Lobbying, Inside and Out: How Special Interest Groups Influence Policy Choices

Stephane Wolton
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Lobbying, Inside and Out: 
How Special Interest Groups Influence Policy Choices*

Stephane Wolton†

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1 Abstract

A decision-maker chooses the scope of a reform and pro- and anti-change Special Interest Groups (SIGs) use inside lobbying (i.e. contributions, transfer of information) to bias the content of the reform and outside lobbying (i.e. political advertising) to affect its fate. In equilibrium, inside lobbying expenditures are associated with policy compromises and denote successful anti-change SIG influence. Outside lobbying activities are correlated with comprehensive reforms and denote successful pro-change SIG influence. I further show that inside lobbying expenditures yield empirically biased estimates of SIG power, whereas outside lobbying expenditures are a more accurate measure of their influence.

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2 Introduction

Dozens of news articles and polls reflect the popular belief that Special Interest Groups (SIGs) exert pervasive influence on political decisions (e.g., CBS News/New York Times, 2015). Their far-reaching power ranges from the writing of bills, for example on banks regulations (Lipton and Protess, 2013), to delaying the introduction of life-saving measures in railways and public transportation (Hasley III and Laris, 2015). Far from improving policies, SIGs’ meddling is widely seen as detrimental to the public. As Zephyr Teachout (2015) writes in an op-ed to the New York Times, “[w]hether influence is bought through a bribe, outside spending, outside income or campaign contributions, the public suffers in the same way.”

The SIGs’ tactics described by Teachout, however, are not mere substitutes. Contributions (transfer of money) or informative lobbying (transfer of information)—henceforth, labelled ‘inside lobbying’—target legislators. Outside spending, political advertising, or grassroots activities—henceforth, ‘outside lobbying’—is meant to mobilize the electorate. While inside lobbying generally, but not exclusively occurs during the formulation of bills (e.g., Baumgartner et al., 2009), outside lobbying tends to happen at later stages when the fate of legislation is to be decided (e.g., Matter and Stutzer, 2016). As this paper shows, because these channels of influence are so distinct, they affect policy outcomes in fundamentally different ways. And empirical studies which fail to take into account outside lobbying activities are unlikely to properly measure SIG influence.

I develop a game-theoretic model which juxtaposes both inside and outside lobbying. A decision-maker (‘she’) decides on the magnitude of a policy change. After proposing a bill, an anti-change SIG, which favors the status quo, and a pro-change SIG, which shares the decision-maker’s preferences for change decide whether to engage in outside lobbying. Outside lobbying activities carried out by the anti-change SIG reduce the likelihood the bill is enacted, whereas outside lobbying activities undertaken by the pro-change SIG reduce the decision-maker’s cost of defending her proposal against the attacks of the anti-change SIG. Outside lobbying entails an opportunity cost which is the SIG’s private information. SIGs can use inside lobbying expenditures to reveal this cost prior to the decision-maker drafting her proposal.

In equilibrium, policy choices are a function of the decision-maker’s assessment of SIGs’ willingness to engage in outside lobbying. Inside lobbying expenditures do not always reflect SIGs’ outside lobbying capacities. These expenditures are always associated with compromise; that is modest policy changes. Compromise, however, denotes a failure to influence policies for pro-change SIGs seeking a comprehensive reform. In turn, compromise denotes a success in influencing policies for anti-change SIGs who wants to avoid significant policy changes. Interestingly, the result is completely reversed for outside lobbying. These activities are always correlated with comprehensive reforms, a mark of successful influence by pro-change SIGs and, conversely a failure by anti-change SIGs.

To make sense of these sharp differences, one should keep in mind how the two types of SIGs make strategic use of outside lobbying. For an anti-change SIG, outside lobbying is a threat. Threats are carried out only when they are unsuccessful. Inside lobbying expenditures, by revealing the extent of the SIG threat, induce the decision-maker to comprise. For a pro-change SIG, outside lobbying is a promise to help if the decision-maker commits
to a significant policy change. And true promises are carried out. A pro-change SIG with high outside lobbying capacity then has little incentive to incur inside lobbying expenditures since it prefers to preserve its war chest to fulfill its costly promise. A pro-change SIG with little willingness to engage in outside lobbying uses inside lobbying expenditures to credibly plead poverty.

In summary, the analysis reveals that similar empirical observations (inside lobbying - compromise; outside - comprehensive reform) have very different meanings depending on the identity of the SIG undertaking the lobbying activity. This conclusion has critical implications for empirical studies of SIG influence. The literature almost exclusively uses inside lobbying expenditures as a proxy of SIG power, examining their effect on policies (e.g., Goldberg and Maggi, 1999; de Figueiredo and Silverman, 2006; Richter et al., 2009) or legislative outcomes (e.g. Ansolabehere et al., 2003; Mian et al., 2010; Kang, 2015). This manuscript shows that the resulting estimates are downwardly biased measures of both the extent (the conditions under which SIGs influence policies) and strength (by how much SIGs bias policies) of SIG power.

Inside lobbying expenditures cannot capture pro-change SIG influence since they are always associated with compromise in equilibrium. For a similar reason, these expenditures fare better when considering anti-change SIGs, but they do not fully reflect their power. They fail to capture influence due to the mere threat of outside lobbying uncorrelated with inside lobbying expenditures.

Outside lobbying expenditures, in turn, yield unbiased estimates of both the extent and strength of influence for pro-change SIG as its power depends on the enactment of its promise to provide support. Outside lobbying activities capture the failure of the threat advanced by an anti-change SIG and thus only provide information (by contrapositive) on the extent of such SIG power. This paper highlights limits to researchers’ ability to measure how and how much anti-change SIGs influence policy choices.

I conclude this introduction by connecting this paper to the theoretical literature on inside and outside lobbying as well as the role of threat in the decision-making process. Many studies investigate SIG influence under the assumption that contributions buy political favors (e.g., Denzau and Munger, 1986; Grossman and Helpman, 1996 and 2001; Besley and Coate, 2001). The present paper instead supposes that inside lobbying expenditures serve to signal an SIG’s private information as in (among others) Potters and Van Widen (1992), Austen-Smith (1995), Ball (1995), Lohmann (1995), Cotton (2012 and 2016). There exist, however, important differences with the extent literature. First, in previous works, inside lobbying improves the policy-making process since SIGs have private information about the quality of various policy proposals. In contrast, this paper supposes that SIGs have private information about their own characteristics. As such, the manuscript is concerned about the negative effect of lobbying which has received so much attention in the Press and recent electoral campaigns. Second, inside lobbying expenditures are only one mean to influence policy choices as SIGs can engage in outside lobbying to affect the fate of a bill. This idea is also present in Gordon and Hafer (2005, 2007) in the context of nuclear regulation, however, unlike the present paper, the SIG’s strategic choice to effectively contest regulation is left unmodeled. Finally, from a technical standpoint, inside lobbying expenditures are not always informative in equilibrium despite
several assumptions meant to favor information transmission (e.g., the single-crossing condition holds). A few papers assume that SIGs use some sort of outside lobbying activities to influence political decisions. Yu (2005) studies a model in which SIGs can raise the salience of an issue before engaging in quid pro quo contributions. Kollman (1998) supposes that outside lobbying activities can change a policy-maker’s legislative agenda. Sobbrio (2011) considers a framework in which SIGs can distort information available to media outlets and thus voters. Bombadini and Trebbi (2011) assume that firms can use money or promise votes by mobilizing their employees in exchange for public subsidies. They find that only intermediary-sized firms use money as small firms find it too costly to enter politics and large firms can promise votes to get their preferred policy. The present manuscript adds to this literature by proposing a framework in which outside lobbying activities occur after the decision-maker’s policy choice and affect the likelihood her bill is enacted into law. Doing so, I derive novel empirical implications regarding what can or cannot be learned with lobbying data. Finally, this paper also relates to a small literature examining the effect of threats on the political process. Ellman and Wantchekon (2000) study how the threat of civil war biases electoral platforms in favor of the party backed by potential rebels, with Scartascini and Tommasi (2012) adapting this set-up to legislative bargaining. Chamon and Kaplan (2013) show that the threat to fund a challenger allows SIGs to obtain favorable policies at low cost in a model of quid pro quo contributions. Influence, however, is still perfectly correlated with inside lobbying expenditures in their framework. Other contributions analyze how threats increase the effectiveness of bribes (Dal Bó and Di Tella, 2003; Dal Bó et al., 2006). Wolton (2015) investigates how threats by the rich induce a governing party to compromise on taxation and shows that the presence of an opposition party can be Pareto improving for politicians and the wealthy alike. Dahm and Porteiro (2008) suppose that an SIG can perform a test to reveal information about an ex-ante unknown state of the world prior to engaging in political pressure which affects the probability a bill is enacted into law. They show that the SIG generally prefers a public test (i.e., all players observe the test’s result) to a private test (i.e., only the SIG observes the result), but do not consider the consequences of their results for empirical analysis. None of these papers assumes that SIGs can use money to transmit private information. This manuscript fills this gap and shows how outside lobbying activities affect the informativeness of inside lobbying expenditures.

3 Evidence on inside and outside lobbying

Inside lobbying expenditures can be divided into two categories: contributions (transfer of money from SIGs to decision-makers) and informative lobbying (transfer of information). While many studies focus on the former due to data availability, contributions represent less than 8% of total inside lobbying expenditures by SIGs. During the 2015-16 electoral cycle, SIGs contributed $360 millions to House candidates and $110 millions to Senate candidates, but spent $5.58 billions on informative lobbying. See also Bennedsen and Fieldmann (2006) for a model in which contributions can be interpreted as political pressures. Only Political Action Committee’s contributions are accounted for in the contributions total. If large individual contributions (more than $200 dollars) are included, House candidates raised $849 millions and Senate candidates $ 584 millions or approximately 20.5% of total inside lobbying expenditures (Source: Center for Responsive Politics).
Contributions appear to have little effect on the fate of a bill. Indeed, many studies have established that a legislator casts a vote based on her/his ideological preferences rather than political donations (see Ansolabehere et al., 2003; for different results see Mian et al., 2010 and 2013). In turn, contributions seem to have some impact on the content of policies (e.g., Goldberg and Maggi, 1999; Bombardini and Trebbi, 2011). Similarly, several papers have found that policy choices are affected by informative lobbying in issues as diverse as academic earmarks (de Figueiredo and Silverman, 2006), corporate taxes (Richter et al., 2009), state subsidy (Payson, 2016) or energy policy (Kang, 2015).

A survey of U.S. legislators and their staff by the magazine Fortune (Fortune’s 1999 Power 25 Survey), however, suggests that inside lobbying expenditures do not fully capture SIG influence. None of the 5 most powerful groups belongs to the top 10 in term of inside lobbying expenditures (Table 1). Further, among the groups cited in the survey, only 12 belong to the top 25 for contributions and only 4 to the top 25 for informative lobbying expenditures. This points to the necessity of considering other avenues of influence.

<table>
<thead>
<tr>
<th>Power 25 Survey Rank</th>
<th>Contributions Rank</th>
<th>Informative Lobbying Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>AARP</td>
<td>1</td>
<td>&gt;100</td>
</tr>
<tr>
<td>NRA</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>NFIB</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>American Israel PAC</td>
<td>4</td>
<td>&gt;100</td>
</tr>
<tr>
<td>AFL-CIO</td>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 1: Most powerful SIGs and their inside lobbying expenditures

Other SIGs’ lobbying tactics have received far less attention empirically despite a long scholarly tradition stressing their importance (e.g., Blaisdell, 1957; Wright, 1996: 90; Kollman, 1998: 103; Hojnacki and Kimball, 1999: 1005-6; Baumgartner et al., 2009: 150-7). Chief among them is outside lobbying, SIGs’ attempt to pressure decision-makers by mobilizing their constituents through issue advocacy advertising or grass-roots activism. Anecdotally, SIGs have used issue advocacy advertising to affect the fate of prominent legislative reforms—for example, Clinton’s 1993 health care reform (West et al., 1996; Goldstein, 1999), the 1998 Senate tobacco bill (Jamieson, 2000; Derthick, 2012), Obama’s 2010 Affordable Care Act (Hall and Anderson, 2012; LaPira, 2012). The empirical evidence on the actual purpose(s) of these activities, however, are scantier. Hall and Reynold (2012) study which legislators are the targets of issue advocacy advertising, but give little information about the timing of outside lobbying activities or their effect on voting decisions. Matter and Stutzer (2016) show that U.S. Members of Congress reduced their public support to the SOPA/PIPA bills after the blackout organized by mainstream internet websites opposed to the two pieces of legislation. Finally, Lord (2000) in a survey of lobbyists and U.S. legislators find that inside lobbying

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3. In a related fashion, Hall and Wayman (1990) find that contributions increase committee members’ efforts. Firms’ behavior is consistent with the idea that inside lobbying expenditures are meant to influence policy choices. Fournais and Hall (2016a, 2016b) show that firms’ contributions vary with legislators’ positions as well as their exposure to regulation.

4. See de Figueiredo and Richter (2014) for a review of the empirical literature on informative lobbying.


6. Falk et al. (2006) estimate that issue advocacy advertising amounted to more than $400 million in the Washington DC media market alone during the 108th Congress. In comparison, SIGs contributed approximately $570m to Members of Congress (excluding presidential-candidate John Kerry), and spent $4bn on lobbying during the 2003-2004 electoral cycle (source: Center for Responsive Politics).
expenditures are more effective in shaping the content of a bill, whereas outside lobbing (constituency building) has greater impact on the legislative success of a policy proposal. Based on this partial evidence, the model described in the next section restricts attention to outside lobbing meant to affect the likelihood a bill is enacted into law.

4 The model

I study a one-period three-player game with a decision-maker (superscript D), a pro-change SIG (P), and an anti-change SIG (A). The decision-maker and the pro-change (anti-change) SIG have similar (opposite) policy preferences. The game has three parts. In the first stage, each SIG observes their opportunity cost to lobby on the particular policy under discussion and decides whether to reveal it to the decision-maker via their inside lobbing strategy. In the second stage, the decision-maker chooses the content of a bill \( b \in [0,1] \), where 0 represents the status quo and 1 a comprehensive reform, which represents the decision-maker and SIG P’s preferred policy. In the third part, SIGs decide whether to engage in outside lobbing \( (l^J_o \in \{0,1\} \text{ for } J \in \{A, P\}) \).

Outside lobbing activities have an impact on the outcome of the game \( y \in \{0,b\} \), either the status quo \( 0 \) or the bill proposed by the decision-maker \( b \). When the anti-change SIG does not engage in outside lobbing \( (l^A_o = 0) \), the decision-maker’s bill is always enacted into law: \( y = b \). Otherwise \( (l^A_o = 1) \), the outcome depends on the decision-maker’s and the pro-change SIG’s choices. The decision-maker chooses the intensity of her response to the anti-change SIG’s outside lobbing activities, \( d \in \{0,1,2\} \). When the decision-maker chooses \( d = 0 \), she backs down and the status quo prevails: \( y = 0 \). When the decision-maker chooses \( d = 2 \), she defends the bill on her own and the bill passes \( (y = b) \) with probability \( p \); with probability \( 1-p \), the status quo is upheld \( (y = 0) \). Finally, when the decision-maker chooses \( d = 1 \), she asks for the pro-change SIG’s support and the outcome then depends on the pro-change SIG’s decision whether to engage in outside lobbing. If the pro-change SIG engages in outside lobbing \( (l^P_o = 1) \), the bill is passed with probability \( p \); if not \( (l^P_o = 0) \), the bill fails and the status quo prevails \( (y = 0) \) with probability \( 1 \).

Outside lobbing is costly for all players. For the decision-maker, the cost of a response with intensity \( d \) is: \( \frac{1}{2} \times d \). Importantly, the decision-maker faces a lower cost when she asks for support \( (d = 1) \) than when she defends the bill on her own \( (d = 2) \). This cost is common knowledge. An SIG’s cost of outside lobbing, in turn, is a function of its opportunity cost \( \tau \in \{H,L\} \), with \( H \) (L) denoting a high (low) opportunity cost, and is its private information. Low opportunity cost for SIG \( J \in \{A, P\} \) is associated with a lower cost of outside lobbing activities: \( c^L \leq c^H \). It is common knowledge that the SIG’s types are uncorrelated and the probability the opportunity cost of SIG \( J \in \{A, P\} \) is low is: \( Pr(\tau^J = L) = q^J \in [0,1] \).

In the first stage, SIGs can reveal their type by engaging in inside lobbing. An SIG’s inside lobbing activities take the form of a costless message \( m \in \{H, L\} \) and costly expenditures \( l^J_i \in \mathbb{R}_+ \text{, } J \in \{A, P\} \) (observe that that \( l^J_i \) can take any weakly positive value).\(^7\) Denote \( \phi^J := (m, l^J_i) \) the signal of SIG \( J \). The cost of inside lobbing expenditures \( \text{The costless message } m \text{ guarantees that an equilibrium always exists after imposing refinements on out-of-equilibrium beliefs (see footnote 20 for more details). Similarly, one can assume that there exists a small fixed cost of incurring inside lobbing expenditures. Such assumption would, however, change some of the empirical implications detailed below.}
depends on an SIG's opportunity cost, and, for ease of exposition, is equal to the cost of outside lobbying activities: $c_J^\tau$, $J \in \{A, P\}$, $\tau \in \{H, L\}$. Henceforth, I refer to $c_J^\tau$ as the "lobbying cost." Observe that since types are drawn independently, the anti-change SIG's signal reveals no information about the pro-change SIG's opportunity cost, and vice versa.

As noted above, the decision-maker’s preferred outcome ($y$) is 1. Incorporating the cost of responding to the anti-change SIG’s outside lobbying activities, her utility function can be expressed as:

$$u^D(y,d) = y - \frac{kd}{2}$$

(1)

The pro-change SIG’s preferred outcome is the same as the decision-maker’s. Its utility function also includes the cost of both inside lobbying expenditures ($l_P^i \in \mathbb{R}_+$) and outside lobbying activities ($l_P^o \in \{0, 1\}$) and thus assumes the following form:

$$u^P(y, l_P^i, l_P^o; \tau) = y - c_P^\tau(l_P^o + l_P^i), \tau \in \{H, L\}$$

(2)

The anti-change SIG prefers the status quo ($y = 0$), any change imposes a payoff loss. Adding the cost of inside ($l_A^i \in \mathbb{R}_+$) and outside lobbying ($l_A^o \in \{0, 1\}$), its utility function is:

$$u^A(y, l_A^i, l_A^o; \tau) = -y - c_A^\tau(l_A^o + l_A^i), \tau \in \{H, L\}$$

(3)

To summarize the timing of the game is:

1. Nature draws SIGs’ types independently: $\tau_J \in \{H, L\}, J \in \{A, P\}$;
2. Both SIGs privately observe their type and send simultaneously a signal: $c^J = (m, l^i_J) \in \{H, L\} \times \mathbb{R}_+$;
3. The decision-maker chooses the content of the bill: $b \in [0, 1]$;
4. The anti-change SIG decides whether to engage in outside lobbying: $l_A^o \in \{0, 1\}$;
5. The decision-maker then decides whether to back down, ask for support, or defend her proposal: $d \in \{0, 1, 2\}$;
6. The pro-change SIG decides whether to engage in outside lobbying: $l_P^o \in \{0, 1\}$;
7. Outcomes are realized, the game ends, and payoffs are realized.

The outcomes as a function of each player’s action are summarized in Table 2.

<table>
<thead>
<tr>
<th>$l_A^o$ = 0</th>
<th>$l_A^o$ = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$d + l_P^o &lt; 2$</td>
<td>$y = b$ with prob. 1</td>
</tr>
<tr>
<td>$d + l_P^o \geq 2$</td>
<td>$y = b$ with prob. 1</td>
</tr>
</tbody>
</table>

Table 2: Summary of outcomes ($y \in \{0, b\}$)

The equilibrium concept is Perfect Bayesian Equilibrium (PBE) in pure strategies (see Supplemental Appendix A for a formal definition).\(^8\) A PBE requires that a) each player’s choices be sequentially rational given her belief at the time of choice and other players’ strategies; b) beliefs satisfy Bayes’ rule on the equilibrium path (are consistent with

\(^8\)In Supplemental Appendix C, I show that the main results hold when I allow for mixed strategies.
priors and equilibrium strategies). As it is common in signaling games, multiple PBE can emerge absent additional restrictions. I therefore impose the Intuitive Criterion (Cho and Kreps, 1987), which (in practice) imply that there should not exist a deviating signaling strategy satisfying (i) the voter anticipates only one type of SIG deviates and, given the voter's belief, (ii) only this specific type finds it profitable to deviate. To restrict further the number of outcome-equivalent equilibria and facilitate the exposition, I also impose that an SIG’s signal as a function of its opportunity cost—denoted $\zeta^d(\tau)$, $\tau \in \{H, L\}$, $J \in \{A, P\}$—satisfies $\zeta^d(H) \neq \zeta^d(L)$ only if its inside lobbying activity influences the decision-maker and opposite SIG’s strategies on the equilibrium path.\(^9\) In what follows, the term ‘equilibrium’ refers to this class of equilibria.

4.1 Assumptions

Assumption 1. The cost of a response $k$ satisfies: $1 - p - k > c^d_k$

Since $c^d_k > 0$, the decision-maker is willing to defend on her own her preferred policy $b = 1$. Further, Assumption 1 states that the decision-maker is not willing to compromise if she cannot defend her proposal.\(^10\)

For the anti-change SIG, I assume that the following inequalities hold:

Assumption 2. The anti-change SIG’s lobbying costs satisfy: $c^d_L < p < c^d_H$

Under assumption 2, a high-opportunity cost anti-change SIG never engages in outside lobbying since it is a strictly dominated strategy. This assumption is meant to simplify the exposition and the main results hold when it is relaxed.

Regarding the pro-change SIG, I impose the following conditions.

Assumption 3. The following inequalities hold: i. $(1 - p) \frac{c^d_L}{p} < c^d_p < (1 - p) < c^d_H$ and ii. $q^p \leq 1/2$

Point i. implies that a high-opportunity cost SIG $P$ never engages in outside lobbying (the inequality $(1 - p) \frac{c^d_L}{p}$ is meant to simplify the analysis, but does not affect the main results). Point ii. is a sufficient condition so that the decision-maker does not ask for support ($d = 1$) when the pro-change SIG’s inside lobbying activities reveal no information about its opportunity cost.

4.2 Discussion

This game shares similarities with traditional signaling games, with one important twist. In traditional signaling games, the sender sends a signal, the receiver decides what action to take after observing the signal, and the game ends. In the present set-up, the game does not end after the receiver’s (decision-maker’s) policy choice. One of

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\(^9\)For a pro-change SIG, define the decision-maker’s policy choice $b$ as a function of the pro-change SIG’s signal $\zeta^P$, and the anti-change SIG’s signal $\zeta^A$; and her response $d$ as a function of $\zeta^P$, $\zeta^A$, the content of the bill $b$, and the anti-change SIG’s outside lobbying activities $l^A$. This restriction imposes that if $b(\zeta^P, \zeta^A) = b(\zeta^P, \zeta^A)$ and $d(\zeta^P, \zeta^A, b(\zeta^P, \zeta^A), l^A) = d(\zeta^P, \zeta^A, b(\zeta^P, \zeta^A), l^A)$ for all $\zeta^P \neq \zeta^P$ and for all $\zeta^A \in \{H, L\} \times \mathbb{R}_+$, $b(\cdot) \in [0, 1]$, and $l^A \in \{0, 1\}$ on the equilibrium path (i.e., the pro-change SIG’s strategy has no impact on equilibrium outcome), then the pro-change SIG plays a pooling strategy $(\zeta^P(L) = \zeta^P(H))$. A similar definition applies to the anti-change SIG. Footnotes 17 and 19 detail the role played by this restriction in the analysis.

\(^10\)Anticipating that the decision-maker does not defend her proposal ($d = 0$), the anti-change SIG gets $-b$ if it does not engage in outside lobbying and $-c^d_L$ if $l^A = 1$ (since the bill fails with probability 1). To make the SIG indifferent, the decision-maker must propose $b = c^d_L$. Assumption 1 guarantees she then prefers proposing $b = 1$ and obtaining in expectation $1 - p - k$. 
the senders (the anti-change SIG) has the opportunity to act again (engage in outside lobbying) to affect the final outcome of the game. This assumption, which corresponds to the idea that outside lobbying is intended to influence the likelihood that a bill is enacted into law, is the key force behind the results below.\textsuperscript{11}

As documented by Kingdon (1989 page 152) in his study of Members of Congress, legislators are particularly concerned about interest groups mobilizing constituents against them. An anti-change SIG has various means to accomplish this goal. For example, it can pay for issue advocacy advertising to inform the public of the consequences of the decision-maker’s proposal.\textsuperscript{12} Outside lobbying can then be understood as a war of information (Gül and Pesendorfer, 2012) as shown in Supplemental Appendix E. Outside lobbying can also be thought as funding a challenger to the decision-maker or expending funds to influence uninformed impressionable voters (Baron, 1994).\textsuperscript{13} These activities can also raise the salience of some issues (Aragonès et al., 2015; Dragu and Fan, 2016) or candidates’ attributes (Abdul-Razzak et al., 2017) to the disadvantage of the incumbent. In this context, the pro-change SIG’s expenditures correspond to ads defending the decision-maker’s proposal or raising her electoral chances, and thus are a form of subsidy. As a minimum number of ads is required to inform and persuade the public, outside lobbying activities are modeled as a binary variable, whereas inside lobbying takes the form of a continuous variable.\textsuperscript{14}

Because decision-makers interact repeatedly with SIGs, they tend to have relevant information about their characteristics. This is reflected in this framework by the decision-maker’s knowledge of (i) the possible realizations of the lobbying cost and (ii) the probability distribution over them. She is, however, uncertain about the opportunity cost for an SIG to become active on a given issue; that is, to rally their members on particular policies (e.g., Ainsworth, 2000 page 122). The AARP may be better able to mobilize its members on issues related to prescription drug (e.g., the 2003 Prescription Drug Bill, Turnham, 2003) than an health care reform with employer mandate like the 1993 Clinton health care initiative (Krauss, 1993).

To facilitate the exposition, I impose several technical assumptions. However, the single-crossing condition—the opportunity cost of outside lobbying is (perfectly) correlated with the cost of inside lobbying—is the only assumption which plays a significant role. Absent this assumption, an anti-change SIG never reveals its type at the inside lobbying stage and inside lobbying expenditures are of no strategic use. Other assumptions are meant to facilitate the exposition. All results hold as long as a bill is less likely to be enacted into law when the anti-change SIG engages in outside spending. The main conclusions remain unchanged for any finite type-space (but the analysis becomes significantly more complicated) or when inside lobbying expenditures are a transfer to the decision-maker (to explicitly incorporate contributions). Finally, restricting the timing of outside lobbying activity is of little consequence for

\textsuperscript{11}Models of signaling in the shadow of war exhibit a similar feature (Fearon, 1997; Arena, 2013). However, signaling in these models is a binary choice variable, the single-crossing condition does not hold, and there is no equivalent to a pro-change SIG. As such, the present paper is substantively and technically different.

\textsuperscript{12}Commenting on the success of the Harry and Louise campaign in the debate on Clinton’s Health Care Reform in 1993, Bill McInturff, who helped in the campaign, explains, “In terms of the questions raised about the “public policy process,” if the White House cannot build majority support faced with “soft” advertising that raised simple and fundamental questions, it suggests to our firm that we have materially made a contribution to the process by not allowing such a substantial piece of legislation to pass without a full airing of its consequences.” (cited in Brodie, 2001 page 1359).

\textsuperscript{13}As such, the model is better adapted to issue advocacy advertising rather than grass-roots mobilization.

\textsuperscript{14}All the results hold with a continuous level of outside lobbying effort (at the cost of complicating the analysis) as long as there is a fixed (entry) cost of engaging in this type of activity.
the results. SIGs perfectly anticipate the decision-maker’s decisions in equilibrium and they would pursue the same strategy whether they act preemptively or react to the decision-maker’s actions. Outside lobbying could also serve a signaling purpose, but this would only limit the usefulness of inside lobbying expenditures and reinforce the paper’s core message. As noted above, it is however critical for the paper’s results that SIGs can employ outside lobbying activities to affect the fate of the decision-maker’s bill after it is proposed.

5 Anti-change SIG influence

In this section, I focus on the anti-change SIG. To this end, I assume that the decision-maker is uncertain ex-ante about the anti-change SIG’s opportunity cost—\(q_A \in (0, 1)\)—, whereas the pro-change SIG’s opportunity cost is known to be high—\(q_P = 0\). Consequently, the pro-change SIG’s signal (\(\zeta^P\)) has no impact on the decision-maker’s policy choice and, under Assumption 3, the decision-maker never asks for help.

At the policy-making stage, the decision-maker faces a choice between proposing her preferred policy \(b = 1\) or finding a compromise with the anti-change SIG. A compromise takes the form of a bill which leaves the anti-change SIG with a low opportunity cost indifferent between engaging in outside lobbying \(l_A^L = 1\) and not \(l_A^H = 0\).\(^{15}\) Denote \(b_L\) this ‘compromise bill.’ Simple algebra yields \(b_L := \frac{c_A^L}{p} < 1\).

To evaluate the consequences in the policy process of an anti-change SIG’s presence, we first need to establish the proper counterfactual which corresponds to the decision-maker’s policy choice absent an anti-change SIG, denoted \(b^*(\zeta^P, \theta)\). As she does not fear outside lobbying activities, the decision-maker always proposes her preferred policy \((b = 1)\) which passes with probability 1.

**Lemma 1.** *Absent an anti-change SIG, the decision-maker’s equilibrium policy choice is \(b^*(\zeta^P, \theta) = 1\).*

Lemma 1 directly implies that the anti-change SIG influences policy choice whenever \(b = b_L\). The SIG can bias the decision-maker’s proposal through two different channels. First, the threat of outside lobbying may induce the decision-maker to compromise. Second, an anti-change SIG plays a separating strategy (i.e., \(\zeta^A(L) \neq \zeta^A(H)\)) so that a low-opportunity cost credibly reveals its type to induce the decision-maker to propose \(b = b_L\); a high-opportunity cost SIG, in turn, obtains \(b = 1\). In this second case, the threat of outside lobbying is channelled through inside lobbying expenditures and the latter fully reflect SIG power. The next Lemma, however, shows that a separating equilibrium exists only under specific conditions.

**Lemma 2.** *A separating equilibrium exists if and only if:*

\[
\max \left\{ 1 - p - k, \frac{k}{1 - p} \right\} \leq \frac{c_A^L}{p} \leq (1 - p) \frac{c_A^H}{p}
\]

*In a separating equilibrium, the decision-maker chooses \(b = b_L\) after signal \(\zeta^A(L)\) and \(b = 1\) after signal \(\zeta^A(H)\).*

**Proof.** All proofs non described in the text are collected in Online Appendix B. \(\square\)

\(^{15}\)It can be checked that any other proposal can only reduce the decision-maker’s policy payoff if the bill is enacted without decreasing the likelihood of outside lobbying activities.
A separating equilibrium exists only if a low-opportunity cost anti-change SIG’s benefit from differentiation is greater than the associated cost. The benefit from differentiation is positive only if the decision-maker chooses \( b_L \) after learning the anti-change SIG has a low opportunity cost. Compromising with a low-cost SIG, however, is the decision-maker’s best response only if the comprise bill is not too moderate: \( b_L \geq \max \left\{ 1 - p - k, \frac{k}{1 - p} \right\} \). When \( b_L < 1 - p - k \), the decision-maker prefers to propose \( b = 1 \) and face the costly lottery induced by the anti-change SIG’s outside lobbying activities rather than to compromise. When \( b_L < \frac{k}{1 - p} \Leftrightarrow (1 - p)b_L - k < 0 \), the decision-maker is not credible when she proposes \( b = b_L \) since she is not willing to defend her proposal if the SIG engages in outside lobbying. By choosing \( I^A = 1 \), the SIG then gets a payoff of \(-c^A_L \) as the bill fails with certainty \((y = 0)\). By choosing \( I^A = 0 \), it gets \(-b_L = -c^A_L/p \) since the compromise bill passes with probability 1. Obviously, a low-opportunity cost anti-change SIG strictly prefers to engage in outside lobbying and, anticipating this, the decision-maker proposes her preferred bill \((b = 1)\) under Assumption 1.

A second necessary condition for a separating equilibrium to exist is that a low-opportunity cost anti-change SIG is willing to reveal its type. Even though the single-crossing condition holds \((c^A_L < c^A_H)\), this is not always guaranteed. To understand this result, notice that in a separating assessment, an SIG with high opportunity cost has strong incentives to imitate a low-opportunity cost SIG since it always obtains a bill closer to the status quo. The benefit from imitation equals \(1 - b_L \). In contrast, a low-opportunity cost SIG has less to gain from revealing its type. While it faces a bill further away from the status quo by pretending to be a high-cost type, it then engages in outside lobbying and reduces the probability the bill is enacted into law. The benefit from differentiation is then equal to: \(-b_L - ((1 - p) - c^A_L) = (1 - p)(1 - b_L)\). Consequently, a high-opportunity cost SIG’s benefit from imitation is always strictly greater than a low-opportunity cost SIG’s benefit from differentiation. This implies that a separating equilibrium can only exist if the two types’ costs of lobbying are sufficiently apart.

The next proposition characterizes the anti-change SIG’s strategy in a separating equilibrium: \( \zeta^A(\tau) \), \( I^A(\tau), \tau \in \{H, L\} \) assuming without loss of generality that the anti-change SIG announces its type \((m^* = \tau)\). Only an anti-change SIG with low opportunity cost incurs strictly positive inside lobbying expenditures since it always obtains the more favorable bill \( b_L \) in return.\(^{16}\) Since the decision-maker always compromises with the low-opportunity cost SIG on the equilibrium path, no type engages in outside lobbying. Denoting \( I^A(b_L) = \frac{b_L}{c^A_L} \), I obtain:

**Proposition 1.** In a separating equilibrium, the anti-change SIG’s equilibrium strategy satisfies:

1. \( \zeta^A(\tau) = (\tau, I^A(\tau)) \), with \( \zeta^A(L) = \frac{L}{c^A_L} \) and \( \zeta^A(H) = 0 \);
2. \( I^A(\tau) = 0, \tau \in \{H, L\} \).

Proposition 1, together with Lemma 2, indicates that in a separating equilibrium, inside lobbying expenditures are correlated with compromise and thus influence. However, as established in Lemma 2, since a separating equilibrium does not always exist, it is necessary to extend the analysis to cases when the anti-change SIG plays a pooling equilibrium (i.e., \( \zeta^A(L) = \zeta^A(H) = \zeta^A \)).

A pooling equilibrium exists unless a low-opportunity cost anti-change SIG has a profitable signaling deviation by the Intuitive Criterion. This is the case only when two sets of conditions are satisfied. First the compromise bill must

\(^{16}\)Observe that imposing the Intuitive Criterion guarantees that the separating equilibrium with the minimum level of expenditures is selected.
satisfy the conditions laid out in Lemma 2 so that a low-opportunity cost SIG has incentives to reveal its type and the
decision-maker to compromise. Second, absent any information at the inside lobbying stage, the decision-maker
must prefer 1 to ²L so that a low-opportunity cost SIG can gain by revealing its type as it would induce the decision-
maker to propose the compromise bill. In all other cases, the Intuitive Criterion does not rule out the existence of
a pooling equilibrium. When a pooling equilibrium exists, the decision-maker’s choice between ²L and 1 depends
on two factors: (i) her assessment of the threat of outside lobbying activity as measured by her prior ¼ that the
SIG has a low opportunity cost of lobbying and (ii) the content of the compromise bill ²L. When the compromise
bill is very moderate (i.e., ²L < max{1 − p − k, k/(1 − p)}), the decision-maker never wants to or cannot credibly
compromise with a low-opportunity cost SIG. Therefore she always proposes b = 1.17 When the compromise
bill is relatively attractive (²L ≥ max{1 − p − k, k/(1 − p)}), the decision-maker prefers ²L to b = 1 whenever the risk of
outside lobbying is high. Hence, the decision-maker proposes b = 1 if and only if ¼ is low. Denote ¾(²L) := \frac{1-²L}{k+²L}.
Lemma 3 summarizes the above reasoning after imposing (1 − p) ³ ¼ > max \{1 − p − k, \frac{k}{1−p}\} to limit the number of
cases (an amended statement holds when the inequality is reversed).

**Lemma 3.** Suppose (1 − p) ³ ¼ > max \{1 − p − k, \frac{k}{1−p}\}. A pooling equilibrium exists if and only if
²L \notin \max \left\{1 − p − k, \frac{k}{1−p}\right\}, \quad (1 − p) ³ ¼ \quad \text{or} \quad ¼ < ¾(²L).
In a pooling equilibrium, the decision-maker’s equilibrium policy choice—b*(‡P, ‡A)—satisfies:
1. b*(‡P, ‡A) = bL if ²L ≥ \max \left\{1 − p − k, \frac{k}{1−p}\right\} and ¼ > ¾(²L);
2. b*(‡P, ‡A) = 1 otherwise.

Lemma 3 indicates that, under certain condition, the threat of outside lobbying is enough to induce the decision-
maker to compromise. The next proposition characterizes the anti-change SIG’s equilibrium strategy in a pooling
equilibrium. Observe first that absent compromise (case 2. of Lemma 3), the anti-change SIG engages in outside
lobbying on the equilibrium path when its opportunity cost is low. In addition, the anti-change SIG may incur
inside lobbying expenditures even though they have no impact on the decision-maker’s policy choice. This result is
driven by the decision-maker’s out-of-equilibrium belief.18 Absent inside lobbying expenditures (an out-of-equilibrium
event), the decision-maker would choose b = 1 against b = ²L when ¼ < 0. The anti-change SIG then incurs inside
lobbying expenditures to induce a compromise.

**Proposition 2.** Suppose (1 − p) ³ ¼ > max \{1 − p − k, \frac{k}{1−p}\}. In a pooling equilibrium, the anti-change SIG’s equi-
librium strategy satisfies m(L) = m(H) ∈ \{L, H\} and:
1. When b*(‡P, ‡A) = bL then ¼(‡L) = ¼(H) ∈ \left[0, ¾(²L)\right] and ¼(‡H) = ¼(H) = 0;
2. When b*(‡P, ‡A) = 1 then ¼(‡L) = ¼(H) = 0 and ¼(‡H) = 1, ¼(H) = 0.

The analysis of the theoretical framework when the decision-maker is uncertain about the anti-change SIG’s op-
portunity cost reveals two important regularities. First, outside lobbying activities are always associated with a

17 Absent the equilibrium restriction on SIGs’ signaling strategy, there exists an equilibrium in which the anti-change SIG reveals its type with
a cheap talk message when ²L ≤ \max \{1 − p − k, k/(1 − p)\}. But the SIG’s separating strategy would have no effect on the decision-maker’s policy
choice (b = 1) or on equilibrium outcomes.

18 Importantly, while the Intuitive Criterion ensures that signaling (inside lobbying) expenditures are uniquely pinned down in a separating
equilibrium, it imposes only moderate restrictions on signaling expenditures in a pooling equilibrium.
comprehensive reform. Second, inside lobbying expenditures are always associated with compromise. Importantly, outside lobbying is a reaction to the absence of compromise and inside lobbying expenditures are not necessarily informative and so do not always channel the threat of outside lobbying.

These theoretical results—summarized in Table 3—can be used to characterize when and how anti-change SIGs influence policies. In particular, they highlight the importance of distinguishing between influence through inside lobbying expenditures in a separating equilibrium (when \( b_L \in (\max\{1-p-k, k, 1-p\} \) and influence through the threat of outside lobbying in a pooling equilibrium (when \( b_L \geq \max\{1-p-k, k, 1-p\} \) and \( q^A \geq \sqrt{q}(b_L) \). They also stress that inside lobbying expenditures are not always the cause of SIG influence (in a pooling equilibrium when \( b_L \in \left(\max\left\{(1-p-k, k, 1-p\}\right\}, (1-p)\sqrt{q}(b_L) \) and \( q^A \geq \sqrt{q}(b_L) \)). These various conclusions turn out to have important consequences for empirical analyses of anti-change SIG influence to which I now turn.

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(a) Inside lobbying

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(b) Outside lobbying

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(c) Policy choice

Table 3: Equilibrium strategies

Table 3 presupposes \((1-p)\sqrt{q} > \max\{1-p-k, k, 1-p\}\) and omits arguments and boundary cases. ‘Cond.’ stands for condition, ‘Sep.’ for separating equilibrium; ‘Pool.’ for pooling equilibrium. Condition 1 corresponds to \( b_L \in (1-p-k, k, 1-p) \) and \( q^A < \sqrt{q}(b_L) \), Condition 2 to \( b_L \in (1-p-k, k, 1-p) \) and \( q^A < \sqrt{q}(b_L) \), Condition 3 to \( b_L \in (1-p-k, k, 1-p) \) and \( q^A < \sqrt{q}(b_L) \), Condition 4 to \( b_L \in (1-p-k, k, 1-p) \) and \( q^A < \sqrt{q}(b_L) \), Condition 5 to \( b_L \in (1-p-k, k, 1-p) \) and \( q^A < \sqrt{q}(b_L) \), and case 6 to \( b_L > (1-p-k, k, 1-p) \) and \( q^A > \sqrt{q}(b_L) \). In Tables 3a and 3b, for each case, the first line \( L \) (second line \( H \)) describes a low-opportunity cost (high-opportunity cost) anti-change SIG’s strategy. In Table 3c, for each case, the first (second) line corresponds to the decision-maker’s bill choice after observing a low-opportunity cost (high-opportunity cost) anti-change SIG’s signal: \( \zeta^A(L) \) (\( \zeta^A(H) \)).

Inside lobbying expenditures are commonly used as a proxy for influence with researchers running regressions of approximately the following form:

\[
b = \beta_0^A + \beta_1^A l_i^A + \beta_2^A X^A + \epsilon^A,
\]

Regression (4) yields \( \hat{\beta}_1^A \leq 0 \) and thus correctly identifies that inside lobbying expenditures are positively correlated with influence. However, even if the researchers’ data set contains the full population of SIGs with multiple obser-
vations for each parameter value (and possible equilibria) and $X^A$ controls for the distribution of anti-change SIGs’ lobbying costs and the decision-maker’s prior ($q^A$), this regression under-estimates both the extent and strength of anti-change SIG influence.

To understand why this regression under-estimates the extent of the SIG influence, suppose condition 5 in Table 3 is satisfied. The coefficient yielded by regression (4) would then be null. However, the anti-change SIG has a strong influence on the policy choice since the equilibrium policy choice is $b = b_L$ even if the SIG’s opportunity cost is high. To understand why this regression under-estimates the strength of the SIG influence, suppose condition 3 in Table 3 is satisfied. The estimate obtained from (4) would suffer from attenuation bias because the researcher faces an equilibrium selection problem: (s)he cannot distinguish whether the anti-change SIG plays a separating or pooling strategy. Because all types obtain a favorable policy in a pooling equilibrium due to the threat of outside lobbying activities, the downward bias in $\hat{\beta}_A^1$ is likely to be severe. The present theoretical framework thus suggests that estimates regarding the impact of informative lobbying expenditures on effective tax rate (Richter et al., 2009) or contributions on trade protection (Maggi and Goldberg, 1999), when SIGs arguably oppose changes, should be understood as lower bounds on SIG influence.

Outside lobbying expenditures can only partially resolve the issues discussed in the previous paragraphs. Since outside lobbying does not occur on the equilibrium path when condition 3 in Table 3 is satisfied, their inclusion cannot help correct for the attenuation bias identified above. Consequently, outside lobbying expenditures cannot inform about the strength of anti-change SIG influence. Outside lobbying activities, however, can serve to recover unbiased estimate of the extent of anti-change SIG influence whenever the (arguably unrealistic) assumption that the researcher can control for $q^A$ is relaxed; that is, the researcher cannot distinguish whether conditions 2 and 3 or 4 and 5 hold. As noted above, outside lobbying is associated with comprehensive reforms and thus captures the SIG’s failure to influence policy choices. Outside lobbying activities provide only an unbiased estimate of the extent of influence.

To understand why outside lobbying is of little help to capture the strength of influence of anti-change SIG, it is necessary to return to the strategic use of these activities. Outside lobbying serves as a threat to the decision-maker—if she does not compromise, she faces the risk of outside lobbying activities. Threats are effective only when they are not carried out. The realization of a threat is an admission of failure; its absence a sign of success. These expenditures are thus uninformative when it comes to the strength or means of influence (threat of outside lobbying activities or inside lobbying expenditures). Overall, the analysis presented here uncovers important limitations to researchers’ ability to empirically measure anti-change SIG influence.

6 Pro-change SIG influence

I now turn to the analysis of pro-change SIG influence. To this end, I assume that the decision-maker is uncertain about the pro-change SIG’s opportunity cost—$q^P \in (0, 1)$—and it is common knowledge that the anti-change SIG has a low opportunity cost—$q^A = 1$. Consequently, an anti-change SIG’s signal $\zeta^A$ reveals no information. As
above, the decision-maker chooses between her preferred policy $b = 1$ and the compromise bill $b_L$, which makes the anti-change SIG indifferent between engaging in outside lobbying and letting the bill pass without further action. To evaluate pro-change SIG influence, I first consider the decision-maker’s equilibrium policy choice absent a pro-change SIG (denoted $b^*(\theta, \zeta^A)$). As described previously, the decision-maker chooses $b_L$ unless the compromise bill is so moderate that the decision-maker is no longer credible $((1-p)b_L - k < 0)$ or she prefers to attempt to pass her preferred bill $(b_L < 1 - p - k)$.

**Lemma 4.** Absent a pro-change SIG, the decision-maker’s equilibrium policy choice is $b^*(\theta, \zeta^A) = b_L$ if and only if $b_L \geq \max\{1 - p - k, \frac{k}{1-p}\}$. and $b^*(\theta, \zeta^A) = 1$ otherwise.

By the previous lemma, whenever $b_L < \max\{1 - p - k, \frac{k}{1-p}\}$, the decision-maker chooses the pro-change SIG’s preferred policy. A pro-change SIG has then no influence on policy choice (Assumption 3 guarantees that the decision-maker never chooses $b = b_L$ when a pro-change SIG is active). To make the problem interesting, I thus assume in the remainder of this section that $b_L \geq \max\{1 - p - k, \frac{k}{1-p}\}$ so the pro-change SIG influences policy choices whenever the decision-maker chooses $b = 1$.

By Assumption 3, the simple presence of the pro-change SIG is not sufficient to generate influence since the decision-maker does not ask for help absent information about the SIG’s type. The pro-change SIG thus can affect policy choices only by playing a separating strategy (i.e., $\zeta^P(L) = \zeta^P(H)$).

I first establish that a separating equilibrium does not always exist. As Lemma 5 indicates, two conditions must be satisfied, the compromise bill cannot be too attractive and a low-opportunity cost SIG must face a sufficiently low cost of lobbying $c_L^P$.

**Lemma 5.** There exists a unique $\overline{cf} : [0, 1]^2 \to (0, (1 - p))$ such that a separating equilibrium exists if and only if (i) the compromise bill $b_L$ satisfies $k/2 \leq 1 - p - b_L$; and (ii) a low-opportunity cost SIG’s lobbying cost satisfies: $c_L^P \leq \overline{cf}(b_L, c_H^P)$.

A separating equilibrium exists when a low-opportunity cost SIG’s benefit from differentiation is greater than the associated cost. The benefit from differentiation is positive only if the decision-maker chooses her preferred bill $(b = 1)$ after learning the pro-change SIG’s opportunity cost is low and can help. The decision-maker must thus prefer the lottery induced by choosing $b = 1$, anticipating the anti-change SIG’s and a type $L$ pro-change SIG’s outside lobbying activities, over the certain payoff from proposing the compromise bill $b_L$. A first necessary condition is thus: $b_L \leq 1 - p - k/2$ (Condition (i)). The cost from differentiation corresponds to the cost of outside lobbying activities since the decision-maker asks for support $(d = 1)$ after choosing $b = 1$. A second necessary condition is then that the cost of outside lobbying activities (measured by the lobbying cost) is not too large: $c_L^P \leq \overline{cf}(b_L, c_H^P)$ (Condition (ii)).

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19 When this condition is not satisfied, the decision-maker chooses $b = b_L$, the anti-change SIG chooses $l_H^A = 0$ on the equilibrium path independently of the pro-change SIG’s signal. The restriction on the pro-change SIG’s equilibrium behavior then implies that the pro-change SIG plays a pooling strategy (i.e., $\zeta^P(L) = \zeta^P(H)$). Absent this restriction, the pro-change SIG might be willing to truthfully reveal its type, but this would be outcome-equivalent and would not affect other players’ equilibrium strategies. As such, the equilibrium restriction simply guarantees that the pro-change SIG biases policy choices if and only if it plays a separating strategy.
Denote $b^*(\zeta^P, \zeta^A)$ the equilibrium bill as a function of the pro-change SIG’s signal. The next remark establishes that in a separating equilibrium, a low-opportunity cost pro-change SIG obtains a more favorable bill (and more favorable outcome in expectation despite the lottery induced by the anti-change SIG’s outside lobbying activities).

**Remark 1.** In a separating equilibrium, $b^*(\zeta^P^*(L), \zeta^A) = 1 > b^*(\zeta^P^*(H), \zeta^A) = b_L$.

The next proposition characterizes the pro-change SIG’s strategy in a separating equilibrium—$\zeta^P^*(\tau), l^P_0^*(\tau), \tau \in \{H, L\}$—assuming without loss of generality that the SIG announces its type $(m(\tau) = \tau)$. To this end, it is useful to define the following quantity: $\overline{t}_i^P(c_L^P, b_L) := \frac{c_L^P - (1 - p - b_L)}{c_L^P}$.

**Proposition 3.** In a separating equilibrium, the pro-change SIG’s equilibrium strategy satisfies:

1. $\zeta^P^*(L) = (L, 0)$ and $\zeta^P^*(H) = (H, l^P_0^*(H))$, with $l^P_0^*(H) = \max \left\{ 0, \overline{t}_i^P(c_L^P, b_L) \right\}$;
2. $l^P_0^*(L) = 1$ and $l^P_0^*(H) = 0$.

The remarkable feature of Proposition 3 is that in a separating equilibrium, a low-opportunity cost SIG $P$ incurs no inside lobbying expenditures: $l^P_0^*(L) = 0$. To understand this result, observe first that a high-opportunity cost SIG has no incentive to mimic a low-opportunity cost. Such a strategy would only lead to no law being passed since the decision-maker would ask for help and not receive it. Hence, inside lobbying expenditures are meant to incentivize a low-opportunity cost SIG to reveal its type. Further, a low-opportunity cost pro-change SIG has no incentive to pay a cost at the inside lobbying stage to reveal it is willing to engage in costly outside lobbying at later stages of the policy-making process. It prefers to preserve its war chest for the upcoming defence of the decision-maker’s comprehensive reform. Consequently, SIG $P$ incurs positive inside lobbying expenditures (for some parameter values) only when its opportunity cost is high to signal it is not able to bear the cost of outside lobbying activities. Inside lobbying expenditures serve to credibly “plead poverty.”

Importantly, costly signaling is not always necessary. When a pro-change SIG faces a relatively low lobbying cost ($c_L^P \leq 1 - p - b_L$), it strictly prefers the risky bill $b = 1$ (anticipating all other actors’ strategies) to the compromise bill $b = b_L$. The low-opportunity cost pro-change SIG’s and the decision-maker’s preferences are then well aligned and cheap talk messages are credible. A separating equilibrium then exists absent any inside lobbying expenditure.\(^{20}\) Proposition 3 generates three important predictions. First, there should be a positive correlation between compromise and inside lobbying expenditures. Second, there should be a positive correlation between comprehensive reform and outside lobbying activities. Lastly, there should be a negative correlation between outside lobbying expenditures by a pro-change SIG. None of these results has so far not been tested. They may, however, explain some interesting patterns. For example, the AARP was highly involved in pushing back against conservative attacks on the Affordable Care Act in 2009 (Young, 2009), but was only moderately active in informative lobbying and made almost no contribution in the 2009-2010 electoral cycle.\(^{21}\) In addition, the results can also be related

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\(^{20}\)Cheap talk messages are then important to have a well-defined equilibrium correspondence. The only separating PBE surviving the Intuitive Criterion has minimum inside lobbying expenditures. Since separation can arise with zero signaling expenditures, both types should incur no inside lobbying expenditures. But the message is then not informative, leading to a contradiction absent cheap talk messages.

\(^{21}\)The AARP made 9 lobbying reports on Medicare & Medicaid issues and 8 on Health issues, against 67 and 93 reports for the most active organizations. The AARP’s informative lobbying activities put it outside of the top 75 on both issues in term of reports produced. Source: Center for Responsive Politics.
to ‘reverse lobbying.’ Legislators are often active lobbying actors who mobilize groups to facilitate policy change (Shaiko, 1998; Ainsworth, 2002; Baumgartner et al., 2009). Examples include President Clinton enlisting business groups to defend NAFTA against trade union attacks (Kollman, 1998) or trade unions to defend his Health Care reform against attacks from business groups (Goldstein, 1999); President Obama securing the help of various SIGs to get the Affordable Care Act enacted (Hall and Anderson, 2012; LaPira, 2012).

While inside and outside lobbying expenditures are negatively correlated, the next remark, together with Remark 1, establishes that (observed) total expenditures are positively correlated with influence.

**Remark 2.** In a separating equilibrium, the following inequality always holds:

\[ l_{P^i}^*(L) + l_{P^o}^*(L) > l_{P^i}^*(H) + l_{P^o}^*(H) \]

As the separating equilibrium exists only under specific conditions, it is essential to characterize conditions for existence of a pooling equilibrium. Under the assumptions, the decision-maker always chooses \( b = b_L \) in this case which corresponds to a high-opportunity cost SIG \( P \)'s preferred option. Hence, a pooling equilibrium exists whenever a low-opportunity cost SIG has no profitable signaling deviation satisfying the Intuitive Criterion. Since a low-opportunity cost SIG does not incur inside lobbying expenditures to reveal it is willing to subsidize the cost of defending the decision-maker’s proposal, a profitable signaling deviation can only occur when cheap talk messages credibly reveal an SIG’s opportunity cost. By Lemma 5 and Proposition 3, this implies that a pooling equilibrium exists whenever

\[ \max\{c_{P^L}^P, k/2\} \geq 1 - p - b_L. \]

In any pooling equilibrium, the decision-maker always compromises and a pro-change SIG never engages in outside lobbying. The latter may, however, incur inside lobbying expenditures as a function of the decision-maker’s out-of-equilibrium belief. To see this, suppose that the decision-maker believes that the pro-change SIG faces a low-opportunity cost absent inside lobbying expenditures (an out-of-equilibrium event). The decision-maker would then (for some parameter values) choose \( b = 1 \) and ask for help following \( l_{P^o}^o = 0 \). The resulting cost imposed on the pro-change SIG encourages it to incur inside lobbying expenditures so that the decision-maker compromises with the anti-change SIG. Since the level of inside lobbying expenditures is not uniquely pinned down, there exist an infinite number of pooling equilibria differing only in the observed level of spending by the pro-change SIG.

**Proposition 4.** A pooling equilibrium exists if and only if

\[ \max\{c_{P^L}^P, k/2\} \geq 1 - p - b_L. \]

The decision-maker always chooses

\[ b^* = (\zeta_{P^i}^P(\tau), \zeta^A) = b_L, \quad \tau \in \{H, L\}. \]

The pro-change SIG’s equilibrium strategy satisfies for \( \tau \in \{H, L\} \):

1. \( \zeta_{P^i}^P(\tau) = (m(\tau), l_{P^i}^o(\tau)) \), with \( m(\tau) \in \{H, L\} \) and \( l_{P^i}^o(\tau) = 0 \) if \( k/2 > 1 - p - b_L \) and \( l_{P^i}^o(\tau) \in \left[ 0, \min \left\{ l_{P^i}^o(c_{P^L}^P, b_L), \frac{b_L}{c_{P^H}^P} \right\} \right] \)

if otherwise;

2. \( l_{P^o}^o(\tau) = 0 \).

As for the analysis of anti-change SIG influence, a pro-change SIG’s inside lobbying expenditures are associated with comprise and its outside lobbying activities with comprehensive reform. However, the interpretation of these observations is very different. Comprehensive reform is a sign of influence by SIG \( P \), compromise of no influence.
Using these theoretical results—summarized in Table 4—we can determine when and how pro-change SIG influences policies. The pro-change SIG changes the decision-maker’s choice only in a separating equilibrium (when \( k/2 \leq 1 - p - b_L \) and \( c_L^P \leq \frac{k/2}{p - b_L} \)). Importantly, as noted above, the pro-change SIG is influential because of its outside lobbying capacities, not its inside lobbying expenditures. Whenever inside lobbying expenditures occur on the equilibrium path (in a separating equilibrium or a pooling equilibrium when \( k/2 < 1 - p - b_L < c_L^P \)), they are associated with policy compromise and thus failure to influence policies. I now discuss how these conclusions affect empirical estimates of pro-change SIG influence.

Table 4: Equilibrium strategies

<table>
<thead>
<tr>
<th>Cond.</th>
<th>Type</th>
<th>Sep.</th>
<th>Pool.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( L )</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>( L )</td>
<td>([0, \frac{k/2}{p - b_L}])</td>
<td>([0, \frac{k/2}{p - b_L}])</td>
</tr>
<tr>
<td>3</td>
<td>( L )</td>
<td>([0, \frac{k/2}{p - b_L}])</td>
<td>([0, \frac{k/2}{p - b_L}])</td>
</tr>
<tr>
<td>4</td>
<td>( L )</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(a) Inside lobbying</td>
<td>(b) Outside lobbying</td>
<td>(c) Policy choice</td>
<td></td>
</tr>
</tbody>
</table>

Observe that regression (5) yields a non-zero coefficient only when primitive values are such that condition 3 holds.

Using inside lobbying expenditures as a proxy, researchers run regressions similar to:

\[
b = \beta_0^P + \beta_1^P t^P + \beta_2^P X^P + \epsilon^P,
\]

with \( X^P \) a set of controls which does not include \( t^P \), and \( \epsilon^P \) the residual.

This section’s results imply that the resulting \( \hat{\beta}_1^P \) mis-estimate the extent and strength of SIG influence even under the (arguably unrealistic) assumption that researchers have a data set which includes the full population of pro-change SIGs and can distinguish between the four conditions described in Table 4.

Observe that regression (5) yields a non-zero coefficient only when primitive values are such that condition 3 holds. When conditions 1 and 2 are satisfied, the pro-change SIG \( P \) has no influence on policy choices, which is adequately reflected by \( \hat{\beta}_1^P = 0 \). The researcher would, however, fail to identify the pro-change SIG influence when condition 4 holds when cheap talk messages are enough to bias the decision-maker’s policy choice.

Further, the estimate obtained when parameters satisfy condition 3 suffers from multiple biases. First, the point estimate is negative leading the researcher to wrongly infer that a pro-change SIG is better off when it does not
engage in inside lobbying. Second, even if the researcher has the proper counterfactual in mind (i.e., inside lobbying expenditures serve to credibly plead poverty), (s)he faces an equilibrium selection problem which makes the estimate difficult to interpret. Multiple pooling equilibria with (possibly) positive inside lobbying expenditures coexist with the separating equilibrium. Since in pooling equilibria, inside lobbying expenditures have no effect on policy choice, $\hat{\beta}_1^P$ suffers from attenuation bias.

In contrast, by running regression (6) which leverages the pro-change SIG’s outside lobbying activities, the researcher recovers an unbiased estimate of both the extent and strength of the SIG influence.

$$b = \alpha_0^P + \alpha_1^P l_{0}^P + \alpha_2^P X + \nu^P$$ (6)

A pro-change SIG engages in outside lobbying if and only if it plays a separating strategy, thereby solving the equilibrium selection problem. Further, outside lobbying expenditures are perfectly correlated with comprehensive reform which ensure they are a correct proxy for influence.

While outside lobbying activities only provide an unbiased estimate of the extent of anti-change SIG power, they can be used to recover both the extent and strength of pro-change SIG influence. This critical distinction is due to the differences in the source of anti-change and pro-change SIG influence. Recall that anti-change SIG influence emerges from the threat of outside lobbying. Not so for the pro-change SIG. For the latter, influence results from the promise of outside lobbying. While effective threats are not carried out, true promises are acted out in equilibrium. Consequently, outside lobbying activities correctly measure the extent and strength of pro-change SIG influence. The specificity of promise also explains why inside lobbying expenditures cannot be employed to assess pro-change SIG power as a low-opportunity cost SIG preserves its war chest for future stages of the policy-making process.

7 Policy choices with competing SIGs

In this section, I briefly discuss the case when both SIGs’ opportunity costs of lobbying are unknown to the decision-maker (i.e., $q^J \in (0, 1), J \in \{A, P\}$) and relegate the formal analysis of this set-up to Supplemental Appendix D. Both SIGs now have an opportunity to affect the decision-maker’s policy choice: there is competition for influence. The competition for influence does not change the key insights uncovered above when it comes to the pro-change SIG. Inside lobbying expenditures are always associated with compromise. This implies that (for some parameter values) a high-opportunity cost SIG uses inside lobbying expenditures to credibly plead poverty. Since, for some parameters, cheap talks is credible and separating equilibrium and pooling equilibria are indistinguishable based on inside lobbying expenditures, inside lobbying expenditures remain a poor proxy to assess pro-change SIG influence.

On the other hand, outside lobbying remains correlated with comprehensive reform. These activities are still an unbiased measure of the strength and extent of pro-change SIG power.

In turn, the link between the anti-change SIG’s strategy and policy choices is more subtle in this setting. Inside lobbying expenditures are correlated with, but no longer guarantee compromise. The decision-maker has now
less incentive to choose a moderate bill since the pro-change SIG may be able to help. She therefore sometimes proposes its preferred policy $b = 1$ even after learning the anti-change SIG has a low opportunity cost of lobbying (i.e., even in a separating equilibrium). Promises thus dominate threats. Since inside lobbying expenditures do not necessarily capture anti-change SIG influence even if it plays a separating strategy, the results discussed above should be understood as an upper bound on empirical researchers’ ability to quantify anti-change SIG influence using these expenditures. Outside lobbying, however, is still associated with a comprehensive reform. As such, these activities reveal the failure of threat both in pooling equilibria and the separating equilibrium. Consequently, even when there is competition for influence, outside lobbying expenditures yield an unbiased estimate of the extent of anti-change SIG influence.

8 Conclusion

A few years ago, Beth Leech (2010 page 534) stated that “the search for a definitive statement about the power of lobbyists has become the Holy Grail of interest group studies.” This paper highlights that this quest risks being in vain. Using a theoretical framework in which SIGs can engage in both inside and outside lobbying, I show that inside lobbying expenditures (informative lobbying, contributions) are a poor proxy for influence. These expenditures are associated with compromise, which has a very different meaning for pro-change and anti-change SIGs. For pro-change SIG, compromise reflects failure to influence policies, so researchers employing inside lobbying expenditures risk obtaining wrongly signed estimates and making incorrect inference about their power. For anti-change SIG, compromise, and thus inside lobbying expenditures, is synonymous with influence. In all cases, however, estimates suffer from attenuation bias due to equilibrium selection problems.

The paper points to the need to consider other lobbying activities in order to assess SIG influence, especially outside lobbying expenditures. Outside lobbying is always associated with comprehensive reform, they are a mark of pro-change SIG influence. Consequently, this type of activities correctly quantifies the extent and strength of these SIG's power. Conversely, comprehensive reforms are a sign of a failure to affect policy choices for anti-change SIG. Consequently, outside lobbying (by contra-positive) only offers an unbiased estimate of the extent of their influence. This important distinction is due to the different strategic uses of outside lobbying activities by these SIGs. For pro-change SIGs, outside lobbying is a promise of future support. Since true promises require to be acted out, researchers can fully recover these SIG influence. For anti-change SIGs, outside lobbying is a threat. But threats are carried out (and thus observed) only when they fail. The observation of outside lobbying expenditures by anti-change SIGs provides information about the extent of their power, but reveals nothing about the strength or the means of their influence. This last conclusion has important implications: groups blocking reforms have a great sway over the policy process in the United States (e.g., Drutman, 2015), and failing to properly assess their influence
makes it difficult to design adequate policies to curb their power. The theoretical framework and conclusions described in this paper do not exclusively apply to SIG influence. They provide useful guidance for researchers in any setting in which threats or promises play a key role. Criminal groups provide a useful illustration. These groups use threats to bias public policies. Hence, violence, the failure of a threat, cannot be used to recover their influence (as confirmed by the null findings documented in Alesina et al., 2016) and more subtle measures are necessary to unveil criminal groups’ power such as exogenous policy interventions (e.g., municipality dissolutions by the Italian government as in Di Cataldo and Mastrorocco, 2017).
9 Appendix: Proofs

Recall $\zeta^d(\tau) \in \{H, L\} \times \mathbb{R}_+$, is the signal of SIG $J \in \{A, P\}$ as a function of its type $\tau \in \{H, L\}$. Throughout, I assume without loss of generality that when an SIG plays a separating strategy, it announces its type: $m(\tau) = \tau$, $\tau \in \{H, L\}$. The decision-maker’s posterior that a pro-change (resp., anti-change) SIG’s opportunity cost is low following its signal is $\mu^P(\zeta^P)$ (resp., $\mu^A(\zeta^A)$). As I restrict attention to pure strategy in the main text, the posterior always satisfies $\mu^i(\zeta^i) \in \{0, q^i, 1\}$, $J \in \{A, P\}$. Denote $b(\zeta^P, \zeta^A) \in [0, 1]$ and $d(\zeta^P, \zeta^A, b, l^A) \in \{0, 1, 2\}$ the decision-maker’s strategy (resp. policy choice and defence of her proposal) as a function of SIGs’ signals, her policy choice, and the anti-change SIG’s outside lobbying activity. Denote $l^A(b, \zeta^P; \tau) \in \{0, 1\}$ the anti-change SIG’s outside lobbying strategy as a function of the decision-maker’s proposal, pro-change SIG’s signal, and its own type. Similarly, denote $l^P(b, l^A, d; \tau) \in \{0, 1\}$ the pro-change SIG’s outside lobbying strategy as a function of the decision-maker’s proposal, anti-change SIG’s outside lobbying activities, decision-maker’s defence strategy, and its own type. Starred strategies denote equilibrium strategies.

In the proofs, I focus on the SIGs’ inside lobbying strategy with players playing their best response down the game tree. This implies in particular (assuming $(1 - p)b - k \geq 0$ so $d^*(\cdot, l^A) = 1 \neq 0$): i) decision-maker’s defence strategy satisfies: $d^*(\zeta^P, \zeta^A, 1) = 1$ if and only if $\mu^P(\zeta^P) = 1$ and $(1 - p)b - c^A_L \geq 0$ (so a low-opportunity cost pro-change SIG has incentive to engage in outside lobbying), and $d^*(\zeta^P, \zeta^A, 1) = 2$ otherwise; ii) the anti-change SIG chooses $l^A(b, \zeta^P; \tau) = 1$ if and only if $-(1 - p)b - c^A_L > -b$, $\forall b \in [0, 1]$. As noted in the text, the decision-maker’s equilibrium proposal satisfies $b^*(\cdot) \in \{b_L, 1\}$, with $b_L = c^A_L$.

I first prove the results regarding the anti-change SIG influence (denoting $\zeta^P$ the pro-change SIG’s uninformative signal). As $q^P = 0$ and $(1 - p) < c^P_H$, $d(\cdot) = 1$ is a strictly dominated strategy.

**Lemma 6.** The anti-change SIG plays a separating strategy (i.e., $\zeta^A(L) \neq \zeta^A(H)$) on the equilibrium path only if $b(\zeta^P, \zeta^A(L)) < b(\zeta^P, \zeta^A(H))$.

**Proof.** First, notice that by Assumptions 1 and 2, the decision-maker’s best response after observing $\zeta^A(H)$ is $b(\zeta^P, \zeta^A(H)) = 1$. If $b(\zeta^P, \zeta^A(L)) = b(\zeta^P, \zeta^A(H)) = 1$, the anti-change SIG’s signal has no effect on the decision-maker’s policy choice and response strategy $d(\cdot)$. Using our equilibrium restriction, this cannot be an equilibrium. \[\Box\]

**Lemma 7.** The anti-change SIG plays a separating strategy on the equilibrium path only if: $l^A(H) = 0$ and $l^A(L) > 0$.

**Proof.** By Lemma 6 (i.e., $b(\zeta^P, \zeta^A(L)) < 1$), a high-opportunity cost SIG’s incentive compatibility constraint (IC) is satisfied only if $l^A(L) > 0$. $l^A(H) = 0$ follows by the Intuitive Criterion. \[\Box\]

**Proof of Lemma 2. Necessity.** Suppose $\zeta^A(L) = (L, l^A(L)) \neq \zeta^A(H) = (H, l^A(H))$. When $1 - p - k > b_L$, the decision-maker strictly prefers 1 to $b_L$. Her best response is then $b^*(\zeta^P, \zeta^A(L)) = 1$. When $(1 - p)b_L - k < 0$, the anti-change SIG’s ‘outside lobbying best response’ is $l^A(b_L, \zeta^P; L) = 1$ since $d(\zeta^P, \zeta^A(L), b_L, 1) = 0$ so the decision-maker gets 0 by choosing $b_L$ and $(1 - p) - k > 0$ by choosing $b = 1$. Under Assumption 1, her best response is
again $b^*(\zeta^P, \zeta^A(L)) = 1$. By Lemma 6, a separating equilibrium cannot exist then. Assume $b_L \geq \max(1-p-k, \frac{1}{1-p})$ so $b(\zeta^P, \zeta^A(L)) = b_L$. Using Lemma 7, a type $H$'s (IC) is: $-1 \geq -b_L - c_A^L l_A^L(L)$. By the Intuitive Criterion, $l_A^L(L) = \frac{1-k}{\frac{1}{1-p}} : \overline{l_A^L(b_L)}$. A type $L$'s (IC) is (using the reasoning in the text): $-b_L - c_A^L l_A^L(L) \geq -(1-p) - c_A^L$. Plugging in $l_A^L(b_L)$ and simple algebra yield that a necessary condition is $c_A^L \leq (1-p)c_A^L$ as claimed. 

**Sufficiency.** Suppose $\max(1-p-k, \frac{1}{1-p}) \leq \frac{c_A^L}{p} \leq \frac{(1-p)c_A^L}{p}$, and consider the following assessment: i) A high-opportunity (low-opportunity) cost anti-change SIG's signal is $\zeta^A(H) = (H, 0)$ $\zeta^A(L) = (L, l_A^L(L))$, with $l_A^L(L) = \overline{l_A^L(b_L)}$; ii) The decision-maker's posterior is: $\mu^A(\zeta^A) = 0$ if $\zeta^A = (m, l_A^m)$ satisfies $l_A^m < l_A^L(L)$ and 1 otherwise; iii) the decision-maker's policy choice is: $b(\zeta^P, \zeta^A) = 1$ if $\zeta^A = (m, l_A^m)$ satisfies $l_A^m < \overline{l_A^L(b_L)}$ and $b(\zeta^P, \zeta^A) = b_L$ otherwise; (iv) all players play their best response down the game tree (see above). It can be checked that beliefs satisfy Bayes' rule, the decision-maker's policy choice is a best response given her belief, and the anti-change SIG's (IC) holds for both types. Hence, the assessment described above is an equilibrium.

**Proof of Proposition 1.** Follows directly from the proof of Lemma 2.

**Proof of Lemma 3.** I just prove necessity (sufficiency follows from similar argument as above). I first characterize the decision-maker's policy choice in a pooling assessment. Denote the anti-change SIG's signal $\zeta^A(\tau) := \zeta^A = (m, l_A^m)$ for $\tau \in \{H, L\}$, some $m \in \{H, L\}$ and $l_A^m \geq 0$ (to be determined). By Bayes' rule, $\mu^A(\zeta^A) = q^A$. When the decision-maker chooses $b = 1$, her expected utility is $q^A(1-p-k) + (1-q^A)$; when $b = b_L$, her expected utility is $b_L$ if $(1-p)b_L - k \geq 0$ and at most $(1-q^A)b_L$ otherwise (due to the low-opportunity cost's lobbying activities). When $b_L < \max(1-p-k, k/(1-p))$, $b_L$ is strictly dominated by $b = 1$ so the claim holds. When $b_L > \max(1-p-k, k/(1-p))$, simple algebra yields $b(\zeta^P, \zeta^A) = 1$ if and only if $q^A \leq \overline{l_A^L(b_L)} = \frac{1-k}{1-p} \overline{l_A^L(b_L)}$ as claimed. I now show that a pooling equilibrium does not exist when $\max(1-p-k, k/(1-p)) < b_L < (1-p)c_A^L/p$ and $q^A < \overline{l_A^L(b_L)}$. By way of contradiction, suppose it does. The equilibrium policy choice then satisfies $b^*(\zeta^P, \zeta^A) = 1$. Consider the out-of-equilibrium signal $\hat{\zeta}^A = (L, \overline{l_A^L(b_L)} + \epsilon$, with $\epsilon > 0$. By Lemma 2, a high-opportunity cost prefers the equilibrium payoff to sending signal $\hat{\zeta}^A$ even if $b(\zeta^P, \hat{\zeta}^A) = b_L$. Hence, by the Intuitive Criterion, the decision-maker's out-of-equilibrium belief satisfies: $\mu^A(\hat{\zeta}^A) = 1$ so $b(\zeta^P, \hat{\zeta}^A) = b_L$. It can be checked that for $\epsilon$ small enough, a type $L$ then prefers the 'inside lobbying strategy' $\hat{\zeta}^A$ to the equilibrium strategy. Hence, the equilibrium does not survive the Intuitive Criterion, a contradiction. A pooling equilibrium exists for all other parameter values.

**Proof of Proposition 2.** 1. Consider the following belief structure: $\mu^A(\zeta^A) = 0$ when $\zeta^A = (m, l_A^m)$ for $m \in \{H, L\}$ and $l_A^m \in [0, l_A^m]$ with $\overline{l_A^m} > 0$, and $\mu^A(\zeta^A) = q^A$, otherwise. Given this belief structure, the decision-maker's best response is: $(b(\zeta^P, \zeta^A) = 1; d(\zeta^P, \zeta^A, 1, 0) = 0, d(\zeta^P, \zeta^A, 1, 1) = 2)$, $\forall \zeta^A \in \{H, L\} \times [0, \overline{l_A^m}]$ and $(b(\zeta^P, \zeta^A) = b_L; d(\zeta^P, \zeta^A, b_L, 0) = 0, d(\zeta^P, \zeta^A, b_L, 1) = 2)$, $\forall \zeta^A \in \{H, L\} \times [\overline{l_A^m}, \infty)$. A type $L$'s (IC) is: $-b_L - c_A^L \overline{l_A^m} \geq -1 - p - c_A^L$. A type $H$'s (IC) is: $-b_L - c_A^L \overline{l_A^m} \geq -1$. Both (IC) are satisfied whenever $\overline{l_A^m} \leq \overline{l_A^L(b_L)}$. So any signaling strategy satisfying $\zeta^A = (m, l_A^m)$ with $l_A^m \leq \overline{l_A^L(b_L)}$ can be part of a pooling equilibrium. Given $b^*(\zeta^P, \zeta^A) = b_L$, outside lobbying activities satisfy $l_A^L(b_L, \zeta^P; \tau) = 0, \tau \in \{H, L\}$.

**Point 2.** Since $b^*(\zeta^P, \zeta^A) = 1$ (i.e., $b_L < \max(1-p-k, k/(1-p)$ or $q^A \leq \overline{l_A^L(b_L)}$), $l_A^L(*) = 0$ (as the decision-maker already chooses the SIG's least preferred policy). Obviously, $l_A^L(1, \zeta^P; L) = 1$. 


I now prove the results regarding the pro-change SIG influence (with $\zeta^A$ the anti-change SIG’s uninformative signal).

**Proof of Lemma 4.** Follows from a similar reasoning as in the proof of Lemma 2.

When $b_L \geq \max\{1-p-k, \frac{k}{1-p}\}$, by Assumptions 2 and 3, the decision-maker’s equilibrium strategy satisfies absent information about SIG P’s type: $b^*(\zeta^P, \zeta^A) = b_L$ and $d^*(\zeta^P, \zeta^A, b_L, 0) = 0$, $d(\zeta^P, \zeta^A, b_L, 1) = 2$. In turn, the anti-change SIG’s strategy is $i_0^A(b_L, \zeta^P; \tau) = 0$, $\tau \in \{H, L\}$.

**Lemma 8.** The pro-change SIG plays a separating strategy on the equilibrium path (i.e. $\zeta^P(H) \neq \zeta^P(L)$) only if:

$b(\zeta^P(L), \zeta^A) = 1$ and $b(\zeta^P(H), \zeta^A) = b_L$.

**Proof.** The proof is by contradiction. Suppose $b^*(\zeta^P(L), \zeta^A) = 1 = b^*(\zeta^P(H), \zeta^A)$ so $i_0^A(1, \zeta^P; \tau) = 1$ for all $\zeta^P$, $\tau$. The decision-maker’s best response is then $d^*(\zeta^P(L), \zeta^A, 1, 1) = 1$ and $d^*(\zeta^P(H), \zeta^A, 1, 1) = 2$. A type L and type H’s (IC) are then, respectively: $(1-p) - c_L^P - c_L^P i_0^P(L) \geq (1-p) - c_L^P i_0^P(H)$ and $(1-p) - c_L^P i_0^P(L) \geq 0 - c_L^P i_0^P(L)$. A necessary condition for existence of such equilibrium is $1 \leq i_0^P(H) - i_0^P(L) \leq \frac{(1-p)}{c_L^P}$, which is never satisfied by Assumption 3. A similar reasoning directly implies that $b(\zeta^P(L), \zeta^A) = b_L$ and $b(\zeta^P(H), \zeta^A) = 1$ cannot be part of an equilibrium. Finally, when $b(\zeta^P(L), \zeta^A) = b_L = b(\zeta^P(H), \zeta^A)$, the pro-change SIG’s signal has no effect on the decision-maker’s strategy on the equilibrium path (since $i_0^A(b_L, \zeta^P; 0) = 0$ and $d^*(\zeta^P, \zeta^A, b_L, 0) = 0$ for $\zeta^P \in \{\zeta^P(H), \zeta^P(L)\}$). The equilibrium restriction then imposes the pro-change SIG plays a pooling strategy.

A direct consequence of Lemma 8 is that whenever the pro-change SIG plays a separating strategy, a type L’s equilibrium outside lobbying strategy satisfies $i_0^A(b^*, i_0^A, d^*; L) = 1$ since $b^*(\zeta^P(L), \zeta^A) = 1$ so $i_0^A(\cdot) = 1$ and $d^*(\zeta^P(L), \zeta^A, 1, 1) = 1$ (given $\mu^P(\zeta^P(L)) = 1$).

**Lemma 9.** The pro-change SIG plays a separating strategy on the equilibrium path only if $i_0^P(L) = 0$.

**Proof.** The proof is by contradiction. Suppose $\zeta^P(L) = (L, i_0^P(L))$ with $i_0^P(L) > 0$. By the Intuitive Criterion, this implies $i_0^P(H) = 0$. By Lemma 8, a type H pro-change SIG’s expected policy payoff is $b_L$ when it sends signal $\zeta^P(H)$ and 0 when it sends signal $\zeta^P(L)$. Consequently, a type H pro-change SIG has no incentive to send a signal $\zeta^P$ satisfying $i_0^P > 0$. Applying the Intuitive Criterion, there then exists a profitable deviation to $i_0^P \in (0, i_0^P(L))$ (i.e., $\mu^P((L, i_0^P)) = 1$ so $b^*((L, i_0^P), \zeta^A) = 1$), leading to a contradiction.

**Proof of Lemma 5.** Necessity. Suppose $\zeta^P(L) \neq \zeta^P(H)$. When $b_L > 1 - p - k/2$, the decision-maker’s best response is: $b(\zeta^P, \zeta^A) = b_L$ for all $\zeta^P$. By Lemma 8, a separating equilibrium does not exist. Suppose $b_L \leq 1-p-k/2$ so the decision-maker’s best response satisfies $b(\zeta^P(L), \zeta^A) = 1$ and $b(\zeta^P(H), \zeta^A) = b_L$. Using Lemma 9, a type L pro-change SIG’s (IC) is: $(1-p) - c_L^P \geq b_L - c_L^P i_0^P(L)$. A type H’s (IC) is: $b_L - c_L^P i_0^P(L) \geq 0$. By the Intuitive Criterion, $i_0^P(H) = \max\left\{\frac{c_L^P + b_L - (1-p)}{c_L^P}, 0\right\}$. Therefore, both (IC) are automatically satisfied whenever $c_L^P \leq (1-p) - b_L$ (so $i_0^P(L) = 0$). When $c_L^P > (1-p) - b_L$, a type H’s (IC) is satisfied if and only if $c_L^P \leq \frac{c_L^P(1-p) - b_L}{c_L^P} = c_L^P(1-p) - b_L$ and $c_L^P(b_L, c_L^P) < (1-p)$ as claimed.

**Sufficiency.** Follows from a similar reasoning as in the proof of Lemma 2.

**Proof of Proposition 3.** Direct from the proof of Lemma 5.
The proof of Remark 1 follows directly from the proof of Lemma 5. The proof of Remark 2 follows from noticing that outside lobbying expenditures are normalized to 1 and $I^P_L(H) < 1$ by Lemma 5.

**Proof of Proposition 4.** Suppose there exists a pooling equilibrium in which $\zeta^P = (m, I^P_L)$, $I^P_L \geq 0$. A type $H$ has no incentive to send signal $\overset{\sim}{\zeta}^P = (m, I^P_L + \epsilon)$ with $\epsilon > 0$ so $\mu^P(\overset{\sim}{\zeta}^P) = 1$ by the Intuitive Criterion. When $e^P_L < 1 - p - b_L$ and $b_L < 1 - p - k/2$, using Lemma 8, $\overset{\sim}{\zeta}^P$ is then a profitable deviation for $\epsilon$ small enough so a pooling equilibrium does not exist then. For all other parameters values, $\overset{\sim}{\zeta}^P$ is not a profitable deviation by Lemma 8 so a pooling equilibrium exists.

Suppose $1 - p - b_L < k/2$. The decision-maker’s best response is $b(\zeta^P, \zeta^A) = b_L$ and $d(\zeta^P, \zeta^A, b_L, 0) = 0, d(\zeta^P, \zeta^A, b_L, 1) = 2$ for all $\zeta^P$. The only equilibrium signal then satisfies $\zeta^{P*}(L) = \zeta^{P*}(H) = (m, 0)$ for some $m \in \{H, L\}$. Suppose $k/2 \leq 1 - p - b_L$ and consider the following belief structure for the decision-maker: $\mu^P(\zeta^P) = 1$, when $\zeta^P = (m, I^P_L)$ for $m \in \{H, L\}$ and $I^P_L > 0$, and $\mu^P(\zeta^P) = q^P$, otherwise. Given this belief structure, the decision-maker’s best response is: $(b(\zeta^P, \zeta^A)) = 1; d(\zeta^P, \zeta^A, 0) = 0, d(\zeta^P, \zeta^A, 1, 1) = 1), \forall \zeta^P \in \{H, L\} \times [0, I^P_L)$ and $(b(\zeta^P, \zeta^A)) = b_L; d(\zeta^P, \zeta^A, b_L, 0) = 0, d(\zeta^P, \zeta^A, b_L, 1) = 2), \forall \zeta^P \in \{H, L\} \times [I^P_L, \infty)$. A type $L$’s (IC) is: $b_L - c^P_L I^P_L \geq (1 - p) - c^P_L$. A type $H$’s (IC) is: $b_L - c^P_H I^P_L \geq 0$. Both (IC) are satisfied whenever $I^P_L \leq \min \{\frac{b_L}{c^P_L} I^P_L, \frac{b_H}{c^P_H} I^P_L\}$. Consequently, when $c^P_L > 1 - p - b_L \geq k/2$, any signaling strategy satisfying $\zeta^P(L) = \zeta^P(H) = (m, I^P_L), \forall I^P_L \leq \min \{\frac{b_L}{c^P_L} I^P_L, \frac{b_H}{c^P_H} I^P_L\}$ can be part of a pooling equilibrium. Since $b^*(\zeta^P, \zeta^A) = b_L$ and $d^*(\zeta^P, \zeta^A, b_L, 0) = 0, d^*(\zeta^P, \zeta^A, b_L, 1) = 2$ in a pooling equilibrium, I directly obtain $I^P_L^*(\tau) = 0, \tau \in \{H, L\}$.

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24By Assumptions 2 and 3, $d(\zeta^P, \zeta^A, b_L, 1) = 2$ for all $\zeta^P$ (since $c^P_L > (1 - p)b_L$). This directly implies that it is never a best response for the decision-maker to propose $b < b_L$. Suppose there exists $\overset{\sim}{\zeta}^P$ such that $b^*(\overset{\sim}{\zeta}^P, \zeta^A) = b_L$. It must be that $\mu^P(\overset{\sim}{\zeta}^P)$ satisfies $\mu^P(\overset{\sim}{\zeta}^P)(1 - p - k/2) - (1 - \mu^P(\overset{\sim}{\zeta}^P))k/2 \geq b_L$, which contradicts $1 - p - b_L < k/2$.
References


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