpha(2-q_\ell-q_\circ)}, 1 + \frac{1}{2\alpha} - \frac{q_\circ - q_\ell}{\alpha(2-q_\ell-q_\circ)}\}$.}
to \( p(\theta_r) = \frac{1-q_r}{2-q_r-q_r} \). L is now advantaged as \( d_\ell \) becomes the equilibrium choice \( \hat{d} \). R offers his truthful contribution schedule \( c^r = (0, 1, 2\beta) \), which is insufficient to avert the final choice \( d_\ell \). L, on the other hand, offers contributions \( c_\ell = 2\beta - \frac{4(q_r-q_r)}{\alpha(2-q_r-q_r)}, \) thus inducing \( \hat{d} = d_\ell \) at least cost.

L’s rent in this case is \( \frac{4(q_r-q_r)}{\alpha(2-q_r-q_r)} \). Notice that the rent is increasing in the difference of the \( q_i \)’s: L benefits from R’s information externality and suffers from his own; the larger the difference the greater the net utility for the less informative group.

This holds true not only once the search has proved uninformative, but also \textit{ex ante}. Each group’s expected utility is

\[
\begin{align*}
R: & \quad v_r = E\left( u_r(\hat{d}) - c_\hat{d} \right) = q_r \min\{\beta, 2/\alpha\} \\
L: & \quad v_\ell = E\left( u_\ell(\hat{d}) - c_\hat{d} \right) = q_\ell \min\{\beta, 2/\alpha\} + 2(q_r - q_\ell),
\end{align*}
\]

where the right hand term in L’s utility is its expected rent: while R has a higher probability of finding the preferred state of the world \( (q_r > q_\ell) \), L receives a rent each time both searches are unsuccessful. It is easy to verify that \( v_\ell \geq v_r \). Thus, the groups whose search is less informative benefits from the opponent’s information externality.

Existence. Both groups satisfy the expectation of searching when the net gain of searching exceeds the search cost \( k \). Since L receives a rent if no information is transmitted, its participation constraint is harder to satisfy. The condition for L (and therefore for both groups) to search is

\[
k \leq q_\ell \left( \min\{\beta, 2/\alpha\} - \frac{2(q_r - q_\ell)}{\alpha(2-q_r-q_r)} \right).
\]

The condition for symmetric equilibria in which both groups search in the previous section without contributions (eqn. 6) was

\[
k \leq q_\ell(\beta - \frac{1}{2}), \tag{7}
\]

provided that \( q_\ell \geq 3q_r - 2 \) (region 2). It is ambiguous whether (6) or (7) is more stringent; it depends on \( \beta \) and the difference \( q_r - q_\ell \). There is more search by both groups when contributions are allowed if \( q_r - q_\ell \) is small and the
information externalities best cancel each other out, and there is less search with contributions if one group’s information technology is much superior or if \( \beta > 2/\alpha \) as the equilibrium benefit for finding the favorable state is bounded when contributions are paid.

Asymmetric equilibria. In the second type of equilibria only one group searches. The results are easily derived following the previous analysis.\(^{13}\) Suffice it to say that the group that searches and contributes benefits from a successful search, while the group that only provides contributions receives an informational rent in the opposite case. The group that does not search is better off \textit{ex ante} than the group that searches, strictly so if \( \beta < 2/\alpha. \)\(^{14}\) Due to the informational spill-over it is better not to search while your opponent searches.

6 Discussion

Interest groups often have privileged access to information and are thus in the position to provide a political decision-maker with knowledge that is crucial for making the correct decision. At the same time, interest groups arguably have the ability to influence the decision maker’s choice via financial incentives in form of campaign contributions. The models we presented in this paper show under what circumstances interest groups have the incentive to collect and provide such information, or to use contributions.

When equipped with the ability to make contributions, the group weights the direct and indirect costs of searching against the cost of inducing a favorable outcome via contributions to the decision-maker. We point out that an unsuccessful search partially informs the decision-maker and thereby raises the cost of inducing the group’s preferred outcome \textit{ex post}. The information

\(^{13}\)Asymmetric equilibria in which R searches and L does not search exist for \( k \in \left[ q_L \min \{ \beta, 2/\alpha \} - \frac{2q_L}{\alpha(2 - q_L)}, \ q_r \min \{ \beta, 2/\alpha \} \right]. \ (\textit{Mutatis mutandis} when L searches and R does not.) Search is reduced relative to no contributions (eqn. 4 and 5) for \( q_r > 2/3 \) while the effect is ambiguous for \( q_r < 2/3. \) Mixed strategies also exist in this range.

\(^{14}\)Suppose R searches and L does not; then the expected utilities are, respectively, \( v_L = q_r \alpha/2 \) and \( v_r = q_r \min \{ \beta, \alpha/2 \}. \) Thus, \( v_L \geq v_r \) and \( v_L > v_r \) if \( \beta < \alpha/2. \)
externality, or indirect search cost, is thus reflected in higher contributions necessary to induce a desired outcome. A strong implication is formalized in Result 2 under the simplifying assumption that the lobby’s search activity is observable: for groups with a strong enough preference for their preferred outcome—groups we call extreme—the indirect search cost always dominates the benefit of getting the most preferred outcome ‘for free’ by providing information. Thus, extreme lobby groups never search and rather use contributions to induce their preferred decision.

The ability to offer contributions thus conflicts with the group’s willingness to search and to provide useful information to the policy maker. The subsequent results show that the implications first derived in the simplified model continue to hold when search is unobservable. If search activity is unobservable, a rational decision maker will still have equilibrium knowledge of whether (or with what probability) the group searched by taking into account the lobby group’s incentive to search. Interest groups search and provide information in equilibrium only if the cost of searching is lower than a threshold, independently of their preference intensity. Result 3, which characterizes the rational expectations equilibria of this game, shows that groups with intense preferences strictly prefer contributions as means to achieve their preferred outcome whenever a high enough search cost makes the abstention from search credible. Result 4 strengthens the implication and shows that allowing for contributions strictly reduces the set of equilibria in which the interest group searches.

Our final discussion shows the incentives to provide information when several information providers compete for a favorable decision. A standard result in the literature holds that search activity and information provision increases when lobbyists compete for influence. We show that this result holds as long as interest groups do not have the ability to make contributions. When monetary incentives are allowed, the presence of a competing information provider makes the group that does not provide information or that has the weaker information technology better off.

The analysis shows the relationship between two major interest group ac-
tivities, campaign financing and information provision to political decision-makers, which the literature has largely treated as separate issues. Our results suggest that the two activities are often strategic substitutes, as information inherently raises the price of contributions. In particular, we show that interest groups with intense preferences and high stakes in their preferred policy—extreme groups—strictly prefer offering contributions to the acquisition and provision of useful information. In this sense our analysis lends support to a rather cynical view of lobby groups’ role in the political process, suggesting that information provision only plays a subordinate role for intense lobby groups.
Appendix

Proof of Lemma 1

Proof. If the lobby group searches but the search does not reveal any favorable information, the \textit{ex post} contributions $c$ necessary to induce $d_\ell$ are

$$c = \alpha^{-1}[u_{dm}(d^* \mid m = \emptyset) - u_{dm}(d_\ell \mid m = \emptyset)],$$

where

$$d^* = \begin{cases} d_o & \Rightarrow u_{dm}(d^* \mid m = \emptyset) = -1 \quad \text{if } q < \frac{2}{3} \\ d_r & \Rightarrow u_{dm}(d^* \mid m = \emptyset) = \frac{1-q}{2-q}(-4) \quad \text{otherwise,} \end{cases}$$

and

$$u_{dm}(d_\ell \mid m = \emptyset) = \frac{-4}{(2-q)\alpha}$$

implies

$$c = \begin{cases} \frac{2+q}{(2-q)\alpha} & \text{if } q < \frac{2}{3} \\ \frac{4q}{(2-q)\alpha} & \text{otherwise.} \end{cases} \quad (8)$$

Notice that $u_{dm}$ is continuous in $q$, and that so is $c$.

\textbf{Case} $q < \frac{2}{3}$: The lobby group prefers to induce $d_\ell$ instead of accepting $d_o$ if and only if

$$2\beta - \frac{2+q}{(2-q)\alpha} > 1$$

$$\Leftrightarrow \quad \beta > \frac{1}{2} + \frac{1+\frac{1}{2}q}{(2-q)\alpha}.$$

\textbf{Case} $q > \frac{2}{3}$: The lobby group prefers to induce $d_\ell$ instead of $d_r$ if and only if

$$2\beta - \frac{4q}{2-q} > 0$$

$$\Leftrightarrow \quad \beta > \frac{2q}{(2-q)\alpha}.$$

The lobby group prefers to induce $d_\ell$ instead of inducing $d_o$ if and only if

$$2\beta - \frac{4q}{(2-q)\alpha} > 1 - \frac{1-4(\frac{1-q}{2-q})}{\alpha}$$

$$\Leftrightarrow \quad \beta > \frac{1}{2} + \frac{1+\frac{1}{2}q}{(2-q)\alpha}.$$

$\square$
Proof of Result 2

Proof. Assume that the decision the group wants to induce (using information and/or contributions) does not depend on the outcome of its search. We show that the expected value of searching and offering contributions ex post when the search does not reveal favorable information (i.e. $\sigma \neq \theta_\ell$) is less than the value of not searching and just offering contributions.

The “ex ante” contribution necessary to induce $d = d_\ell$ given the decision-maker’s prior beliefs is 1. Thus, the value of offering contributions without searching is

$$V_\ell(\text{contribution}) = 2\beta - \frac{1}{\alpha}.$$ 

The ex ante value of searching and offering ex post contributions for the lobby group then becomes

$$V_\ell(\text{search, contribution}) = 2\beta - \left(1 - \frac{q}{2}\right)c - k = \begin{cases} 2\beta - \frac{2+q}{2\alpha} - k & \text{if } q < \frac{2}{3} \\ 2\beta - \frac{2q}{\alpha} - k & \text{if } q > \frac{2}{3}, \end{cases}$$

where $c$ is defined in equation (8).

The net expected gain from searching is therefore:

$$\text{Gain from searching} = V_\ell(\text{search, contribution}) - V_\ell(\text{contribution}) = \begin{cases} -\frac{2+q}{2\alpha} - k + \frac{1}{\alpha} = \frac{-q}{2\alpha} - k & \text{if } q < \frac{2}{3} \\ -\frac{2q}{\alpha} - k + \frac{1}{\alpha} = \frac{1-2q}{\alpha} - k & \text{if } q > \frac{2}{3}. \end{cases}$$

Notice that for $q > 0$ the gain is strictly negative, even if $k = 0$. □

Proof of Result 3

Proof. Assume the decision-maker expects the lobby group not to search. For this to be a rational expectation equilibrium, it must be the case that the value of searching followed by ex post contributions is less than the value of offering contributions alone, i.e.

$$\frac{q}{2}2\beta + \left(1 - \frac{q}{2}\right)\left(2\beta - \frac{1}{\alpha}\right) - k < 2\beta - \frac{1}{\alpha}.$$
The right hand side is the value of offering contributions without searching. The equation reduces to the condition on $k$

$$k > \frac{q}{2\alpha} \equiv \bar{k}$$

(9)

Thus, if the direct cost of searching is sufficiently high, there exists a rational expectation equilibrium where the group does not search, and the contribution that induced $d = d_\ell$ is $\frac{1}{\alpha}$.

Next, assume that the decision-maker expects the lobby group to search. It was shown in the proof for Lemma 1 that the decision-maker’s expected utility of choosing $d_\ell$ conditional on $m = \emptyset$ is continuous in the success probability of the search $q$. Furthermore we showed there that the contribution necessary to induce $d_\ell$ when the decision-maker expects the group to search is given by equation (8). In order for search to maximize the group’s expected utility, the value of searching must exceed the value of not searching, or

$$2\beta - \left(1 - \frac{q}{2}\right)c - k > 2\beta - c$$

where $c$ is given in (8). Hence searching is a REE strategy if and only if

$$k < \bar{k} \equiv \begin{cases} \frac{q}{\alpha\left(\frac{2+q}{2-q}\right)} & \text{if } q < \frac{2}{3} \\ \frac{q}{2\alpha} & \text{otherwise.} \end{cases}$$

(10)

Lemma 2

Lemma 2.

a) Let $q < \frac{2}{3}$. Then $\beta > \bar{\beta}(q)$ and $k < \bar{k}$ implies that $\beta > \frac{1}{2} + \frac{k}{q}$.

b) Let $q > \frac{2}{3}$. (i) $\beta > \bar{\beta}(q)$ and $k < \bar{k}$ implies that $\beta > \frac{k}{q}$. (ii) $\beta > \bar{\beta}(q)$ and $k < \bar{k}$ implies that $\beta > \frac{1}{2} + \frac{k}{q}$.

Proof. a) $\frac{1}{2} + \frac{k}{q} < \frac{1}{2} + \frac{1}{2\alpha}\left(\frac{2+q}{2-q}\right) < \beta$ where the first inequality uses the definition of $\bar{k}$ and the second uses the definition of $\bar{\beta}(q)$. b) (i) $\frac{k}{q} < \frac{k}{q} = \frac{2q}{(2-q)\alpha} < \beta$. (ii) $\beta > \frac{1}{2} + \frac{1+q}{(2-q)\alpha} > \frac{1}{2} + \frac{1}{\alpha} > \frac{1}{2} + \frac{k}{q} > \frac{1}{2} + \frac{k}{q}$. □
Mixed Strategies

In this section we characterize the mixed strategy equilibria from Result 3.

**Lemma 3 (Mixed strategies).** Assume that search is unobservable, that the lobby group’s preferences are sufficiently intense ($\beta > \beta(q)$), and that $k \in [\tilde{k}, \bar{k}]$. Then there exists a mixed strategy rational expectation equilibrium that is characterized as follows. Define

$$s_1 = \frac{4\alpha k - 2q}{q^2 + 2\alpha qk} \quad \text{and} \quad s_2 = \frac{2\alpha k}{2q^2 + \alpha qk}.$$

(i) If $q < \frac{2}{3}$, then the interest group searches with probability $s = s_1$. If it does not search or does not find favorable information, it offers contributions $C(s) = \frac{2 + sq}{2 - sq} / \alpha$ for the choice of $d_\ell$, 0 otherwise.

(ii) If $q > \frac{2}{3}$, then the interest group searches with probability $s_1$ if $k \in [\tilde{k}, k^*]$ and with probability $s_2$ if $k \in [k^*, \bar{k}]$, where $k^* = \frac{q}{\alpha}$. If it does not search or does not find favorable information, it offers contributions $C(s) = \frac{4sq}{2 - sq} / \alpha$ for the choice of $d_\ell$, 0 otherwise.

In both cases the decision-maker always chooses $d_\ell$ upon receiving hard evidence for $\theta_\ell$ or for contributions of at least $C(s)$.

**Proof.** Assume that the group uses a mixed search strategy in which it searches with probability $s$, and that the decision-maker expects the group to search with probability $\tilde{s}$. Whenever the decision-maker does not receive hard information $m = \theta_\ell$, she updates her beliefs about $\theta$, which becomes $p(\theta_r \mid m = \emptyset) = \frac{1/2}{1 - sq/2} = \frac{1}{2 - sq}$. With this belief the optimal decision independently of contributions ‘switches’ at $\tilde{sq} = \frac{2}{3}$, i.e.

$$d^* = \begin{cases} \ d_\circ & \text{if } \tilde{sq} < \frac{2}{3} \\ \ d_r & \text{otherwise.} \end{cases}$$

The decision-maker’s expected utility from the project choice is

$$u_{dm}(d^* \mid m = \emptyset) = \begin{cases} -1 & \text{if } \tilde{sq} < \frac{2}{3} \\ -\frac{4(1 - \tilde{sq})}{2 - sq} & \text{otherwise}, \end{cases}$$

31
while \( u_{dm}(d_\ell | m = \emptyset) = \frac{-1}{2-sq} \). The contributions necessary to induce \( d_\ell \) are therefore

\[
C(\tilde{s}) = \begin{cases} 
\frac{(-1 + \frac{4}{2-sq})}{\alpha} & \text{if } \tilde{sq} < \frac{2}{3} \\
\frac{(-4(1-\tilde{sq})}{2-\tilde{sq}} + \frac{4}{2-sq})}{\alpha} & \text{otherwise}.
\end{cases}
\]

In a mixed strategy rational expectations equilibrium the interest group must be indifferent between searching and not searching, or \( \frac{q}{2} 2\beta + (1-\frac{q}{2})(2\beta - C(\tilde{s})) - k = 2\beta - C(\tilde{s}) \), which implies

\[
\frac{q}{2} C(\tilde{s}) = k. \tag{11}
\]

Furthermore, the expected search probability must equal the actual one, \( \tilde{s} = s \).

**Case 1:** Assume \( \tilde{sq} < \frac{2}{3} \). Plugging \( C(\tilde{s}) \) into (11), we get \( \frac{q}{2} \frac{2+\tilde{sq}}{2-\tilde{sq}} / \alpha = k \). Solving for the search probability yields

\[
\tilde{s} = \frac{4\alpha k - 2q}{q^2 + 2\alpha qk} \equiv s_1.
\]

It is easy to show that \( s_1 \) is a valid probability (\( s_1 \in [0, 1] \)) for \( k \in [\tilde{k}, \bar{k}] \) (where \( \tilde{k}, \bar{k} \) are defined in Result 3). Furthermore, \( s_1 \) is decreasing in \( q \) and increasing in \( k \) and \( \alpha \).

\( q < \frac{2}{3} \) guarantees that \( \tilde{sq} < \frac{2}{3} \). Thus, \( \tilde{s} = s_1 \) constitutes an equilibrium mixed strategy for the interest group and decision-maker equilibrium belief whenever \( q < \frac{2}{3} \) and \( k \in [\tilde{k}, \bar{k}] \).

If \( q > \frac{2}{3} \), then \( \tilde{sq} < \frac{2}{3} \) requires that \( \frac{4\alpha k - 2q}{q^2 + 2\alpha qk} q < \frac{2}{3} \). Solving for \( k \) we get as condition for a valid probability

\[
k < \frac{q}{\alpha} \equiv k^*.
\]

It is easy to show that in this case \( \tilde{k} < k^* < \bar{k} \). Thus, \( \tilde{s} = s_1 \) also constitutes an equilibrium mixed strategy for the interest group and decision-maker equilibrium belief whenever \( q > \frac{2}{3} \) and \( k \in [\tilde{k}, k^*] \).
Case 2: Assume $\tilde{s}q > \frac{2}{3}$. Plugging $C(\tilde{s})$ into (11) for this case we have

$$q \frac{4\tilde{s}q}{2 - \tilde{s}q}/\alpha = k.$$ 

Solving for $\tilde{s}$ we get

$$\tilde{s} = \frac{2\alpha k}{2q^2 + \alpha qk} \equiv s_2.$$ 

Again, one can show that $s_2$ is decreasing in $q$ and increasing in $k$. For $k \in [0, \bar{k}]$, $s_2$ is a valid probability. Naturally, $\tilde{s}q > \frac{2}{3}$ implies $q > \frac{2}{3}$ and $k > k^*$. Thus, $\tilde{s} = s_2$ constitutes an equilibrium mixed strategy for the interest group and decision-maker equilibrium belief whenever $q > \frac{2}{3}$ and $k \in [k^*, \bar{k}]$. 

\[\square\]
References


