Lobbying, Inside and Out:

How Special Interest Groups Influence Policy Choices[*]

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Abstract

Special interest groups (SIGs) have multiple channels of influence: contributing to decision-makers or providing them with information (henceforth, inside lobbying) and grassroots mobilizations or advertising their position to voters (henceforth, outside lobbying). How do these channels interact? I study a signaling model in which a politician chooses the scope of a reform, two SIGs, one defending the status quo, the other pushing for change, use inside lobbying to bias the content of the proposed policy and outside lobbying to affect its fate. In equilibrium, inside lobbying expenditures are associated with policy compromises, a mark of influence of the SIG supportive of the status quo; meanwhile, outside lobbying activities are associated with comprehensive reforms, a sign of pro-change SIG power. I discuss how these findings can potentially inform the empirical research on SIG influence.

"Drain the swamp" Donald J Trump proclaimed (Time, 2017). I will "take on lobbyists" Barack H Obama told voters (Washington Post, 2008). These campaign promises are a response to the widespread perception that Special Interest Groups (SIGs) exert pervasive influence on political decisions (e.g., CBS News/New York Times, 2015). Many newspaper articles describe SIGs' far-reaching power, ranging from the writing of bills on bank regulations (Lipton and Protess, 2013), to delaying the introduction of life-saving measures in public transportation (Hasley III and Laris, 2015).[1] In contrast to this anecdotal evidence, the empirical literature has so far painted a much more nuanced picture. Studies focusing on contributions (the transfer of money) find a limited impact of SIGs on policy choices and outcomes (Ansolabehere, de Figueiredo and Snyder , 2003; cf. Mian, Sufi and Trebbi, 2010), whereas works using informative lobbying (the transfer of information) have generally been more successful at linking SIGs' actions with policy decisions (de Figueiredo and Richter, 2014). Yet, overall, there appears to be a mismatch between what almost everybody believes—that SIG power is far reaching—and what many empirical works capture—that SIGs have a rather limited influence via contributions or informative lobbying.

To resolve this discrepancy, some scholars have investigated other potential avenues of influence for interest groups beyond the U.S. Congress. Earlier works highlighted the importance of grass-roots mobilizations to raise or reveal the salience an issue (e.g., Gais and Walker, 1991; Kollman, 1998). Recent contributions have focused on pathways of influence as diverse as SIGs' charitable contributions (Bertrand et al., 2020), firms' efforts to mobilize their employees (Bombardini and Trebbi, 2011), or SIG's attempts to persuade voters via minority protests (Gillion, 2013 and 2020; Matter and Stutzer, 2016; Wasow, 2020). While these works, old and new, undoubtedly improve our understanding of SIG influence, some questions remain. How can we relate their findings to those of empirical analyses centred around the U.S. Congress? And are all these studies enough, separately or combined, to uncover the extent and consequences of SIG power?

This paper aims to make some progress in tackling these questions. I develop a stylised model of policy choices under the influence of SIGs. In my theoretical framework, groups can undertake two types of actions. They can attempt to shape the content of a bill with inside lobbying (here, a form of informative lobbying), and they can try to affect the fate of a bill with outside lobbying (here,

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[1]This goes beyond the U.S. The sugar company Tate & Lyle, which finances the U.K. Conservative party and supported the country's exit from the European Union, is set to gain £73m from a reduction in the import tariff of raw sugar post-Brexit (The Observer, 2020).

principally via issue advertising). SIG influence, I show, comes from the threat or promise of outside lobbying activities. These threats and promises are only imperfectly captured by inside lobbying expenditures. As such, regressions employing inside lobbying expenditures as an explanatory factor yield downwardly biased estimates of SIG influence. This downward bias is present even though there is no competition between SIGs and inside and outside lobbying activities serve different purposes (i.e., they are non-substitutable). Outside lobbying fares better as a proxy, though it is not without problem either. While my work provides some theoretical support for the renewed empirical focus on SIGs' activities outside of Congress, my findings also highlight the difficulty of understanding SIG power when employing their strategic choices as an independent variable.

Formally, I study a model in which a decision-maker ('she') decides on the magnitude of a policy change. After proposing a bill, two SIGs, one which supports the status quo, the other which shares the decision-maker's preference for change, decide whether to engage in outside lobbying. Outside lobbying activities carried out by the SIG defending the status quo decrease the likelihood the bill is enacted, whereas outside lobbying activities undertaken by the pro-change SIG reduce the effectiveness of the opposing SIG's attacks. Each SIG has private information about its marginal benefit or cost of policy change, which I label a group's resolve to borrow a term from the international relations literature. Each group can use inside lobbying expenditures to reveal its resolve (type) before the decision-maker drafts 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' incentives to undertake outside lobbying activities. These expenditures are generally associated with compromise—that is, a relatively modest policy change. Compromise represents a success for the SIG defending the status quo since it wants to avoid a comprehensive reform, but a failure for the pro-change SIG which seeks it. Outside lobbying activities, in turn, are always correlated with comprehensive reforms, a mark of successful influence by pro-change SIGs and, conversely, failure by SIGs supportive of the status quo.

To make sense of these sharp differences, one should keep in mind how ideologically distinct SIGs strategically use outside lobbying. For an SIG supportive of the status quo, outside lobbying is a threat. Threats are carried out only when they are unsuccessful. Inside lobbying expenditures, by revealing the extent of the SIG's threat, induce the decision-maker to compromise. For a pro-

change SIG, outside lobbying is a promise to improve the odds of a policy representing a significant change passing, and true promises are followed through. A pro-change SIG with high resolve, which is willing to pay the cost of outside lobbying activities, generally does not incur inside lobbying expenditures since it prefers to preserve its war chest to fulfil its costly promise. A pro-change SIG with low resolve and no willingness to engage in outside lobbying uses inside lobbying expenditures to credibly plead poverty. Overall, the analysis reveals that similar empirical observations (inside lobbying with compromise; outside with comprehensive reform) can have very different meanings depending on the ideological leaning of the SIG undertaking the lobbying activity.

These conclusions yield some implications for empirical research on SIG influence. In a latter part of the paper, I consider what estimates of SIG power would look like in the closed world of my model. The goal there is not to reinterpret, even less to repudiate, existing findings. Rather, it is to illustrate the difficulties of assessing SIG influence, even in an abstract environment like my framework.

As noted above, a large literature uses inside lobbying expenditures as a proxy for SIG power, to examine SIGs' impact on policies (e.g., Goldberg and Maggi, 1999; de Figueiredo and Silverman, 2006; Richter et al., 2009) or on legislative outcomes (e.g. Ansolabehere et al., 2003; Mian et al., 2010; Kang, 2016). In my framework, estimates of influence using inside lobbying expenditures as a proxy yield downwardly biased measures of both the extent (when SIGs' interventions change policies) and strength (by how much SIGs bias policies) of SIG influence.

Inside lobbying expenditures cannot capture pro-change SIG influence since they are always associated with compromise in equilibrium even absent any countervailing lobbying effort by an SIG supportive of the status quo. For a similar reason, these expenditures fare better when considering SIGs defending the status quo, but they do not fully reflect their power. Inside lobbying expenditures fail to capture influence due to the successful threat of outside lobbying uncorrelated with these expenditures.

In this model, outside lobbying expenditures fare slightly better. An SIG which defends the status quo uses outside lobbying only when it has failed to induce the decision-maker to compromise; that is, it has failed to influence policy choice. By contrapositive, these activities then allow researchers to measure the extent of influence of SIG supportive of the status quo. For pro-change SIG, outside lobbying is the enactment of a promise, thereby making it a good measure of their

ability to sway policy. Yet, it is not perfect. I show that, for some parameter values, the mere hope of assistance by a pro-change SIG encourages the decision-maker to propose a comprehensive reform, thus reducing the usefulness of outside lobbying as a measure of pro-change SIG influence.

The results of this paper have both negative and positive implications for the empirical research on SIG influence. On the negative side, my results suggest that correctly assessing how and by how much SIGs bias policy choices can remain elusive. Researchers must use caution when interpreting regressions where the main independent variable corresponds to strategic choices by interest groups. On the positive side, if SIGs' strategic choices are the only available variables to researchers, outside lobbying seems to be a more promising avenue than inside lobbying expenditures to estimate the extent of SIG power.

I conclude this introduction by connecting this paper to the theoretical literature on inside and outside lobbying as well as the literature on the role of threat in the decision-making process. Many studies investigate SIG influence under the assumption that contributions buy political favors (i.a., 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 Potters and Van Widen (1992), Austen-Smith (1995), Ball (1995), Lohmann (1995), Cotton (2012 and 2016), and Schnakenberg and Turner (2020), among others.[2] There exist important differences between my paper and the existing 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 assumes that SIGs have private information about their own characteristics. As such, this work studies a different type of interactions between SIGs and policy-makers, one that could be related to the negative effect of lobbying that has received so much attention in the press and recent electoral campaigns. Second, from a technical standpoint, inside lobbying expenditures are not always informative in equilibrium despite several assumptions meant to favor information transmission.

A few papers look beyond inside lobbying, whether directly or indirectly. Schnakenberg and Turner (2020) study a model in which SIGs' expenditures are a form of independent expenditures,

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[2]Schnakenberg and Turner (2019) blend both approaches. In their model, an SIG uses bribery to sway corrupt politicians and provides policy-relevant information to persuade honest ones. There, candidates, rather than the SIG, engage in a form of signaling by promising to deny access to the group (in the spirit of Coate and Morris, 2005).

serving both to signal policy-relevant information and to improve the electoral chances of the candidate of their choosing. Yu (2005) supposes SIGs can raise the salience of an issue before engaging in quid pro quo contributions. Kollman (1998) proposes a model in which outside lobbying activities can change a policy-maker's legislative agenda with outside lobbying activities. Holburn and Raiha (2018) consider the different outside lobbying strategies groups can use, from online petitions to protests. Sobbrio (2011) studies a framework in which SIGs can distort information available to media outlets and thus voters. Tomasi (2020) analyses how economic elites can manipulate (or threaten to manipulate) information about policy-makers' reputation via the media outlets they own to obtain public assets at a low price. Bombardini and Trebbi (2011) assume that firms can use money or promise votes by mobilizing their employees in exchange for public subsidies. In their work, the two activities are fully substitutable, whereas they serve different purposes in mine. Closest to the present manuscript, Gordon and Hafer (2005, 2007) look at SIG influence in the context of nuclear regulation when SIGs can engage in outside lobbying to affect the fate of an agency's decision. Unlike the present work, Gordon and Hafer leave the SIG's strategic choice to effectively contest regulation unmodeled. Further, they also focus on the substantive implications of their findings rather than the consequences of their theoretical predictions for the empirical research on lobbying.

Finally, my work also relates to a literature examining the effect of threats in 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. In important contributions, Dal Bó and Di Tella (2003) and Dal Bó et al. (2006) document how threats can improve the effectiveness of interest groups' bribes. 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. Wolton (2015) investigates how threats of protests by the rich induce a governing party to compromise on taxation. He also shows that the presence of an opposition party can be Pareto improving for politicians and the wealthy alike. Dahm and Porteiro (2008) assume 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.[3] None of these papers assumes that SIGs can use money to transmit private

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[3]See also Bennedsen and Fieldmann (2006) and Ellis and Groll (2020) for models in which contributions can be

information. This manuscript fills this gap and shows how outside lobbying activities affect the informativeness of inside lobbying expenditures.

Evidence on inside and outside lobbying

Inside lobbying captures a broad class of SIGs' activities directly targeting office-holders. It includes two prominent types of actions: contributions (the transfer of money from SIGs to decision-makers) and informative lobbying (the 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 2017-18 electoral cycle, SIGs contributed $405 million to House candidates and $105 millions to Senate candidates, but they spent $6.82 billion on informative lobbying.[4]

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).[5] Similarly, several papers have found that policy choices are affected by informative lobbying on issues as widespread as academic earmarks (de Figueiredo and Silverman, 2006), corporate taxes (Richter et al., 2009), state subsidies (Payson, 2020) and energy policy (Kang, 2015).[6]

A survey of U.S. legislators and their staff by Fortune magazine (Fortune's 1999 Power 25 Survey) indicates that inside lobbying expenditures may not fully capture SIG influence. None of the 5 most powerful groups according to the survey belongs to the top 10 in terms of contributions or informative lobbying expenditures (Table 1). Furthermore, among the 25 groups cited in the survey, only 12 belong to the top 25 for contributions and only 4 to the top 25 for informative lobbying

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interpreted as political pressures occurring after strategic information transmission by an SIG.

[4]Only Political Action Committee's contributions are accounted for in the contributions total. If large individual contributions (more than $200) are included, House candidates raised $1,361 million and Senate candidates $728 million, or approximately 26.5% of total inside lobbying expenditures, Source: Center for Responsive Politics (http://www.opensecrets.org/).

[5]Similarly, 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. Fouirnaies and Hall (2016, 2018) show that firms' contributions vary with legislators' positions as well as the firms' exposure to regulation.

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

expenditures.[7] This points to the importance of considering other avenues of SIG influence.

	Power 25 Survey 1999	Contributions Rank 1998	Informative Lobbying Rank 1999
AARP	1	>100	59
NRA	2	13	>100
NFIB	3	24	>100
American Israel PAC	4	>100	>100
AFL-CIO	5	30	33

Table 1: Most powerful SIGs and their inside lobbying expenditures

Chief among them is outside lobbying, with a long scholarly tradition stressing its importance (Blaisdell, 1957; Kingdon, 1991; Wright, 1996; Hojnacki and Kimball, 1999: 1005-6; Baumgartner et al., 2009). Outside lobbying takes different forms. It consists of "appeals to the public through the mass media and efforts to the broad-scale mobilization of citizens at the 'grass roots'" (Walker, 1991, page 9). Outside lobbying serves multiple purposes. It can be used to raise the salience of an issue to change the legislative agenda (Kollman, 1998), with the Extinction Rebellion and Black Lives Matter movements recent examples of such a practice. Groups may also engage in outside lobbying to affect the fate of a bill via appeals to the decision-maker's constituents (Lord, 2000). Many advertising campaigns belong to this category: the campaigns for and against Clinton's 1993 health care reform (West et al., 1996; Goldstein, 1999), the 1998 Senate tobacco bill (Jamieson, 2000; Derthick, 2012), and Obama's 2010 Affordable Care Act (Hall and Anderson, 2012; LaPira, 2012) are among them. The blackout of internet giants against the SOPA/PIPA bills served the same purpose. Uber's online petition against its ban in London in 2017 and Airbnb's mobilization of its users against city regulations across the world can also be seen under this lens (however, see Holburn and Raihan, 2018, for a different interpretation). Finally, outside lobbying can be employed to attempt to defeat a policy-maker in an upcoming election, whether by funding a challenger or by advertising to voters.

Like inside lobbying, outside lobbying is a catch-all category. Unlike inside lobbying, there is little evidence regarding which outside lobbying activities or objectives are prevalent. In an important paper, Hall and Reynold (2012) show that the legislators targeted by outside activities change as the bill moves through the legislative process. But this tells us little about the consequences of

[7]Source for the power ranking: Birndaum (1999). Source for SIGs' expenditures: Center for Responsive Politics.

outside lobbying. Matter and Stutzer (2016) show that the internet protest against SOPA/PIPA bills affected the public stance of legislators. But it is uncertain whether their findings extend beyond this particular case. 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.[8] But this says nothing about other outside activities.

Rather than offering a complete theoretical overview of outside lobbying, this paper focuses on a slice of it. I only consider outside lobbying meant to affect the likelihood a bill is passed into law, and the model I present in the next section is better adapted to appeals to the public through mass media than grassroots mobilization. As such, as the examples above illustrate, my framework best captures the strategies of big donors or relatively big companies, both wealthy enough to effectively carry out these type of activities (unlike non-profit organizations such as Extinction Rebellion). Yet, despite these limitations, I elect to keep the phrase "outside lobbying," as these aspects appear to be an important part of this multifaceted phenomenon.

The model

I study a one-period three-player game with a decision-maker (superscript D), a pro-change SIG (P), and an SIG supportive of the status quo (Q). The decision-maker chooses the content of a bill $b \in [0, 1]$ to address an issue, with 0 the status quo, 1 a complete reform, and anything in-between a form of compromise. SIG Q (henceforth, simply Q) prefers a bill which equals 0 everything else equals, whereas SIG P (henceforth, simply P) and the decision-maker prefer the full reform $b = 1$ all else equal. Both SIGs have private information about how much they care about the issue at hand. I measure the intensity of preference by the marginal benefit (for P) or cost (for Q) of change, which I refer to as a group's resolve, using a term from the international relations literature. I assume this resolve (type) can be either high ($\tau = H$) or low ($\tau = L$). The type of each group is drawn independently, and it is common knowledge that J is of high resolve with probability $\pi^J \in [0, 1]$: $Pr(\tau^J = H) = \pi^J$. In what follows, I refer to a type-τ SIG P as $P(\tau)$ and a type-τ SIG Q as $Q(\tau)$.

SIGs intervene at two moments in the policy process. In the first stage of the game, each SIG

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[8]As a point of reference, members of Congress, excluding presidential-candidate John Kerry, received $570 million contributions during the same period. Informative lobbying spending amounted to $4 billion on lobbying during the 2003-04 electoral cycle. Source for all figures: Center for Responsive Politics.

can decide whether to reveal its resolve using inside lobbying expenditures $l_i^J \in \mathbb{R}^+$, $J \in \{P, Q\}$. In the last part, SIGs decide whether to engage in outside lobbying ($l_o^J \in \{0, 1\}$ for $J \in \{P, Q\}$).

Outside lobbying has an impact on the outcome of the game, denoted y, which can be either the status quo 0 or the bill b proposed by the decision-maker: $y \in \{0, b\}$. When the SIG supportive of the status quo does not engage in outside lobbying ($l_o^Q = 0$), the decision-maker's bill is always enacted into law: $y = b$. Otherwise ($l_o^Q = 1$), the outcome is probabilistic with the probability a bill passes a function of P's action. If the pro-change SIG does not defend the bill with outside lobbying ($l_o^P = 0$), then the status quo is upheld with probability $\bar{p} \in (0, 1]$; if it does ($l_o^P = 1$), the status quo remains in place with probability $\underline{p} \in (0, \bar{p})$. Outside lobbying is costly for interest groups if they choose to carry it out. For simplicity, I assume that this cost is common to both groups and equals $c > 0$ (i.e., c could be understood as the cost of sufficient issue advertising to reach and possibly influence the electorate).

When it comes to inside lobbying, I consider two possible activities. The first is a costless message, $m \in \{H, L\}$. The second corresponds to costly expenditures, $l_i^J \in \mathbb{R}_+$, $J \in \{P, Q\}$, with a marginal cost of one to simplify notation.[9] A group's signal, thus, takes the form of $\zeta^J := (m, l_i^J)$. Observe that since types are drawn independently, P's signal reveals no information about Q's resolve, and vice versa.

Regarding payoffs, the decision-maker only cares about the final outcome, with her preferred outcome (y) being 1.

$$u^D(y) = y \tag{1}$$

The pro-change SIG's preferred outcome is the same as the decision-maker's. Its gain from change y, however, is $\gamma_\tau^P \times y$, meaning γ_τ^P captures P's resolve, with $\gamma_H^P > \gamma_L^P$. Its utility function also includes the cost of both inside lobbying expenditures ($l_i^P \in \mathbb{R}_+$) and outside lobbying activities ($l_o^P \in \{0, 1\}$) and, thus, assumes the following form:

$$u^P(y, l_i^P, l_o^P; \tau) = \gamma_\tau^P \times y - l_i^P - c \times l_o^P, \ \tau \in \{H, L\} \tag{2}$$

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[9]The costless message m guarantees that an equilibrium always exists after imposing refinements on out-of-equilibrium beliefs (see footnote 14 for more details). Similarly, one can assume that there exists a small fixed cost of incurring inside lobbying expenditures. Such assumptions would marginally change some of the empirical implications detailed below.

Q, in turn, prefers the status quo ($y = 0$), and any change imposes a payoff loss. The size of the loss is $\gamma_\tau^Q \times y$ so γ_τ^Q corresponds to Q's resolve and satisfies $\gamma_H^Q > \gamma_L^Q$. Adding the cost of inside lobbying ($l_i^Q \in \mathbb{R}_+$) and outside lobbying ($l_o^Q \in \{0, 1\}$), its utility function is:

$$u^Q(y, l_i^Q, l_o^Q; \tau) = -\gamma_\tau^Q \times y - l_i^Q - c \times l_o^Q, \ \tau \in \{H, L\} \tag{3}$$

The game, in turn, proceeds as follow:

1. Nature draws SIGs' types independently: $\tau^J \in \{H, L\}, \ J \in \{P, Q\}$;

2. Each SIG privately observes its resolve and the two groups simultaneously send a signal: $\zeta^J = (m, l_i^J) \in \{H, L\} \times \mathbb{R}_+$;

3. The decision-maker chooses the content of the bill: $b \in [0, 1]$;

4. The SIG supportive of the status quo decides whether to engage in outside lobbying: $l_o^Q \in \{0, 1\}$;

5. The pro-change SIG decides whether to engage in outside lobbying: $l_o^P \in \{0, 1\}$;

6. Outcomes are realized, the game ends, and payoffs are realized.

Table 2 summarizes the possible outcomes of the game as a function of both SIGs' outside lobbying activities.

	$l_o^Q = 0$	$l_o^Q = 1$
$l_o^P = 0$	$y = b$ with prob. 1	$y = b$ with prob. $1 - \bar{p}$
$l_o^P = 1$	$y = b$ with prob. 1	$y = b$ with prob. $1 - \underline{p}$

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

Table 3 provides a point of reference by describing the model's main parameters as well as choice variables.

The equilibrium concept is Perfect Bayesian Equilibrium (PBE) in pure strategies (in Supplemental Appendix C, I allow for mixed strategies and show that the restriction is without loss of generality). A PBE requires that a) each player's choices be sequentially rational given her belief at the time of choice and other players' strategies, and b) beliefs satisfy Bayes' rule on the equilibrium path (see Supplemental Appendix A for a formal definition). As is common in signaling games,

Variables	Definition
τ^J	Type (H or L) of $J \in \{P, Q\}$
γ_τ^J	Resolve of J with type τ
π^J	Probability J is of high resolve
$P(\tau)$	A pro-change SIG with type τ
$Q(\tau)$	An SIG supportive of the status quo with type τ
c	Cost of outside lobbying activities for SIGs
l_i^J	Inside lobbying expenditures by J
l_o^J	Outside lobbying activity by J
b	Bill content
y	Outcome of the game
$\overline{p}$ & $\underline{p}$	Probabilities that status quo is upheld

Table 3: Main variables and parameters

multiple PBE can emerge absent additional restrictions. I impose the Intuitive Criterion (Cho and Kreps, 1987), which, in practice, implies that there should not exist a deviating signaling strategy such that (i) the decision-maker anticipates that only one type of SIG deviates and, furthermore, given the decision-maker'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 type, denoted $\zeta^J(\tau)$, $\tau \in \{H, L\}$, $J \in \{P, Q\}$, satisfies $\zeta^J(H) \neq \zeta^J(L)$ only if its inside lobbying activity influences the decision-maker and its opposing SIG's strategies on the equilibrium path.[10] This last restriction simplifies the analysis, but it plays no substantive role when it comes to the theoretical findings or empirical implications (see footnotes 12 and 13 for more details). In what follows, the term 'equilibrium' refers to this class of equilibria.

In the main analysis, I also impose some assumptions on parameter values. I only briefly describe them here and discuss their importance in a later section. First, I impose some restrictions on $Q(H)$ and $P(H)$'s resolve.

Assumption 1. $Q(H)$ and $P(H)$'s resolve satisfies, respectively: (i) $\gamma_H^Q > \frac{c}{\underline{p}}$ and (ii) $\gamma_H^P > \frac{c}{\overline{p} - \underline{p}}$.

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[10]For a pro-change SIG, define the decision-maker's policy choice b as a function of the pro-change SIG's signal ζ^P and the signal of the SIG supportive of the status quo ζ^Q. This restriction imposes that if $b(\zeta^P, \zeta^Q) = b(\widehat{\zeta^P}, \zeta^Q)$ for all $\zeta^P, \widehat{\zeta^P}$ (i..e, the pro-change SIG's strategy has no impact on the equilibrium outcome), then the pro-change SIG plays a pooling strategy ($\zeta^P(L) = \zeta^P(H)$). A similar definition applies to Q.

Assumption 1.(i) guarantees that whenever the decision-maker proposes a comprehensive reform, $Q(H)$ chooses $l_o^Q = 1$ so as to reduce the probability the bill is enacted. In turn, when the decision-maker proposes $b = 1$, $P(H)$ is willing to defend the bill and increase its probability of passage with outside lobbying.

I also assume that $Q(L)$ and $P(L)$ never engage in outside lobbying.

Assumption 2. $Q(L)$ and $P(L)$'s resolve satisfies, respectively: (i) $\gamma_L^Q < \frac{c}{\bar{p}}$ and (ii) $\gamma_L^P < \frac{c}{\bar{p}-\underline{p}}$.

Finally, the third assumption is helpful to restrict the number of cases considered. Substantively, it broadly implies that $P(H)$ has no incentive to defend a compromise between the decision-maker and Q.

Assumption 3. The ratio of SIGs' resolves satisfy $\frac{\gamma_H^P}{\gamma_H^Q} < \frac{\bar{p}}{\bar{p}-\underline{p}}$.

Discussion

The set-up resembles a traditional signaling game, with a twist. In canonical signaling frameworks and their applications, the sender sends a signal, the receiver decides what action to take after observing the signal, and the game ends. In the present model, the game does not end after the receiver's (decision-maker's) policy choice. One of the senders (the SIG defending the status quo) 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.[11]

There are various ways outside lobbying can influence the fate of a policy proposal. For example, outside lobbying can take the form of issue advocacy advertising to inform the public of the consequences of the decision-maker's proposal. A famous case is the Harry and Louise advertising campaign in the debate of Clinton's health care reform in 1993. These ads, according to Bill McInturff, who worked on the advertising campaign, "made a contribution to the [policy-making] 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). In Supplemental Appendix F, I micro-found the

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[11]Models of signaling in the shadow of war exhibit a similar feature (Fearon, 1997; Wolton, 2020). In these models, conflict takes the form of a winner-takes-all lottery. As Wolton (2020) shows, costly signaling reveals no information then. Furthermore, no paper I know of in this literature incorporates the equivalent of a pro-change SIG's signal. As such, the present paper is substantively and technically different.

consequences of outside lobbying along these lines building on Gül and Pesendorfer's (2012) War of Information. There, political actors as well as voters are unaware of the welfare consequences of the decision-maker's proposal. Outside lobbying then sends an informative signal of the potential impact of the bill. After receiving these signals, voters decide to side with the decision-maker (in which case the bill passes) or with Q (in which case the bill is abandoned). I show that the results presented below hold in this extended setting. Outside lobbying could also be thought of as pressuring the bureaucracy to water down the content of the bill (see also Gordon and Hafer, 2007, for the role of this type of threats). Alternatively, as alluded to above, outside lobbying can take the form of support for challengers—via contributions or independent expenditures—in a future (unmodeled) election. (For an analysis of the electoral effect of independent expenditures, see Klumpp et al., 2016 and Abdul-Razzak et al., 2020.). The probability of the bill being abandoned could then be understood as the likelihood that the decision-maker is not re-elected. In this case, outside lobbying may also impose a cost on D, a possibility I discuss in a later section.

Inside lobbying, in turn, is a mean for SIGs to signal their resolve. Resolve corresponds to the cost or benefit the members of an SIG would receive if a bill passes, a common argument provided by SIGs (used by 53% of groups) to members of the U.S. Congress when groups lobby for or against a piece of legislation, according to Baumgartner et al. (2009: Table 7.1). Resolve could alternatively be related to an SIG's capacity to mobilize its members on a given issue (Ainsworth, 2000: 122). For example, the AARP may be better able to mobilize its members to help pass a bill reducing the price of prescription drug, like the 2003 Prescription Drug Bill (Turnham, 2003), than the organization can for an health care reform imposing an employer mandate, like the 1993 Clinton health care initiative (Krauss, 1993).

As a final note, let me reiterate an important caveat. I do not claim that inside lobbying only serves to transmit information about SIGs' resolve. Indeed, the literature (mentioned above) has long recognized other uses of inside lobbying expenditures, including increasing the credibility of information about the welfare consequences of a bill or buying policy favours. Rather than replacing existing mechanisms in the literature, the present framework suggests an additional one.

The influence of SIGs supportive of the status quo

In this section, I focus on the SIG supportive of the status quo. To this end, I assume that the decision-maker is uncertain ex-ante about Q's resolve, $\pi^Q \in (0,1)$, whereas she know the pro-change SIG is a low type: $\pi^P = 0$. Consequently, the pro-change SIG's signal (ζ^P) has no impact on the decision-maker's policy choice, and, under Assumption 2.(ii), the pro-change SIG never engages in outside lobbying activities.

How and when does the presence of an SIG defending the status uo influence policy choices? To answer this question, I first establish the counterfactual bill absent such SIG, denoted by $b^*(\zeta^P, \emptyset)$. As the decision-maker does not fear outside lobbying activities, she always proposes her preferred policy ($b = 1$) which passes with probability 1.

Lemma 1. *Absent an SIG defending the status quo, the decision-maker's equilibrium policy choice is $b^*(\zeta^P, \emptyset) = 1$.*

When Q is active, at the policy-making stage, the decision-maker faces a choice between proposing her preferred policy $b = 1$ or finding a compromise with the SIG supportive of the status quo. A compromise takes the form of a bill which leaves $Q(H)$ indifferent between engaging in outside lobbying ($l_o^Q = 1$) and doing nothing ($l_o^Q = 0$). Any other proposal in the unit interval can only reduce the decision-maker's policy payoff when the bill is enacted, without decreasing the likelihood of outside lobbying activities. Denote b_H this 'compromise bill.' Simple algebra yields $b_H := \frac{c}{\gamma_H^Q \bar{p}} < 1$. Combining Lemma 1 with the present reasoning indicates that Q influences policy choice whenever $b = b_H$.

The SIG can bias the decision-maker's proposal through two distinct channels. First, the threat of outside lobbying may induce the decision-maker to compromise. Second, the SIG's signal may credibly reveal information about its resolve (i.e., $\zeta^Q(L) \neq \zeta^Q(H)$) so that the decision-maker compromises ($b = b_H$) when she learns the SIG has high resolve, and she passes a comprehensive reform $b = 1$ otherwise (her best response since there is no threat of outside lobbying). I first consider this second case, when the threat of outside lobbying is channelled through inside lobbying expenditures.

The next Lemma characterizes conditions for the existence of a separating equilibrium. Despite $Q(H)$ having a relatively lower cost of inside lobbying (relative to the benefits from moderate law),

an equilibrium in which inside lobbying expenditures reveal the SIG's resolve exists only under specific conditions.

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

$$1 - \bar{p} \leq \frac{c}{\bar{p}\gamma_H^Q} \leq (1 - \bar{p})\frac{c}{\bar{p}\gamma_L^Q}$$

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

Proof. All proofs for the main analysis not described in the text are collected in Online Appendix B. $\square$

A separating equilibrium exists only if $Q(H)$'s benefit from differentiation is greater than the associated cost. The benefit from differentiation is positive only if the decision-maker chooses b_H after learning the Q has high resolve. Compromising with $Q(H)$, however, is the decision-maker's best response only if the comprise bill is not too moderate: $b_H \geq 1 - \bar{p}$. When this inequality does not hold, the decision-maker prefers to propose $b = 1$ and face the costly lottery resulting from the SIG's outside lobbying activities over compromising. $Q(H)$ then gains nothing from revealing its type (it faces $b = 1$ no matter what), and a separating equilibrium does not exist.

A second necessary condition for a separating equilibrium to exist is that $Q(H)$ is willing to reveal its type. This is not always guaranteed. To understand why, first notice that in a separating assessment, $Q(L)$ has strong incentives to imitate $Q(H)$ since it always obtains a bill closer to the status quo. $Q(L)$'s benefit from imitation equals $\gamma_L^Q(1 - b_H)$. In turn, while $Q(H)$ faces a comprehensive reform when pretending to be of low resolve, it then engages in outside lobbying and reduces the probability the bill is enacted into law. $Q(H)$'s benefit from differentiation is $-\gamma_H^Q b_H - (-\gamma_H^Q(1 - p) - c)$, which equals $\gamma_H^Q(1 - \bar{p})(1 - b_H)$ using the definition of b_H $(-\gamma_H^Q b_H = -\gamma_H^Q(1 - \bar{p})b_H - c)$. The policy gain from imitation for $Q(L)$ equals $1 - b_H$ and is higher than the expected policy gain from differentiation for $Q(H)$, which totals $(1 - \bar{p})(1 - b_H)$. To compensate for this difference and induce separation, it must then be that the two types' resolves are sufficiently apart: $\gamma_H^Q \geq (1 - \bar{p})\gamma_L^Q$.

The next proposition characterizes the strategy of an SIG supportive of the status quo in a

separating equilibrium: $\zeta_i^{Q*}(\tau)$, $l_o^{Q*}(\tau)$, $\tau \in \{H, L\}$ assuming without loss of generality that Q announces its type ($m^*(\tau) = \tau$). Only $Q(H)$ incurs strictly positive inside lobbying expenditures and it obtains the compromise bill b_H in return. Since the decision-maker compromises with $Q(H)$, on the equilibrium path, neither $Q(H)$ nor $Q(L)$ engages in outside lobbying. Denoting $\overline{l_i^Q}(b_H) := \gamma_L^Q(1 - b_H)$, I obtain:

Proposition 1. *In a separating equilibrium, Q's equilibrium strategy satisfies:*

1. *$\zeta^{Q*}(\tau) = (\tau, l_i^{Q*}(\tau))$, with $l_i^{Q*}(H) = \overline{l_i^Q}(b_H)$ and $l_i^{Q*}(L) = 0$;*

2. *$l_o^{Q*}(\tau) = 0$, $\tau \in \{H, L\}$.*

In a separating equilibrium, there is a perfect correlation between inside lobbying expenditures and compromise. However, a separating equilibrium does not exist for all parameter values. We thus need to extend the analysis to cases in which Q plays a pooling equilibrium (i.e., $\zeta^{Q*}(L) = \zeta^{Q*}(H) = \zeta^Q$).

A pooling equilibrium exists unless $Q(H)$ has a profitable signaling deviation using the Intuitive Criterion. Such deviation exists when two sets of conditions are satisfied. First, the compromise bill satisfies the conditions laid out in Lemma 2 so that $Q(H)$ has incentives to credibly reveal its type and the decision-maker compromises upon learning Q has high resolve. Second, absent any information at the inside lobbying stage, the decision-maker prefers a comprehensive reform $b = 1$ to b_H so that by revealing its type, $Q(H)$ 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 b_H and 1 depends on (i) the content of the compromise bill and (ii) the threat of outside lobbying. When b_H is too moderate (i.e., $b_H < 1 - \overline{p}$), the decision-maker never wants to compromise with Q. Therefore, she always proposes $b = 1$.[12] When the compromise bill is relatively attractive ($b_H \geq 1 - \overline{p}$), the decision-maker's assessment of the threat of outside lobbying, as measured by her prior π^Q, plays a key role. Whenever the risk of outside lobbying is high, the decision-maker proposes b_H; she

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[12]Absent the equilibrium restriction on the SIG's signaling strategy, there exists an equilibrium in which Q reveals its type with a cheap talk message when $b_H \leq 1 - \overline{p}$. However, the SIG's separating strategy would have no effect on the decision-maker's policy choice ($b = 1$) or on equilibrium outcomes and it would not involve inside lobbying expenditures.

chooses the comprehensive reform when the risk is low. Denoting $\overline{\pi^Q}(b_H) := \frac{1-b_H}{\overline{p}}$ and remarking that $\overline{\pi^Q}(b_H) \geq 1$ for all $b_H \leq 1 - \overline{p}$, Lemma 3 summarizes the above reasoning.

Lemma 3. *A pooling equilibrium exists if and only if $b_H \notin \left[1 - \overline{p}, (1-\overline{p})\frac{c}{\overline{p}\gamma_L^Q}\right)$ or $\pi^Q > \overline{\pi^Q}(b_H)$. In a pooling equilibrium, the decision-maker's equilibrium policy choice, $b^*(\zeta^P, \zeta^Q)$, satisfies:*

1. $b^*(\zeta^P, \zeta^Q) = b_H$ if $\pi^Q \geq \overline{\pi^Q}(b_H)$;

2. $b^*(\zeta^P, \zeta^Q) = 1$ otherwise.

Lemma 3 establishes that there exist parameter values such that the mere threat of outside lobbying encourages the decision-maker to compromise. The next proposition characterizes the equilibrium strategy of an SIG supportive of the status quo in a pooling equilibrium. Absent compromise (case 2 of Lemma 3), Q engages in outside lobbying on the equilibrium path when its resolve is high ($\tau^Q = H$). There are no inside lobbying expenditures on the equilibrium path since Q gets its least preferred option. In turn, when the decision-maker compromises (case 1 of Lemma 3), there is obviously no outside lobbying on path, but inside lobbying expenditures may occur even though they have no (direct) impact on the decision-maker's policy choice. This result is driven by the decision-maker's out-of-equilibrium beliefs (the Intuitive Criterion imposes only moderate restrictions on these beliefs in a pooling equilibrium). Absent inside lobbying expenditures (an out-of-equilibrium event), the decision-maker would choose $b = 1$ rather than $b = b_H$. To obtain the compromise bill, Q then incurs inside lobbying expenditures.

Proposition 2. *In a pooling equilibrium, Q's equilibrium strategy satisfies $m(L) = m(H) \in \{L, H\}$ and:*

1. When $b^*(\zeta^P, \zeta^Q) = b_H$, then $l_i^{Q*}(H) = l_i^{Q*}(L) \in \left[0, \overline{l_i^Q}(b_H)\right]$ and $l_o^{Q*}(H) = l_o^{Q*}(L) = 0$;

2. When $b^*(\zeta^P, \zeta^Q) = 1$, then $l_i^{Q*}(H) = l_i^{Q*}(L) = 0$ and $l_o^{Q*}(H) = 1$, $l_o^{Q*}(L) = 0$.

This section's theoretical findings are summarized in Table 4 which highlights two important regularities: Outside lobbying activities are always associated with a comprehensive reform, whereas inside lobbying expenditures are always associated with compromise.

Cond.	Type	Sep.	Pool.
1	H		0
	L		0
2	H	$\overline{l_i^Q}$	
	L	0	
3	H	$\overline{l_i^Q}$	$\left[0, \overline{l_i^Q}\right]$
	L	0	$\left[0, \overline{l_i^Q}\right]$
4	H		0
	L		0
5	H		$\left[0, \overline{l_i^Q}\right]$
	L		$\left[0, \overline{l_i^Q}\right]$

(a) Inside lobbying

Cond.	Type	Sep.	Pool.
1	H		1
	L		0
2	H	0	
	L	0	
3	H	0	0
	L	0	0
4	H		1
	L		0
5	H		0
	L		0

(b) Outside lobbying

Cond.	Type	Sep.	Pool.
1	H		1
	L		1
2	H	b_H	
	L	1	
3	H	b_H	b_H
	L	1	b_H
4	H		1
	L		1
5	H		b_H
	L		b_H

(c) Policy choice

Table 4: Equilibrium strategies

Table 4 omits arguments and boundary cases. 'Cond.' stands for condition, 'Sep.' for separating equilibrium; 'Pool.' for pooling equilibrium. Condition 1 corresponds to $b_H < 1 - \overline{p}$, Condition 2 to $b_H \in (1 - \overline{p}, (1 - \overline{p})\frac{c}{\overline{p}\gamma_L^Q})$ and $\pi^Q < \overline{\pi^Q}(b_H)$, Condition 3 to $b_H \in (1 - \overline{p}, (1 - \overline{p})\frac{c}{\overline{p}\gamma_L^Q})$ and $\pi^Q > \overline{\pi^Q}(b_H)$, Condition 4 to $b_H > (1 - \overline{p})\frac{c}{\overline{p}\gamma_L^Q}$ and $\pi^Q < \overline{\pi^Q}(b_H)$, and Condition 5 to $b_H > (1 - p)\frac{c}{\overline{p}\gamma_L^Q}$ and $\pi^Q > \overline{\pi^Q}(b_H)$. In Tables 4a and 4b, for each condition, the first line H (second line L) describes $Q(H)$'s ($Q(L)$'s) strategy. In Table 4c, for each condition, the first (second) line corresponds to the decision-maker's bill choice after observing $Q(H)$'s ($Q(L)$'s) signal: $\zeta^{Q*}(H)$ ($\zeta^{Q*}(L)$).

The influence of SIGs favourable to change

I now turn to the analysis of pro-change SIG influence. To this end, I assume that the decision-maker is uncertain about P's resolve, $\pi^P \in (0, 1)$, and it is common knowledge that Q is of high resolve, or $\pi^Q = 1$. Consequently, the signal of an SIG supportive of the status quo, ζ^Q, reveals no information. As above, the decision-maker chooses between her preferred policy $b = 1$ and the compromise bill b_H, which makes Q 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 when the pro-change SIG is inactive (denoted $b^*(\emptyset, \zeta^Q)$). In line with the previous analysis, the decision-maker compromises unless she prefers the chances of passing a comprehensive reform ($b_H < 1 - \overline{p}$).

Lemma 4. *Absent a pro-change SIG, the decision-maker's equilibrium policy choice is $b^*(\emptyset, \zeta^Q) =$*

19

b_H *if and only if* $b_H \geq 1 - \bar{p}$, *and* $b^*(\emptyset, \zeta^Q) = 1$ *otherwise.*

When $b_H < 1 - \bar{p}$, the decision-maker never has any incentive to compromise, whether P is active or not. As a result, P has no influence on policy outcomes then. To make the problem interesting, I impose that $b_H \geq 1 - \bar{p}$ in what follows. The decision-maker's 'default option' is the compromise bill, and pro-change SIG influences the decision-maker when she proposes $b = 1$.

As for the SIG supportive of the status quo, P can influence policy choices via two paths. First, the mere possibility that P defends the proposal may be enough to induce the decision-maker to gamble by choosing $b = 1$. Second, P may reveal its resolve with its signal so that the decision-maker goes for a comprehensive reform after learning the pro-change SIG is of high resolve. I, first, consider this second possibility and study the conditions for existence and the characteristics of a separating equilibrium (in which $P(H)$'s signal differs from $P(L)$'s signal: $\zeta^{P*}(H) \neq \zeta^{P*}(L)$).

The next lemma highlights that a separating equilibrium only exists for specific parameter values.

Lemma 5. *There exists a unique* $\underline{\gamma} : [0,1]^2 \to \mathbb{R}_+$, *satisfying* $\underline{\gamma}(b_H, \gamma_L^P) > \frac{c}{\bar{p}-\underline{p}}$ *such that a separating equilibrium exists if and only if (i) the compromise bill* b_H *satisfies* $b_H \leq 1 - \underline{p}$; *and (ii) the pro-change SIG's resolve satisfies* $\gamma_H^P \geq \underline{\gamma}(b_H, \gamma_L^P)$.
In a separating equilibrium, the decision-maker chooses $b = 1$ *after signal* $\zeta^{P*}(H)$ *and* $b = b_H$ *after signal* $\zeta^{P*}(L)$.

A separating equilibrium exists when $P(H)$'s benefit from differentiation is greater than the associated cost. The benefit from differentiation is positive only if the decision-maker prefers the risks associated with attempting to pass a comprehensive reform ($b = 1$) over the safe compromise $b = b_H$ after learning P's resolve is high. Given that SIG P's outside lobbying increases the likelihood the bill passes (from $1 - \bar{p}$ to $1 - \underline{p}$), this condition is equivalent to: $b_H \leq 1 - \underline{p}$ (Condition (i)).[13] The cost from differentiation comes from the cost of outside lobbying activities to improve the odds of passage of the decision-maker's proposal. For this cost to be lower than the benefit from differentiation, the marginal gain from change must be sufficiently high: $\gamma_H^P \geq \underline{\gamma}(b_H, \gamma_L^P)$ (Condition (ii)).

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[13]When this condition is not satisfied, the decision-maker chooses $b = b_H$ and Q chooses $l_o^Q = 0$ on the equilibrium path independently of the pro-change SIG's signal. The restriction on P's equilibrium behavior then implies that P plays a pooling strategy (i.e., $\zeta^P(L) = \zeta^P(H)$). Absent this restriction, the pro-change SIG may be willing to truthfully reveal its type with cheap talk message (but not with costly inside lobbying).

The next proposition characterizes P's strategy in a separating equilibrium, $\zeta^{P*}(\tau)$, $l_o^{P*}(\tau)$, $\tau \in \{H, L\}$, 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: $\overline{l_i^P}(b_H) := c - ((1 - \underline{p}) - b_H)\gamma_H^P$.

Proposition 3. *In a separating equilibrium, P's equilibrium strategies satisfy:*

1. $\zeta^{P*}(H) = (H, 0)$ and $\zeta^{P*}(L) = (L, l_i^{P*}(L))$, with $l_i^{P*}(L) = \max\left\{0, \overline{l_i^P}(b_H)\right\}$;

2. $l_o^{P*}(H) = 1$ and $l_o^{P*}(L) = 0$.

Noticeably, in a separating equilibrium, $P(H)$ incurs no inside lobbying expenditures: $l_i^{P*}(H) = 0$. To understand this result, observe first that $P(L)$ has no incentive to mimic $P(H)$. By Assumption 2.(ii), $P(L)$ never engages in outside lobbying. Hence, when the decision-maker proposes $b = 1$, the comprehensive reform passes with probability $1 - \overline{p}$ from the perspective of $P(L)$. Just like the decision-maker, $P(L)$ then prefers the certainty associated with the compromise bill b_H over the lottery resulting from the choice of $b = 1$. In turn, $P(H)$ 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. In some sense, it prefers to preserve its war chest for the upcoming defence of the decision-maker's comprehensive reform. Consequently, P incurs positive inside lobbying expenditures (for some parameter values) only when its resolve is low to signal it is *not* willing to engage in outside lobbying. Inside lobbying expenditures serve to credibly 'plead poverty.'

Costly signaling, however, is not always necessary. When outside lobbying is not too costly $(c < ((1 - \underline{p}) - b_H)\gamma_H^P)$, $P(H)$'s preference and the decision-maker's preference are well aligned. Both prefer a comprehensive reform with $1 - \underline{p}$ chance of passing over the compromise bill $b = b_H$. Cheap talk messages are then credible and a separating equilibrium exists absent any inside lobbying expenditures.[14]

Even though $P(H)$ does not incur inside lobbying expenditures on the equilibrium path, it would be wrong to conclude it influences policy for cheap. Indeed, in equilibrium, the level of inside lobbying expenditures by $P(L)$ is always lower than the cost of outside lobbying incurred by $P(H)$.

Remark 1. *In a separating equilibrium, the following inequality holds: $l_i^{P*}(L) \leq c$, with strict inequality a.e.*

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[14]Cheap talk messages guarantee that the equilibrium correspondence is well-defined for all parameter values. The Intuitive Criterion "selects" the separating equilibrium with the lowest level of inside lobbying expenditures. When $c \leq ((1 - \underline{p}) - b_H)\gamma_H^P$, both types would incur no inside lobbying expenditures. Then the signal is no longer informative absent cheap talk, leading to the non-existence of an equilibrium.

As the separating equilibrium exists only under specific conditions, I now consider the second way a pro-change SIG may influence policy choices: via the expectation that it will help to pass the comprehensive reform even absent any additional information about P's type ($\zeta^{P*}(H) = \zeta^{P*}(L)$). Then, the decision-maker chooses the comprehensive reform if and only if the probability that SIG P is of high resolve is sufficiently large: $\pi^P \geq \frac{b_H - (1 - \bar{p})}{\bar{p} - \underline{p}} =: \overline{\pi^P}(b_H)$. Otherwise, she proposes the compromise bill $b = b_H$.

With this in mind, the next Lemma characterizes conditions under which a pooling equilibrium exists. To meet the Intuitive Criterion, there should not exist a profitable deviation that allows $P(L)$ or $P(H)$ to credibly reveal its type. When the decision-maker picks $b = b_H$ absent informative signal, this condition fails when $P(H)$ prefers $b = 1$ to $b = b_H$, since $P(L)$ never has any incentive to obtain $b = 1$ by the reasoning above. Using Lemma 5, a pooling equilibrium cannot exist when $c < ((1 - \underline{p}) - b_H)\gamma_H^P$. In turn, when the decision-maker chooses $b = 1$, the Intuitive Criterion rules out a pooling equilibrium whenever $P(L)$ can credibly separate itself from $P(H)$. Again using Lemma 5, this occurs if $c < ((1 - \underline{p}) - b_H)\gamma_H^P$ and, when this inequality is reversed, if $\gamma_H^P \geq \underline{\gamma}(b_H, \gamma_L^P)$.

Lemma 6. *A pooling equilibrium exists if and only if $b_H \geq 1 - \underline{p} - \frac{c}{\gamma_H^P}$ and either $\pi^P \leq \overline{\pi^P}(b_H)$ or $\gamma_H^P < \underline{\gamma}(b_H, \gamma_L^P)$.*

In a pooling equilibrium, the decision-maker's equilibrium policy choice, $b^*(\zeta^P, \zeta^Q)$, satisfies:

1. $b^*(\zeta^P, \zeta^Q) = b_H$ if $\pi^P \leq \overline{\pi^P}(b_H)$; and

2. $b^*(\zeta^P, \zeta^Q) = 1$ otherwise.

P's strategy—for both inside and outside lobbying—in a pooling equilibrium depends on the decision-maker's policy choice. When she picks $b = b_H$, a pro-change SIG never engages in outside lobbying. Due to the decision-maker's out-of-equilibrium belief, P may, however, incur some inside lobbying expenditures. To see this, suppose that the decision-maker believes that the pro-change SIG has high resolve absent inside lobbying expenditures (an out-of-equilibrium event). The decision-maker would then choose $b = 1$ (if it is her best response), a policy choice that does not appeal to $P(H)$ and $P(L)$. To encourage the decision-maker to compromise, the pro-change SIG then uses inside lobbying expenditures. 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. When the decision-maker, in turn, chooses $b = 1$, $P(H)$

finds it optimal to defend the comprehensive reform and, as a result, engages in outside lobbying on the equilibrium path. There is, however, no inside lobbying expenditures in this case. Indeed, to sustain positive inside lobbying expenditures, the only possible out-of-equilibrium belief would be that the SIG P has low resolve after observing $l_i^P = 0$. But both types would be too happy to get $b = b_H$ (the decision-maker's best response given her belief) at so low a price. Hence, $l_i^{P*} = 0$ on the equilibrium path when $b^*(\zeta^P, \zeta^Q) = 1$. Denote $\widehat{l_i^P}(b_H) = \gamma_L^P(b_H - (1 - \overline{p}))$. Proposition 4 summarizes the reasoning above.

Proposition 4. *In a pooling equilibrium, the pro-change SIG's equilibrium strategy satisfies $m(L) = m(H) \in \{H, L\}$ and:*

1. *When $b^*(\zeta^P, \zeta^Q) = b_H$, then $l_i^{P*}(H) = l_i^{P*}(L) = 0$ if $b_H > 1 - \underline{p}$ or $l_i^{P*}(H) = l_i^{P*}(L) \in \left[0, \min\left\{\overline{l_i^P}(b_H), \widehat{l_i^P}(b_H)\right\}\right]$ if $b_H \leq 1 - \underline{p}$; in all cases, $l_o^{P*}(H) = l_o^{P*}(L) = 0$;*

2. *When $b^*(\zeta^P, \zeta^Q) = 1$, then $l_i^{P*}(H) = l_i^{P*}(L) = 0$ and $l_o^{P*}(H) = 1$, $l_o^{P*}(L) = 0$.*

Table 5 summarizes this section's theoretical results. As in the case of the SIG supportive of the status quo, for P, inside lobbying expenditures are associated with compromise and outside lobbying activity with comprehensive reform. The substantive and empirical implications of these findings are, however, very different for P compared to Q as I discuss in the next section.

Implications

The theoretical results presented in the last two sections have substantive and empirical implications for understanding and measuring SIG power. I turn to both in this section.

When it comes to SIGs supportive of the status quo, this paper highlights that threats can be a powerful mechanism behind their influence (see Dal Bó and Tella, 2003, and Dal Bó et al., 2006, for a similar point). As the threat of outside lobbying activities increases, so does the decision-maker's propensity to compromise (assuming the compromise bill is not too moderate). In the limit, when D is certain that Q is high resolve (i.e., $\pi^Q = 1$), compromise may well be her sole option. As such, the model proposes *one* possible way to understand the pattern described in Table 1. Some of these five groups may be especially strong, despite low levels of inside lobbying, because their threats are so ominous.

Cond.	Type	Sep.	Pool.		Cond.	Type	Sep.	Pool.		Cond.	Type	Sep.	Pool.
1	H		0		1	H		0		1	H		b_H
	L		0			L		0			L		b_H
2	H		$[0, \widehat{l_i^P}]$		2	H		0		2	H		b_H
	L		$[0, \widehat{l_i^P}]$			L		0			L		b_H
3	H		0		3	H		1		3	H		1
	L		0			L		0			L		1
4	H	0	$[0, \overline{l_i^P}]$		4	H	1	0		4	H	1	b_H
	L	$\overline{l_i^P}$	$[0, \overline{l_i^P}]$			L	0	0			L	b_H	b_H
5	H	0			5	H	1			5	H	1	
	L	$\overline{l_i^P}$				L	0				L	b_H	
6	H	0			6	H	1			6	H	1	
	L	0				L	0				L	b_H	
(a) Inside lobbying					(b) Outside lobbying					(c) Policy choice			

Table 5: Equilibrium strategies

'Cond.' stands for condition, 'Sep.' for separating equilibrium; 'Pool.' for pooling equilibria. Condition 1 corresponds to $0 > 1 - \underline{p} - b_H$, Condition 2 to $0 < 1 - \underline{p} - b_H < \frac{c}{\gamma_H^P}$, $\gamma_H^P < \underline{\gamma}$, and $\pi^P < \overline{\pi^P}$, Condition 3 to $0 < 1 - \underline{p} - b_H < \frac{c}{\gamma_H^P}$, $\gamma_H^P < \underline{\gamma}$, and $\pi^P > \overline{\pi^P}$, Condition 4 to $0 < 1 - \underline{p} - b_H < \frac{c}{\gamma_H^P}$, $\gamma_H^P > \underline{\gamma}$, and $\pi^P < \overline{\pi^P}$, Condition 5 to $0 < 1 - \underline{p} - b_H < \frac{c}{\gamma_H^P}$, $\gamma_H^P > \underline{\gamma}$, and $\pi^P > \overline{\pi^P}$, and condition 6 to $\frac{c}{\gamma_H^P} < 1 - \underline{p} - b_H$. In Tables 5a and 5b, for each condition, the first line H (second line L) describes $P(H)$'s ($P(L)$'s) lobbying strategy. In Table 5c, for each condition, the first (second) line corresponds to the decision-maker's bill choice after observing a $P(H)$'s ($P(L)$'s) signal: $\zeta^{P*}(H)$ ($\zeta^{P*}(L)$).

However, the present paper does not just reproduce Dal Bó and co-authors' analysis. It also considers whether inside lobbying expenditures can mediate the threat of SIG defending the status quo when the decision-maker is uncertain about the group's resolve.[15] Inside lobbying expenditures are informative only under certain conditions. In other words, the role of threat is not well captured by inside lobbying expenditures when the latter serves as a signal. I also show that threats may fail. The decision-maker may, despite the risks, choose a comprehensive reform, forcing $Q(H)$ to engage in outside lobbying. This has important implications for what can and cannot be observed by researchers. Successful threats operate in the shadows; the realization of a threat is the confession of its ineffectiveness.

In turn, pro-change SIGs influence policy choices with promises, to defend the decision-maker's

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[15]As mentioned in the literature review, inside lobbying expenditures, in the form of bribes, are complements to threats in Dal Bó and co-authors' papers.

proposal against the attacks of SIGs supportive of the status quo. This pledge can be implicit, in which case the decision-maker must decide based on her prior. Or it can be explicit via the use of cheap talk messages or inside lobbying expenditures. Here lies, perhaps, the most surprising result so far. Under the assumptions of the baseline analysis, $P(L)$ pleads poverty by using inside lobbying expenditures to encourage the decision-maker to compromise and, consequently, to avoid engaging in outside lobbying activities. As a result, just like for Q, inside lobbying expenditures are correlated with moderation, but, unlike the case of SIGs supportive of the status quo, moderation marks a failure to influence policies for pro-change SIGs. Outside lobbying is associated with comprehensive changes and corresponds to success for P. Unlike threats, effective promises are acted out.

These findings may explain some empirical patterns. Some groups seem to concentrate their efforts on helping a piece of legislation pass. This was the case of the AARP in 2009 which was highly involved in pushing back against conservative attacks on the Affordable Care Act in 2009 (Young, 2009), but was only moderately active at the legislative drafting stage and made almost no contribution during the 2009-10 electoral cycle.[16] Other groups sometimes (though rarely publicly) urge compromise: Farm groups pushed for an agreement on the federal farm bill (Farm Progress, 2013), right-wing organizations encouraged Congress and the White House to come to a solution on immigration (National Immigration Forum, 2019), California housing organizations asked the state legislature to find a compromise on rent control (California Forward, 2018), and survivors of distracted driving called for a resolution of the legislative stalemate on a hands-free driving bill in Massachusetts (McGrath, 2019). While it is impossible to ascertain that these groups sought a middle ground because of their low resolve, these examples highlight that the search for compromise by interest groups, even those in favour of change, is not unheard of. Indeed, for some scholars, it appears to be the norm rather than the exception (e.g., Tesh, 1984; Holyoke, 2011).

Stretching the interpretation of the results a bit, the theoretical findings can also provide a rationale for 'reverse lobbying.' Legislators are often active lobbying actors who mobilize groups to facilitate policy change (Shaiko, 1998; Ainsworth, 2002; Baumgartner et al., 2009; Box-Steffensmeier, Christenson, and Craig, 2019). Examples include President Clinton enlisting business groups to defend NAFTA against trade union attacks (Kollman, 1998) or President Obama securing the help

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[16]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.

of various SIGs to get the Affordable Care Act enacted (Hall and Anderson, 2012; LaPira, 2012).

The results above can also be used to inform empirical analyses of the effect of inside and outside lobbying. Obviously, there are important limitation to this exercise. I take a narrow view of inside lobbying, which only serves to signal resolve, and outside lobbying, which only serves to affect the fate of a bill. Still, the discussion that follows can be interpreted as an illustration of the difficulties of measuring SIG power when groups have multiple avenues of influence.

There are two aspects of SIG influence: their extent (when do SIGs affect policies?) and their strength (by how much do SIGs' active presence change policies?). To measure the first, scholars would simply use as dependent variable an indicator which takes a value of one if the bill is the comprehensive reform. To measure the second, researchers would regress the bill content on a set of independent variables. How should we interpret regressions that employ lobbying activities as independent variables? For both the strength and extent, when scholars regress their dependent variable (a dummy or a measure of bill contact) on lobbying choices, a positive coefficient represents a sign of weakness for SIGs supportive of the status quo, whereas it is a mark of influence for pro-change SIGs. The reverse is true for a negative coefficient. Does the researcher recover unbiased estimates of the extent or the strength of influence using inside lobbying expenditures as a proxy? My model suggests the answer is no. Inside lobbying expenditures, I now show, fail to be a satisfactory proxy for both the extent and strength of influence, for both P and Q.

Consider SIGs supportive of the status quo. In a pooling equilibrium, if the prior π^Q is high enough, D chooses b_H even though inside lobbying expenditures play no role (e.g., Condition 5 in Table 4). If most or all drawn observations fall into these parameter values, a researcher using inside lobbying expenditures as an independent variable is likely to recover a null result. She/he would wrongly conclude such SIGs have little influence when, in fact, they have the most. But even if the researcher is able to avoid this pitfall, she/he is not necessarily on safe ground. Indeed, a separating equilibrium and a pooling equilibrium co-exist for some parameter values (see Condition 3 in Table 4). This induces an equilibrium selection problem, and any estimate, though correctly signed, suffers from attenuation bias. Overall, studies using inside lobbying expenditures may only uncover a lower bound on SIG power. As such, the theoretical results presented here provide a rational for the discrepancy, highlighted in the introduction, between academic findings and public opinion.

The matter is even worse for the pro-change SIG. Inside lobbying expenditures again do not fully capture the extent of influence since cheap talk messages can be informative in a separating equilibrium (Condition 6 in Table 5) and the mere expectations of assistance may induce the decision-maker to propose a comprehensive reform in a pooling equilibrium (Condition 3 in Table 5). Furthermore, when inside lobbying expenditures are informative, and, thus, affect the decision-maker's policy choice, they are meant to plead poverty. Regressing these expenditures on bill choice yields a negative coefficient, revealing a lack of SIG influence. Simply inverting the sign of the coefficient is not a satisfactory solution as any estimate may suffer from attenuation bias due to equilibrium selection problems (Condition 4 in Table 5). Estimates of the strength of SIG influence are even harder to predict as no inside lobbying expenditures are associated with comprehensive reform, but inside lobbying expenditures also decrease with the moderation of the compromise bill. Whatever their sign, these estimates also suffer from attenuation bias.

Outside lobbying seems to fare better, though these activities remain an imperfect proxy. As noted above, for SIGs defending the status quo, outside lobbying occurs in equilibrium when this SIG's threat fails, when it fails to influence policy choices. By contra-positive, the observation of outside lobbying activities, thus, reveals the extent of the power of SIG supportive of the status quo (for the same reason, outside lobbying activities are uninformative about their strength). For the pro-change SIG, outside lobbying is a good indicator of influence in a *separating equilibrium*. Used when the group has high resolve, these activities occur on the equilibrium path if and only if the decision-maker picks the comprehensive reform. The same does not necessarily hold true in a pooling equilibrium where the hope of a pro-change SIG's support encourages the decision-maker to gamble on $b = 1$, with this help not always materialising (see Condition 3 in Table 5). So while the researcher finds a positive correlation between outside lobbying activities and the likelihood of comprehensive reform (i.e., a mark of pro-change SIG influence), the estimate the researcher obtains still suffers from some attenuation bias.

Table 6 briefly summarizes these empirical implications. Even after making strong assumptions about the goals groups pursue with their various means of influence, only outside lobbying activities can yield an unbiased estimate and, even so, only for the extent of influence of SIG supportive of the status quo. This relatively negative conclusion is related to Bueno de Mesquita and Tyson's (2020) commensurability problem, which highlights the difficulty of interpreting regressions when

the dependent variable (here, bill content) and the main explanatory factor (here, lobbying choices) are the result of strategic behaviors.

	Anti	Pro
Extent	< 0 coefficient Attenuation bias	< 0 coefficient Attenuation bias
Strength	< 0 coefficient Attenuation bias	? coefficient Attenuation bias

(a) Inside lobbying

	Anti	Pro
Extent	> 0 coefficient Unbiased	> 0 coefficient Attenuation bias
Strength	Uninformative	Uninformative

(b) Outside lobbying

Table 6: Empirical implications

Extent describes the outcome and problems of regressing a dummy variable taking value one for $b = 1$ on the inside lobbying expenditures (for Table 6a) or the outside lobbying activities (for Table 6b) of the SIG supportive of the status quo (middle column) or of the pro-change SIG (last column). Strength captures the same quantities while regressing the content b on inside/outside lobbying choices. A positive coefficient is a sign of influence (weakness) for pro-change SIG (the SIG supportive of the status quo). The reverse is true for a negative coefficient.

Robustness

For the main analysis, I restricted parameter values (Assumptions 1-3) and looked separately at the influence of SIGs Q and P. In this section, I briefly describe the robustness of the results when these assumptions are relaxed.

Relaxing assumptions

It is apparent that SIGs can influence policy choices only if Assumption 1 holds. Otherwise, Q is not a threat (if $\gamma_H^Q < \frac{c}{\bar{p}}$, it never engages in outside lobbying even if $b = 1$) or P never helps the decision-maker (if $\gamma_H^P < \frac{c}{\bar{p}-\underline{p}}$, it has no incentive to defend b even if it is the comprehensive reform). Relaxing Assumption 2.(ii) implies that the pro-change SIG is always of high resolve and so there is no room for inside lobbying expenditures to be informative. This is again of limited interest in the context of this paper. Results change when Assumption 2.(i) or Assumption 3 is relaxed as I now describe (see Online Appendix D for a more formal discussion).

When Assumption 2.(i) is dropped, meaning $\gamma_L^Q > \frac{c}{\bar{p}}$, the decision-maker now needs to compromise with $Q(L)$ to avoid outside lobbying activity by proposing a bill $b_L = \frac{c}{\bar{p}\gamma_L^Q} \in (0,1)$. For same

reasons as in the analysis above, to sustain separation, it must be that $(1 - \bar{p})\gamma_H^Q \geq \gamma_L^Q$, which can be rewritten as $b_H \leq (1 - \bar{p})b_L$ (recall $b_H = \frac{c}{\bar{p}\gamma_H^Q}$). Since a separating equilibrium exists only if the decision-maker is willing to compromise with $Q(H)$, just like above, a second necessary condition is $b_H \geq 1 - \bar{p}$. Both conditions, however, can no longer be satisfied simultaneously (since $b_L < 1$), and a separating equilibrium does not exist. Hence, Assumption 2.(i) is necessary for inside lobbying expenditures to be able to serve as a proxy for Q influence on policy choices. Inside lobbying expenditures can still appear on the equilibrium path when Assumption 2.(i) does not hold, but only in a pooling equilibrium—that is, when such expenditures have no direct effect on policy choice, but only have an indirect effect via the decision-maker's out-of-equilibrium belief.

Assuming $\frac{\gamma_L^Q}{\gamma_H^Q} > \frac{p}{\bar{p}-p}$ (i.e., the reverse of Assumption 3) changes the set of undominated policy choice for the decision-maker. When she learns that P is of high resolve, she has the opportunity to propose a new compromise bill, which I denote $\overline{b_H} = \frac{c}{\underline{p}\gamma_H^P}$, relatively similar to a comprehensive reform $(\overline{b_H} > b_H)$. Anticipating that it would only obtain the status quo with probability $\underline{p}$ (as P defends $\overline{b_H}$), $Q(H)$ is indifferent between engaging in outside lobbying and doing nothing when the bill proposed is $\overline{b_H}$. If the decision-maker prefers the gamble associated with a comprehensive reform over this new compromise $(\overline{b_H} \leq 1 - \underline{p})$, the analysis remains broadly similar to before. A more interesting pattern emerges when $\overline{b_H} > 1 - \underline{p}$. Then, when P plays a separating strategy, the decision-maker picks $\overline{b_H}$ upon learning P is of high resolve and b_H when P reveals itself to be of low resolve. In both cases, there is no outside lobbying on path. The game reduces to a classic signaling game, with $P(H)$ having no incentive to imitate a type L, but $P(L)$ very much willing to mimic a type H since $P(L)$ would obtain a better bill without risk. Quite logically, a separating equilibrium always exists with $P(H)$ incurring inside lobbying expenditures to differentiate itself. This equilibrium is also the unique equilibrium of this amended game. Inside lobbying expenditures then become a perfect proxy for pro-change SIG influence.

Proposition 5. *Suppose that Assumption 3 does not hold, $\pi^Q = 1$, $\pi^P \in (0, 1)$, and $\overline{b_H} = \frac{c}{\gamma_H^Q \underline{p}} > 1 - \underline{p}$. Then, the unique equilibrium is a separating equilibrium in which $l_i^{P*}(H) > l_i^{P*}(L) = 0$, $b^*(\zeta^{P*}(H), \zeta^Q) = \overline{b_H} > b_H = b^*(\zeta^{P*}(L), \zeta^Q)$, and $l_o^{P*}(H) = l_o^{P*}(L) = 0$.*

Propositions 3 to 5 highlight the importance of distinguishing between two cases. When the pro-change SIG has little capacity to move public opinion ($\underline{p}$ is close to $\bar{p}$, and Assumption 3 holds),

we should expect a negative relationship between inside lobbying expenditures and policy choice. When the pro-change SIG is relatively influential ($\underline{p}$ is significantly lower than $\bar{p}$, so Assumption 3 does not hold and $\overline{b_H} > 1 - \underline{p}$), we should see a positive correlation between l_i^P and the content of a bill. What is more, inside lobbying expenditures are a perfect proxy for influence and researchers can uncover both the extent and strength of pro-change SIG. The main issue is that empirical researchers cannot properly distinguish between these two cases. In fact, as the effects of inside lobbying go in opposite directions, recovering a true measure of SIG power becomes even harder for scholars when Assumption 3 does not hold for all pro-change SIGs.

Another assumption in the baseline model is that outside lobbying by Q has no direct impact on the decision-maker's utility. This does not have to be the case. The decision-maker may suffer a tarnished reputation (if Q attacks her character as in Tomasi, 2020) or/and may experience a decrease in her chances of reelection (if outside lobbying is a form of independent expenditures) following $l_o^Q = 1$. So, in some circumstances, outside lobbying may impose a cost $k > 0$ on D (see Online Appendix B for a formal treatment). The introduction of k increases the decision-maker's incentives to compromise with Q and so facilitates the existence of a separating equilibrium (the lower bound in Lemma 2 becomes $1 - \bar{p} - k$). More interestingly, the presence of a direct cost sometimes introduces a wedge between $P(L)$ and the decision-maker. The decision-maker now prefers to compromise whenever $1 - \bar{p} - k \leq b_H$. In turn, $P(L)$ SIG prefers the comprehensive reform whenever $1 - \bar{p} \geq b_H$. Hence, for some parameter values, the decision-maker would choose $b = b_H$ after learning P has low resolve, but $P(L)$ would like to mimic $P(H)$ to induce D to attempt to pass $b = 1$ (i.e., when $1 - \bar{p} - k \leq b_H \leq 1 - \bar{p}$). Since $P(H)$ also prefers the comprehensive reform in this case, we are back to the context of a classical signaling game in which all types prefer $b = 1$ to $b = b_H$, and $P(H)$ needs to incur some inside lobbying expenditures to credibly reveal its type. As in the previous paragraph, in equilibrium, the correlation between l_i^P and the likelihood of comprehensive reform or the bill content is positive. Absent a way to control for k, this finding complicates the analysis for empirical research since inside lobbying expenditures sometimes reveal P's high resolve and sometimes simply serve to plead poverty.

Competing SIGs

Here, I return to the case of the main analysis (Assumptions 1-3 hold, $k = 0$) and briefly discuss the case when both SIGs' resolves are unknown to the decision-maker: $\pi^Q, \pi^P \in (0, 1)^2$ (the formal analysis and proofs can be found in Online Appendix E). Both SIGs now have an opportunity to affect the decision-maker's policy choice with inside lobbying expenditures: There is competition for influence at this stage.

There is no change when it comes to the pro-change SIG. A separating equilibrium does not always exist, and, when it does, either cheap talk messages are credible or inside lobbying expenditures are incurred by $P(L)$ to plead poverty. As a result, just as in the main analysis, inside lobbying is correlated with compromise, outside lobbying with comprehensive reform and all the implications discussed above remain valid.

The analysis is more subtle for the SIG supportive of the status quo. With the pro-change SIG possibly having high resolve and willing to defend a comprehensive reform, the decision-maker now has less of an incentive to choose the compromise bill b_H even when she knows that Q is of high resolve. Indeed, comprehensive reform follows Q's inside lobbying expenditures with positive probability when both SIGs plays a separating strategy. As before, upon learning that Q is of low resolve, the decision-maker always chooses the comprehensive reform since she has nothing to fear. Now, consider the decision-maker's policy choice when Q reveals it has high resolve. If D always chooses the comprehensive reform, Q has no incentive to reveal its type. If D always picks the compromise bill, P has no incentive to send an informative signal (D's choice is fully determined by Q's inside lobbying expenditures). Hence, separation by both groups occurs when the decision-maker proposes $b = 1$ if P is a high type ($b = b_H$ if P is of low resolve) when Q reveals itself to be of high resolve. In an equilibrium in which both SIGs separate (and Proposition E.4 shows such an equilibrium exists for some parameter values), promises dominate threats.

A direct implication is that inside lobbying expenditures no longer necessarily correlate with compromise for an SIG supportive of the status quo with both SIGs competing. As a result, the bias associated with inside lobbying expenditures as a proxy for influence is even more severe. Outside lobbying, however, is still associated with a comprehensive reform. It reveals failure of a threat, in both *separating and pooling equilibria*, thereby capturing the extent of the power of SIGs

defending the status quo by contra-positive.

Conclusion

A few years ago, political scientist Beth Leech (2010: 534) declared that "the search for a definitive statement about the power of lobbyists has become the Holy Grail of interest group studies." This paper provides some guidance for researchers on this quest. I develop a theoretical framework in which SIGs can engage in inside lobbying to influence the content of a bill and outside lobbying to affect its fate. Applying the conclusion of this particular model to empirical analysis of SIG power, I show that inside lobbying expenditures may yield downward (for SIGs supportive of the status quo) or wrongly signed (for pro-change SIGs) estimates of SIG influence. These issues arise even absent competition between SIGs and become more severe when I allow for it. In turn, outside lobbying activities fare slightly better, but even then only provide unbiased estimates of the extent of the influence of groups defending the status quo. While these results offer some (limited) theoretical support for the literature looking for influence outside Congress (e.g., Bertrand et al., 2020; Matter and Stutzer, 2019), they also highlight the difficulty of using SIGs' strategic actions to uncover their power (in the spirit of Bueno de Mesquita and Tyson, 2020).

So, where should researchers look for influence? While a full answer is beyond the scope of this paper, my results suggest some possible leads to explore. Influence can only be understood in term of fundamentals: the level of threat or the chances of help (π^Q, π^P), as well as groups' ability to persuade public opinion ($\bar{p}$, $\underline{p}$). Measuring these quantities generally proves difficult. But changes in regulations can be understood as implicit changes in those parameters, providing glimpses into SIG power. For example, by removing restrictions on the funding of independent expenditures in *Citizens United v. FEC*, the Supreme Court may have increased the advantage of the best funded groups in mobilizing the public (as postulated by Abdul-Razzak et al., 2020). If so, this controversial decision corresponds to an increase in $\bar{p}$ if the SIG supportive of the status quo is the wealthiest, increasing the chance of compromise, or a decrease in $\underline{p}$ if the pro-change SIG has the most resources, raising the likelihood of comprehensive reform. Empirically exploiting this ruling could, thus, give us some ideas of the role of threats and promises in the policy-making process.

On a more general note, the theoretical framework and conclusions described in this paper do

not exclusively apply to SIG influence. They can also help researchers who study other settings where 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 determine their influence (as confirmed by the null findings documented in Alesina et al., 2019). As with special interest groups, 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, 2019).

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