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Informational lobbying and agenda distortion

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ABSTRACT. We challenge the prevailing view that pure informational lobbying (in the absence of political contributions and evidence distortion or withholding) leads to better informed policymaking. In the absence of lobbying, the policymaker may prioritize the more-important or ex ante more-promising issues. Recognizing this, interest groups involved with other issues can have an incentive to lobby, in order to change the issues that the policymaker learns about and prioritize. We identify two channels through which informational lobbying is detrimental, in the sense of leading to worse policy and possibly less-informed policy choices. First, it can cause the policymaker to give priority to less important issues with active lobbies, rather than the issues that are more-important to his constituents. Second, lobbying by interest groups on issues with ex ante less-promising reforms may crowd out information collection by the policymaker on issues with more-promising reforms. The analysis fully characterizes the set of detrimental lobbying equilibria under two alternative types of issue asymmetry.

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1. Introduction

Formal models of political lobbying tend to assume that interest groups influence policymakers through the provision of either money or information. First, special interests may provide political contributions to policymakers in an implicit or explicit exchange for policy favors (e.g., Tullock 1980, Hillman and Riley 1989, Grossman and Helpman 1994). Second, special interests may collect and share policy relevant information in order to influence policymakers' beliefs about the costs and benefits of alternative policy choices (e.g., Milgrom and Roberts 1986, Austen-Smith and Wright 1992). Influence through payments is widely viewed as corrupt, as it shifts policy away from the needs of constituents and towards the preferences of monied special interests (see, for example, Grossman and Helpman 2001). Influence through information, on the other hand, is often seen as beneficial, as it leads to better informed policymaking (e.g., Austen-Smith and Wright 1992, Cotton 2009). Several accounts of the policymaking process in the U.S. (e.g. Bauer, Dexter and de Sola Pool 1963, Hansen 1991, Hall 1996) argue that special interests' activities typically consist of collecting and sharing information with policymakers rather than quid pro quo exchange of money for favors.[1] The observation has led some to conclude that special interests' activities actually help improve policymaking and are beneficial to constituents.[2]

Our analysis challenges the view that pure informational lobbying (henceforth IL), in the absence of political contributions and evidence distortion or withholding, is a beneficial type of special interest group activity. We illustrate how even undistorted information provision by interest groups can distort the policy agenda and lead to worse policy outcomes from the perspective of constituents.

To develop our argument, we present a model of informational lobbying that does not include traditional channels through which lobbying distorts policymaking in favor of special interests. We assume that the only means of interest group influence is the collection of policy relevant information. There is no private information, and interest groups cannot hide or distort information. Interest groups and the policymaker have access to information of the same quality. There are no political contributions, and all else equal, the policymaker prefers the same policy as his constituents. Even though we block the traditional channels for detrimental interest groups' influence, we still show that lobbying can lead to systematically worse policy. The analysis characterizes necessary and sufficient conditions for IL to lead to worse policy compared to an alternative setting in which lobbying is not allowed. This is because IL has the potential to shift the policymaker's attention away from the issues constituents would like to see prioritized, and to focus it on issues on which special interests have greater incentive to lobby.

We develop our argument using a simple model of informational lobbying in which a policymaker (PM), who shares policy preferences with his constituents, must decide for each of two issues whether to implement a proposed reform or keep the status quo. The PM can exert effort to learn about alternative reforms before deciding which reform, if either, to implement. Because the PM faces private costs of learning, an agency problem arises between the PM and his constituents, with the PM possibly choosing to remain less informed than his constituents

[1] Additionally, Ansolabehere, Snyder and Tripathi (2002) presents evidence that groups that contribute do so to secure access rather than engage in bribery, and de Figueiredo and Cameron (2006) reports that in the late 1990s, special interests in the U.S. spent five times more on lobbying than on campaign contributions, suggesting that the acquisition and communication of information makes up the majority of interest group political spending.

[2] As Baumgartner et al. (2009, p124) writes: "There is evidence that organizational advocates are often successful in getting Congress to make policy decisions that are informed by research and the technical expertise that they provide." As a U.S. Senator in 1956, John F. Kennedy (1956) wrote: "Lobbyists are in many cases expert technicians capable of examining complex and difficult subjects in clear, understandable fashion. They engage in personal discussion with members of Congress in which they explain in detail the reasons for the positions they advocate... The lobbyists who speak for the various economic, commercial and other functional interests of the country serve a useful purpose and have assumed an important role in the legislative process."

prefer. We model lobbying as information collection: Interest groups (IGs) advocating on behalf of separate reforms may collect evidence about the merits of their preferred reform (or subsidize the direct collection of information by the PM or his staff). There is strategic substitutability between IG and PM information acquisition, and information provided by IGs may reduce the PM's incentives to learn about other issues and change the order in which the PM prioritizes issues.

In the absence of lobbying, the PM may exert effort to learn about the most-promising reform or most-important issue. In our framework, lobbying may be beneficial if it increases the number of issues that the PM learns about, allowing him to better compare the merits of reforms on different issues. Lobbying may be detrimental, however, if it leads the PM to shift consideration away from more-important issues or issues with more-promising reforms, and towards less-important issues and issues with less-promising reforms with an active IG.

A necessary condition for informational lobbying to be detrimental is that only the IG involved with the less-important issue or the issue with the less-promising reform lobbies in equilibrium. This means that in equilibrium, the IG associated with the other issue must not have sufficient incentives to engage in counteractive lobbying in an effort to offset the lobbying efforts of the other IG. If the IG involved with the more important issue lobbies, the PM is at least as informed, and policy is at least as beneficial, as in the absence of lobbying. Therefore, the probability of successful lobbying by the IG associated with the less-important issue must be sufficiently low (i.e., the probability of getting favorable evidence in support of its reform must be sufficiently low), that the IG associated with the more-important issue refrains from lobbying, hoping that the other IG will fail in its efforts and that the PM will proceed with its favored policy just as the PM would do in the absence of lobbying. The analysis identifies conditions under which such behavior takes place in equilibrium and leads to worse policy outcomes.

Key to our analysis are three features of the policymaking process which we incorporate into our model. The first feature is that policymaking is restricted by time and budget constraints. Policymakers lack the time and resources to attend to all problems that deserve attention, and must therefore set their agenda, deciding which issues to prioritize.[3] The second feature is that policymakers do not always need interest groups and lobbying to learn about an issue and implement policy. There are many instances where policymakers can collect information on their own, e.g., through their own staff, through government agencies, by holding legislative hearings or by spending time in their districts in order to better understand the needs of their constituents. Thus, even in the absence of lobbying, a policymaker may work to learn about and implement reforms that are sufficiently promising or important. The third feature is an agency problem between policymakers and their constituents. Policymakers must bear private costs of learning about issues (e.g., opportunity costs of spending time in their districts to get a better sense of which policies would benefit their constituents), costs for which constituents cannot or are unwilling to compensate policymakers.

In our framework, all three of these features are necessary for informational lobbying to lead to worse policy. This happens since interest groups may collect information on different issues than a policymaker would choose to learn about in the absence of lobbying, which can weaken the policymaker's incentives to learn on his own about the other issues, and can then alter the priority the policymaker gives to the different issues. In the absence of lobbying, a policymaker prefers to collect information on the more important issue. With lobbying, he may become informed about the less important issue, and may prefer to immediately implement that reform, rather than exert additional effort to also learn the merits about the reform on the more important issue. In

[3] As Hansen (1991, p2) writes: "Limited in time, attention and resources, lawmakers cannot attend to all [problems], but they must attend to some. The decisive stage of interest group influence, therefore, is the choice of the problems and pressures to which to respond." Hall (1996), Jones and Baumgartner (2005), and Bauer, Dexter and de Sola Pool (1963), among others, make similar observations.

essence, informational lobbying provides an informational subsidy which can alter policymakers' incentives to collect information on their own and induce them to shift their attention from more-important issues to less-important issues with active lobbies. This shift in policymakers' attention away from the most-important issues can lead to worse policy decisions.

The analysis considers how detrimental lobbying differs in a case where issues differ in terms of their importance, and in a case where reforms differ in terms of their expected merits. In the first case, lobbying is detrimental when it shifts priority from the more-important issue to the less-important issue. In this case, lobbying simultaneously increases how informed the policymaker expects to become, and decreases the expected quality of the policy outcome. In the second case, lobbying is detrimental when it crowds out the policymaker's own information collection efforts and leads to less informed policymaking, in expectation. Here, lobbying is detrimental precisely because it leads to a less informed policymaker. In both cases, a set of necessary and sufficient conditions is identified such that informational lobbying leads to worse policy. Specifically, in each case: i) interest groups' information collection must induce a shift in the policymaker's attention resulting in the alignment of the policy agenda on the priorities of active lobbies; ii) among interest groups, only those involved with the less important issue or the issue with the ex ante less-promising reform have sufficiently strong incentives to collect information and lobby; and iii) the agenda distortion resulting from the shift in the policymaker's attention is harmful to constituents.

The analysis further considers, including, 1) how the presence of informational lobbying affects the probability with which the policymaker makes the same policy choice he would make if he were fully informed; 2) the interest groups' motives for lobbying; and 3) the preference alignment between the policymaker and active lobbies. Of particular interest are the results that informational lobbying can lead to better-informed, but worse policy choices, and that even friendly lobbying (i.e., interest groups lobbying a policymaker whose position is already biased in their favor) can lead to worse policy.

Our argument is consistent with empirical descriptions of the policymaking process. In our model, the policy agenda may not be aligned with the policy priorities of constituents, but rather with the 'lobbying agenda' pushed by active interest groups. This is consistent with Baumgartner et al. (2009), which presents evidence that the most active interest groups are *not* involved with the issues the public views as most important, and Cohen-Eliya and Hammer (2011, p280), which describes how "lobbying distorts the democratic process by manipulating the overcrowded public agenda and prioritizing specific issues that are determined by lobbyists," helping interest groups "jump the queue" on the policy agenda. Lessig (2011) provides an example of agenda distortion by interest groups. In a related way, Caldeira and Wright (1988) provides evidence suggesting that interest groups' activity, in the form of amicus curiae briefs, influences the U.S. Supreme Court's decisions of which cases to review. These accounts are consistent with our argument that interest groups involved with less-important issues lobby in an effort to change policymakers' priorities and alter the policy agenda. We make this point in a model of informational lobbying, although the logic at the foundation of our argument may apply to other types of lobbying as well.[4]

The remainder of the paper is organized as follows. Section 2 reviews the most relevant literature. Section 3 presents our baseline model. Sections 4 and 5 derive and discuss our main results. Section 6 concludes. All proofs are in the Appendix. An Online Appendix studies extensions to the model.

[4]Our argument applies to academic recruitment as well. A department that has special needs in one field may see department members in other fields actively gathering information on their candidates, in the hope of inducing the recruitment committee to hire one of their candidates rather than a candidate who would better fill the needs of the department, but on whom busy members of the recruitment committee would need to gather information on their own.

2. Related Literature

There is an extensive literature on informational lobbying and persuasion. Potters and van Winden (1992), Austen-Smith (1995) and Lohmann (1995) present models of informational lobbying in which interest groups have private, non-verifiable information, which they may be able to convey to a policymaker through a combination of cheap talk and signaling through political contributions.[5] In our framework, information is verifiable and we do not consider payments. In Milgrom and Roberts (1986), special interests with conflicting interests are endowed with verifiable information about the state of the world, and engage in a game of strategic information transmission. In Cotton (2009, 2012), interest groups make payments to a policymaker before being given access to disclose their verifiable private information. In each of these papers, interest groups are endowed with private information about the true state of the world. We focus on a setting in which interest groups choose whether to collect information that is then revealed to the policymaker, and which is more closely related to papers where interest groups must collect verifiable information (e.g., a signal realization that is correlated with the true state) before disclosing it to a policymaker. Austen-Smith and Wright (1992), Austen-Smith (1998), Dewatripont and Tirole (1999), Bennedsen and Feldmann (2002, 2006), and Dahm and Porteiro (2008*a*,*b*) consider such models in the context of lobbying and policymaking. These papers differ from ours in at least two fundamental ways: 1) they assume that the policymaker has no firsthand access to information; and 2) they consider a policy choice on a single issue, which eliminates the agenda setting considerations at the heart of our analysis. Lagerlöf (1997) also considers a model in which an interest group chooses to collect verifiable information. As in our paper, informational lobbying can lead to inefficient policymaking. However, contrary to our setting where information is symmetric, Lagerlöf's result relies crucially on an information asymmetry between the policymaker and the interest group.[6]

Rasmusen (1993) studies strategic information transmission, and like us assumes that the policymaker can acquire firsthand information. However, Rasmusen considers a single issue and therefore cannot capture the agenda-setting considerations that are key to our analysis. He still finds that informational lobbying may lead to worse policy if interest groups can sometimes deceive (i.e., tell lies to) the policymaker. Deception is absent from our framework. Some scholars argue it rarely occurs in practice. This is because, as Berry (1997, p121) notes, "credibility comes first" for lobbyists, and Hansen (1991) describes how interest groups must maintain a reputation for reliability in order to maintain access to policymakers.[7]

Esteban and Ray (2006) studies a lobbying game in which a policymaker must allocate a limited number of licenses to firms differing in their productivity and in their wealth. Wealth differences imply differences in firms' ability to lobby the policymaker. Like us, they consider a multidimensional policy space and introduce a constraint on the policymaker's agenda, and find that lobbying can lead to worse policy decisions, even when the policymaker is 'honest.' However,

[5]Dessein (2002) considers whether a decision maker is better off communicating with or delegating authority to a better informed expert; Argenziano, Severinov and Squintani (2014) considers a similar setting when information by an expert is costly. Pei (2015) considers a related environment in which experts collect information before communicating with a decision maker. The information structure in these papers differs from ours in that information is unverifiable, communication is cheap talk, and the decision maker is unable to collect information on his own.

[6]Brocas and Carrillo (2007), Brocas, Carrillo and Palfrey (2012), Kamenica and Gentzkow (2011) and Gul and Pesendorfer (2012) present models of persuasion in which agents decide how much public information to produce before a decision maker takes an action. In addition to focusing on a different set of questions than us, these papers also differ from ours in that they do not allow for firsthand evidence collection by the decision maker and they consider a single (policy) decision. Cotton and Li (2015) models a policymaker's decision to collect information in order to influence incentives that special interest groups have to lobby. In that paper, interest groups only engage in monetary, rather than informational, lobbying.

[7]See also Ainsworth (2002, p132), Rosenthal (1993, p121), and Ornstein and Elder (1978, p77).

the driving force underlying the result is different in the two papers. In Esteban and Ray (2006), the policymaker has no access to firsthand information, and the driving force is an information asymmetry between firms and the policymaker. In our framework, information is symmetric, and the driving force is the policymaker's access to firsthand information.

Our paper is also related to a series of papers that view informational lobbying as seeking to mobilize friendly legislators, rather than to change their policy preferences. Hall and Wayman (1990) and Hall (1996) argue that legislators lack time and that interest groups offer political contributions to friendly legislators in exchange for them investing time on the interest group's issue. In the same spirit, Hall and Deardorff (2006) argues that interest groups act as 'service bureaus' for friendly legislators with the purpose of relaxing the time and resource constraints they face. In addition to focusing on a different question than us, these papers also differ from ours in that they view informational lobbying as a way to mobilize *legislators*, while our paper views informational lobbying as a way to mobilize *issues* on a policymaker's agenda.

Finally, our paper is related to a vast literature in which a politician or other decision maker choose how to allocate scarce time or resources (e.g. Holmstrom and Milgrom 1991). Coviello, Ichino and Persico (2014) shows how pressure from clients can lead to inefficient prioritizing of tasks by firms. Dellis (2009) shows how elections can induce a policymaker to address a different set of issues in an effort at changing the issues on which citizens will base their voting decisions. Daley and Snowberg (2011) shows how politicians may prioritize fundraising rather than legislating when they are concerned about signaling their competence to voters. In this way, a similar agency problem exists between constituents and a policymaker, with the policymaker spending less time or effort learning about or implementing policy than constituents would prefer. However, their model does not include either interest groups or lobbying.[8] While Daley and Snowberg focus on implications for campaign finance reform, there are no political contributions and thus no role for campaign finance reform in our framework. Our results suggest that even in the absence of campaign contributions, informational lobbying can distort policy. Thus, unlike in Daley and Snowberg, banning contributions in our model does not ensure that the policymaker takes the action preferred by voters.

3. A Model of Informational Lobbying

We develop our argument using a simple model of IL, which we generalize along several dimensions in the online appendix.

A risk-neutral PM has to take action on two issues, indexed by $n = 1, 2$. An issue can be interpreted literally (e.g., abortion, same-sex marriage or gun control) or as a public investment project (e.g., a new bridge or a sports arena). We denote a policy by $p = (p_1, p_2)$, where $p_n \in \{R_n, S_n\}$ is the policy on issue n. Policy $p_n = R_n$ corresponds to the adoption of a policy reform or the funding of a public investment project. Policy $p_n = S_n$ corresponds to keeping the status quo. Given time and budget constraints, the PM is able to implement at most one reform or public investment project.

The state of the world on issue n is given by $\theta_n \in \{r_n, s_n\}$. State r_n corresponds to circumstances in which the electorate benefits from reforming issue n, and state s_n corresponds to circumstances in which the electorate benefits from keeping the status quo. The state of the world on each issue is initially unknown to all players, although the distribution is common knowledge:

$$\theta_n = \begin{cases} r_n & \text{with prob.} \quad \pi_n \in (0,1) \\ s_n & \text{with prob.} \quad 1 - \pi_n. \end{cases}$$

The PM and the electorate (a passive player in our model) share the same preferences over policy. Given policy $p = (p_1, p_2)$ and state of the world $\theta = (\theta_1, \theta_2)$, the electorate's payoff, or

[8]Although the presence of interest groups may be implicit in the fundraising process.

policy utility, is

$$u(p,\theta) = \alpha u_1(p_1,\theta_1) + u_2(p_2,\theta_2),$$

where $\alpha \geq 1$ represents the importance of issue 1 relative to issue 2, and

$$u_n(p_n,\theta_n) = \begin{cases} 1 & \text{if } (p_n,\theta_n) \in \{(R_n,r_n),(S_n,s_n)\} \\ 0 & \text{if } (p_n,\theta_n) \in \{(R_n,s_n),(S_n,r_n)\} \end{cases}$$

represents policy utility over issue n. Hence for each issue the PM and the electorate prefer the policy and the state of the world to coincide.

Throughout the paper, we adopt ex ante expected policy utility, $Eu(p,\theta)$, as the measure of policymaking effectiveness and electorate welfare. The online appendix provides a detailed discussion of this measure, and how our results carry over to alternative measures of policymaking effectiveness.

If the PM knew θ, then he could choose p to maximize $u(p,\theta)$. However, the PM is ex ante uncertain about θ. Before choosing policy p, the PM may observe information about θ. This information can come from two different sources. First, interest groups (henceforth IGs) may pay costs to collect information about the state of the world on their respective issues, and share this information with the PM. Second, the PM may pay costs to collect firsthand information about the realized state of the world for either or both issues.

Information collection and provision by IGs– There are two interest group advocates, each representing a separate issue. The IG for issue n (hereafter IG_n) prefers the reform R_n to the status quo S_n, regardless of the state θ_n. IG_n's payoff from policy p is $v_n(p_n) = 1$ when $p_n = R_n$ and $v_n(p_n) = 0$ when $p_n = S_n$. It is worth mentioning that the important feature for our results is not that IGs are advocates, but rather that they are single-issue minded (i.e., that they care only about their own issue).[9]

There is no private information, and like the PM, IGs are ex ante uncertain about the state of the world θ. In the first stage of the game, IGs simultaneously decide whether to collect public information on the state of their issue. If it chooses to do so, IG_n pays cost $c > 0$ and θ_n becomes publicly observable.[10] Information cannot be distorted or concealed from the PM.[11]

Each IG's strategy determines whether or not it lobbies. In our setting, lobbying corresponds to collecting information. IGs' pure strategies are given by $\ell = (\ell_1,\ell_2)$, where $\ell_n = 1$ if IG_n chooses to lobby and $\ell_n = 0$ otherwise. We denote by $m(\ell,\theta) = (m_1,m_2)$ the signals received by the IGs, with $m_n = \theta_n$ when IG_n collects information and $m_n = \emptyset$ when IG_n does not. Let γ_n denote the PM's interim belief that $\theta_n = r_n$ following any lobbying by IG_n. If IG_n collects information, $\gamma_n \in \{0,1\}$. If IG_n does not collect information, $\gamma_n = \pi_n$.

Information collection by the PM– Following lobbying by the IGs, the PM can collect firsthand information on the state of the world. His information collection involves a sequential decision. He decides which, if either, issue to collect information about first, and then after learning about

[9]Indeed, our results carry over to a setting in which IGs share the same policy preferences as the electorate on their specific issue, i.e., IG_n's payoff from policy p is $v_n(p_n,\theta_n) = u_n(p_n,\theta_n)$. It is worth mentioning as well that the assumption that there is only one IG per issue is a first pass. The online appendix considers a setting in which there are two IGs per issue, one in favor of the reform proposal and another one in favor of the status quo.

[10]In the online appendix, we allow for information collection costs to differ across issues. We also allow for information to be noisy and vary across issues (i.e., θ_n is observed with probability $q_n \in (1/2,1]$ if IG_n collects information).

[11]This setting is equivalent to one in which the PM observes IGs' decisions to collect verifiable information and IGs decide whether to reveal their information, as IGs will always choose to reveal favorable information in equilibrium.

that issue decides whether to also collect information about the second issue.[12] If he collects information on issue n, the PM pays cost $d > 0$ and θ_n becomes publicly observed.[13]

Let $\sigma = (\sigma_1, \sigma_2)$ denote the PM's information collection strategy, where $\sigma_1 \in \{1, 2, \emptyset\}$ specifies the issue the PM decides to investigate first, and $\sigma_2 \in \{1, 2, \emptyset\}$ the issue he decides to investigate second. If the PM chooses to not collect any information on his own, then $\sigma_1 = \sigma_2 = \emptyset$. The decision about whether to collect information on a first issue can condition on signals obtained by IGs, (m_1, m_2). The decision about whether to collect information on a second issue can condition on (m_1, m_2) and on the signal obtained on the first issue the PM chooses to investigate. For example, the PM may choose to collect information on issue 1 first, and to collect information on issue 2 only if $\theta_1 = s_1$. Let $m^{PM} = (m_1^{PM}, m_2^{PM})$ denote the signals obtained by the PM, with $m_n^{PM} = \theta_n$ when the PM collects information about issue n and $m_n^{PM} = \emptyset$ when the PM does not.

Policy selection– After the IGs and the PM have had the opportunity to collect information, the PM chooses policy. On each issue n, he chooses between keeping the status quo $p_n = S_n$ and adopting reform $p_n = R_n$. Denote the PM's policy strategy by p, which can condition on information about the state of the world revealed through IG lobbying and the PM's own information collection efforts, (m, m^{PM}).

Let β_n denote the PM's posterior belief that $\theta_n = r_n$ following any lobbying by the IGs and any information collection on his own. If either the IG or the PM collected information on issue n, then $\beta_n \in \{0, 1\}$. If no one collected information on issue n, then $\beta_n = \pi_n$.

Payoffs– Given policy p, IG_n earns payoff $v_n(p_n) - c$ if it lobbied and $v_n(p_n)$ if it did not. The electorate gets policy utility $u(p, \theta)$. Finally, the PM earns payoff $U^{PM} = u(p, \theta) - 2d$ if he collected firsthand information on the two issues, $U^{PM} = u(p, \theta) - d$ if he collected firsthand information on only one issue, and $U^{PM} = u(p, \theta)$ if he collected no firsthand information. Given signals (m, m^{PM}), the PM chooses policy that maximizes expected policy utility given his posterior beliefs $\beta = (\beta_1, \beta_2)$ on θ, $E_\beta u(p, \theta)$. However, the PM faces costs of information collection which are not shared with the electorate. The PM may therefore choose to remain uninformed about an issue on which the electorate would prefer him to become informed. In this way, there exists an agency problem between the PM and the electorate.[14]

Timing– In stage 0, nature chooses the state θ_n for each issue n. States are drawn independently across issues. In stage 1, IGs decide simultaneously and non-cooperatively whether to collect information on their respective issues, i.e., whether to lobby.[15] When IG_n collects information, θ_n

[12] The online appendix considers cases where the PM must choose simultaneously, instead of sequentially, on which issue(s) to collect information, and where information collection costs and the precision of noisy signals differ across issues, rather than be the same across issues. The online appendix considers also the case where the PM decides on his information collection before IGs decide whether to lobby.

[13] The PM's information collection costs can consist of monetary and non-monetary costs. Examples of monetary costs are costs of ordering an opinion poll in order for the PM to get a sense of which policy choice is favored by a majority of his constituents. Examples of non-monetary costs are opportunity costs for the time the PM spends attending legislative hearings or gathering documentation on the issue.

[14] There are issues setting up a contract or institution to ensure that the PM collects the information if the PM's efforts are unobservable, if the electorate is unwilling to cover the PM's information collection costs once an IG has provided information, if the electorate is unable to credibly commit to compensate the PM for his information collection costs, or if it is infeasible to compensate the PM for undertaking information collection.

[15] The assumption that IGs move simultaneously is standard in the literature. This would correspond to circumstances in which the PM has a short time span to make his policy decision (e.g., because of a looming election) or to circumstances in which information collection takes time, so that an IG cannot wait to see the signal collected by other IGs before making its own information collection decision. Having said this, there are other circumstances in which IGs may be able to make information collection decisions sequentially. One might then wonder whether our

is observed by the IG and the PM. In stage 2, the PM decides whether to collect information on his own. In stage 3, the PM chooses policy.

Equilibrium– We consider pure strategy perfect Bayesian equilibria. Loosely speaking, an equilibrium consists of strategies ℓ^*, $\sigma^*(.)$ and $p^*(.)$, and beliefs $\gamma^*(.)$ and $\beta^*(.)$ such that 1) at every decision stage each agent takes an action that maximizes its expected payoff given its beliefs and others' behavior, and 2) beliefs are derived using Bayes' rule and are consistent with equilibrium strategies and the priors. Except for cases of indifference, the equilibrium is unique.[16]

Detrimental IL– We have described above a model in which IGs are present, and where lobbying involves the collection of information about the merits of one's preferred reform. Our analysis involves comparing the above game to one in which there are no IGs, or in which IL is not feasible or allowed. This game is similar to the one described above except that IGs are removed as players. We refer to this game as the game without IGs and to the game described above as the game with IGs.

To study the implications of IL, we compare these two games. Throughout the paper, we use electorate's equilibrium ex ante expected policy utility $Eu(p,\theta)$ as our measure of policymaking efficiency, and focus on determining conditions under which this measure is lower in the presence of IGs. We say that IL is *detrimental* if $Eu(p^{IL},\theta) < Eu(p,\theta)$, where p is the equilibrium policy in the game without IGs and p^{IL} is the equilibrium policy in the game with IGs.

4. Detrimental Informational Lobbying

This section identifies situations in which IL is detrimental in equilibrium. First, we present an example in order to build intuition for the more-formal analysis. Then we present a necessary condition for IL to be detrimental, before fully characterizing detrimental IL in two polar cases: one in which issues differ only in their relative importance and another in which issues differ only in priors. In each of these two cases, we identify regions of the parameter space in which IL is detrimental.

4.1. **An Example.** We begin with an illustrative example showing how the presence of IL can distort the policy agenda and be detrimental. Consider a situation in which issues differ only in their relative importance. We choose specific parameter values to make the example straightforward. Assume

- $\alpha = 3$, i.e., issue 1 is thrice as important as issue 2;
- $\pi_1 = \pi_2 = 2/5$, i.e., the status quo is ex ante preferable than implementing a reform; and
- $c = 1/3$ and $d = 1$.[17]

Consider first the equilibrium in the game without IGs. Given our parameter values, the PM prefers to collect information on issue 1, and then implement policy $p = (R_1, S_2)$ when $\theta_1 = r_1$ and $p = (S_1, S_2)$ when $\theta_1 = s_1$. This strategy gives the PM an expected payoff of $U^{PM} = \alpha + (1 - \pi_2) - d = 13/5$, which is higher than his expected payoff of alternative information collection

results are robust to IGs moving sequentially, the second mover observing the signal received by the first mover before deciding whether to collect information. All our results are robust to having the IG involved with the more-important issue or the issue with higher priors moving first. Moreover, the result stated in Proposition 2 is robust to having the IG involved with the issue with lower priors moving first. However, the result stated in Proposition 1 is not robust to having the IG involved with the less-important issue moving first.

[16] In case of indifference between collecting and not collecting information on an issue, we assume that the PM or an IG chooses to collect information. Likewise, in case of indifference between adopting and not adopting a reform, the PM chooses to adopt the reform.

[17] Notice that $c < d$ does not imply that the PM faces higher monetary costs of information collection compared to the IGs. The IGs' potential policy benefit is normalized to 1, while the PM's per issue policy utility ranges are 3 on issue 1 and 1 on issue 2.

strategies. Indeed, collecting no information before acting on his priors and implementing $p = (S_1, S_2)$ yields $U^{PM} = (1-\pi_1)\alpha + (1-\pi_2) = 12/5 < 13/5$, and collecting information on issue 2 is never optimal since the information collection costs d are larger than the expected gain, equal to π_2. In equilibrium, the PM considers reforming the most important issue, but ignores the less important issue. The PM always implements the best policy on issue 1, and keeps the status quo on issue 2 regardless of θ_2. Electorate welfare in this case is $Eu\,(p,\theta) = \alpha + (1-\pi_2) = 18/5$.

Consider next the game with IGs. In equilibrium, only IG_2 lobbies. When IG_2 gets favorable information (i.e., $m_2 = r_2$), the PM chooses $p = (S_1, R_2)$ without collecting any information on issue 1. When IG_2 gets unfavorable information (i.e., $m_2 = s_2$), the PM responds by collecting information on issue 1 and then implementing either $p = (R_1, S_2)$ or $p = (S_1, S_2)$ depending on θ_1. We now verify that these are indeed the strategies in the equilibrium of the game with IGs.

First, we establish that IG_2 prefers to lobby. This is because in the absence of lobbying, the PM ignores issue 2 (as we established above). For IG_2, lobbying yields an expected payoff of $\pi_2 - c = 1/15$, which is higher than the payoff of 0 from not lobbying.

Second, consider the PM's action in response to lobbying in which he learns that reform 2 is beneficial (i.e., $m_2 = r_2$). Even though the PM cares more about issue 1 than issue 2, he is not sure which policy is better on issue 1, contrary to issue 2. Furthermore, even if the PM were to collect information on issue 1 and learn that reform on issue 1 is beneficial (i.e., $m_1^{PM} = r_1$), implementing the reform on issue 1 would involve forgoing the reform on issue 2, which he already knows to be preferable to the status quo; this reduces the expected gain from collecting information on issue 1 compared to the case where the PM is not informed about issue 2 and, a fortiori, to the case where the PM knows the status quo to be preferable on issue 2. In equilibrium, following the revelation that $m_2 = r_2$, the PM chooses not to collect information on issue 1 (earning $U^{PM} = (1-\pi_1)\alpha + 1 = 14/5$) rather than collecting information on issue 1 before choosing policy (alternatively earning $U^{PM} = \alpha + (1-\pi_1) - d = 13/5 < 14/5$).

Third, consider the PM's action when he learns that reform 2 is not beneficial (i.e., $m_2 = s_2$). In this case, the PM chooses to learn about issue 1 prior to choosing policy (earning $U^{PM} = \alpha + 1 - d = 3$) over not collecting information on issue 1 and keeping the status quo on both issues (alternatively earning $U^{PM} = (1-\pi_1)\alpha + 1 = 14/5 < 3$). The key difference between the case where $m_2 = s_2$ and $m_2 = r_2$ is that when $m_2 = s_2$, the gain of adopting the reform on issue 1 following signal $m_1^{PM} = r_1$ is higher, as it does not involve forgoing a reform on issue 2 which is already known to be beneficial.

Fourth, it remains to consider the decision of IG_1 not to lobby. It is essential that IG_1 does not engage in counteractive lobbying in order to offset the lobbying efforts of IG_2, as lobbying by both IGs would lead to a fully informed PM who can always choose the policy that maximizes $u\,(p,\theta)$. In the absence of lobbying by IG_2, IG_1 would never have an incentive to lobby because the PM will himself collect information on issue 1 (as we established in the game without IGs). When IG_2 lobbies, however, there is a positive probability that IG_2 succeeds in its lobbying efforts, and the PM implements the reform on issue 2 without first learning about issue 1. By lobbying, IG_1 can maintain priority on the PM's agenda, and expects payoff $\pi_1 - c = 1/15$. By not lobbying, on the other hand, IG_1 loses priority, but also saves information collection costs, expecting payoff $(1-\pi_2)\pi_1 = 6/25 > 1/15$. Thus, IG_1 prefers not to lobby, hoping that IG_2 fails to get favorable information, in which case the PM will collect his own information on issue 1.

In the equilibrium of the game with IGs, the PM always implements the best policy on issue 2, and implements the best policy on issue 1 only if $\theta_1 = s_1$ or IG_2's lobbying efforts are unsuccessful (i.e., $\theta_2 = s_2$). Electorate welfare in this case is $Eu(p^{IL},\theta) = \alpha(1-\pi_2\pi_1) + 1 = 88/25 (< 18/5 = Eu(p,\theta))$. Comparing $Eu(p,\theta)$ with $Eu(p^{IL},\theta)$ establishes that IL is detrimental. This happens because equilibrium lobbying by IG_2 changes the PM's incentives to collect information on his own, inducing the PM to change his priorities and triggering a distortion in the policy agenda.

To sum up, if there were no lobbying, the PM would take it upon himself to learn about the more-important issue before choosing policy. Because the PM never considers reforming the less-important issue, it is conceivable that IL would improve policymaking if it resulted in the PM becoming informed about the two issues. In that case, the PM would still prioritize issue 1, but would not ignore issue 2 if he discovers unfavorable information on the more-important issue. But, the analysis shows that this is not the case. Instead, only the IG involved with the less-important issue chooses to lobby, and when it gets favorable information, the PM no longer finds it worthwhile to devote resources towards reviewing the reform on the more-important issue, and instead chooses to adopt the reform on the less-important issue. Only when IG_2's efforts reveal that the reform on the less-important issue is not beneficial does the PM go on to review the more-important issue. This means that the presence of IGs leads the PM to be more often informed about the less-important issue, and less often informed about the more-important issue. Comparing expected equilibrium policy utility in the two scenarios establishes that IL results in worse policy compared to the case without IL.

4.2. **Necessary conditions.** Our argument relies on two fundamental assumptions that are incorporated into our model. First, our argument requires that the PM is able to implement at most one reform. The PM must therefore set his agenda, deciding which issue to prioritize. This introduces the possibility that lobbying changes the priorities of the PM. Second, our argument requires that the PM can collect information on his own, and therefore may become informed about policy even in the absence of lobbying. This introduces the possibility that lobbying changes the issues on which the PM becomes informed. If the PM is not constrained on the number of issues he can reform, or if he cannot learn about issues on his own, then in no equilibrium is IL detrimental.[18]

The following lemma identifies an additional requirement for IL to be detrimental.

Lemma 1. *$Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$ only if $\alpha \neq 1$ and/or $\pi_1 \neq \pi_2$, i.e., issues differ in their relative importance and/or their priors.*

The lemma rules out the case where issues are equally important ($\alpha = 1$) and their reform proposals equally promising ($\pi_1 = \pi_2$). Essentially, this condition means that the PM must value information on one issue more than he values information on the other issue. The intuition underlying this condition relies on the fact that when $\alpha = 1$ and $\pi_1 = \pi_2$, IL can lead to worse policy only if the expected number of issues on which the PM gets informed is smaller in the game with IGs than in the game without IGs. For this to be true, it would have to be that 1) in the game without IGs, the PM collects information on both issues with a positive probability, and 2) in the game with IGs, information collection by one IG deters the PM from collecting information on the other issue. This cannot be true if the PM values equally the information on each issue.[19]

4.3. **Detrimental IL when issues differ in their relative importance.** We now analyze the polar case in which issues differ only in their relative importance. Specifically, we assume $\pi_1 = \pi_2$ and $\alpha > 1$. We refer to this case as the α-case.

In the game without IGs, the PM will choose either to learn about neither issue ($\sigma_1 = \sigma_2 = \emptyset$), or to learn about the more-important issue during the first step of his information collection ($\sigma_1 = 1$). Because the two reforms are equally likely to be beneficial, the PM prefers to prioritize information collection on the more-important issue. If he chooses to learn about neither issue,

[18]The online appendix contains a formal proof of this claim.

[19]We show in the online appendix that when we allow for a difference in the quality of signals across issues, i.e., $q_1 \neq q_2$, where $q_n \in (1/2, 1]$ is the probability that information collection on issue n correctly reveals θ_n, the condition of Lemma 1 writes: "$\alpha \neq 1$ and/or $\pi_1 \neq \pi_2$ and/or $q_1 \neq q_2$".

then IL cannot be detrimental, as it can only expand the set of issues on which the PM becomes informed before choosing policy. Therefore, for lobbying to be detrimental, the PM must begin by learning about issue 1 on his own in the absence of lobbying. If this information search on issue 1 yields favorable evidence ($m_1^{PM} = r_1$), then the PM will implement the reform on issue 1 and will keep the status quo on issue 2. In this way, the PM gives priority to the more-important issue, choosing to rule out reform on issue 1 before considering reform on issue 2.

For lobbying to be detrimental, it must shift the PM's priority away from the more-important issue and to the less-important issue. For this to be the case, only IG_2 can lobby in equilibrium of the game with IGs, and when successful in showing $m_2 = r_2$ this lobbying must cause the PM to implement the reform on issue 2 without collecting his own information on issue 1. IL cannot be detrimental if the PM still always becomes informed about issue 1 before choosing policy. This is the case if the PM always collects information himself about issue 1 before choosing policy, or if IG_1 engages in 'counteractive lobbying' to prevent the priority shift to the other issue. In each of these two situations, IL will not be detrimental as the PM will still prioritize issue 1, implementing the reform on issue 1 whenever it is beneficial. The following lemma establishes this formally.

Lemma 2. *In the α-case, IL is detrimental only if each of the following holds:*

(L2.1) In the game without IGs, the PM prioritizes issue 1, learning about it first (i.e., $\sigma_1 = 1$), and implementing the reform on issue 1 whenever it is beneficial (i.e., $m_1^{PM} = r_1$).

(L2.2) In the game with IGs, IL leads the PM to prioritize issue 2. This requires that only IG_2 lobbies (i.e., $\ell_1 = 0$ and $\ell_2 = 1$), and that the PM prioritizes issue 2 whenever IG_2 gets favorable information (i.e., $m_2 = r_2$).

Proposition 1 identifies the regions of the parameter space in which IL is detrimental. For each of the parameter configurations satisfying the conditions in the proposition, equilibrium behavior satisfies the necessary conditions of Lemma 2 for IL to be detrimental.

Proposition 1. *Let $\pi_1 = \pi_2 \equiv \pi$ and $\alpha > 1$. $Eu\left(p^{IL}, \theta\right) < Eu\left(p, \theta\right)$ if and only if each of the following four conditions holds:*

(P1.1) $\pi < 1/2$,

(P1.2) $\pi\left(\alpha - 1\right) < d \leq \pi\alpha$,

(P1.3) $\pi^2 < c \leq \pi$, *and*

(P1.4) $1/\pi < \alpha$.

To understand the conditions in Proposition 1, it is helpful to start by distinguishing the two types of motive that an IG may have to lobby. We say that IG_n exercises an *agenda motive* if it seeks to induce the PM to prioritize issue n. We say that IG_n exercises a *persuasion motive* if it seeks to persuade the PM that $\theta_n = r_n$. The latter motive is the standard one studied in the literature. The agenda motive is more specific to our analysis where the PM is constrained on the number of issues he can reform.

Whenever IL is detrimental, lobbying by IG_2 switches priority away from issue 1 and to issue 2. As discussed above, this switch requires that only IG_2 lobbies. Given $\pi_1 = \pi_2$, the agenda motive for IG_2 to lobby is the same as the agenda motive for IG_1 to 'lobby counteractively' and prevent the priority shift to issue 2. When $\pi \geq 1/2$, there is no persuasion motive for an IG to lobby, and the benefit that IG_2 has to lobby is as large as the benefit that IG_1 has to lobby counteractively. Hence, condition P1.1, which is necessary for IGs to have a persuasion motive to lobby.

When $\pi < 1/2$, in contrast, there exists a range of parameter values in which IG_2 has a larger benefit from lobbying than does IG_1 have from counteractive lobbying. This is because when the priors favor the status quo, IGs may have not only an agenda motive for lobbying, but also a persuasion motive since the PM needs to get favorable information on a reform before he considers adopting it. This persuasion motive is stronger for IG_2 than for IG_1 if the PM chooses to learn on his own about issue 1 when IG_2 fails in its persuasion attempt (i.e., $m_2 = s_2$), but would never choose to collect information on issue 2. For the PM to collect information on issue 1 when he knows that $\theta_2 = s_2$, his expected gain $\pi\alpha$ must be at least as large as his information collection costs d. Hence, the upper bound in condition P1.2.

Lemma 2 implies that IL can be detrimental only if the PM prioritizes issue 2 whenever IG_2's persuasion attempt is successful and the PM knows $\theta_2 = r_2$. The PM must then forgo learning about issue 1 when he knows that $\theta_2 = r_2$, which happens when his expected gain from doing so, $\pi(\alpha - 1)$, is smaller than his information collection costs d. Hence, the lower bound in condition P1.2.

Condition P1.3 guarantees that IGs' information collection costs are small enough that IG_2's persuasion motive is sufficient for this IG to lobby, but are nonetheless small enough that IG_1's agenda motive is not sufficient for this IG to lobby.

To summarize, the equilibrium outcome of the game without IGs is:

- The PM collects information on issue 1, and only on issue 1: $\sigma_1 = 1$ and $\sigma_2 = \emptyset$.
- The PM chooses policy

$$p = \begin{cases} (R_1, S_2) & \text{if } m_1^{PM} = r_1 \\ (S_1, S_2) & \text{if } m_1^{PM} = s_1. \end{cases}$$

- Ex ante expected policy utility is $Eu(p, \theta) = \alpha + (1 - \pi)$.

The equilibrium outcome of the game with IGs is:

- IG_2, and only IG_2, lobbies: $(\ell_1, \ell_2) = (0, 1)$.
- The PM collects information on issue 1 if and only if $m_2 = s_2$:

$$\sigma_1 = \begin{cases} 1 & \text{if } m_2 = s_2 \\ \emptyset & \text{if } m_2 = r_2 \end{cases} \quad \text{and } \sigma_2 = \emptyset.$$

- The PM chooses policy

$$p^{IL} = \begin{cases} (S_1, R_2) & \text{if } m_2 = r_2 \\ (R_1, S_2) & \text{if } m_2 = s_2 \text{ and } m_1^{PM} = r_1 \\ (S_1, S_2) & \text{if } m_2 = s_2 \text{ and } m_1^{PM} = s_1. \end{cases}$$

- Ex ante expected policy utility is $Eu(p^{IL}, \theta) = [\pi(1 - \pi) + (1 - \pi)]\alpha + 1 = (1 - \pi^2)\alpha + 1$.

IL is detrimental when the priority shift yields $Eu(p^{IL}, \theta) < Eu(p, \theta)$. In the game without IGs, the PM implements the reform on issue 1 whenever it is beneficial and ignores issue 2. He implements the best policy in all cases except where $\theta = (s_1, r_2)$, when the best policy involves reforming issue 2. The expected cost of this mistake to constituents is $1 \cdot (1 - \pi)\pi$. In the game with IGs, the PM no longer ignores issue 2, which is beneficial for policy. At the same time, priority shifts to the less-important issue, which is harmful for policy. With IGs, the PM implements the best policy in all cases except where $\theta = (r_1, r_2)$. The expected cost of this mistake to constituents is $(\alpha - 1)\pi^2$. The expected cost is smaller in the game without IGs than in the game with IGs when $(1 - \pi)\pi < (\alpha - 1)\pi^2$, or $1/\pi < \alpha$. Hence, condition P1.4. Intuitively, this condition requires that issue 1 is sufficiently more important than issue 2.

To summarize, IL is detrimental whenever the conditions in Proposition 1 hold. These conditions require that the priors support status quo policies, that the costs of information collection are moderate for both the IGs and the PM, and that one of the issues is sufficiently more important than the other.

4.4. **Detrimental IL when issues differ in priors.** This section considers the other polar case, where issues differ only in priors. Specifically, we assume $\pi_1 > \pi_2$ and $\alpha = 1$. We refer to this case as the π-case.

In the previous section, IL was detrimental when it shifted priority from a more-important issue to a less-important issue. In this section, the two issues are equally important, but the probability of reform being beneficial differs across issues. Here, IL can be detrimental if it crowds out information collection by the PM, resulting in policy decisions that are less informed, in expectation.

For lobbying to be detrimental, the PM must begin by learning on his own about the more-promising issue (i.e., the issue with higher priors) in the absence of lobbying. If this information search on issue 1 yields favorable evidence ($m_1^{PM} = r_1$), then the PM will implement the reform on issue 1 and will keep the status quo on issue 2. In this way, the PM gives priority to the more-promising issue, choosing to rule out reform on issue 1 before considering reform on issue 2. For lobbying to crowd out information collection by the PM, it must be moreover that when the PM observes $m_1^{PM} = s_1$, he collects information on issue 2 before choosing policy. In this way, the expected number of issues on which the PM will be informed in the absence of lobbying exceeds one.

For IL to be detrimental, it must be also that only IG_2 lobbies in equilibrium of the game with IGs. When IG_2 receives signal $m_2 = r_2$, the PM implements reform on issue 2. In this way, the PM gives priority to the less-promising issue, ruling out reform on issue 2 before considering reform on issue 1. For IL to crowd out information collection by the PM, it must also be that when IG_2 receives signal $m_2 = s_2$, the PM prefers *not* to collect information on issue 1. In this way, the PM will be informed on only one issue in the presence of lobbying, which is smaller than the expected number of issues on which the PM would be informed in the absence of lobbying. If the PM were to collect information on issue 1 following $m_2 = s_2$, the expected number of issues on which he would be informed in the presence of lobbying (equal to $2 - \pi_2$) would exceed the corresponding number in the absence of lobbying (equal to $2 - \pi_1$). In this case, IL would *not* lead to less-informed policy decisions, and could *not* be detrimental.

From this discussion, we can see that the conditions in Lemma 2 carry over to this environment.

Lemma 3. *In the π-case, Lemma 2 continues to hold.*

The following proposition identifies the region of the parameter space in which IL is detrimental.

Proposition 2. *Let $\pi_1 > \pi_2$ and $\alpha = 1$. $Eu\left(p^{IL}, \theta\right) < Eu\left(p, \theta\right)$ if and only if each of the following two conditions holds:*

(1)
(P2.1) $1 - \pi_1 < d \leq \min\{\pi_2, 1 - \pi_2, (1 - \pi_1)(1 + \pi_2)/(2 - \pi_1)\}$, *and*
(P2.2) $c \leq \pi_1 \pi_2$.

The upper bound in condition P2.1 ensures that the costs of information collection for the PM are sufficiently low that in the absence of lobbying, the PM prefers to collect information on issue 1, followed by issue 2 if he learns $m_1^{PM} = s_1$. The three possible upper bounds correspond to different outside options, depending on whether the next best strategy involves forgoing information collection all together, or forgoing information collection on issue 2. In this latter case, the upper bound also depends on whether π_2 is greater than or less than $1/2$.

The lower bound in condition P2.1 ensures that the costs of information collection for the PM are sufficiently high that the PM prefers to forgo information collection on issue 1 if he learns about issue 2 first. Given that $1 - \pi_1 < d \leq \pi_2$ and $\pi_2 < \pi_1$ together imply $|1/2 - \pi_2| <$

$|1/2-\pi_1|$ and, therefore, $\pi_1 > 1/2$, this involves implementing the reform on issue 1 based on the priors rather than collecting information on issue 1 when lobbying provides $m_2 = s_2$.[20]

Condition P2.2 ensures that the costs of information collection for the IGs are low enough that IG_2 prefers to lobby in an attempt at switching the priorities of the PM from issue 1 (in the absence of lobbying) to issue 2. Even for very low c, IG_1 prefers not to lobby if in any case the PM implements the reform on issue 2 following $m_2 = r_2$, and always implements the reform on issue 1 following $m_2 = s_2$.

To summarize, the equilibrium outcome of the game without IGs is:

- The PM starts by collecting information on issue 1, and continues by collecting information on issue 2 if and only if $m_1^{PM} = s_1$: $\sigma_1 = 1$, $\sigma_2 = \emptyset$ if $m_1^{PM} = r_1$, and $\sigma_2 = 2$ if $m_1^{PM} = s_1$.
- The PM chooses policy

$$p = \begin{cases} (R_1, S_2) & \text{if } m_1^{PM} = r_1 \\ (S_1, R_2) & \text{if } m_1^{PM} = s_1 \text{ and } m_2^{PM} = r_2 \\ (S_1, S_2) & \text{if } m_1^{PM} = s_1 \text{ and } m_2^{PM} = s_2. \end{cases}$$

- Ex ante expected policy utility is $Eu(p, \theta) = 2 - \pi_1\pi_2$.

The equilibrium outcome of the game with IGs is:

- IG_2, and only IG_2, lobbies: $(\ell_1, \ell_2) = (0, 1)$.
- The PM does not collect information: $\sigma_1 = \sigma_2 = \emptyset$.
- The PM chooses policy

$$p^{IL} = \begin{cases} (S_1, R_2) & \text{if } m_2 = r_2 \\ (R_1, S_2) & \text{if } m_2 = s_2. \end{cases}$$

- Ex ante expected policy utility is $Eu\left(p^{IL}, \theta\right) = [\pi_2 (1-\pi_1) + (1-\pi_2)\pi_1] + 1 < Eu(p, \theta)$.

5. Discussion

We now discuss several implications of detrimental IL.

5.1. **Probability of implementing an optimal policy.**

First, we consider the probability of the PM implementing an optimal policy. By optimal policy we mean a policy that maximizes policy utility $u(p, \theta)$ given θ, i.e., that the PM would choose if he were completely informed about the state of the world $\theta = (\theta_1, \theta_2)$.

When IL is detrimental, it reduces the probability of the PM becoming informed about issue 1, while simultaneously increasing the probability of the PM becoming informed about issue 2.

In the α-case, IL has a larger positive impact on the probability of learning θ_2 than it has a negative impact on the probability of learning θ_1. In this case IL *increases* the probability of the PM implementing an optimal policy. Yet, IL is nonetheless detrimental because it makes the PM more likely of choosing the wrong policy on the more-important issue. Interestingly, this result shows that IL can be informative (in the sense of leading to better-informed policy choices, in expectation) and yet be detrimental.

The opposite is true in the π-case. IL has a smaller positive impact on the probability of learning θ_2 than it has a negative impact on the probability of learning θ_1. In this case, IL is detrimental precisely because it decreases the PM's incentives to collect information on his own, and *reduces* the probability of the PM implementing an optimal policy. Interestingly, this result shows that IL can actually lead to less-informed policy choices, in expectation.

[20] Observe that $|1/2-\pi_2| < |1/2-\pi_1|$ explains why the PM chooses to investigate issue 2 following signal $m_1^{PM} = s_1$ (in the equilibrium of the game without IGs), and chooses *not* to investigate issue 1 following signal $m_2 = s_2$ (in the equilibrium of the game with IGs).

This discussion is summarized in the following implication.

Implication 1. *Detrimental IL strictly increases the probability of the PM implementing an optimal policy in the α-case and strictly decreases the probability in the π-case.*

5.2. **IG and PM preference alignment.** Next, we consider the possibility of friendly lobbying, defined as lobbying by an IG involved with an issue on which the PM ex ante believes that the policy advocated by the IG is the best policy on this issue. Formally, in our setting where IGs advocate reforms, lobbying by IG_n is said to be *friendly* if $\pi_n \geq 1/2$, meaning that the PM ex ante believes that the reform on issue n is beneficial. Lobbying by IG_n is said to be *confrontational* if instead $\pi_n < 1/2$, meaning that the PM is predisposed against implementing the reform on issue n.

Implication 2. *Detrimental IL is always confrontational in the α-case, but can be friendly or confrontational in the π-case.*

An interesting feature of our analysis is that it can rationalize friendly lobbying. This is because agreement between the PM and an IG that reform is (likely) beneficial does not guarantee that the PM prioritizes that reform. In our framework, an interest group may be motivated to lobby not by the need to sway the PM's beliefs about the benefits to be in favor of reform, but rather to gain priority on the policymaking agenda. This motive is key in the π-case, where IG_2 may lobby even when $\pi_2 > 1/2$, where lobbying may therefore be friendly. By contrast, condition P1.1 implies that the persuasion motive is always present in the α-case, implying that lobbying cannot be friendly.

Implication 2 has special significance for the debate on lobbying. As Kollman (1997, p520) writes, some people have concluded that: "If interest groups lobby their friends (the friendly model), the influence of lobbying may not be as large as many people think because lobbyists merely reinforce existing policy preferences among legislators." Our analysis contradicts this type of statement, showing that friendly lobbying can have a substantial impact on policymaking and even be detrimental.

5.3. **Motivation for lobbying.** Finally, we assess the motives an IG has for lobbying. Recall that there are two possible motives, an agenda motive and a persuasion motive. We say that the agenda motive is necessary for IG_n to lobby if IG_n would not lobby in equilibrium if there were no restriction on the number of reform proposals the PM can implement. We say that the persuasion motive is necessary for IG_n to lobby if IG_n would not lobby in equilibrium if $\pi_n \geq 1/2$.

Implication 3. *Consider a parameter configuration for which IL is detrimental. In the α-case, IG_2 necessarily has a persuasion motive, but not necessarily an agenda motive, for lobbying. In the π-case, IG_2 necessarily has an agenda motive, but not necessarily a persuasion motive, for lobbying.*

Interestingly, Implication 3 shows that in the α-case, detrimental IL is driven by IG_2's attempt at persuading the PM, and not necessarily at switching the PM's priority. Yet, IL is detrimental because it has the (unintended) consequence of inducing the PM to switch priority to a less-important issue.

6. Conclusion

In this paper, we challenge the view that pure informational lobbying (in the absence of political contributions and evidence distortion or withholding) leads on average to better policy. We do so under the assumptions that interest groups can influence policymaking only through information provision and cannot manipulate or hide information, that the policymaker and interest groups have access to the same information collection technology, and that the policymaker's and the electorate's policy preferences are perfectly aligned. We have shown that even in such a context, pure informational lobbying can lead to worse policy in a systematic way.

Our results rely on a number of features of the policymaking process. First, the policymaker has limited capacity to implement reform. This means that the policymaker must prioritize issues, which allows for the possibility that informational lobbying by interest groups may influence the policy agenda. Second, the policymaker has the ability to learn about issues on his own. This means that the presence of informational lobbying is not necessary for informed policymaking, as the policymaker may collect firsthand information. It also introduces the possibility that the policymaker chooses to become informed about different issues without lobbying than he learns about with lobbying. Third, the policymaker faces costs of information collection. This is consistent with the idea that it takes effort for the policymaker to learn about and understand an issue, and that this effort is not directly observable, that the contractable framework is incomplete or that the electorate is unwilling to ex-post compensate the policymaker for the costs of information collection. This results in an agency problem between the policymaker and the electorate who, before any information collection by interest groups, may prefer the policymaker to collect more information than the policymaker effectively chooses to collect ex post.

This means that interest group influence may lead to worse policy even when there is no 'corruption' on the part of interest groups or policymakers. In our analysis, interest group influence leads to worse policy without requiring interest groups to engage in any form of 'bribery' (whether legal, e.g. political contributions, or illegal, e.g. corruption), deception of policymakers, or exploitation of a political advantage ensuing from some interest group's ability at solving their collective action problem and other interests' inability at solving this problem.

Our analysis has important implications for the debate on the merits of campaign finance reform and lobbying. It shows that eliminating special interest money from the political process is not sufficient to ensure that policymakers implement the policies favored by their constituents, even if they share the same policy preferences.

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Mathematical Appendix

Proof of Lemma 1. Assume by way of contradiction that $\alpha = 1$ and $\pi_1 = \pi_2 \equiv \pi$. Let $U_{\max}$ denote the expected policy utility when the PM is fully informed about the realized θ_1 and θ_2. Let $Eu\left(p^{\Gamma},\theta\right)$ denote the equilibrium expected policy utility in game $\Gamma \in \{\emptyset, IL\}$.

Observe that $Eu\left(p^{IL},\theta\right) \geq Eu\left(p,\theta\right)$ whenever both IGs adopt the same information collection strategy, i.e., $\ell_1 = \ell_2$. Specifically, if $\ell_1 = \ell_2 = 1$, then $Eu\left(p^{IL},\theta\right) = U_{\max} \geq Eu\left(p,\theta\right)$. If $\ell_1 = \ell_2 = 0$, then $Eu\left(p^{IL},\theta\right) = Eu\left(p,\theta\right)$. Hence, $Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$ implies $\ell_1 \neq \ell_2$. W.l.o.g. suppose $\ell_1 = 1$ and $\ell_2 = 0$.

For $Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$, it must be that in the game with IGs, the PM does not collect information on issue 2; otherwise, the PM would be fully informed about θ_1 and θ_2 (given $\ell_1 = 1$) and we would then have $Eu\left(p^{IL},\theta\right) = U_{\max} \geq Eu\left(p,\theta\right)$. For the PM to not collect information on issue 2 (following a signal $m_1 = s_1$), it must be that $d > \underline{\pi}$, where $\underline{\pi} \equiv \min\{\pi, 1-\pi\}$.

For $Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$, given $\ell_1 = 1$ it must be that in the game without IGs the PM starts by collecting information on issue 2. Moreover, it must be that following $m_2^{PM} = s_2$, the PM collects information on issue 1 so that, in expectation, he is informed on a greater number of issues in the game without IGs than in the game with IGs. This requires $\underline{\pi} \geq d$, which contradicts $d > \underline{\pi}$ (from the above paragraph). ■

Proof of Lemma 2. We start by establishing the necessity of condition L2.1.

For $Eu\left(p,\theta\right) > Eu\left(p^{IL},\theta\right)$, it must be that in the game without IGs, the PM collects information on at least one issue. Assume by way of contradiction that he starts by collecting information on issue 2.

It must then be that in the game with IGs, IG_1 is the only IG to collect information, i.e., $(\ell_1, \ell_2) = (1, 0)$. Moreover, following signal $m_1 = s_1$, the PM must not collect information on issue 2; otherwise he would make a full information policy choice, in which case $Eu\left(p^{IL},\theta\right) = U_{\max} \geq Eu\left(p,\theta\right)$. For the latter to be true, it must be that $d > \underline{\pi}$.

It must also be that in the game without IGs, the PM collects information on issue 1 after some signal $m_2^{PM} \in \{r_2, s_2\}$. Given $d > \underline{\pi}$, the PM would however be strictly better off starting by collecting information on issue 1 and not acquiring any information on issue 2. Hence the contradiction.

The necessity of condition L2.2 is a direct consequence of condition L2.1. ■

Proof of Proposition 1. *(Necessity)* Suppose $Eu\left(p,\theta\right) > Eu\left(p^{IL},\theta\right)$.

First, we establish the necessity of condition P1.1. Assume by way of contradiction that $\pi \geq 1/2$. We know from Lemma 2 that in the game with IGs, $(\ell_1, \ell_2) = (0, 1)$. If IG_2 were to deviate and not collect information, we would be in the same situation as in the game without IGs, and the PM would start by collecting information on issue 1. Following signal $m_1^{PM} = r_1$, the PM would choose $p = (R_1, S_2)$. Following signal $m_1^{PM} = s_1$, he would collect information on issue 2 if $(1 - \pi) \geq d$, and choose $p = (S_1, R_2)$ if $m_2^{PM} = r_2$ and $p = (S_1, S_2)$ if $m_2^{PM} = s_2$. If $(1 - \pi) < d$, the PM would not collect information on issue 2 and would choose $p = (S_1, R_2)$. Thus, IG_2's expected utility would be

$$\widetilde{V}_2 = \begin{cases} (1-\pi)\,\pi & \text{if} \quad d \leq 1 - \pi \\ 1 - \pi & \text{otherwise.} \end{cases}$$

It is easy to check that $\ell_2 = 1$ only if following signal $m_2 = r_2$, the PM chooses $p = (S_1, R_2)$, in which case IG_2's expected utility is $V_2 = \pi - c$.

Consider now IG_1. In equilibrium, it gets its reform implemented only following signal $m_2 = s_2$. If $(1 - \pi)\,\alpha \geq d$, then following $m_2 = s_2$, the PM collects information on issue 1 and chooses $p = (R_1, S_2)$ if $m_1^{PM} = r_1$ and $p = (S_1, S_2)$ if $m_1^{PM} = s_1$. Otherwise, the PM does not collect information on issue 1 and chooses $p = (R_1, S_2)$. Thus, IG_1's expected utility is

$$V_1 = \begin{cases} (1-\pi)\,\pi & \text{if} \quad d \leq (1 - \pi)\,\alpha \\ 1 - \pi & \text{otherwise.} \end{cases}$$

If IG_1 were to deviate by collecting information, it would get its reform implemented with probability π (i.e., following signal $m_1 = r_1$). Its expected utility would be $\widetilde{V}_1 = \pi - c$.

Simple algebra shows that $V_2 \geq \widetilde{V}_2$ implies $\widetilde{V}_1 \geq V_1$, which contradicts $(\ell_1, \ell_2) = (0, 1)$. Hence, it must be that $\pi < 1/2$.

Second, we establish the necessity of $\pi\alpha \geq d$ in condition P1.2. Assume by way of contradiction that $\pi\alpha < d$. This implies that following signal $m_2 = s_2$, the PM does not collect information on issue 1. Since $\pi < 1/2$, he then chooses $p = (S_1, S_2)$. IGs' expected utilities are $V_1 = 0$ and $V_2 = \pi - c$. If IG_1 were to deviate by collecting information, we know from above that its expected utility would be $\widetilde{V}_1 = \pi - c$. If IG_2 were to deviate by not collecting information, it would not get its reform implemented. This is because $d > \pi\alpha$ and $\alpha > 1$ imply $d > \pi$, in which case the PM would not collect information on issue 2. Since $\pi < 1/2$, the PM would then choose $p = (S_1, S_2)$. IG_2's expected utility would then be $\widetilde{V}_2 = 0$. Simple algebra shows again that $V_2 \geq \widetilde{V}_2$ implies $\widetilde{V}_1 \geq V_1$, which contradicts $(\ell_1, \ell_2) = (0, 1)$. Hence, it must be that $\pi\alpha \geq d$ and, therefore, that the PM collects information on issue 1 following signal $m_2 = s_2$.

Third, we establish the necessity of $d > \pi\,(\alpha - 1)$ in condition P1.2. Since the PM collects information on issue 1 following signal $m_2 = s_2$, it must be that he does not do so following signal $m_2 = r_2$; otherwise the PM would be fully informed and $Eu\left(p^{IL}, \theta\right) = U_{\max} \geq Eu\,(p, \theta)$. Hence, it must be that $d > \pi\,(\alpha - 1)$.

From the above conditions, we can infer that in the game with IGs, IG_2 is the only IG to collect information. Following signal $m_2 = r_2$, the PM chooses $p = (S_1, R_2)$. Following signal $m_2 = s_2$, the PM collects information on issue 1 and chooses $p = (R_1, S_2)$ if $m_1^{PM} = r_1$ and $p = (S_1, S_2)$ if $m_1^{PM} = s_1$. IGs' expected utilities are $V_1 = (1 - \pi)\,\pi$ and $V_2 = \pi - c$. Expected policy utility is $Eu\left(p^{IL}, \theta\right) = \left(1 - \pi^2\right)\alpha + 1$.

Fourth, we establish the necessity for $d > \pi$. Assume by way of contradiction that $\pi \geq d$. This implies that in the game without IGs and following signal $m_1^{PM} = s_1$, the PM collects information on issue 2 and chooses $p = (S_1, R_2)$ if $m_2^{PM} = r_2$ and $p = (S_1, S_2)$ if $m_2^{PM} = s_2$. Now, in the game with IGs, if IG_2 were to deviate by not collecting information, its expected utility would be $\widetilde{V}_2 = (1 - \pi)\,\pi$. Recall from above that if IG_1 were to deviate by collecting information, its expected utility would be $\widetilde{V}_1 = \pi - c$. Simple algebra shows again that $V_2 \geq \widetilde{V}_2$ implies $\widetilde{V}_1 \geq V_1$, which contradicts $(\ell_1, \ell_2) = (0, 1)$. Hence, it must be that $d > \pi$ and, therefore, that the PM does not collect information on issue 2 following signal $m_1^{PM} = s_1$. Observe that $d > \pi$ is satisfied given conditions P1.1, P1.2 and P1.4.

From the above conditions, we can infer that in the game without IGs, the PM collects information on issue 1 only. Following signal $m_1^{PM} = r_1$, he chooses $p = (R_1, S_2)$. Following signal $m_1^{PM} = s_1$, he chooses $p = (S_1, S_2)$. Expected policy utility is $Eu(p, \theta) = \alpha + (1 - \pi)$. It follows that in the game with IGs, if IG_2 were to deviate by not collecting information, its expected utility would be $\widetilde{V}_2 = 0$.

Fifth, we establish the necessity of condition P1.3. For $\ell_1 = 0$, it must be that $V_1 > \widetilde{V}_1$. Recall from above that $V_1 = (1 - \pi)\pi$ and $\widetilde{V}_1 = \pi - c$. It must then be that $c > \pi^2$. For $\ell_2 = 1$, it must be that $V_2 \geq \widetilde{V}_2$. Recall from above that $V_2 = \pi - c$ and $\widetilde{V}_2 = 0$. It must then be that $\pi \geq c$.

Sixth, we establish the necessity of condition P1.4. Recall that $Eu(p, \theta) = \alpha + (1 - \pi)$ and $Eu\left(p^{IL}, \theta\right) = \left(1 - \pi^2\right)\alpha + 1$. Simple algebra shows that $Eu(p, \theta) > Eu\left(p^{IL}, \theta\right)$ only if $\pi\alpha > 1$.
(Sufficiency) Suppose conditions P1.1-P1.4 are satisfied. It is not difficult to check that the strategies described above are equilibrium strategies and that $Eu(p, \theta) > Eu\left(p^{IL}, \theta\right)$. ■

Proof to Lemma 3 and Proposition 2. *(Necessity)* Because $\alpha = 1$, the two issues are equally important. When both reforms are beneficial, it does not matter for $u(p, \theta)$ which reform the PM implements, as long as he implements one of them. Thus, the PM will never collect information on a second issue after observing that reform on one issue is beneficial; instead he will just implement reform on the first issue. In a game without IGs, collecting information on issue 1 and then issue 2 (if $m_1^{PM} = s_1$) gives the same expected policy utility as first collecting information on issue 2 and then issue 1 (if $m_2^{PR} = s_2$). From here, it follows that

(i) If the PM collects no information in the game without IGs, then IL cannot make the PM less informed and is never detrimental.
(ii) If the PM collects information on only one issue (and never collects information on the other issue) in the game without IGs, then IL can be detrimental only if it leads to the PM becoming informed on only the other issue.
(iii) If the PM collects information on both issues (on the second only if he learns that status quo is the correct policy on the first) in the game without IGs, then IL can be detrimental only if it leads to the PM becoming informed about only one of the two issues.

For IL to be detrimental, either (ii) or (iii) must be happening in equilibrium. We first rule out the possibility of (ii).

Consider possibility (ii). If $1/2 \leq \pi_2 < \pi_1$, then only ever learning about issue 1 results in $Eu(p, \theta) = 1 + [\pi_1(1 - \pi_2) + (1 - \pi_1)\pi_2]$, and only ever learning about issue 2 results in $Eu(p, \theta) = [\pi_2(1 - \pi_1) + (1 - \pi_2)\pi_1] + 1$. Expected policy utility is equal in both cases. Therefore, even if the presence of IGs caused the PM to learn about the other issue, it would not yield $Eu(p, \theta) > Eu\left(p^{IL}, \theta\right)$.

If $\pi_2 < 1/2 \leq \pi_1$, then learning about only issue 1 results in $Eu(p, \theta) = 1 + (1 - \pi_2)$ and learning about only issue 2 results in $Eu(p, \theta) = [\pi_2(1 - \pi_1) + (1 - \pi_2)\pi_1] + 1$. Algebra shows that $Eu(p, \theta)$ is higher when the PM only learns about issue 1 rather than only learn about issue 2. Similarly, if $\pi_2 < \pi_1 < 1/2$, then it is again better for the PM to learn only about issue 1 than only about issue 2 (since $1 + (1 - \pi_2) > (1 - \pi_1) + 1$). Therefore, in both cases, IL may be detrimental only if in the game without IGs, the PM collects information only on issue 1, and in the game with IGs, only IG_2 lobbies and the PM never collects information on issue 1. Therefore, we need the PM to prefer to collect information on issue 1 rather than neither issue in the game without lobbying (which requires $1 + (1 - \pi_2) - d \geq \max\{\pi_1, 1 - \pi_1\} + (1 - \pi_2)$, or $d \leq \min\{\pi_1, 1 - \pi_1\}$). We also require that the PM does not want to collect information on issue

1 if IG_2 lobbies and he observes $m_2 = s_2$, which requires $\min\{\pi_1, 1-\pi_1\} < d$, contradicting the condition above that $d \leq \min\{\pi_1, 1-\pi_1\}$.

Therefore, only possibility (iii) remains a viable possibility for the existence of detrimental IL. Thus, in the absence of lobbying, the PM will collect information on one issue, and then collect information on the second if he does not learn that reform on the first is beneficial. Because $\pi_1 > \pi_2$, the PM strictly prefers collecting information on issue 1 first, as it has a higher possibility of being beneficial, which means a lower probability that the PM spends effort collecting information on a second issue. As a result, detrimental IL must involve information collection by IG_2 (whose issue does not have priority in the absence of lobbying), as well as no information collection by either IG_1 or the PM on issue 1. *Lemma 3 follows immediately from this argument.*

In the game without IGs, the parameters must be such that the PM is willing to collect information on both issues starting with issue 1. The PM's expected payoff from doing so is

$$(2-\pi_1\pi_2) - (2-\pi_1)\,d.$$

Alternatively, the PM may collect information on neither issue, earning

$$\max\{\pi_1, 1-\pi_1\} + (1-\pi_2)\,.$$

Or, the PM may collect information on only issue 1, earning

$$1 + \pi_1(1-\pi_2) + (1-\pi_1)\max\{\pi_2, 1-\pi_2\} - d.$$

Or, the PM may collect information on only issue 2, earning

$$1 + \pi_2(1-\pi_1) + (1-\pi_2)\max\{\pi_1, 1-\pi_1\} - d.$$

We can rule out the case where $\pi_2 < \pi_1 < 1/2$. When this is the case, the PM is willing to collect information on issue 2 after learning that $\theta_1 = s_1$ (a necessary condition for detrimental IL) if $d \leq \pi_2$. At the same time, the PM must not prefer to follow up failed lobbying by IG_2 by collecting information on issue 1. This is true if $\pi_1 < d$. Thus, $d \leq \pi_2 < \pi_1 < d$, a contradiction, ruling out the possibility that IL is detrimental when $\pi_2 < \pi_1 < 1/2$. Observe that $\pi_1 \geq 1/2$ is satisfied given $1-\pi_1 < \pi_2$ (condition P2.1) and $\pi_2 < \pi_1$.

Next, consider the possibility that $\pi_2 < 1/2 \leq \pi_1$. The PM is willing to collect information on both issues rather than only on issue 1 as long as $d \leq \pi_2$. He is willing to collect information on both issues rather than only on issue 2 if $d \leq 1-\pi_2$. He is willing to collect information on both issues rather than neither if

$$d \leq \frac{(1-\pi_1)(1+\pi_2)}{2-\pi_1}.$$

At the same time, he must not prefer to collect information on issue 1 following failed lobbying by IG_2, which is the case when $d > 1-\pi_1$. These conditions give us the range of d stated in condition P2.1.

It must also be the case that only IG_2 lobbies. For IG_2 to lobby, it must be that $\pi_2 - c \geq (1-\pi_1)\pi_2$, or $c \leq \pi_1\pi_2$. For IG_1 not to lobbying in equilibrium, it must be that $(1-\pi_2)\pi_1 \geq Z\pi_1\pi_2 + \pi_1(1-\pi_2) - c$, where Z is the probability that the PM implements the reform on issue 1 when he knows $\theta = (r_1, r_2)$ and is therefore indifferent between $p = (R_1, S_2)$ and $p = (S_1, R_2)$. Letting $Z = 0$, IG_1 never prefers to lobby in response to lobbying by IG_2. The possibility of detrimental IL therefore requires that $c \leq \pi_1\pi_2$ (condition P2.2).

Finally, consider the possibility that $1/2 \leq \pi_2 < \pi_1$. In this case, the PM's equilibrium strategy continues to require that $1-\pi_1 < d$, and $d \leq (1-\pi_1)(1+\pi_2)/(2-\pi_1)$ for the same reasons as in the previous case. Additionally, one can show that the other two restrictions both imply that $d \leq 1-\pi_2$, which in this case is at least as restrictive than $d < \pi_2$ whenever $\pi_2 \geq 1/2$. Thus, the same conditions apply for variable d, and condition P2.1 must continue to hold. Restrictions on c are also unchanged. Hence, condition P2.2 must continue to hold.

(Sufficiency) Suppose conditions P2.1-P2.2 are satisfied. It is not difficult to check that the strategies described above are equilibrium strategies. Simple algebra shows that $Eu(p, \theta) > Eu\left(p^{IL}, \theta\right)$. ■

Remaining analysis is included in the Online Appendix.

Online Appendix for "Informational Lobbying and Agenda Distortion"

Christopher Cotton and Arnaud Dellis

This document extends our baseline model in a number of ways. Online appendix section A.1 relaxes a restriction on the PM's information collection capacity that will be maintained throughout the rest of the document. Section A.2 investigates the implication for detrimental IL of a constraint on the PM's information collection capacity. Section A.3 considers a situation in which the PM's information collection decisions are simultaneous instead of sequential. Section A.4 considers an alternative information collection sequence, one in which the PM moves first and is followed by the IGs. Section A.5 explores the implications of asymmetries in information collection costs. Section A.6 allows for imperfectly informative signals, and explores the implications of asymmetries in information quality across issues. Section A.7 considers a situation in which there are, for each issue, two IG advocates with conflicting interests. Finally, section A.8 discusses alternative measures of policymaking efficiency.

Proofs are included after the discussion.

A.1. A less restrictive model. In this document, we allow for additional generality in the model than we did in the body of the paper. Let $K \in \{0,1,2\}$ denote the number of issues on which the PM can collect information. Let $M \in \{1,2\}$ denote the number of reforms that the PM can implement. In the body of the paper, $K = 2$ and $M = 1$. (In later sections, we will also allow for the possibility that evidence does not perfectly reveal the state of an issue, and for information collection costs to differ across issues, with $c_1 \neq c_2$ or $d_1 \neq d_2$.)

The following lemma is a generalization of Lemma 1 from the paper. It identifies a set of three conditions which are all necessary for IL to be detrimental.

Lemma 4. *$Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$ only if each of the following three conditions is satisfied:*

(L4.1) $K \neq 0$, i.e., the PM can choose to collect some information on his own;
(L4.2) $M = 1$, i.e., the PM is constrained on the number of reform proposals he can implement; and
(L4.3) $\alpha \neq 1$ and/or $\pi_1 \neq \pi_2$, i.e., issues differ in their salience and/or their priors.

Condition L4.1 rules out the case where $K = 0$, i.e., the case where the PM cannot collect any information on his own. The intuition underlying this condition relies on the fact that signals collected by IGs are informative. It follows that when $K = 0$, IL cannot lead to less informed policy decisions and worse policy.

Condition L4.2 rules out the case where $M = 2$, i.e., where the PM can implement both reform proposals and, therefore, does not have to prioritize one issue over the other. The intuition underlying this condition relies on the fact that when $M = 2$, the PM's policy choice on an issue depends on his beliefs about the realized state *for that issue only*; it does not depend on his beliefs about the realized state for the other issue. Since the PM and the IGs have access to signals of similar quality, this feature implies that when $M = 2$, IL cannot lead to less informed policy decisions and worse policy. Indeed, there are two possible types of situation. In one type of situation, an IG collects a signal on an issue for which the PM would not have collected information on his own. The PM is therefore better informed on this issue and, since the collection of information on one issue does not affect the incentives to collect information on the other issue (given $M = 2$), the PM is at least as well informed on the other issue. In the other type of situation, IGs collect a signal on an issue for which the PM would have chosen to collect information, which frees informational resources for the PM and, if $K = 1$, allows him to collect information on the other issue.

Observe that conditions L4.1 and L4.2 correspond to the two features we have introduced into the analysis of IL, namely, the PM's ability to collect firsthand information and the constraint on the agenda. Thus, Lemma 4 shows that, in our model, these two features are necessary for IL to be detrimental. Condition L4.3 corresponds to the condition identified in Lemma 1 from the body of the paper.

Throughout the rest of this document, we assume that $K \in \{1, 2\}$ and $M = 1$.

A.2. Constraint on PM information collection capacity. In this section, we assume that the PM can collect information on at most one issue on his own. This may be due to limited staff time or resources. When this is the case, IL cannot be detrimental when issues only differ in terms of priors (i.e., the π-case from the body of the paper). It can, however, be detrimental in the α-case.

Let $Eu^K(\cdot, \theta)$ denote expected equilibrium policy utility when the PM can collect information on up to $K \in \{1, 2\}$ issues. Also, let $\mathcal{E}_K$ be the set of parameter lists $(\pi_1, \pi_2, \alpha, d, c)$ for which $Eu^K\left(p^{IL}, \theta\right) < Eu^K(p, \theta)$ given $K \in \{1, 2\}$.

Proposition 3. *We have:*

(P3.1) In the π-case, $\mathcal{E}_1 = \emptyset \neq \mathcal{E}_2$. For any $e \in \mathcal{E}_2$, we have

$$Eu^1(p, \theta) \leq Eu^1\left(p^{IL}, \theta\right) = Eu^2\left(p^{IL}, \theta\right) < Eu^2(p, \theta).$$

(P3.2) In the α-case, $\mathcal{E}_1 = \mathcal{E}_2 \neq \emptyset$.

Thus, in the π-case IL is less likely to be detrimental when the informational resources are limited than when they are not limited (i.e., $\mathcal{E}_1 \subsetneq \mathcal{E}_2$). The intuition runs as follows. Observe that $\mathcal{E}_1 = \emptyset$. This condition happens because IL can be detrimental only if the PM gets informed, in expectation, on a smaller number of issues in the game with IGs than in the game without IGs. Obviously, this cannot be when $K = 1$. At the same time, Proposition 2 establishes that $\mathcal{E}_2 \neq \emptyset$.

One might then be tempted to conclude that reducing the PM's available informational resources would be beneficial to the electorate by eliminating detrimental IL. P3.2 establishes that such a conclusion is actually erroneous. More specifically, it shows that moving from $K = 2$ to $K = 1$ eliminates detrimental IL not by increasing expected policy utility in the game with IGs, but instead by decreasing expected policy utility in the game without IGs.

In the α-case the detrimental nature of IL is independent of whether $K = 1$ or $K = 2$. This is easily understood by observing that in equilibrium, the PM collects firsthand information on at most one issue, both in the game with IGs and in the game without IGs.[21]

A.3. Simultaneous information collection. In our baseline model we have assumed that the PM makes his information collection decisions sequentially, one issue at a time (hereafter the "sequential protocol"). This assumption was made so the equilibrium information collection sequencing in the game without IGs parallels the equilibrium sequencing in the game with IGs (where information is collected sequentially, first by IG_2 and then by the PM). In this section, we consider an alternative specification in which the PM makes his information collection decision on both issues simultaneously (hereafter "simultaneous protocol"). Throughout this subsection, we restrict attention to the non-trivial case where K=2, i.e., where the PM can effectively choose to collect information on both issues.

The key difference between the simultaneous and the sequential protocols lies in the fact that, in the absence of IL, the PM's incentives to collect information are weaker under the simultaneous protocol than under the sequential protocol. This is because when deciding on collecting information on a second issue, the PM knows the realized state for the other issue under the sequential protocol, but not under the simultaneous protocol. The PM thus knows for sure whether the extra information will be decisive for his policy choice under the sequential protocol, but is uncertain under the simultaneous protocol.

[21] The proof of Proposition 3 is straightforward and is omitted here.

This difference between the two protocols has opposite implications in the π-case and in the α-case. Recall that, in the π-case, IL can be detrimental only if in the game without IGs, the PM collects information, in expectation, on more than one issue. By weakening the PM's incentives for collecting information, the simultaneous protocol makes it more difficult for this condition to be satisfied. It follows that, in the π-case, detrimental IL is less likely under the simultaneous protocol than under the sequential protocol. Instead, in the α-case, IL can be detrimental only if in the absence of IL, the PM collects information on one issue only. By weakening the PM's incentives for collecting information, the simultaneous protocol makes it easier for this condition to be satisfied. It follows that, in the α-case, detrimental IL is at least as likely under the simultaneous protocol as under the sequential protocol.

The following proposition formalizes this discussion. In the statement of the proposition, we denote by $\mathcal{E}$ the region of the parameter space for which $Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$. We add a subscript S to refer to the simultaneous protocol, while the absence of a subscript S refers to the sequential protocol.

Proposition 4. *Let $K = 2$.*

(P4.1) In the π-case, $\mathcal{E}_S = \emptyset \neq \mathcal{E}$. For any $e \in \mathcal{E}$, we have

$$Eu\left(p_S,\theta\right) \leq Eu\left(p_S^{IL},\theta\right) = Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$$

(P4.2) In the α-case, $\mathcal{E}_S = \mathcal{E} \neq \emptyset$.

Note the similarity between Propositions 3 and 4. The two statements are similar, with the simultaneous protocol standing for $K = 1$ and the sequential protocol standing for $K = 2$. In our model, simultaneous information collection and a limitation on the informational resources available to the PM have thus similar implications. This happens because simultaneous information collection weakens the PM's incentives to collect information and make use of the available informational resources.

A.4. Information collection sequencing. In our baseline model we have assumed that IGs are the first to make their information collection decision, and that their choice is followed by the PM's own decision of whether to collect information (hereafter the "IG-first protocol"). A key implication of this assumption is that information collection by IG_2 may deter the PM from collecting information on issue 1. We now investigate whether the PM can avoid this type of situation by moving first (hereafter the "PM-first protocol").

We find that the PM moving first does not eliminate detrimental IL. Actually, the exact opposite happens in the π-case, where moving from the IG-first protocol to the PM-first protocol triggers an expansion of the region of the parameter space in which $Eu\left(p^{IL},\theta\right) < Eu\left(p,\theta\right)$. Likewise, in the α-case, we find that IL can be detrimental in the PM-first protocol. However, in the α-case the regions of the parameter space in which IL is detrimental are disjoint under the two protocols. The following proposition makes this precise. In the statement of the proposition, a subscript K indicates the number of issues on which the PM can collect information. A superscript PM refers to the PM-first protocol, while the absence of superscript refers to our baseline, IG-first protocol.

Proposition 5. *For any $K \in \{1,2\}$, the set of parameter lists under which IL is detrimental in the PM-first protocol, $\mathcal{E}_K^{PM}$, is non-empty. Moreover,*

(P5.1) in the π-case, $\mathcal{E}_K \subsetneq \mathcal{E}_K^{PM}$, and
(P5.2) in the α-case, $\mathcal{E}_K \cap \mathcal{E}_K^{PM} = \emptyset$.

We start by discussing the intuition for the π-case. For IL to be detrimental it must be that in equilibrium of the game with IGs, only IG_2 collects information, while neither IG_1 nor the PM collects information. This must be true under each of the two protocols.

Given IG_1's and the PM's information collection strategies, IG_2 has incentives to collect information that are at least as strong under the PM-first protocol as under the IG-first protocol. This happens since, under the PM-first protocol, the PM has already made his information collection decision—effectively choosing to *not* collect information—when IG_2 makes its information collection decision. As a result, if IG_2 does not collect information, the PM will base his policy choice on his priors and, given $\pi_1 > \pi_2$, will not implement the reform on issue 2. The only way for IG_2 to get its reform adopted is therefore to collect information itself.

Likewise, in the game with IGs, the PM's incentives to *not* collect information (on issue 1) are stronger under the PM-first protocol than under the IG-first protocol. This happens since in the PM-first protocol, the PM must make his information collection decision before observing IG_2's signal and, therefore, without knowing for sure whether information on issue 1 will improve policy.

Finally, IG_1's incentives to collect information are the same under both protocols since, in any case, IG_1 takes its information collection decision before observing any signal on issue 2.

We now discuss the intuition for the α-case. Pick a parameter list under which IL is detrimental under the IG-first protocol, and consider the PM-first protocol. It follows that in the game without IGs (where the two protocols are trivially 'equivalent'), the PM collects information on issue 1 only. For IL to be detrimental, it must then be that, in the game with IGs, the PM does not collect information on issue 1. But since $\pi < 1/2$ (by condition P1.1), IG_1 will then have a persuasion motive to collect information on its issue if the PM does not do so on his own. And since $\pi \geq c$ (by P1.3), IG_1 will want to exercise this persuasion motive and collect information. It follows that the PM is at least as well informed in the game with IGs as in the game without IGs and, therefore, IL cannot be detrimental. Hence, IL cannot be detrimental under the PM-first protocol for any of the parameter lists in the region of the parameter space where IL is detrimental under the IG-first protocol. That there exists a region of the parameter space in which IL is detrimental under the PM-first protocol is easily seen by constructing examples.

A.5. Information collection costs. In our baseline model we have assumed that information collection costs are the same for both issues. This assumption allowed us to focus on the implications of differences in priors and in issue importance. We now consider two alternative specifications in which information collection costs vary across issues.

In one specification, $d_1 = d_2$ and $c_1 \neq c_2$. Given that it is equally costly for the PM to collect information on each issue ($d_1 = d_2$), we can interpret the difference in IGs' information collection costs ($c_1 \neq c_2$) as reflecting an asymmetry in IGs' access to funds and resources. For example, this specification could capture a situation in which one interest is concentrated, and is therefore able to solve the collective action problem and raise funds easily, while the other interest is diffused, and is unable to solve the collective action problem and faces difficulties in raising funds. The former interest would have the lowest c_n among the two interests, and the latter interest would have the highest c_n.

In another specification, $d_1 = c_1 \neq d_2 = c_2$. Given that, for each issue, the information collection cost is the same for the PM and the IG advocating the issue ($d_n = c_n$ for $n = 1, 2$), we can interpret the difference in costs as reflecting an asymmetry in the complexity of issues. For example, the specification could capture a situation in which one issue would require costly scientific evidence to determine the realized state of the world (e.g., whether intensive use of cellphones can cause brain cancer), while the other issue would require a relatively low cost, small-scale opinion poll to assess the needs of a local community.[22]

[22]The specification in which $d_1 = c_1 \neq d_2 = c_2$ has an interesting feature which is worth mentioning here. We saw that in the α-case, the detrimental nature of IL is independent of the informational resources to which the PM has access. This is no longer true however when d_1 is sufficiently larger than d_2. In this case, IL is more likely to be detrimental in the case where the informational resources are limited; that is, $\mathcal{E}_2 \subsetneq \mathcal{E}_1$. Curiously, this is

The argument turns out to be almost identical under these two alternative specifications. We shall therefore focus our presentation on the former specification (i.e., the one in which $d_1 = d_2$ and $c_1 \neq c_2$).

The intuition and results from the body of the paper still hold in the π-case. This is because the information collection strategies along the equilibrium path must be the same as in our baseline model. As a result, the set of necessary and sufficient conditions for detrimental IL are identical to the ones in Proposition 2, except for condition P2.2 which is replaced with $\pi_1\pi_2 \geq c_2$.

Consider now the α-case. The intuition and results from the body of the paper still hold when $c_2 \geq c_1$, i.e., when the IG advocating the less important issue is also the IG for which lobbying is relatively more costly. To understand why, recall from Lemma 2 that IL can be detrimental only if: 1) in the game without IGs, the PM starts by collecting information on issue 1; and 2) in the game with IGs, IG_2 is the only IG collecting information. The latter condition requires information collection incentives to be stronger for IG_2 than for IG_1. Given that the agenda motive is here the same for both IGs and that information collection is at least as costly for IG_2 as for IG_1, IG_2 must have a stronger persuasion motive to lobby than IG_1. It must then be that: 1) in the game without IGs, the PM never implements the reform for issue 2, which requires two things, namely, that the PM does not collect information on issue 2 and that $\pi < 1/2$; and 2) in the game with IGs, the PM implements the reform for issue 1 with positive probability, which, given $\pi < 1/2$, requires that the PM collects information on issue 1 when IG_2 obtains unfavorable information ($m_2 = s_2$). To sum up, information collection strategies along the equilibrium path must be the same as in the body of the paper. The set of necessary and sufficient conditions for detrimental IL is therefore the same as in Proposition 1, except that condition P1.3 is replaced with $c_1 > \pi^2$ and $\pi \geq c_2$.

In contrast, when $c_1 > c_2$, it is no longer necessary that IG_2 faces a stronger persuasion motive than IG_1 for IG_2 to be the only IG collecting information. This observation has two important implications. First, it is now possible to have $\pi \geq 1/2$, implying that it is now possible to have lobbying which is both detrimental and friendly, something which is not possible when $c_1 = c_2$. Second, in the game without IGs, it is now possible to have the PM collecting firsthand information on issue 2 following unfavorable evidence on issue 1 ($m_1^{PM} = s_1$).

A.6. Less-than-perfect information accuracy. In our baseline model we have assumed that information is perfectly informative about the state of the world. If the IG (resp. PM) collects information on issue n, then until now the signal reveals the state of the world with probability one. In this section, we consider an alternative specification of the model in which the signal reveals the state of the world with probability $q_n \in (1/2, 1]$. With probability $(1 - q_n)$, the signal reflects the wrong state of the world.

To make the discussion interesting, we assume that q_n is sufficiently accurate to overturn the PM's priors in favor of or against the reform. That is, $q_n \geq \max\{\pi_n, 1 - \pi_n\}$ for both issues. We further assume that information is identical, regardless whom collects it. This implies that regardless of whether IG_n or the PM or both collect information on issue n, the PM is exposed to the same evidence. No additional evidence is revealed when both collect information compared with when only one of them collects information.

In this setting, the main qualitative results from the previous sections continue to hold for the cases where issues differ in only importance or priors, and $q_1 = q_2$ is sufficiently large. This observation is not really surprising. This section therefore focuses on an alternative question; we

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the very case in which we would be expecting IL to improve policymaking since IL would then complement the PM's informational resources. The intuition behind this counterintuitive result lies in stronger lobbying incentives. Specifically, a limitation on the informational resources precludes the PM from collecting information on issue 2 in the game without IGs. This creates a persuasion motive for IG_2, thereby strengthening its incentives to collect information, and increasing the prospects for detrimental IL.

ask whether IL can be detrimental when issues only differ in their information quality, q_n. Here, we assume $\alpha = 1$, $\pi_1 = \pi_2 \equiv \pi$, $c_1 = c_2 \equiv c$, $d_1 = d_2 \equiv d$, and finally $1/2 < q_2 < q_1 \leq 1$.

Let $\tau_n \equiv \pi q_n + (1-\pi)(1-q_n)$ denote the probability that information collection on issue n results in a signal supporting reform (i.e., $m_n = r_n$ if IG_n collects and $m_n^{PM} = r_n$ if the PM collects).

Proposition 6. *$Eu\left(p^{IL}, \theta\right) < Eu\left(p, \theta\right)$ if and only if each of the following three conditions holds:*
(P6.1) $\pi \geq 1/2$,
(P6.2) $2\pi(1-\pi)(2q_1 - 1) \geq d > q_1 - \pi$, *and*
(P6.3) $\tau_1 + \tau_2 - 1 \geq c$.

The conditions correspond to a region of the parameter space in which, in the game without IGs, the PM collects information on issue 1 and then either implements policy $p = (R_1, S_2)$ when $m_1^{PM} = r_1$ or implements $p = (S_1, R_2)$ when $m_1^{PM} = s_1$. In the game with IGs, the parameters lead to an equilibrium in which IG_2 (driven by an agenda motive) collects information and IG_1 does not, and the PM implements $p = (S_1, R_2)$ when $m_2 = r_2$ and implements $p = (R_1, S_2)$ when $m_2 = s_2$. In the game without IGs, the PM always learns about θ_1 and never learns about θ_2 before choosing policy. In the game with IGs, the PM always learns about θ_2 and never learns about θ_1 before choosing policy. Expected policy utility is higher when the PM learns about θ_1 rather than θ_2; it is higher in the game without IGs.

A.7. Groups with conflicting interests. Our baseline model assumes there is only one IG advocate per issue and that it always prefers the reform proposal to the status quo. However, as Baumgartner et al. (2009) shows for the U.S., there are often two sides to an issue, "one side seeking some particular type of change to the existing policy and another one seeking to protect the status quo" (p7).

We now consider an alternative specification in which there are two IG advocates per issue: one which always prefers the reform proposal to the status quo, and another which always prefers the status quo to the reform proposal. Specifically, given a policy p_n the utility of the pro-reform IG for issue n (hereafter IG_n^R) is given by $v_n^R(p_n) = 1$ when $p_n = R_n$ and $v_n^R(p_n) = 0$ when $p_n = S_n$. By contrast, the utility of the anti-reform IG for issue n (hereafter IG_n^S) is given by $v_n^S(p_n) = 1$ when $p_n = S_n$ and $v_n^S(p_n) = 0$ when $p_n = R_n$.

The addition of anti-reform IGs in our baseline model leaves unchanged the region of the parameter space in which $Eu\left(p^{IL}, \theta\right) < Eu\left(p, \theta\right)$. To see why our previous results are robust to the addition of anti-reform IGs, consider a parameter list for which IL leads to worse policy when there are only pro-reform IGs. For such a parameter list, neither of the two anti-reform IGs will want to lobby. First, IG_1^S has no incentive to collect information since it actually benefits from the agenda distortion triggered by IG_2^R. Second, IG_2^S has no incentive to collect information given our assumption that signals reveal the realized state of the world with probability one.

A.8 Alternative measures of policy efficiency. Until now, our analysis has used the ex ante expected equilibrium policy utility $Eu\left(p, \theta\right)$ as a measure of policymaking efficiency. We now discuss alternative measures.

We start by considering measures of policymaking efficiency that include information collection costs in our baseline measure. Formally, we consider the following family of measures

$$Eu\left(p, \theta\right) - \phi C - \mu D$$

where C and D represent total information collection costs incurred by the IGs and the PM respectively, and $\phi \in [0, 1]$ and $\mu \in [0, 1]$ represent the importance of these costs relative to the policy outcome for the electorate.

The polar case where $\phi = \mu = 0$ corresponds to our baseline measure. Excluding all information collection costs may be justified as a way to put aside the possibility for IL to be detrimental because IG competition leads to over-investment in information collection. In our baseline analysis, we have therefore been able to isolate agenda distortion as a source of detrimental IL.

An alternative polar case is the one where $\phi = \mu = 1$, i.e., where we subtract from the ex ante expected equilibrium policy utility any information collection costs incurred by the IGs or the PM. Our results are qualitatively robust to incorporating all information collection costs into the measure of policymaking efficiency.[23] This measure can be justified if the electorate funds the information collection activities of the PM and of the IGs. For example, part of the electorate may constitute the membership of the IGs, and fund IGs' information collection efforts through membership fees and contributions. They may also be shareholders of firms engaging in lobbying, and may indirectly fund the firms' information collection activities by receiving lower dividends. Likewise, the PM's information collection efforts may be financed by taxpayer money.

A similar discussion holds for the intermediate cases where $\phi = \mu \in (0, 1)$.

Another polar case is the one where $\phi = 0$ and $\mu = 1$, i.e., where we subtract from the ex ante expected equilibrium policy utility any information collection costs incurred by the PM, but none of the information collection costs incurred by the IGs. This measure corresponds to the PM's ex ante expected payoff. Our results are not robust to using this alternative measure; IL cannot be detrimental according to this measure. This is because IL cannot make the PM worse off given that it does not change the PM's set of feasible actions and that IGs cannot deceive the PM. In a way, the result is not really surprising since this measure treats the information collected by the IGs as a freebie. Having said this, this measure can be justified in circumstances where the electorate funds the PM's information collection activities (e.g., through tax payments) and where the IGs are controlled and financed by foreign entities whose welfare is of no direct concern to the electorate.

Intermediate cases between the previous polar case ($\phi = 0$ and $\mu = 1$) and our baseline measure ($\phi = \mu = 0$) involve $\phi = 0$ and $\mu \in (0, 1)$. These cases may represent situations in which the PM cares more about his own information collection costs relative to policy utility than the electorate does. Our results are qualitatively robust to such measures when μ is sufficiently small.

We have so far discussed measures of policymaking efficiency which rely on expected policy utility $Eu(p, \theta)$. Another measure frequently used in the literature to evaluate the impact of IL on policy is the ex ante probability that the PM implements policy *as if* he were fully informed about the realized state of the world. While this measure leads to the same conclusion as our baseline measure in settings with a single issue, we show in Implication 1 that this is not necessarily true in a setting like ours with multiple issues, when the electorate cares about one issue more than another. In such settings, we can find circumstances in which IL is detrimental according to one measure, but not according to the other measure. Between these two measures our preferences go toward our baseline measure since it is better at capturing the differential weights the electorate puts on the different issues.

Proofs for the online appendix

Proof of Lemma 4. We start by proving the necessity of $K \in \{1, 2\}$. Assume by way of contradiction that $K = 0$, i.e., the PM cannot collect any information on his own. It follows that in the game without IGs, the PM's posterior beliefs coincide trivially with his priors, i.e., $\beta_n = \pi_n$ for $n = 1, 2$. At the same time, in the game with IGs, for each issue n the IG involved with this issue, IG_n, either collects information or does not. In the former case, the PM gets fully informed about θ_n, and his posterior belief about θ_n is $\beta_n \in \{0, 1\}$. In the latter case, the PM's posterior belief about

[23]IL is yet again detrimental according to this measure if the conditions stated in Proposition 1 or Proposition 2, together with an additional condition on the difference between c and d, are satisfied. Moreover, there is now an additional region of the parameter space where IL is detrimental in the π-case.

θ_n coincides with his prior, i.e., $\beta_n = \pi_n$. In both cases, the PM's posterior beliefs are at least as precise as his priors, i.e., $|\beta_n - 1/2| \geq |\pi_n - 1/2|$ for $n = 1,2$. Hence $Eu\left(p^{IL},\theta\right) \geq Eu\left(p,\theta\right)$, a contradiction. From now on, we shall assume $K \in \{1,2\}$.

We continue by proving the necessity of $M = 1$. Assume by way of contradiction that $M = 2$, i.e., the PM can address both issues. It follows that for each issue n, the PM chooses policy $p_n = R_n\ (S_n)$ if $\beta_n > 1/2$ ($\beta_n < 1/2$), and is indifferent between $p_n = R_n$ and $p_n = S_n$ if $\beta_n = 1/2$. Note that $\beta_n \in \{0, \pi_n, 1\}$ for $n = 1,2$, where $\beta_n \in \{0,1\}$ if the PM or IG_n collected information about θ_n, and $\beta_n = \pi_n$ otherwise. Let $\overline{\beta}_n \equiv \max\{\beta_n, 1-\beta_n\}$, which corresponds to the PM's ex post belief that he is making the right policy choice on issue n. To prove the necessity of $M = 1$, it is sufficient to show that $\overline{\beta}_n^{IL} \geq \overline{\beta}_n$ for $n = 1,2$, where superscript IL indicates the game with IGs ($\Gamma = IL$) and the absence of superscript IL indicates the game without IGs ($\Gamma = \emptyset$).

Consider the PM's information collection decision. In the game $\Gamma \in \{\emptyset, IL\}$, let $\underline{\gamma}_n^{\Gamma} \equiv \min\{\gamma_n, 1-\gamma_n\}$, which corresponds to the PM's belief before he decides whether to collect information that he would be making the wrong policy choice on issue n if he were to not collect information about θ_n. Observe that in the game without IGs, we have $\underline{\gamma}_n = \min\{\pi_n, 1-\pi_n\}$. At the same time, in the game with IGs, we have $\underline{\gamma}_n^{IL} = 0$ if IG_n collected information, and $\underline{\gamma}_n^{IL} = \min\{\pi_n, 1-\pi_n\}$ if it did not. Observe also that in game $\Gamma \in \{\emptyset, IL\}$, the PM collects information on issue n when $\underline{\gamma}_n^{\Gamma}\alpha_n \geq d$ and, if $K = 1$, only when $\underline{\gamma}_n^{\Gamma}\alpha_n \geq \underline{\gamma}_{-n}^{\Gamma}\alpha_{-n}$, where $\alpha_1 \equiv \alpha$ and $\alpha_2 \equiv 1$.

Consider an arbitrary issue n. In the game with IGs, there are two cases to consider.

In one case, IG_n collected information, in which case $\underline{\gamma}_n^{IL} = 0$, the PM does not collect information on issue n, and $\overline{\beta}_n^{IL} = 1 \geq \overline{\beta}_n$. Moreover, the PM is at least as likely to be informed on the other issue, issue $-n$, in the game with IGs than in the game without IGs since in the game with IGs, either IG_{-n} collects information or $\underline{\gamma}_{-n}\alpha_{-n} \geq d$ and $\underline{\gamma}_{-n}\alpha_{-n} \geq \underline{\gamma}_n\alpha_n$ then imply $\underline{\gamma}_{-n}^{IL}\alpha_{-n} \geq d$ and $\underline{\gamma}_{-n}^{IL}\alpha_{-n} \geq \underline{\gamma}_n^{IL}\alpha_n$. Hence, we have $\overline{\beta}_{-n}^{IL} \geq \overline{\beta}_{-n}$.

In the other case, IG_n did not collect information, in which case $\underline{\gamma}_n^{IL} = \underline{\gamma}_n$. Since $\underline{\gamma}_{-n}^{IL} \leq \underline{\gamma}_{-n}$, the PM is at least as likely to collect information on issue n in the game with IGs than in the game without. It follows that $\overline{\beta}_n^{IL} \geq \overline{\beta}_n$ and $\overline{\beta}_{-n}^{IL} \geq \overline{\beta}_{-n}$ again.

From now on, we shall therefore assume $M = 1$.

The necessity of $\alpha \neq 1$ and/or $\pi_1 \neq \pi_2$ is proven in the appendix to the paper. ■

Proof of Proposition 4. We first consider the π-case. Assume by way of contradiction that $\mathcal{E}_S \neq \emptyset$. Proceeding as in the proof of Proposition 2, we can establish that in the game with IGs, $(\ell_1, \ell_2) = (0,1)$ and the PM does not collect information (on issue 1). For the latter to be true, it must be that $d > \underline{\pi}_1$. Since $(\ell_1, \ell_2) = (0,1)$, it must also be that in the game without IGs, the PM collects information only on issue 1 or on both issues.

Suppose the former. Observe first that we must have $\pi_2 < 1/2$; otherwise $Eu\left(p_S,\theta\right) = Eu\left(p_S^{IL},\theta\right)$, which would contradict $\mathcal{E}_S \neq \emptyset$. Following signal $m_1^{PM} = r_1$, the PM chooses $p = (R_1, S_2)$. Following signal $m_1^{PM} = s_1$, he chooses $p = (S_1, S_2)$. The PM's expected utility is then $U_1 = 1 + (1-\pi_2) - d$. If the PM were to deviate by not collecting any information, he would choose $p = (R_1, S_2)$ if $\pi_1 \geq 1/2$ and $p = (S_1, S_2)$ if $\pi_1 < 1/2$. His expected utility would be $U_\emptyset = \overline{\pi}_1 + (1-\pi_2)$. Now, $d > \underline{\pi}_1$ implies $U_\emptyset > U_1$, a contradiction.

Suppose now that the PM collects information on both issues. He chooses $p \in \{(R_1, S_2), (S_1, R_2)\}$ following signals $m_1^{PM} = r_1$ and $m_2^{PM} = r_2$. He chooses policy corresponding to (θ_1, θ_2) otherwise. His expected utility is $U_{12} = \pi_1\pi_2 + (1 - \pi_1\pi_2) 2 - 2d$. If the PM were to deviate by collecting information on issue 2 only, he would choose $p = (S_1, R_2)$ following signal $m_2^{PM} = r_2$. Following signal $m_2^{PM} = s_2$, he would choose $p = (R_1, S_2)$ if $\pi_1 \geq 1/2$ and $p = (S_1, S_2)$ if $\pi_1 < 1/2$. His expected utility is $U_2 = \pi_2 [(1 - \pi_1) + 1] + (1 - \pi_2)(\overline{\pi}_1 + 1) - d$. Now, $d > \underline{\pi}_1$ implies $U_2 > U_{12}$, a contradiction. We have thus established that $\mathcal{E}_S = \emptyset$.

Pick $e \in \mathcal{E}$. We now show that $Eu(p_S, \theta) \leq Eu(p_S^{IL}, \theta) = Eu(p^{IL}, \theta) < Eu(p, \theta)$. Consider first the sequential protocol. We know from the proof of Proposition 2 that $Eu(p, \theta) = 2 - \pi_1\pi_2$ and $Eu(p^{IL}, \theta) = 1 + \pi_1(1 - \pi_2) + (1 - \pi_1)\pi_2$. Consider second the simultaneous protocol. Proceeding as above, we can establish that in the game without IGs, the PM collects information on at most one issue. There are two cases to consider:

(1) $d > 2\pi_2(1 - \pi_1)$. In this case, the PM collects no information and chooses $p = (R_1, S_2)$. Here, $Eu(p_S, \theta) = \pi_1 + (1 - \pi_2)$. In the game with IGs, $(\ell_1, \ell_2) = (0, 1)$ and the PM collects no information. This is the same as under the sequential protocol, which implies $Eu(p_S^{IL}, \theta) = Eu(p^{IL}, \theta)$. Simple algebra shows that $Eu(p_S, \theta) < Eu(p_S^{IL}, \theta)$.
(2) $d \leq 2\pi_2(1 - \pi_1)$. This, together with $d > \underline{\pi}_1 = (1 - \pi_1)$, implies $\pi_2 > 1/2$. In the game without IGs, the PM collects information only on issue 1. Following signal $m_1^{PM} = r_1$, he chooses $p = (R_1, S_2)$. Following signal $m_1^{PM} = s_1$, he chooses $p = (S_1, R_2)$. It follows that $Eu(p_S, \theta) = \pi_1[1 + (1 - \pi_2)] + (1 - \pi_1)(1 + \pi_2)$. In the game with IGs, either $c > \pi_1 + \pi_2 - 1$, in which case $(\ell_1, \ell_2) = (0, 0)$ and $Eu(p_S, \theta) = Eu(p_S^{IL}, \theta)$. Or $c \leq \pi_1 + \pi_2 - 1$, in which case $(\ell_1, \ell_2) = (0, 1)$ and the PM collects no information. In this case, $Eu(p_S, \theta) < Eu(p_S^{IL}, \theta)$.

We now turn to the α-case. We first establish that $\mathcal{E} \subseteq \mathcal{E}_S$. Pick a parameter list $e \in \mathcal{E}$. Hence, all the conditions stated in Proposition 1 must be satisfied. To prove the result, it is sufficient to show that in the game without IGs, the PM collects information only on issue 1. To see this, observe that the PM has four options available:

(1) Collecting information only on issue 1. Since $\pi < 1/2$, he then chooses $p = (R_1, S_2)$ if $m_1^{PM} = r_1$ and $p = (S_1, S_2)$ if $m_1^{PM} = s_1$. His expected utility is $U_1 = \alpha + (1 - \pi) - d$.
(2) Collecting information only on issue 2. Since $\pi < 1/2$, he then chooses $p = (S_1, R_2)$ if $m_2^{PM} = r_2$ and $p = (S_1, S_2)$ if $m_2^{PM} = s_2$. His expected utility is $U_2 = (1 - \pi)\alpha + 1 - d$. Now, $\alpha > 1$ implies $U_1 > U_2$.
(3) Collecting information on both issues. He chooses $p = (R_1, S_2)$ following signals $(m_1^{PM}, m_2^{PM}) = (r_1, r_2)$, and chooses policy corresponding to (θ_1, θ_2) otherwise. His expected utility is $U_{12} = \alpha + (1 - \pi^2) - 2d$. Now, $d > \pi$ (from proof of Proposition 1) implies $U_1 > U_{12}$.
(4) Collecting no information. Since $\pi < 1/2$, he chooses $p = (S_1, S_2)$. His expected utility is $U_\emptyset = (1 - \pi)(\alpha + 1)$. Condition P1.2 implies $U_1 \geq U_\emptyset$.

Since these four cases exhaust all possibilities, we have shown that in the game without IGs, under both protocols the PM collects information only on issue 1. It is then straightforward to show that $e \in \mathcal{E}_S$. Hence $\mathcal{E} \subseteq \mathcal{E}_S$.

We now establish that $\mathcal{E}_S \subseteq \mathcal{E}$. Pick a parameter list $e \in \mathcal{E}_S$. Proceeding as in the proof of Proposition 1, we can establish the necessity of each of the following conditions:

(1) $\pi < 1/2$.
(2) $(\ell_1, \ell_2) = (0, 1)$, which implies $\pi \geq c > \pi^2$.
(3) Following signal $m_2 = r_2$, the PM does not collect information on issue 1 and chooses $p = (S_1, R_2)$, which implies $d > \pi(\alpha - 1)$.

(4) Following signal $m_2 = s_2$, the PM collects information on issue 1 and chooses $p = (R_1, S_2)$ if $m_1^{PM} = r_1$ and $p = (S_1, S_2)$ if $m_1^{PM} = s_1$.
(5) In the game without IGs, the PM collects information only on issue 1, and chooses $p = (R_1, S_2)$ if $m_1^{PM} = r_1$ and $p = (S_1, S_2)$ if $m_1^{PM} = s_1$.

Taken together, these five conditions imply

$$Eu\,(p_S, \theta) = \alpha + (1 - \pi)$$

and

$$Eu\left(p_S^{IL}, \theta\right) = \pi\left[(1 - \pi)\,\alpha + 1\right] + (1 - \pi)\,(\alpha + 1)\,.$$

Simple algebra shows that $Eu\,(p_S, \theta) > Eu\left(p_S^{IL}, \theta\right)$ only if $\pi\alpha > 1$. Hence, all four conditions P1.1-P1.4 are satisfied, and $e \in \mathcal{E}$. It follows that $\mathcal{E}_S \subseteq \mathcal{E}$, which together with $\mathcal{E} \subseteq \mathcal{E}_S$, implies $\mathcal{E} = \mathcal{E}_S$. That $\mathcal{E} = \mathcal{E}_S \neq \emptyset$ is easily seen by constructing a parameter list e. ■

Proof of Proposition 5. It is easy to construct parameter lists $e \in \mathcal{E}_K^{PM}$, thereby establishing $\mathcal{E}_K^{PM} \neq \emptyset$.

We first consider the π-case, and establish $\mathcal{E}_K \subsetneq \mathcal{E}_K^{PM}$. The result is trivial for $K = 1$ since $\mathcal{E}_1 = \emptyset$ and $\mathcal{E}_1^{PM} \neq \emptyset$. So suppose $K = 2$. We first show that $\mathcal{E}_2 \subseteq \mathcal{E}_2^{PM}$. Pick a parameter list $e \in \mathcal{E}_2$. Conditions P2.1 and P2.2 are then satisfied. Suppose the PM-first protocol. Observe that in the game without IGs, the two protocols are trivially equivalent. We then know that the PM starts by collecting information on issue 1. Following signal $m_1^{PM} = r_1$, he chooses $p = (R_1, S_2)$. Following signal $m_1^{PM} = s_1$, he collects information on issue 2 and chooses policy corresponding to (θ_1, θ_2). Here, $Eu\,(p, \theta) = 2 - \pi_1\pi_2$.

In the game with IGs, only IG_2 collects information. To see this, consider each of the five information collection decisions the PM might choose:

(1) Collecting no information. In this case, $\pi_1 \geq 1/2$ and condition P2.2 imply that only IG_2 collects information. Following signal $m_2 = r_2$, the PM chooses $p = (S_1, R_2)$. Following signal $m_2 = s_2$, he chooses $p = (R_1, S_2)$. His expected utility is $U_\emptyset = 1 + \pi_1\,(1 - \pi_2) + (1 - \pi_1)\,\pi_2$.
(2) Collecting information only on issue 1. In this case, IG_1 collects no information, while IG_2 collects information if and only if $\pi_2 < 1/2$ and $m_1^{PM} = s_1$. The PM's expected utility is
$$U_1 = \begin{cases} \pi_1\left[1 + (1 - \pi_2)\right] + (1 - \pi_1)\,(1 + \pi_2) - d & \text{if } \pi_2 \geq 1/2 \\ \pi_1\left[1 + (1 - \pi_2)\right] + (1 - \pi_1)\,2 - d & \text{if } \pi_2 < 1/2. \end{cases}$$
Now, $d > (1 - \pi_1)$ implies $U_\emptyset > U_1$.
(3) Starting by collecting information on issue 1 and, following signal $m_1^{PM} = s_1$, collecting information on issue 2 as well. In this case, neither IG collects information. The PM's expected utility is $U_{12} = 2 - \pi_1\pi_2 - (2 - \pi_1)\,d$. Now, $d > (1 - \pi_1)$ implies $U_\emptyset > U_{12}$.
(4) Collecting information only on issue 2. In this case, IG_2 collects no information, while IG_1 may collect information following signal $m_2^{PM} = r_2$ only (depending on Z, the probability the PM implements its reform following signals $m_1 = r_1$ and $m_2^{PM} = r_2$). The PM's expected utility is
$$U_2 = \pi_2\left[\pi_1 + (1 - \pi_1)\,2\right] + (1 - \pi_2)\,(\pi_1 + 1) - d < U_\emptyset.$$
(5) Starting by collecting information on issue 2 and, following signal $m_2^{PM} = s_2$, collecting information on issue 1 as well. IGs' information collection strategies are the same as in the previous case. The PM's expected utility is $U_{21} = 2 - \pi_1\pi_2 - (2 - \pi_2)\,d$. Hence, $U_{12} > U_{21}$ which, together with $U_\emptyset > U_{12}$, implies $U_\emptyset > U_{21}$.

Thus, in the game with IGs the PM collects no information, and $Eu\left(p^{IL},\theta\right) = 1 + \pi_1\left(1-\pi_2\right) + \left(1-\pi_1\right)\pi_2$. Simple algebra shows that $Eu\left(p,\theta\right) > Eu\left(p^{IL},\theta\right)$. Hence, $e \in \mathcal{E}_2^{PM}$, which implies $\mathcal{E}_2 \subseteq \mathcal{E}_2^{PM}$. That $\mathcal{E}_2 \subsetneq \mathcal{E}_2^{PM}$ is easily seen by constructing parameter lists $e \in \mathcal{E}_2^{PM} \backslash \mathcal{E}_2$.

We now turn to the α-case, and establish $\mathcal{E}_K \cap \mathcal{E}_K^{PM} = \emptyset$. We consider the case in which $K = 2$; a similar argument applies when $K = 1$. Pick a parameter list $e \in \mathcal{E}_2$. Conditions P1.1-P1.4 are then satisfied. Consider the PM-first protocol. Given that in the game without IGs the two protocols are equivalent, we know that the PM collects information only on issue 1, and chooses $p = \left(R_1, S_2\right)$ if $m_1^{PM} = r_1$ and $p = \left(S_1, S_2\right)$ if $m_1^{PM} = s_1$. Here, $Eu\left(p,\theta\right) = \alpha + \left(1-\pi\right)$.

In the game with IGs, the PM collects no information, while IG_1 (and possibly IG_2) collects information. To see this, consider again each of the five information collection decisions the PM might choose:

(1) Collecting no information. In this case, $\pi < 1/2$ and $\pi \geq c$ imply that IG_1 collects information. The PM's expected utility is then $U_\emptyset \geq \alpha + \left(1-\pi\right)$.
(2) Collecting information only on issue 1. In this case, IG_1 collects no information, while IG_2 collects information following signal $m_1^{PM} = s_1$ only. The PM's expected utility is $U_1 = \alpha + \left(1-\pi^2\right) - d$. Now, $d > \pi$ (from proof of Proposition 1) implies $U_\emptyset > U_1$.
(3) Starting by collecting information on issue 1 and, following signal $m_1^{PM} = s_1$, collecting information on issue 2 as well. In this case, neither IG collects information. We then have $U_{12} < U_1 < U_\emptyset$.
(4) Collecting information only on issue 2. In this case, IG_2 collects no information, while IG_1 does. The PM's expected utility is $U_2 = \alpha + \left(1-\pi^2\right) - d = U_1 < U_\emptyset$.
(5) Starting by collecting information on issue 2 and, following signal $m_2^{PM} = s_2$, collecting information on issue 1 as well. It is easy to see that the PM's expected utility $U_{21} < U_2$ which, together with $U_2 < U_\emptyset$, implies $U_{21} < U_\emptyset$.

Thus, in the game with IGs, the PM collects no information and $Eu\left(p^{IL},\theta\right) \geq \alpha + \left(1-\pi\right)$. Hence, $Eu\left(p^{IL},\theta\right) \geq Eu\left(p,\theta\right)$ and $e \notin \mathcal{E}_2^{PM}$. It follows that $\mathcal{E}_2 \cap \mathcal{E}_2^{PM} = \emptyset$. ∎

Proof of Proposition 6. Let $\alpha = 1$, $\pi_1 = \pi_2 = \pi$, $c_1 = c_2 = c$, $d_1 = d_2 = d$, and finally $1/2 < q_2 < q_1 \leq 1$. Denote $\tau_n \equiv \pi q_n + (1-\pi)(1-q_n)$ and let $q_n \geq \max\{\pi, 1-\pi\}$ for both n.

Consider first the PM's choice of whether to collect information on issue j, given that he previously observed signal m_i (or equivalently m_i^{PM}). First note that since $\alpha = 1$, both issues are equally important. This means that when $m_i = r_i$, the PM prefers to implement R_i rather than collect m_j^{PM}. When $m_i = s_i$, the PM may choose to implement R_j, which results in expected payoff $Eu_j = \pi$, to implement neither reform, resulting in $Eu_j = 1-\pi$, or to collect m_j^{PM}, resulting in $Eu_j = q_j - d$. The PM prefers to collect information on j when

$$d < \min\{q_j - (1-\pi), q_j - \pi\}. \tag{1}$$

He prefers to implement (S_i, R_j) without collecting m_j^{PM} if

$$\pi \geq \frac{1}{2} \quad \text{and} \quad d \geq q_j - \pi. \tag{2}$$

He prefers to implement (S_i, S_j) without collecting m_j^{PM} if

$$\pi < \frac{1}{2} \quad \text{and} \quad d \geq q_j - (1-\pi). \tag{3}$$

Consider second the PM's choice of whether to collect information, and on which issue to collect information on first, in the event that $m_i = m_j = \emptyset$. If the uninformed PM does not collect information, his expected payoffs is $Eu = 2(1-\pi)$ if he maintains S_n on both issues and is $Eu = \pi + (1-\pi) = 1$ if he implements either reform. If, rather, he begins by collecting information on issue i, then his expected payoff depends on what he does after observing m_i^{PM}, i.e., depends on whether (1) or (2) or (3) hold. Collecting information on issue 1 first results in $Eu = q_i - d + \tau_i(1-\pi) + (1-\tau_i)\hat{u}_j$, where $\hat{u}_j = q_j - d$ when (1) holds, $\hat{u}_j = \pi$ when (2) holds, and $\hat{u}_j = 1-\pi$ when (3) holds.

In determining the PM's behavior in the absence of lobbying, we first analyze the setting where $\pi \geq 1/2$. Since $q_1 > q_2$, it follows that $q_1 - \pi < q_2 - \pi$, and thus the cut value associated with (1) and (2) is higher when $j = 1$ than when $j = 2$. The analysis refers to the following three cases, where i denotes the issue on which the PM collects information first: (i) $d < q_2 - \pi$ (e.g., when $m_i^{PM} = s_i$ the PM collect information on the second issue); (ii) $q_2 - \pi \leq d < q_1 - \pi$ (e.g., when $m_i^{PM} = s_i$ the PM collects information on the second issue when $i = 2$, and implements reform on the second issue without additional information when $i = 1$); (iii) $q_1 - \pi \leq d$ (e.g., when $m_i^{PM} = s_i$ the PM implements reform on the second issue without additional information). In all of these cases, when $m_i^{PM} = r_i$, the PM implements reform R_i.

In all three cases, one can show that the PM prefers to collect information on issue 1 first than to collect information on issue 2 first. That is,

$$q_1 - d + \tau_1(1-\pi) + (1-\tau_1)\hat{u}_2 \geq q_2 - d + \tau_2(1-\pi) + (1-\tau_2)\hat{u}_1 \tag{4}$$

regardless of whether (i) holds where $\hat{u}_1 = q_1 - d$ and $\hat{u}_2 = q_2 - d$, (ii) holds where $\hat{u}_1 = q_1 - d$ and $\hat{u}_2 = \pi$, or (iii) holds where $\hat{u}_1 = \hat{u}_2 = \pi$. Notice that $\hat{u}_1 \geq \hat{u}_2$ in all cases since $q_1 - d > q_2 - d$ and $q_1 - d > \alpha$ given that $d < q_1 - \pi$. The expression simplifies to

$$\hat{q} + \hat{q}(2\pi - 1)(1-\pi) \geq (1-\tau_2)\hat{u}_1 - (1-\tau_1)\hat{u}_2,$$

where $\hat{q} \equiv q_1 - q_2$. In case (i), the right hand side becomes $\hat{q}(\pi - (2\pi - 1)d)$. Substituting in to the above inequality and simplifying gives

$$q - \pi + (2\pi - 1)(1 + d - \pi) \geq 0,$$

an expression which is always satisfied given the constraints. One can similarly show that the PM prefers to collect information on issue 1 first than to collect information on issue 2 first in cases (ii) and (iii).

Having established that the PM prefers to begin his information collection on issue 1 rather than 2, we must now determine when the PM prefers to collect information on issue 1 first rather than implement a reform without collecting any information. In cases (i) and (ii) the costs of information collection d are sufficiently low that the PM always prefers to collect information on issue 1 than to not collect information. In case (iii), the PM will prefer to collect information on 1 rather than no information if

$$q_1 - d + \tau_1(1-\pi) + (1-\tau_1)\pi > \pi + (1-\pi) = 1.$$

This simplifies to a requirement that

$$d < q_1 - (1-\pi) - (2\pi - 1)\tau_1 = 2\pi(2q_1 - 1)(1-\pi). \tag{5}$$

For larger values of d, an uninformed PM chooses to implement a reform without first collecting any information.

Next we analyze PM behavior in the absence of lobbying when $\pi < 1/2$. Here, condition (1) or (3) hold, never (2). We consider three cases of d: (iv) when $d < q_2 - (1-\pi)$, (v) when $q_2 - (1-\pi) \leq d < q_1 - (1-\pi)$, and (vi) when $q_1 - (1-\pi) \leq d$. Proceeding as we did for the case when $\pi \geq 1/2$, one can show that in all three cases, the PM prefers to first collect information on issue 1 rather than on issue 2. One can also show that in cases (iv) and (v), the PM always prefers to search on issue 1 first than to search on neither. In case (vi), however, the PM prefers to implement neither reform without collecting any information.

In order for $Eu\left(p,\theta\right) > Eu\left(p^{IL},\theta\right)$, it must decrease the probability that the PM implements a beneficial reform when one exists. In the no-lobbying subgame equilibria under (i) and (iv), this will not be the case since the PM will always follow up a realization that $\theta_n = S_n$ by searching on the issue he remains uninformed about. In the no-lobbying subgame equilibria under (ii) and (v), similar logic applies. In these equilibria, the PM collects information on issue 1, and then makes a decision without collecting information on issue 2. If IG_1 collects information, then the PM is always at least as informed as without lobbying. If only IG_2 collects information, then the PM implements a beneficial reform when $m_2 = R_2$, and collects information on issue 1 when $m_2 = S_2$. That is, the PM always implements a beneficial reform when one exists. In case (vi) as well as case (iii) when (5) is violated, the PM did not collect information in the absence of lobbying, and therefore IL cannot decrease his information.

Only case (iii) when (5) holds remains a viable option for IL to be detrimental. In this case,

$$\pi \geq 1/2 \quad \text{and} \quad q_1 - \pi \leq d < 2\pi(1-\pi)(2q_1 - 1). \tag{6}$$

Here, the PM collects information on issue 1 when he is uninformed, and then chooses whether to implement a reform without collecting information on issue 2. If IL involves information collection by IG_2 and not IG_1, then the PM will make a reform decision without collecting information on issue 1. This means that when $m_2 = s_2$, the PM chooses R_1 without further search, this leads to $Eu\left(p^{IL},\theta\right) = q_2 + \tau_2(1-\pi) + (1-\tau_2)\pi$, versus expected expected policy utility without IL of $Eu\left(p,\theta\right) = q_1 + \tau_1(1-\pi) + (1-\tau-1)\pi$. In this case, $Eu\left(p,\theta\right) > Eu\left(p^{IL},\theta\right)$.

We must find conditions under which IG_2 prefers to collect information and IG_1 does not in equilibrium. In this case, IG_2 expects payoff from collecting information of $\tau_2 - c$ and from deviating to not collect information of $1 - \tau_1$. It must be that $\tau_2 - c \geq 1 - \tau_1$, which becomes $c \leq \tau_1 + \tau_2 - 1$. Additionally, IG_1 expects payoff from not collecting information of $1 - \tau_2$ and from deviating to collect information of $\tau_1(Z\tau_2 + 1 - \tau_2) - c$. It must be that $1 - \tau_2 > \tau_1(1 - \tau_2(1-Z)) - c$. This condition becomes $c > \tau_1 + \tau_2 - 1 - \tau_1\tau_2(1-z)$, and is necessarily satisfied for $Z = 0$. Therefore, for IL to be detrimental, it must be that

$$c \leq \tau_1 + \tau_2 - 1. \tag{7}$$

From conditions (6) and (7) we get the ranges of π, c, and d for which IL decreases expected equilibrium policy utility. There is no constraint on K and the PM only collects information on one issue in the relevant parameter case. ■