The value of confidential policy information: persuasion, transparency, and influence

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Abstract

Transparency of the lobbying process is hailed as an effective means to limit the influence of special interest groups, but should transparency also apply to the information obtained by policy makers? This paper extends theories of informational lobbying by explicitly modelling the choice of policy makers to obtain information before interacting with lobbyists. This approach reveals a new channel for the value of confidentiality: extracting evidence from special interest groups. It shows that, counter-intuitively, the influence of special interest groups can increase as policy makers become more expert. These results shed light on the relationship between confidentiality, good governance, and influence.

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1 Introduction

Transparent policy making is often considered a defining feature of democracy. When the information available to policy makers is easily accessible, the public can scrutinise policy decisions and hold elected representatives accountable.

While governments have started disclosing the identity of external sources of information and the interests they represent, through bills such as the Lobbying Disclosure Act in the US in 1995 or the Transparency of Lobbying Act in the UK in 2014, there is an ongoing debate about whether their internal sources should remain confidential. For example, the Congressional Research Service (CRS) has defended the confidentiality of its research for many years until eventually agreeing to make its reports publicly available in 2018 (DeBonis 2017, Hayden 2018).[1] One of the arguments advanced by the CRS to defend the confidentiality of its reports is the risk of influence by outsiders: "Widespread public dissemination will almost certainly increase partisan and special interest pressure [...]. Such pressure from the public [...] could subtly affect the way CRS authors write their reports. Congress may ultimately benefit less from the information in CRS Reports."[2] In parallel, a debate arose about how much influence legislators should have on the way this research is carried out. According to a former CRS researcher, following pressure from members of congress "CRS analysts were told not to end their reports with a section titled 'conclusion.' That sounded far too definitive and authoritative." (Kosar 2015).[3]

In this paper, I evaluate the effect of keeping internal information confidential on the influence that special interest groups exert on policies. I extend theories of informational lobbying – the influence of interest groups through the provision of information, rather than through monetary contributions – by explicitly considering policy makers' control over their internal information. This approach reveals a novel channel through which confidentiality can be beneficial: by keeping their own information confidential, policy makers can induce special interest groups to provide more evidence. The value of confidentiality to policy makers is not driven by reputational concerns or bargaining considerations, and hence can be socially beneficial. Therefore, while preventing the release of CRS reports might have been driven by more prosaic considerations such as the cost of disseminating them or legal protection for its authors, this confidentiality might have had positive effects on the quality of policies. I characterise the policy makers' strategic choices of internal information and show that they can benefit from limiting the precision of their information. To the extent that avoiding authoritative conclusions reduces the precision of the information available, legislators' suggestions to CRS researchers may have lead to better policy decisions.

The relationship between policy makers' choices of internal information and the provision of infor-

[1] Memos to individual congress members remain confidential and can be made public only at the discretion of members.
[2] See `https://fas.org/sgp/crs/considerations.pdf`.
[3] This is also suggested in the UK Parliament's Parliamentary Research Handbook: "On subjects that are controversial and for which there is not good evidence, be particularly careful about giving conclusions."

mation by special interest groups is driven by a simple intuition. When interest groups can observe the information already available to policy makers, they can produce evidence that is just sufficiently accurate to tilt the policy decision in their favour. When the information available to the government is not publicly available, interest groups form beliefs about the information policy makers are most likely to have. These beliefs determine whether interest groups want to offer more or less information: if they believe that policy makers are likely to be sceptical about their preferred policy, then they need to offer more evidence. Therefore, policy makers should shape their preliminary investigations to let lobbyists believe that they are sufficiently sceptical and that more evidence is needed.

I formalise this intuition to address the following questions. First, when is confidentiality valuable to policy makers, and therefore most likely to be used by governments? Second, how does the government's control over internal investigations affect the influence that special interest groups exert on policy making?

To answer these questions, I consider a model with a single policy maker and a lobbyist. The policy maker has to decide whether to enact a new policy that is supported by the lobbyist, but faces uncertainty. In the first stage, the policy maker chooses the precision of a signal about an unknown state of nature that she receives confidentially. She would like to choose the welfare-maximising policy given the state, but her limited expertise constrains the precision of her signal. The lobbyist also acquires some independent signals to share with the policy maker. His expertise is not limited and he can perfectly adjust the precision of his information to persuade the policy maker to choose his preferred policy.

I show that confidentiality is valuable as it forces the lobbyist to choose an investigation that reveals more evidence than necessary to persuade the policy maker. By keeping her own signal realisations confidential, the policy maker strategically creates a situation of asymmetric information which allows her to extract informational rent. This occurs even when her preliminary information would have no effect on her policy choice, in the absence of lobbying.

The value of confidentiality has limits, however. I show that the policy maker may need to distort her own information in order to induce the lobbyist to provide more evidence than he would like to. These distortions involve reducing the precision of certain conclusions of the investigation, and hence reduce its overall informativeness. There is thus a trade-off between obtaining information internally and extracting it from external sources.

This trade-off generates results relevant for two commonly studied policy questions. First, the value of confidentiality is non-monotonic in the policy maker's expertise. When government expertise is low, the value of confidentiality increases in expertise, as more expertise allows the policy maker to extract more evidence from the lobbyist. However, when expertise is high, that value eventually declines as the additional gains from inducing the lobbyist to provide more information are relatively less important, compared to the costs of distorting internal information. In addition, the value of confidentiality is higher for policy makers who are initially opposed to the lobbyist's policy than for allies of the lobbyist.

Second, the influence of the lobbyist on policy can sometimes increase with the government's expertise. This arises because more expertise can make the policy maker more likely to choose the lobbyist's least-preferred policy and therefore makes the lobbyist's presence even more important to overturn that choice. This occurs despite the fact that expertise improves policy choice and makes the policy maker better-off. The influence of the lobbyist is also higher on policy makers who initially agree with them than on those who initially disagree with them, because the former are easier to re-convince, should they temporarily change their mind after acquiring their own information.

These results have both positive implications for evaluating the influence of interest groups, and normative consequences for the optimal design of institutions.

Consider the fact that the resources spent on lobbying in the US have significantly increased in real terms over the last 15 years, while the budget of the Congressional Research Service has remained relatively constant (figure 1). This could suggest that information generation is increasingly being outsourced to external groups whose influence is increasing. An alternative explanation is that even with limited resources, policy makers can force lobbyists to provide additional information, and therefore expend more resources, so these changes in fact reflect a loss of influence. Which of these two explanations is correct depends on how these sources of information interact with one another. More generally, whether returns to lobbying expenditures can be interpreted as influence depends on the information available to policy makers in a counterfactual world without lobbying. This paper offers a framework to think about this counterfactual scenario.

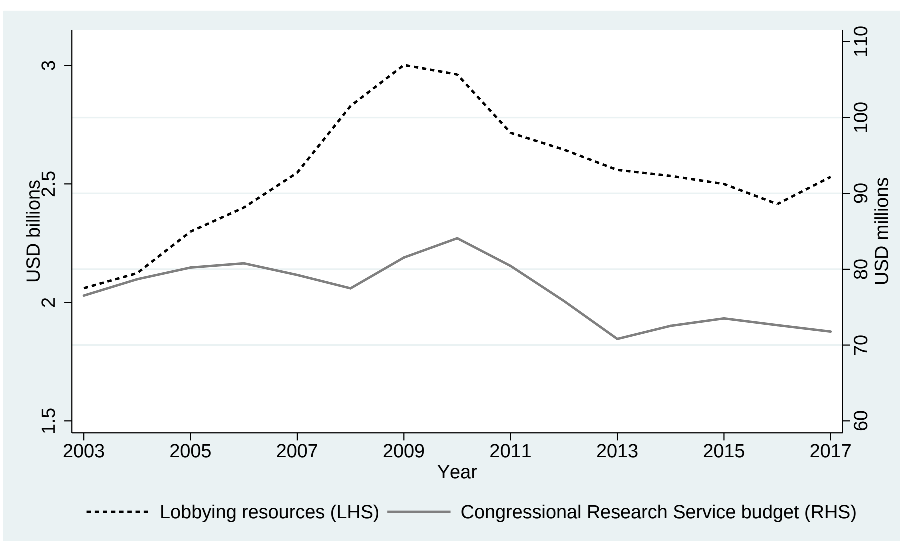


Figure 1: Lobbying resources (excl. campaign donations) (LHS) and Congressional Research Service budget (RHS), inflation-adjusted. Sources: CRS annual report and Center for Responsive Politics.

The results also explain why preferences over confidentiality can vary over time and across policy areas as the policy agenda evolves or as more technocratic policy makers get elected. These strategic preferences for confidentiality can be positively correlated with the quality of policy making even in the absence of a causal relationship between the two variables. This is consistent with empirical evidence that higher levels of transparency are associated with better governance (e.g. Islam 2006) but suggests that there can be other factors, such as government expertise, moving both of these variables. In fact, the model shows that shining too much light on the policy process can reduce the quality of policy making.

Finally, the paper offers a new rationale for the observation that lobbyists often target friendly legislators who already support their policies.[4] Lobbyists may want to provide information to policy makers who already support their proposal because there is a risk that the policy makers change their policy choice after acquiring their own information. Since these policy makers are easier to re-convince, lobbyists have more to gain from targeting them.

Related literature

This paper relates to two strands of literature: models of informational lobbying and studies of transparency in political institutions. It shows that these two questions are linked: transparency determines how information flows between policy makers and lobbyists which, in turn, affects the information that lobbyists provide.

A large literature has looked at how information is transmitted to legislators by lobbyists (e.g. Potters & van Winden (1992), Austen-Smith & Wright (1992), Rasmusen (1993), Austen-Smith (1993), Lagerlof (1997)). The most closely related papers study how informational lobbying is affected by information already held by policy makers. Felgenhauer (2013) shows that expert politicians are not always better than non-experts in the presence of lobbyists. In his model, the expertise of the politician only has an effect when two lobbies compete. By allowing the information to be concealed, I show that even a single lobby can be induced to provide more information as the politician's expertise increases. Cotton & Dellis (2016) show that informational lobbying can be detrimental if more information provided by lobbyists shifts the focus of a policy maker towards less important issues and thus reduces the information she collects. This substitution across the two sources of information relies on the existence of multiple policies and the limited capacity of the policy maker to act on these policies. Substitution arises in my model even with one policy dimension because information can be confidential, so that the policy maker's choice of information affects the beliefs of lobbyists and the evidence they provide. Finally, in Ellis & Groll (2020), the trade-off between acquiring costly information in-house or relying on that provided by lobbyists comes from the difference in their resource constraints. Information is costless in

[4] See Kollman (1997), Hojnacki & Kimball (1998), Hall & Miler (2008), Beyers & Hanegraaff (2017) for evidence and e.g. Cotton & Dellis (2016), Schnakenberg (2017), Awad (2020) for existing theoretical explanations.

my model and the interaction between the two types of information depends on whether that information is made public or not.[5] Another closely related paper, Cotton & Li (2018), studies the effect of internal information on monetary lobbying. They show that because a better informed politician might be harder to sway through contributions, politicians might prefer to reduce the informativeness of their signals. Because they focus on the effect of internal information on monetary rather than informational lobbying, this paper is complementary to theirs. In particular, I show that additional internal information can be detrimental even with a benevolent politician rather than one who maximises contributions.

In the transparency literature, Felgenhauer (2010) and Gailmard & Patty (2019) study the effect of making policy makers' information public.[6] Felgenhauer (2010) finds that confidentiality can be socially beneficial as it can reduce monetary contributions from lobbyists and result in better policies. More internal information is unambiguously valuable as it reduces lobbyists' influence. Instead, I show that with informational lobbying, more precise information can be detrimental. Gailmard & Patty (2019) find that transparency of the policy maker's information can reduce the amount of information transmitted from a bureaucrat. Their focus on bureaucracies, rather than interest groups' influence, leads them to study optimal delegation rules rather than distortions in the policy maker's information.

From a technical perspective, this paper builds on the persuasion literature with privately informed receivers, such as Kolotilin (2018) and Guo & Shmaya (2019). These papers show that the receiver's payoff can be decreasing in the precision of her private information. This paper extends their analysis in a simpler setting by showing that the receiver would indeed prefer to keep her information private as long as its precision is limited, and by characterising the optimal investigation of the receiver. This paper mainly differs in its objective, however: to propose a simple model of the relationship between policy makers' information choices and the influence of lobbyists, rather than to add to the theory of persuasion.

The rest of the paper is organised as follows. Section 2 introduces the model. Section 3 characterises the lobbyist's and the policy maker's choice of information and shows that the policy maker can gain from confidentiality. Section 4 shows that both confidentiality and interest group influence vary non-monotonically in the policy maker's expertise and compares these outcomes between allied and opposed policy makers. Section 5 discusses some empirical implications of these results and some extensions. Section 6 concludes. All proofs are presented in appendix.

[5] Other papers also study how political institutions affect the influence of informational lobbying. Bennedsen & Feldmann (2002a) look at the effect of the vote of confidence procedure, Bennedsen & Feldmann (2002b) at party cohesion, Dellis & Oak (2020) at the legislature's subpoena power, while Dahm & Porteiro (2008a) and Wolton (2018) look at the interaction between informational lobbying and other forms of pressure.

[6] A large literature has shown how transparency of an agent's *actions* can be damaging in a number of institutions, including decision making in committees of experts (Levy (2007), Meade & Stasavage (2008), Seidmann (2011), Swank & Visser (2013), Hansen et al. (2017), Fehrler & Hughes (2018), Gradwohl & Feddersen (2018)) or more general principal-agent relationships (Prat (2005), Fox (2007)). This article focuses instead on transparency of *information*.

2 Model

The model has two players: a policy maker (PM) and a lobbyist, and three stages. In the first stage, the PM can acquire some information about a binary state $\omega \in \{0, 1\}$. In the second stage, the lobbyist acquires some additional information about ω to present to the PM. All players share a prior $\mu_0 := \mathbb{P}(\omega = 1)$. Throughout the paper a belief refers to the probability that the state is $\omega = 1$, unless otherwise specified.

In the final stage, the PM chooses a policy $x \in \{0, 1\}$ whose consequences are uncertain. The PM wants the policy to match the state. Her utility function is

$$u(x, \omega) = \begin{cases} 1 & \text{if } x = \omega, \\ 0 & \text{if } x \neq \omega. \end{cases}$$

The lobbyist cares about the final action of the PM independently of the state, and wants her to choose policy $x = 1$. His utility function is

$$v(x) = \begin{cases} 1 & \text{if } x = 1, \\ 0 & \text{if } x = 0. \end{cases}$$

Because of the uncertainty, the PM would like to obtain more information about the state. This information can come from two sources. In the first stage, she can launch a preliminary *investigation*. An *investigation* consists of a pair of conditional probability distributions over binary signal realisations $r \in \{r_0, r_1\}$, for each value of the state:[7]

$$p = \{p(r|\omega = 1), p(r|\omega = 0)\}$$

The PM updates her beliefs according to Bayes rule upon observing $r \in \{r_0, r_1\}$, to

$$\mu^r = \mathbb{P}(\omega = 1|r) = \frac{p(r|\omega = 1)\mu_0}{p(r|\omega = 1)\mu_0 + p(r|\omega = 0)(1 - \mu_0)}$$

In the second stage, the PM obtains additional information from the lobbyist. The lobbyist also produces evidence by choosing an investigation which produces one of two signals s_0 and s_1. I refer to this choice of investigation as the lobbyist's *persuasion strategy* and denote it π. A *persuasion strategy* consists of a pair of probability distributions over realisations $s \in \{s_0, s_1\}$ conditional on ω:

$$\pi = \{\pi(s|\omega = 1), \pi(s|\omega = 0)\}$$

[7] The main insights continue to hold if the PM has access to a more complex investigation generating more than two signals. See online appendix (section D) for details.

The lobbyist can credibly commit to this strategy and to revealing s to the PM. I denote the posterior belief of the PM following realisations r and s by $\mu_s^r := \mathbb{P}(\omega = 1|s, r)$.

Acquiring information is costless for both players. However, a key feature of the model is that the PM's expertise is limited. Formally, expertise is captured by a bound $B \in [1, +\infty)$ on the likelihood ratios of the signals r. So that, for every p,

$$\frac{1}{B} \leq \frac{p(r|\omega)}{p(r|\omega')} \leq B$$

This bound implies that the PM cannot learn the state of the world perfectly: the posterior beliefs μ^r must belong to an interval $\left[\underline{\mu}, \bar{\mu}\right] \subset [0, 1]$. The lowest and highest posterior beliefs that she can induce are: $\underline{\mu} = \frac{\mu_0}{\mu_0+(1-\mu_0)B}$ and $\bar{\mu} = \frac{B\mu_0}{B\mu_0+(1-\mu_0)}$. The parameter B captures the difference in expertise between the PM and the lobbyist and is public knowledge. The lobbyist's advantage stems from facing no expertise bound as, in effect, $B = +\infty$ for him.

I refer to the investigation p such that $\frac{p(r_0|\omega=0)}{p(r_0|\omega=1)} = \frac{p(r_1|\omega=1)}{p(r_1|\omega=0)} = B$ as the *the most informative investigation* available to the PM and denote it $\bar{p}$. This investigation induces interim beliefs $\mu^{r_0} = \underline{\mu}$ and $\mu^{r_1} = \bar{\mu}$.

I consider three possible regimes. Under *transparency*, the lobbyist observes both the PM's choice of investigation p and its outcome r. Under *partial confidentiality*, the lobbyist observes the choice of p but not its outcome r. Finally, under *full confidentiality*, the lobbyist observes neither p nor r.

Under partial confidentiality, the timing is as follows:

1. The PM publicly chooses a preliminary investigation p.

2. $r \in \{r_0, r_1\}$ is realised but only observed by the PM.

3. The lobbyist chooses a persuasion strategy π after observing p.

4. $s \in \{s_0, s_1\}$ is publicly realised.

5. The PM updates her beliefs and chooses $x \in \{0, 1\}$.

Under transparency, the timing is the same, but the lobbyist can observe the realised r and therefore condition π on both p and r. The full confidentiality case is equivalent to both players choosing π and p simultaneously, before observing both realisations r and s.

The equilibrium concept is weak perfect Bayesian equilibrium: the players' strategies are sequentially rational given their beliefs, and beliefs are updated according to Bayes rule whenever possible.[8] I focus on pure strategy equilibria within this class.[9]

[8] Players cannot signal any private information through their actions so there is no need to refine beliefs following off-equilibrium actions.

[9] In equilibrium, the PM never mixes across policy choices. If she did, the lobbyist would deviate to break the PM's

Discussion of assumptions. The assumption that the lobbyist can commit to disclosing his information makes the model more tractable and allows me to focus on the *type of evidence* that both parties generate, and the *influence* this information has on policies. While there are some lobbying situations that satisfy this assumption,[10] not all interactions between lobbyists and policy makers necessarily involve truthful communication. In the online appendix (section A), I consider an extension of the model in which the lobbyist can lie about his information.[11] I show that the main results continue to hold: the policy maker can benefit from confidential information but the benefits from confidentiality disappear as her information becomes more precise, she can gain from reducing the precision of internal information, and an increase in her expertise can both force the lobbyist to spend more resources and decrease his influence. In the online appendix (section C), I also show that it is not necessary for the policy maker to commit to keeping that information confidential: if she had the possibility to disclose it, she would never choose to do so in equilibrium.

Policy choice

In the final stage, the PM chooses policy $x = 0$ (respectively, $x = 1$) if she is sufficiently confident that the state is $\omega = 0$ (respectively, $\omega = 1$). I assume that the PM selects $x = 1$ when indifferent. The policy choice can be expressed as a function of some generic posterior belief μ:

$$x(\mu) = \begin{cases} 0 & \text{if } \mu < \frac{1}{2}, \\ 1 & \text{if } \mu \geq \frac{1}{2} \end{cases}$$

Given this strategy $x(\mu)$, we can express the PM and lobbyist's expected utilities as functions of μ. Let $U(\mu) = \mu u(x(\mu), 1) + (1 - \mu)u(x(\mu), 0)$ and $V(\mu) = v(x(\mu))$. Then,

$$\text{for the PM,} \quad U(\mu) = \begin{cases} 1 - \mu & \text{if } \mu < \frac{1}{2}, \\ \mu & \text{if } \mu \geq \frac{1}{2} \end{cases} \quad \text{and for the lobbyist,} \quad V(\mu) = \begin{cases} 0 & \text{if } \mu < \frac{1}{2}, \\ 1 & \text{if } \mu \geq \frac{1}{2}\,. \end{cases}$$

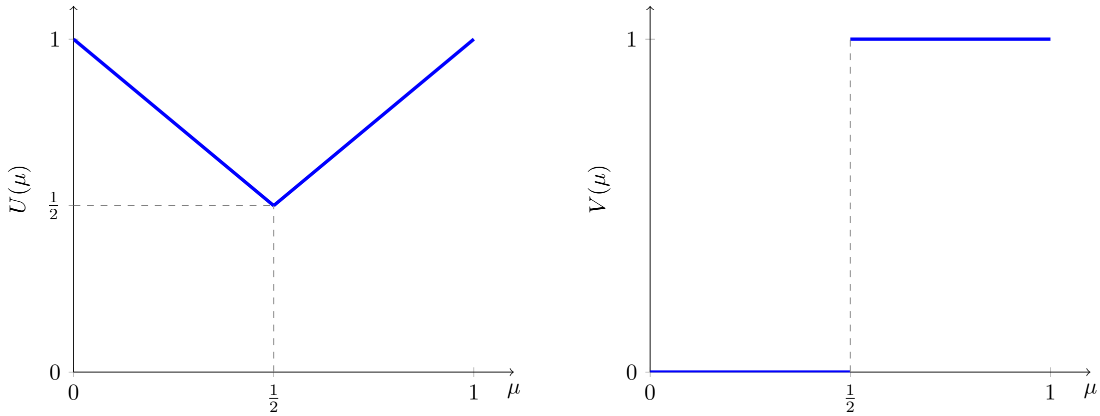
These expected utilities are illustrated in figure 2.

When the PM's prior belief μ_0 is below $\frac{1}{2}$, she needs to be persuaded to take action $x = 1$. When

indifference and increase the probability of getting his preferred policy. Mixing across persuasion strategies leads to another distribution over posterior beliefs which could be replicated with a pure strategy.

[10] For instance, special interest groups may fund and help design scientific studies. Once the results of these studies are released in peer-reviewed publications, special interest groups can no longer control their disclosure (for examples, see White & Bero 2010, Kearns et al. 2016, Nestle 2016). Pharmaceutical companies have also funded patient advocacy groups to send patients to testify in Congress (Kopp et al. 2018). The companies can influence what patients are likely to reveal, but do not have control over the final testimony, so this type of influence strategy is akin to running an uncertain experiment and committing to disclosing the results. Other existing models of informational lobbying (e.g. Austen-Smith 1998, Cotton & Dellis 2016) also make this assumption.

[11] I extend the present model to three possible states and allow partial alignment between the players so that some (but not necessary all) information can potentially be credibly transmitted.



(a) Policy maker's expected utility

(b) Lobbyist's expected utility

Figure 2: Policy maker and lobbyist's expected utilities

$\mu_0 \geq \frac{1}{2}$, the PM does not need to be persuaded absent any preliminary information. However, the information she acquires can push her belief below $\frac{1}{2}$ and induce the lobbyist to provide additional information. In line with the literature on friendly lobbying (see e.g. Cotton & Dellis 2016, Schnakenberg 2017, Awad 2020), I refer to the PM in the first case as an *enemy* and in the second case as an *ally*. In both cases, I say that the PM becomes more *sympathetic* after receiving some preliminary information if her belief increases towards 1 and becomes more *sceptical* if her belief decreases.

For a given p and a given π, the PM's ex-ante expected utility is

$$\mathbb{E}\left[U(\mu)|(p,\pi)\right] = \sum_{r\in\{r_0,r_1\}} \mathbb{P}_p(r) \sum_{s\in\{s_0,s_1\}} \mathbb{P}_\pi(s|r) U\left(\mu_s^r\right)$$

$\mathbb{P}_p(r)$ is the probability of observing realisation r from the PM's investigation p: $\mathbb{P}_p(r) = \mu_0 p(r|1) + (1-\mu_0)p(r|0)$. Similarly, $\mathbb{P}_\pi(s|r)$ is the probability of observing realisation s from the lobbyist's persuasion strategy π, conditional on having observed signal r that is: $\mathbb{P}_\pi(s|r) = \mu^r\pi(s|1) + (1-\mu^r)\pi(s|0)$.

3 The role of confidential policy information

In this section, I explain how the PM to extract information from the lobbyist. I first describe the players' strategies under transparency. I then show how the lobbyist adapts his strategy to confidentiality and how the PM maximises the benefits from her investigation.

3.1 Transparency

Suppose first that the PM's information is not confidential. Following realisation r from the PM's investigation, both players share the belief μ^r.

Lobbyist's persuasion strategy

The lobbyist's strategy, π, induces a lottery over the PM's posterior beliefs: with probability $\mathbb{P}_\pi(s_0|r)$, the PM observes s_0 and updates her belief to $\mu^r_{s_0}$, while with probability $\mathbb{P}_\pi(s_1|r)$ she updates her belief to $\mu^r_{s_1}$, where $\mu^r_{s_0} \leq \mu^r \leq \mu^r_{s_1}$. The lobbyist only gains when the PM chooses $x = 1$, which requires her belief to be above $\frac{1}{2}$. If the PM already chooses the lobbyist's preferred policy given her own information ($\mu^r \geq \frac{1}{2}$), the lobbyist does not need to provide any evidence.

If $\mu^r < \frac{1}{2}$, a posterior belief above $\frac{1}{2}$ can only occur following realisation s_1. The lobbyist's problem is therefore to maximise the probability that s_1 occurs, while ensuring that the PM chooses policy $x = 1$ after observing that realisation. As shown in Kamenica & Gentzkow (2011), this can be achieved with a persuasion strategy π such that the PM is just sufficiently persuaded following favourable evidence ($\mu^r_{s_1} = \frac{1}{2}$), and such that unfavourable evidence is as precise as possible ($\mu^r_{s_0} = 0$).

Lemma 1. *Under transparency, if the PM is not already persuaded ($\mu^r < \frac{1}{2}$), the lobbyist's equilibrium persuasion strategy, denoted π_r, induces the beliefs $\mu^r_{s_1} = \frac{1}{2}$ and $\mu^r_{s_0} = 0$, and satisfies*

$$(\pi_r(s_1|\omega = 1), \pi_r(s_1|\omega = 0)) = \left(1, \frac{\mu^r}{1-\mu^r}\right)$$

As μ^r increases, persuasion becomes easier ($\mathbb{P}_{\pi_r}(s_1|r) = \mu^r\pi_r(s_1|1)+(1-\mu^r)\pi_r(s_1|0) = 2\mu^r$ increases), and the lobbyist needs to provide less information (the 'noise' from his persuasion strategy, $\pi_r(s_1|\omega = 0) = \frac{\mu^r}{1-\mu^r}$, increases).

Policy maker's preliminary investigation

Given this persuasion strategy, the PM's expected utility as a function of her interim beliefs is

$$U^P(\mu^{r_0}, \mu^{r_1}) = \begin{cases} \sum_{r\in\{r_0,r_1\}} \mathbb{P}(r) \left[\mathbb{P}_{\pi_r}(s_0|r) \cdot 1 + \mathbb{P}_{\pi_r}(s_1|r) \cdot \left(\frac{1}{2}\right)\right] & \text{if } \mu^{r_0}, \mu^{r_1} < \frac{1}{2}, \\ \mathbb{P}(r_0) \left[\mathbb{P}_{\pi_{r_0}}(s_0|r_0) \cdot 1 + \mathbb{P}_{\pi_{r_0}}(s_1|r_0) \cdot \left(\frac{1}{2}\right)\right] + \mathbb{P}(r_1)\mu^{r_1} & \text{if } \mu^{r_0} < \frac{1}{2} \leq \mu^{r_1}, \\ \mathbb{P}(r_0)\mu^{r_0} + \mathbb{P}(r_1)\mu^{r_1} & \text{if } \mu^{r_1}, \mu^{r_0} \geq \frac{1}{2} \end{cases} \quad (1)$$

where the probability of a realisation r, is fully determined by the pair of interim beliefs (μ^{r_0}, μ^{r_1}) and the Bayes plausibility constraint: $\mathbb{P}(r_0)\mu^{r_0} + \mathbb{P}(r_1)\mu^{r_1} = \mu_0$.

The PM chooses her investigation to maximise the total information that she receives. If the PM is an enemy and her expertise is limited (so that μ^r is always below $\frac{1}{2}$), the lobbyist will optimally adjust his persuasion strategy to the PM's belief. The PM cannot gain from her own information and is therefore indifferent between any investigation. If her expertise is sufficiently high ($\bar{\mu} > \frac{1}{2}$), the lobbyist provides no valuable information following r_1 if $\mu^{r_1} > \frac{1}{2}$. The PM faces a sharp trade-off: if she chooses the most informative investigation herself, and obtains some belief $\bar{\mu} > \frac{1}{2}$, the lobbyist stops providing information. This trade-off is resolved in favour of obtaining more preliminary information: by choosing the most informative investigation (and inducing $\bar{\mu} > \frac{1}{2}$), she can become more confident in her policy decision than she would ever be with the lobbyist's information. If the PM is an ally ($\mu_0 \geq \frac{1}{2}$) and her expertise is sufficiently high ($\underline{\mu} < \frac{1}{2}$), she can trigger the lobbyist to provide information following r_0 if $\mu^{r_0} < \frac{1}{2}$, so choosing the most informative investigation is beneficial. An allied PM with limited expertise ($\underline{\mu} \geq \frac{1}{2}$) never obtains information from the lobbyist and is indifferent between any investigation.

In any of these cases, the PM does not gain from the lobbyist's information, and it is optimal for her to obtain as much preliminary information as possible.[12]

Proposition 1. *Under transparency, the most informative investigation ($\bar{p}$) is an equilibrium strategy for the PM.*

3.2 Partial confidentiality

Suppose now that the PM's information is confidential. The lobbyist observes the investigation commissioned by the PM (p), but not the conclusions of this investigation (r). This corresponds to situations where policy makers can run pilot projects, or commission reports in visible ways without having to publicise the results. Each realisation r of the investigation defines a *type* of the PM.

Lobbyist's persuasion strategy

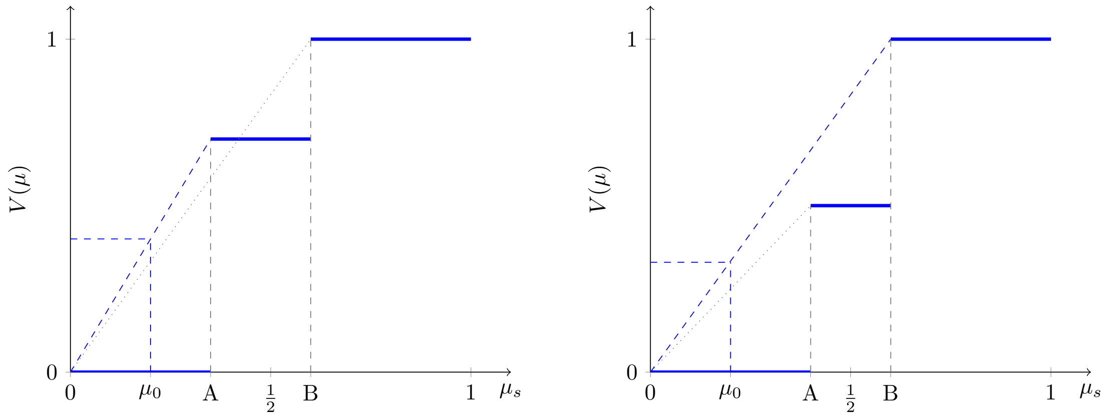
When the PM is an ally and her expertise is limited ($\underline{\mu} \geq \frac{1}{2}$), the lobbyist is indifferent between any persuasion strategy that keeps posterior beliefs above $\frac{1}{2}$ for any possible realisation of r. Therefore, providing no information is an optimal strategy.

When the PM is an enemy and her expertise is limited, her interim beliefs (μ^r) are always below $\frac{1}{2}$, so one realisation of the lobbyist's strategy (s_0) will not persuade any type. The lobbyist needs to choose between generating favourable evidence (s_1) that persuades both the *sceptical* type r_0 and the *sympathetic* type r_1 and favourable evidence that only persuades the sympathetic type r_1.

When the PM's expertise is sufficiently high, her own information is sometimes persuasive ($\mu^r \geq \frac{1}{2}$) and sometimes not ($\mu^r < \frac{1}{2}$). This can happen both for allies and enemies. In this case, the favourable realisation (s_1) should always persuade both types but the lobbyist chooses whether the unfavourable realisation (s_0) should fully reveal the state to be $\omega = 0$, or be sufficiently imprecise that the sympathetic type (r_1) still prefers policy $x = 1$, i.e. $\mu^{r_1}_{s_0} \geq \frac{1}{2}$.

In equilibrium, the lobbyist will choose one of two persuasion strategies. In particular, restricting the lobbyist's persuasion strategy to binary signals is without loss of generality. This is illustrated in figure 3

[12] The PM does not gain from the lobbyist's information because it never makes her change her policy choice. She either continues to prefer policy $x = 0$ or is indifferent between the two policies.



(a) Persuade only sympathetic type

(b) Persuade both types

Figure 3: In equilibrium, the lobbyist only chooses one of two strategies with binary signals

for the case where $\bar{\mu} < \frac{1}{2}$. If the lobbyist's favourable evidence is not very informative, and only induces a belief at point A, it only persuades the sympathetic type (μ^{r_1}), and generates a payoff less than 1. If it is more informative, and induces a belief at B, it can persuade both types and generates a payoff of 1. The optimal persuasion strategy can be determined by the concavification of this step function.[13]

I refer to the optimal persuasion strategy which targets the sympathetic type r_1 as the *targeted* persuasion strategy (π_T). If the sympathetic type is not already persuaded ($\mu^{r_1} < \frac{1}{2}$), this persuasion strategy should be designed as if the lobbyist knew that the policy maker had observed r_1, that is $\pi_T = \pi_{r_1}$, as defined in Lemma 1. When the sympathetic type is already persuaded ($\mu^{r_1} > \frac{1}{2}$), favourable evidence (s_1) should persuade the sceptical type ($\mu^{r_0}_{s_1} = \frac{1}{2}$) and unfavourable evidence (s_0) should leave the sympathetic type just persuaded to choose policy $x = 1$ ($\mu^{r_1}_{s_0} = \frac{1}{2}$).

Definition 1. ***Targeted persuasion strategy.*** *π_T is the persuasion strategy defined by:*

$$\pi_T \ s.t. \ \begin{cases} \pi_T(s_1|1) = 1 \ \textit{and} \ \pi_T(s_1|0) = \frac{\mu^{r_1}}{(1-\mu^{r_1})} & \textit{if } \mu^{r_1} < \frac{1}{2} \\ \frac{\pi_T(s_1|0)}{\pi_T(s_1|1)} = \frac{\mu^{r_0}}{(1-\mu^{r_0})} \ \textit{and} \ \frac{\pi_T(s_0|0)}{\pi_T(s_0|1)} = \frac{\mu^{r_1}}{(1-\mu^{r_1})} & \textit{if } \mu^{r_1} \geq \frac{1}{2} \end{cases}$$

I call the optimal persuasion strategy which persuades both types a *general* persuasion strategy (π_G). This strategy should be designed as if the lobbyist knew that the PM had observed r_0: $\pi_G = \pi_{r_0}$, as defined in Lemma 1.

[13] Kolotilin (2018) shows that the problem faced by the lobbyist allocating probabilities across different possible realisations is a linear programming problem. The relative marginal gains and marginal costs associated with each realisation can be ranked and one of of the two possible persuasive realisation will dominate the other. The lobbyist therefore always prefers either the persuasion strategy that exactly persuades the favourable type r_1 or the one that persuades both, but never a combination of these strategies.

Definition 2. ***General persuasion strategy.*** *π_G is the persuasion strategy defined by:*

$$\pi_G(s_1|1) = 1 \text{ and } \pi_G(s_1|0) = \frac{\mu^{r_0}}{(1-\mu^{r_0})}$$

Which of these two strategies is optimal depends on the relative likelihood of the two types (captured by the height of the first step in figure 3) and the relative distance between the beliefs (captured by the distance between points A and B). A general strategy π_G requires more favourable evidence, and makes the favourable results (s_1) less likely. On the other hand, persuading only the sympathetic type with a targeted strategy π_T requires less evidence and makes s_1 more likely, but the lobbyist no longer guarantees that favourable evidence (s_1) always persuades the PM.[14] Formally, the lobbyist chooses π_G over π_T if:

$$\begin{aligned} & \mathbb{P}_{\pi_G}(s_1) > \mathbb{P}_p(r_1)\,\mathbb{P}_{\pi_T}(s_1|r_1) \text{ if } \mu^{r_1} < \frac{1}{2} \\ \text{and} \quad & \mathbb{P}_{\pi_G}(s_1) > \mathbb{P}_{\pi_T}(s_1) + \mathbb{P}_p(r_1)\,\mathbb{P}_{\pi_T}(s_0|r_1) \text{ if } \mu^{r_1} \geq \frac{1}{2} \end{aligned}$$

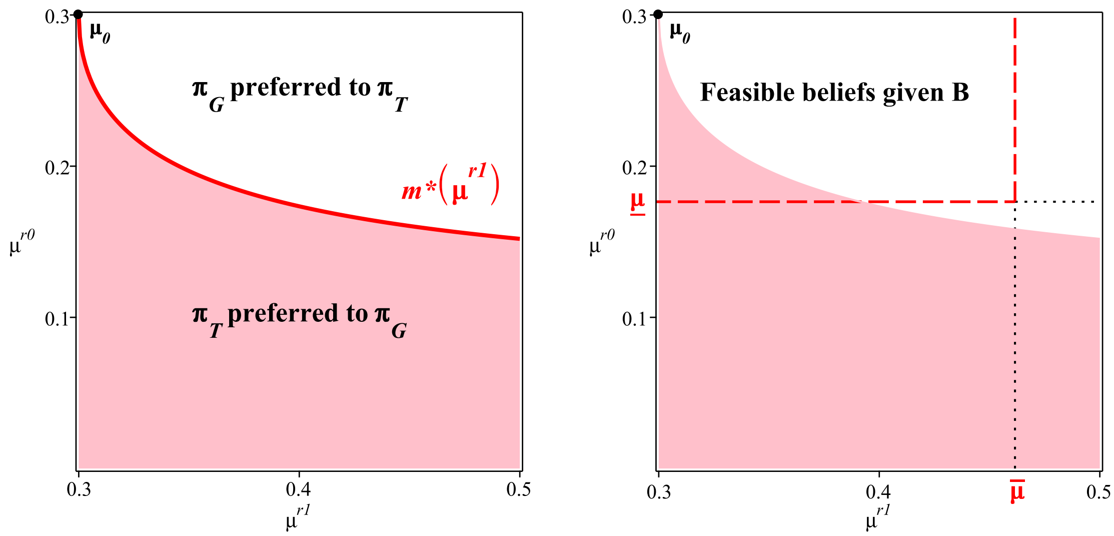
These conditions can be expressed in terms of interim beliefs μ^{r_0} and μ^{r_1}. As the sceptical type's belief becomes more sceptical (μ^{r_0} decreases), the PM becomes more likely to be sympathetic ($r = r_1$), and a targeted strategy π_T becomes more attractive. The lobbyist therefore chooses the targeted strategy π_T if the sceptical type is sufficiently sceptical and the general strategy otherwise.

Lemma 2. *Under confidentiality, there is a threshold $m^*(\mu^{r_1}) \in (0, \mu_0)$ such that the lobbyist chooses a general persuasion strategy π_G if the belief μ^{r_0} is above $m^*(\mu^{r_1})$, and chooses a targeted strategy π_T otherwise.*

I refer to the condition $\mu^{r_0} \geq m^*(\mu^{r_1})$ as the *incentive constraint.* The *expertise constraint* refers to the bounds imposed on μ^{r_0} and μ^{r_1} by the PM's expertise: $\mu^{r_0} \geq \underline{\mu}$ and $\mu^{r_1} \leq \bar{\mu}$. These constraints are illustrated in figure 4.

Intuitively, there are two reasons why the lobbyist prefers a targeted persuasion strategy π_T if the interim belief of the sceptical type r_0 is too low. First, the more sceptical the PM is, the more evidence a general persuasion strategy requires. Second, the lower the sceptical belief μ^{r_0} an investigation generates, the more likely that investigation is to make the PM sympathetic ($r = r_1$). Conversely, as the belief of the sympathetic PM μ^{r_1} increases, the probability of r_1 decreases, which makes the general persuasion strategy π_G more valuable to the lobbyist. The threshold $m^*(\mu^{r_1})$ therefore decreases as the sympathetic type becomes more sympathetic (μ^{r_1} increases).

[14] A similar intuition applies when the policy maker's own preliminary information is sometimes persuasive ($\mu^{r_1} \geq \frac{1}{2}$).



(a) Incentive constraint

(b) Expertise constraint

Figure 4: Set of interim beliefs and incentive and expertise constraints

Policy maker's preliminary investigation

I first show under what conditions the PM strictly benefits from confidential information, and then show that these benefits are limited by the incentive constraint. I focus on the case where the PM is either an enemy, or an ally with sufficient expertise to generate some interim beliefs below $\frac{1}{2}$. An ally with insufficient expertise never receives any information from the lobbyist and is indifferent between any investigation.

Gains from confidentiality When information is confidential, the PM's expected utility as a function of her interim beliefs is

$$U^C(\mu^{r_0}, \mu^{r_1}) = \begin{cases} \sum_{r\in\{r_0,r_1\}} \mathbb{P}(r) \sum_{s\in\{s_0,s_1\}} \mathbb{P}_{\pi_G}(s|r) U\left(\mu^r_s\right) & \text{if } \mu^{r_0} \geq m^*(\mu^{r_1}) \\ \sum_{r\in\{r_0,r_1\}} \mathbb{P}(r) \sum_{s\in\{s_0,s_1\}} \mathbb{P}_{\pi_T}(s|r) U\left(\mu^r_s\right) & \text{if } \mu^{r_0} < m^*(\mu^{r_1}) \end{cases} \tag{2}$$

Where, as before, $\mathbb{P}(r)$, is determined by the pair of interim beliefs (μ^{r_0}, μ^{r_1}) and the Bayes plausibility constraint: $\mathbb{P}(r_0)\mu^{r_0} + \mathbb{P}(r_1)\mu^{r_1} = \mu_0$.

The PM's gain from confidential information arises when the lobbyist chooses a general persuasion strategy: π_G is designed to persuade the sceptical type r_0 who requires more evidence to be persuaded. This additional evidence is valuable to the sympathetic type r_1 who gains some informational rent. Had the lobbyist known that the PM was sympathetic, he would have provided less evidence.

The rent obtained from confidential information is captured by the distance between the belief that

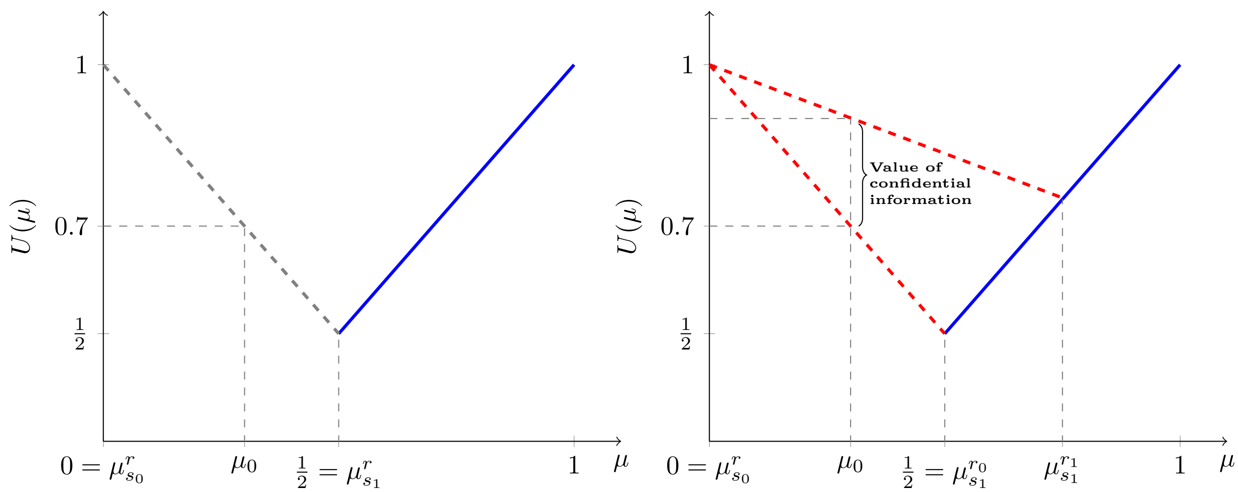


Figure 5: Distribution of posterior beliefs when the PM's information is public (left) and when it is confidential and the lobbyist chooses π_G (right).

the lobbyist would like to induce following favourable evidence ($\frac{1}{2}$), and the belief the sympathetic type actually has ($\mu^{r_1}_{s_1}$). When the latter is strictly above $\frac{1}{2}$, the PM is more confident that choosing policy $x = 1$ is the correct thing to do: she is better off because her uncertainty is reduced. This intuition is illustrated in figure 5.

When the lobbyist chooses a targeted strategy π_T, the PM gains no informational rent since the beliefs induced by the lobbyist never make her strictly prefer policy $x = 1$. A targeted persuasion strategy π_T therefore yields the same payoff as public information.[15]

These results are formalised in Proposition 2.

Proposition 2. *For any pair of interim beliefs (μ^{r_0}, μ^{r_1}) the PM strictly gains from confidentiality, $U^C(\mu^{r_0}, \mu^{r_1}) > U^P(\mu^{r_0}, \mu^{r_1})$, if and only if (μ^{r_0}, μ^{r_1}) satisfies the incentive constraint: $\mu^{r_0} \geq m^*(\mu^{r_1})$.*

For low expertise, the incentive constraint is satisfied even under the most informative investigation $\bar{p}$, so the PM strictly gains from confidentiality. Interestingly, if $\bar{\mu} < \frac{1}{2}$, the PM would not change her decision based on her own information and her information would have no value in the absence of lobbying. The PM therefore does not gain from her own information because that information helps her decision *directly*, or because she uses this information to *audit* the information provided by the lobbyist.[16] Instead, the PM gains from her information *indirectly*, by inducing the lobbyist to provide additional evidence. While it is natural to expect the PM to gain from having a second source of information, this mechanism allows

[15] When information is public, the lobbyist perfectly targets each of the PM's types. The targeted strategy is designed to persuade the sympathetic PM, so a sceptical PM obtains little information. By revealing herself to be sceptical, the PM would force the lobbyist to provide additional evidence to persuade her. However, that additional information would never be sufficient to make her strictly prefer a different policy, so she does not gain from it.

[16] As for instance in Dellis & Oak (2020).

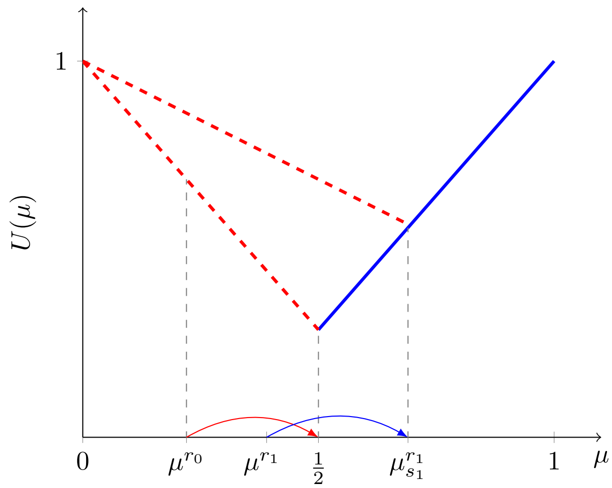


Figure 6: Reducing μ^{r_0} to $\mu^{r'_0}$ forces the lobbyist to provide more evidence to induce $\mu^{r_0}_{s_1} = \frac{1}{2}$. This increases $\mu^{r_1}_{s_1}$ and the policy maker's expected utility.

her to gain even if that second source of information is redundant from a policy choice perspective.[17]

Limits of confidentiality and optimal investigation Given a general persuasion strategy, the PM prefers to be as sceptical as possible as this forces the lobbyist to provide more evidence. This is illustrated in figure 6: the lower the sceptical belief μ^{r_0}, the more evidence the lobbyist needs to produce under a general strategy π_G to ensure that the sceptical PM chooses policy $x = 1$. The PM's expected utility given π_G is therefore decreasing in μ^{r_0}.[18]

However, to induce the lobbyist to choose that strategy, the PM may need to distort her information. When expertise B is high, making full use of expertise (choosing $p = \bar{p}$) induces beliefs $(\underline{\mu}, \bar{\mu})$ that violate the incentive constraint ($\underline{\mu} < m^*(\bar{\mu})$). The lobbyist therefore chooses a targeted strategy π_T (Lemma 2) which provides less evidence than a general strategy π_G.

The PM therefore faces a trade-off: to *extract* more information from the lobbyist, she needs to distort the preliminary information she *obtains*. The distortion needs to ensure that the sceptical type is sufficiently likely and not too hard to persuade, so the PM chooses an investigation that makes her sceptical type not too sceptical ($\mu^{r_0} \geq m^*(\mu^{r_1})$). This limits the value of confidential information.

These observations lead to the following characterisation of the PM's optimal strategy.

[17] The information is redundant in the sense that the lobbyist's strategy will reveal at least as much information as the PM's investigation. Alonso & Câmara (2018) also show that strategic uses of redundant information can arise when the sender (rather than the receiver) is privately informed.

[18] The PM's expected utility is independent of μ^{r_1} because the increase in utility due to a higher posterior belief is exactly offset by the lower probability of that belief occurring. However, when the incentive constraint binds $\mu^{r_0} = m^*(\mu^{r_1})$, it is still preferable to choose the highest sympathetic belief $\mu^{r_1} = \bar{\mu}$ since this loosens the constraint: $m^*(\bar{\mu}) < m^*(\mu^{r_1})$, for any $\mu^{r_1} < \bar{\mu}$.

Proposition 3. *Under partial confidentiality, there exist thresholds* $\underline{B}$ *and* $\overline{B}(\mu_0)$ *such that:*

- *The PM chooses the most informative investigation* $\bar{p}$ *if either* $B \leq \underline{B}$ *or* $B \geq \overline{B}(\mu_0)$
- *She imposes distortions on her investigation if* $\underline{B} < B < \overline{B}(\mu_0)$ *and sets*

$$\frac{p(r_0|0)}{p(r_0|1)} = \frac{1 - m^*(\bar{\mu})}{m^*(\bar{\mu})} \cdot \frac{\mu_0}{1-\mu_0} \quad \text{and} \quad \frac{p(r_1|1)}{p(r_1|0)} = B$$

The precision of the PM's investigation relative to her expertise B is therefore non-linear in expertise: at low expertise, the PM chooses the most informative investigation, at intermediate expertise she restricts her information to induce the lobbyist to choose a general persuasion strategy, and at higher expertise she chooses the most informative investigation. This is illustrated in figure 7. The solid line represents the sceptical type's belief μ^{r_0} induced by the PM's equilibrium investigation. The dashed line represents the lowest possible belief $\underline{\mu}$ and the dash–dot line the incentive constraint $m^*(\bar{\mu})$, both as functions of B.

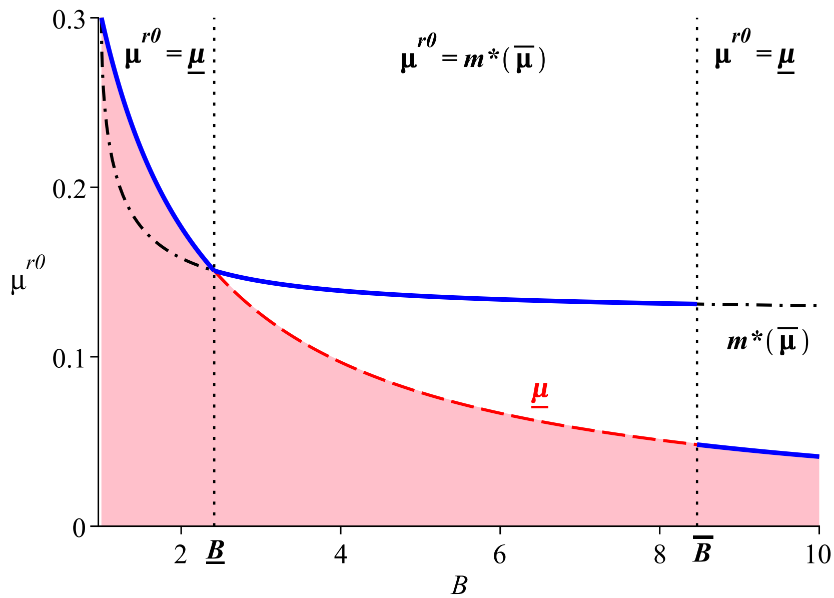


Figure 7: Sceptical belief μ^{r_0} induced in equilibrium as a function of expertise B

When expertise (B) is low, the expertise constraint ($\mu^{r_0} \geq \underline{\mu}$) binds before the incentive constraint ($\mu^{r_0} \geq m^*(\bar{\mu})$). The PM does not need to distort her information to induce the lobbyist to choose π_G and generates the lowest possible sceptical belief: $\mu^{r_0} = \underline{\mu}$.[19] The solid line (equilibrium μ^{r_0}) coincides with the dashed line (lowest possible belief $\underline{\mu}$).

[19]Since her payoff is independent of μ^{r_1}, she can choose any μ^{r_1} such that (μ^{r_0}, μ^{r_1}) induces π_G. In particular, choosing the most informative investigation is an equilibrium.

When expertise (B) is intermediate, the incentive constraint binds so the PM faces a trade-off between obtaining more preliminary information (setting $\mu^{r_0} = \underline{\mu}$) and inducing the lobbyist to provide more evidence (choosing π_G). The loss in expected utility from distorting her information (setting $\mu^{r_0} = m^*(\bar{\mu}) > \underline{\mu}$) is small relative to the gain from extracting information from the lobbyist (inducing π_G instead of π_T). Conditional on inducing the lobbyist to play a general persuasion strategy π_G, she chooses her investigation to induce the lowest possible sceptical belief: $\mu^{r_0} = m^*(\mu^{r_1})$. As the constraint $m^*(\mu^{r_1})$ is decreasing in the sympathetic type's belief μ^{r_1}, it is optimal to induce $\mu^{r_1} = \bar{\mu}$. The solid line therefore coincides with the dash–dot line (incentive constraint $m^*(\bar{\mu})$).

As expertise (B) becomes sufficiently large, the PM is willing to give up inducing a general persuasion strategy π_G if the gains from making full use of her expertise ($\mu^{r_0} = \underline{\mu}$ and $\mu^{r_1} = \bar{\mu}$) are sufficiently large. The solid line (equilibrium μ^{r_0}) coincides again with the dashed line (lowest possible belief $\underline{\mu}$). Intuitively, in the limit (as B becomes very large), the PM can learn the state almost perfectly and the lobbyist's signal becomes negligible.

The interval $[\underline{B}, \overline{B}(\mu_0)]$ is non-empty as long as μ_0 is not too large,[20] so this characterisation applies to any enemy and to an ally who faces sufficient uncertainty. An ally who is sufficiently certain that the state is 1 would always choose the most informative investigation, because the lowest belief which satisfies the incentive constraint, $m^*(\bar{\mu})$, is never far enough below $\frac{1}{2}$ for a general strategy to be beneficial.

3.3 Full confidentiality

Another possible regime is full confidentiality. Under this regime, neither the PM's investigation p nor the results r are observable. This transforms the problem into a simultaneous move game.

Lobbyist's persuasion strategy. In this modified game, the lobbyist best responds to the investigation that he expects the PM to choose in equilibrium. His best-response to a given equilibrium investigation p, inducing interim beliefs (μ^{r_0}, μ^{r_1}) is determined exactly as in Lemma 2. If (μ^{r_0}, μ^{r_1}) are such that $\mu^{r_0} \geq m^*(\mu^{r_1})$, then the lobbyist chooses a general strategy, and if $\mu^{r_0} < m^*(\mu^{r_1})$ he chooses a targeted strategy.

Policy maker's preliminary investigation. The PM's payoff in equilibrium (that is, when the lobbyist has the correct beliefs about the PM's choice of investigation) is the same as under the partial confidentiality case. However, her payoff following a deviation is now different: because the lobbyist cannot observe that deviation, deviating to a different investigation does not affect the choice of persuasion strategy. However, the posterior beliefs induced by the lobbyist's strategy are now different than what the lobbyist intended.

[20] In particular, we need $\mu_0 < \frac{1+\sqrt{2}}{2+\sqrt{2}} \simeq 0.71$.

As a result, starting from any candidate equilibrium investigation that induces beliefs $\mu^{r_0} > \underline{\mu}$ and $\mu^{r_1} < \bar{\mu}$, the PM prefers to deviate to a more informative investigation. In particular, the PM would deviate from an investigation inducing $(m^*(\bar{\mu}), \bar{\mu})$ to one inducing $(\underline{\mu}, \bar{\mu})$. She can therefore no longer manipulate the beliefs of the lobbyist. Intuitively, the only reason the PM would deliberately limit the informativeness of her investigation is to induce the lobbyist to choose a general strategy. However, given that the lobbyist chooses such as a strategy, the PM would prefer to deviate and obtain more information. The lobbyist anticipates this behaviour and chooses the optimal persuasion strategy corresponding to the PM's most informative investigation.

However, choosing the most informative investigation does constitute an equilibrium. Indeed, given this preliminary investigation, the lobbyist optimally chooses a targeted strategy (π_T) if expertise is high ($B > \underline{B}$), and the PM would get a lower payoff by deviating to a less informative investigation. If expertise is low ($B \leq \underline{B}$), the lobbyist would choose a general strategy and it is indeed optimal for the PM to choose the most informative investigation $\bar{p}$.[21]

The PM only gains from concealing r when the lobbyist plays a general persuasion strategy. If expertise is sufficiently low ($B \leq \underline{B}$), the lobbyist chooses a general persuasion strategy (π_G) in equilibrium. But if expertise is too high ($B > \underline{B}$), the lobbyist plays a targeted persuasion strategy in any equilibrium. We therefore obtain the following result.

Proposition 4. *Under full confidentiality, there exists an equilibrium such that the PM chooses the most informative investigation, and every equilibrium yields the same payoff for the PM. The PM strictly gains from confidentiality if and only if her expertise is sufficiently low:* $B \leq \underline{B}$.

Under full confidentiality, the PM still gains from concealing information. However, she only gains when her expertise B is not too large, and she can no longer manipulate the beliefs of the lobbyist by simply choosing a different investigation. Instead, extracting additional information would require more drastic steps such as reducing the expertise available.

It is worth noting that the same equilibrium would arise if the order of move were reversed.[22] If the lobbyist first chooses his strategy and the PM moves second, the PM always prefers to choose the most informative investigation. Anticipating this, the lobbyist designs his optimal persuasion strategy based on his expectation of the distribution of signals that the PM will receive under the most informative investigation. This corresponds to the general strategy when expertise is low enough and the targeted strategy otherwise.

[21] However, multiple equilibria can arise under full confidentiality. In particular, in an equilibrium where the lobbyist chooses π_G, the PM's utility is independent of μ^{r_1}, so any investigation that induces $\mu^{r_0} = \underline{\mu}$ and some $\mu^{r_1} \in [\mu_0, \bar{\mu}]$ is an equilibrium. Similarly, when the lobbyist chooses π_T, any investigation that induces $\mu^{r_1} = \bar{\mu}$ is an equilibrium.

[22] Many government agencies can only make policies after a case is brought to their attention and information is provided by the petitioners. This is the case for consumer protection agencies (Consumer Product Safety Commission, FDA), or agencies in charge of permits or licences (see Carpenter & Ting 2004). I am grateful to anonymous referees for suggesting this extension and these examples.

4 The value of confidentiality and its effect on influence

In this section, I show that confidentiality improves the quality of policy making most when government expertise is intermediate and that the lobbyist's influence (how often his preferred policy is passed) can increase in the PM's expertise. I also show that an allied PM values confidentiality less than an enemy, and that a lobbyist has more influence on an allied PM than an enemy, but only if the PM's expertise is sufficiently large. The discussion below focuses on the case of partial confidentiality, which provides richer results, but the main observations also apply to full confidentiality.[23]

4.1 Value of confidentiality

I define the equilibrium value of confidentiality, $W_i(B)$, as the difference between the probability of choosing the correct policy (i.e. $x = \omega$) when information is confidential and when it is public, for an ally $i = A$ or an enemy $i = E$.[24] Let $\mathcal{P}_i^C(B)$ the equilibrium probability of choosing a correct policy under partial confidentiality given expertise B. Similarly, let $\mathcal{P}_i^P(B)$ that probability under transparency. The index denotes whether the PM is an ally or an enemy in both cases. The value of confidentiality is:

$$W_i(B) = \mathcal{P}_i^C(B) - \mathcal{P}_i^P(B) \tag{3}$$

Expertise affects the equilibrium choice of investigation p and persuasion strategy π, as well as the probability of error given some strategies. For example, increasing expertise (B) can decrease the probability of error under transparency, but also make the lobbyist switch from a general persuasion strategy to a targeted one.

The first result is that the value of confidentiality varies non-monotonically in expertise (B) for both enemies and allies as illustrated in figure 8.

Proposition 5. *The value of confidentiality satisfies the following properties:*

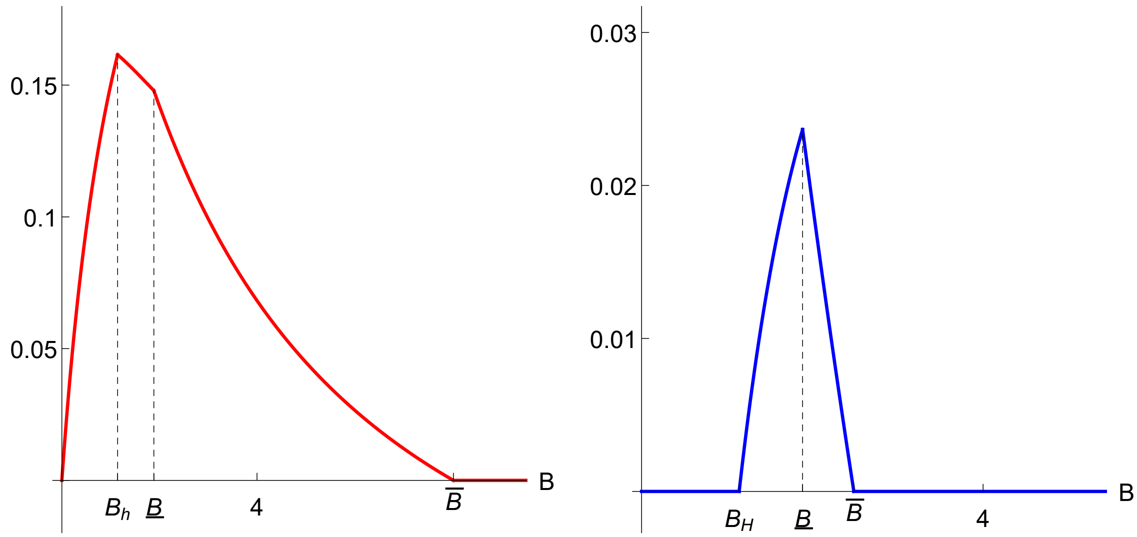
- *It is weakly increasing in expertise (B) at low levels and weakly decreasing at higher levels. For sufficiently high expertise, the PM is indifferent between transparency and confidentiality.*
- *Holding the distance between μ_0 and $\frac{1}{2}$ constant, that value is higher for an enemy than an ally.*

The non-monotonicity in expertise is always strict for an enemy or an ally with sufficiently low prior μ_0. For an ally with prior close to 1, the value of confidentiality is always zero.

Intuitively, as the expertise of the PM increases, two opposite effects arise. The PM can extract more information from the lobbyist when keeping her information confidential: she can make her sceptical belief

[23] See online appendix (section E).

[24] This also corresponds to the difference in the PM's equilibrium expected utility when information is confidential (U^C from expression (2)) and when information is public (U^P from expression (1)).



(a) Value of confidentiality to an enemy ($\mu_0 = 0.35$)

(b) Value of confidentiality to an ally ($\mu_0 = 0.65$)

Figure 8: Value of confidentiality as a function of expertise B

(μ^{r_0}) more sceptical and force the lobbyist to produce more evidence. This increases the probability of choosing the right policy. On the other hand, expertise increases the value of information under transparency, which decreases the value of confidentiality. The second effect does not arise when expertise is low, so the the value of confidentiality initially increases in expertise. When expertise is high, the probability of making the right policy choice increases under both transparency and confidentiality. However, the increase under confidentiality dampens as the policy maker needs to distort her information. As a result, the value of confidentiality decreases in expertise.

When expertise is very large, the PM prefers to make full use of her expertise (Proposition 3). The lobbyist uses a targeted strategy which induces the same probability of choosing the correct policy as in the transparency regime (Proposition 2). In this case, confidentiality does not improve policy making. In fact, the PM receives strictly less information under confidentiality than under transparency.[25]

The second part of the proposition suggests that an ally would be more open to sharing information with lobbyists than an enemy. Intuitively, if expertise is low, an ally cannot extract additional information under confidentiality, while an enemy can, so an enemy benefits more. If expertise is high, both can extract information and the amount of information extracted is inversely proportional to the PM's sceptical belief ($m^*(\bar{\mu})$), this belief is higher for an ally than an enemy, so the enemy benefits more.

Proposition 5 reveals that the effect of transparent institutions on the quality of policy making depends on both the policy environment and the political environment. Transparent institutions should be more

[25]The probability of choosing the correct policy under both regimes is the same because the additional information available under transparency has no effect on the policy maker's policy choice. If one also cared about the total amount of information received, the transparency regime would be strictly more valuable than partial confidentiality.

prevalent in areas where the government is either not very competent, or on the contrary, very good at obtaining precise policy-relevant information. This depends on the policy's complexity, on whether the government is composed of technocrats, or on the attractiveness of the civil service relative to the private sector for competent researchers. Transparency is also relatively more valuable when legislators are sufficiently aligned with lobbyists and cannot extract much information from them.

Even though the results presented here are for partial confidentiality, it is easy to see that partial confidentiality is weakly preferred to full confidentiality. When expertise is low, the incentive constraint does not bind and the equilibrium outcomes are the same in both confidentiality regimes. When expertise is intermediate, the PM can only extract additional information under partial confidentiality, when the lobbyist is aware of the type of investigation ran by the PM. When expertise is high, the equilibrium outcomes are again the same in both regimes. If she can, the PM would therefore prefer to inform the lobbyist about the design of her investigation (but to withhold the results of that investigation).[26]

4.2 Effect of confidential information on influence

In this section, I analyse how the policy maker's control over her investigation affects the lobbyist's influence. In line with the existing literature (e.g. Cotton & Dellis 2016, Ellis & Groll 2020), I view influence as the change in policy choice that results from the presence of the lobbyist.[27] One might expect that the better informed a policy maker is, the less likely she is to be influenced by a lobbyist. I show that under certain conditions, an increase in government expertise can both increase the lobbyist's influence and the probability of choosing the right policy. This result cautions against the popular view that external influence always has a negative impact on policy making.

Formally, I define influence as the difference in the ex-ante probability that the PM chooses the lobbyist's preferred policy ($x = 1$) with and without the lobbyist:

$$F(B) = \mathbb{P}(x = 1|\pi^*, p^*) - \mathbb{P}(x = 1|\bar{p}) \tag{4}$$

Influence is a different metric than the lobbyist's payoff because it accounts for the policy that the PM would choose in the absence of lobbying. Explicitly modelling the PM's choice of information highlights that her equilibrium strategy in the counterfactual (in the absence of lobbyist) may be different.[28]

In the absence of lobbying, the PM weakly prefers the most informative investigation. If her expertise is too low to ever change her choice ($\bar{\mu} < \frac{1}{2}$ or $\underline{\mu} > \frac{1}{2}$), the probability of choosing policy $x = 1$ is 0 for an enemy and 1 for an ally. Otherwise, it is equal to the probability of observing signal r_1.

[26] Partial confidentiality might have unintended consequences, such as generating interest from the lobbyist in that investigation and increasing the risk of leaks. I discuss this possibility in the next section.

[27] This effect does not necessarily result from unfair or unethical lobbying strategies (such as misrepresenting evidence or exchanging policies for donations), or be detrimental to policy choice.

[28] For a similar argument based on the role of outside lobbying, see Wolton (2018).

In the presence of lobbying, the lobbyist chooses a general persuasion strategy π_G in equilibrium whenever the PM strictly prefers information to be confidential ($B < \overline{B}(\mu_0)$). The probability of inducing policy $x = 1$ is therefore the probability of producing a signal $s = s_1$. When the PM prefers information to be public ($B > \overline{B}(\mu_0)$), the probability that the policy is $x = 1$ is also the probability that $s = s_1$, unless the PM is already persuaded ($r = r_1$ and $\bar{\mu} > \frac{1}{2}$).

As government expertise increases, the PM is better equipped to defend herself. She can make the lobbyist believe that she is very sceptical and force him to produce more evidence. Therefore, as expertise B increases, influence initially decreases.

However, influence can also increase in expertise. If the PM is an enemy ($\mu_0 < \frac{1}{2}$), $\omega = 0$ is more likely than $\omega = 1$. An increase in expertise makes the PM's signal more precise, and her investigation is more likely to indicate that the state is $\omega = 0$. In the absence of lobbying, the PM therefore becomes more likely to choose policy $x = 0$. By contrast, the presence of a lobbyist leads to a relatively high probability that the policy chosen is $x = 1$. As a result, influence increases in the PM's expertise B. The co-movement of influence and the probability of making the correct decision is illustrated in figure 9.[29]

Proposition 6. *There exists a range* $\left[B_h(\mu_0), \overline{B}(\mu_0)\right]$ *such that both influence and the probability of making the correct decision increase in* B *when* $B \in \left[B_h(\mu_0), \overline{B}(\mu_0)\right]$.

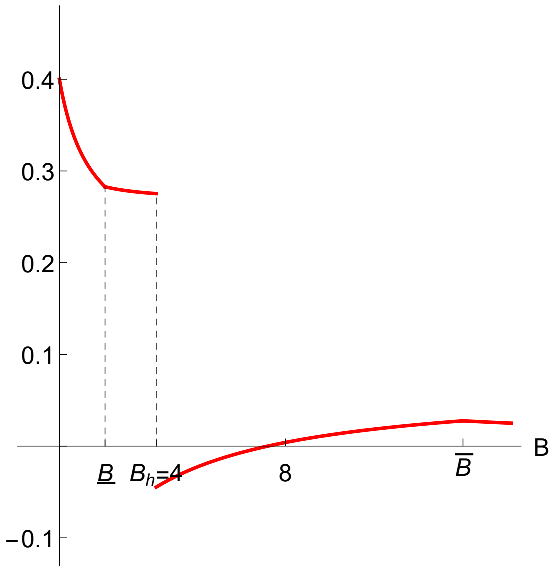
Since the lobbyist always provides information that would not be otherwise available to the PM, lobbying is valuable in this setup, and the PM's interests and those of the lobbyist may be aligned. However, the presence of lobbying implies that policy $x = 1$ is chosen more often than it would in its absence. Proposition 6 shows that this is not always against the interest of the PM, or detrimental to social welfare. More influence can be associated with better policy making. Although increasing expertise can also increase influence, this effect should not stop the acquisition of expertise as more expertise always makes the PM better-off.

A second interesting result is that whenever the lobbyist has some influence on the decision of an ally, that influence is higher than on an enemy, holding uncertainty constant (that is, comparing an enemy with prior $\mu_0 < \frac{1}{2}$ and an ally with prior $\mu_1 = 1 - \mu_0 > \frac{1}{2}$). This occurs only if the ally has sufficient expertise to sometimes choose the lobbyist's less preferred policy.[30] We therefore obtain the following result, illustrated in figure 10.

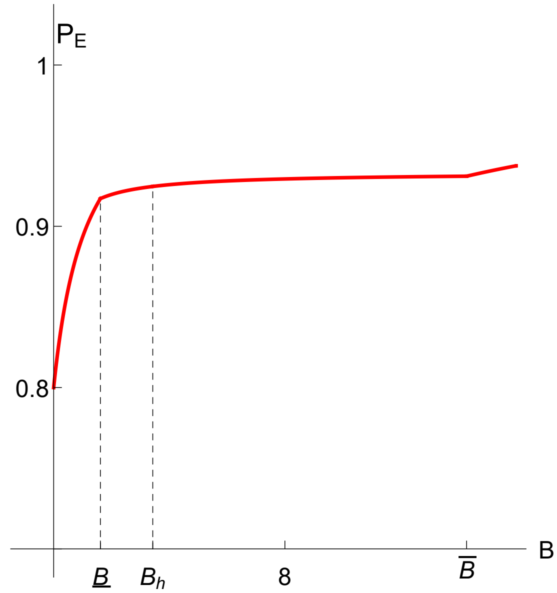
Proposition 7. *As long as the lobbyist's influence on an ally is positive, the lobbyist's influence is higher on an ally than on an enemy.*

[29] Note that this co-movement can also occur with an ally but for a different reason. When expertise is low, influence is 0 as the PM chooses the lobbyist's preferred policy with or without the lobbyist. However, when expertise increases the PM would sometimes choose policy $x = 0$, so the lobbyist's influence becomes positive.

[30] Otherwise, the ally chooses $x = 1$ with or without the lobbyist, and the lobbyist has no influence.

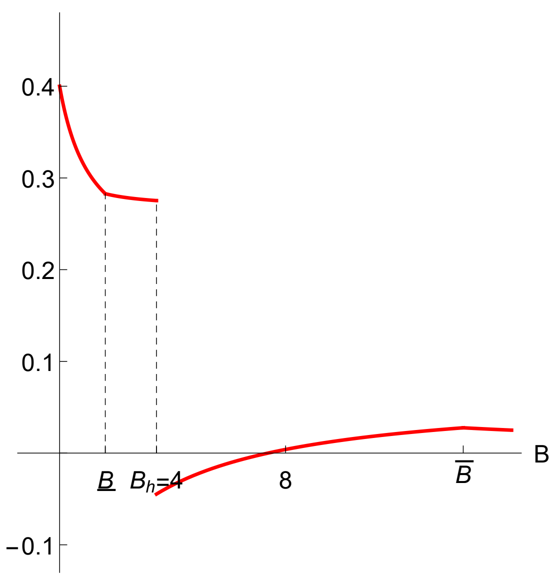


(a) Influence as a function of expertise

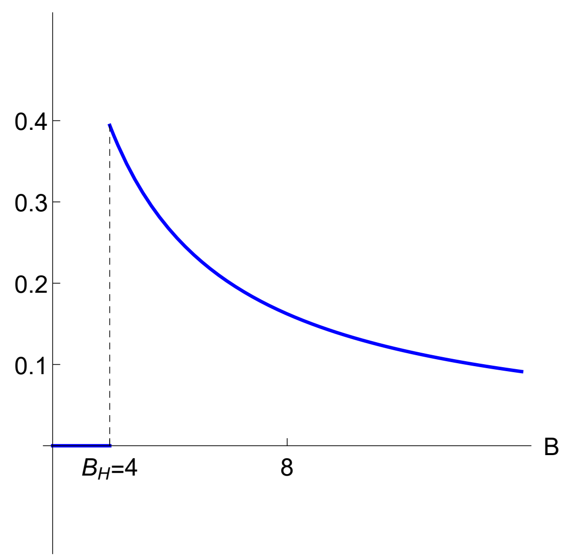


(b) Prob. of correct policy as a function of expertise

Figure 9: Influence, probability of choosing the correct policy, and expertise (B) for an enemy ($\mu_0 = 0.2$)



(a) Influence on an enemy ($\mu_0 = 0.2$)



(b) Influence on an ally ($\mu_0 = 0.8$)

Figure 10: Influence on different types of policy makers

This result can rationalise the existence of 'friendly lobbying'. Lobbyists engage in friendly lobbying because there is a possibility that an ally changes her policy choice after carrying out her own investigation. They are more likely to target allies because it is easier to influence them. This complements recent theoretical explanations for the empirical observation that lobbyists prefer to work with friendly legislators (Cotton & Dellis 2016, Schnakenberg 2017, Ellis & Groll 2020, Awad 2020). However, the results also highlight that this preference depends on the expertise of legislators: it is only valuable to target an ally if that ally can sometimes change her decision based on her own information.

Finally, it is worth noting that influence may be negative, as shown in figure 9 (a). The probability of enacting the lobbyist's preferred policy can be higher without the lobbyist than with him. Without a lobbyist, the PM would choose the most informative investigation whereas she distorts her information when facing a lobbyist. This distortion decreases the probability that she chooses the lobbyist's preferred policy $x = 1$, even following the lobbyist's persuasion attempt. The lobbyist would therefore like to *commit* not to intervene in the policy process for some levels of expertise and alignment. By distorting her information, the PM forces the lobbyist to intervene and provide information.

Corollary 1. *Confidentiality can force the lobbyist to provide information when he would prefer not to intervene ex-ante.*

5 Discussion

Evolution of institutions. The results from Section 4 provide a rationale for the development of information-gathering institutions and contributes to a more general literature on the role and development of legislative institutions (e.g. Krehbiel (1991), Bimber (1991), Krehbiel (2004)). The diversity of sources of information within governments (agencies, legislative research services, public consultations, legislative hearings, etc.) raises a number of questions: why might legislators obtain redundant information from both internal and external sources? What explains transitions from confidentiality to transparency, such as congressional hearings in the U.S. in the 1970s and congressional research memos more recently?

The model shows that internal information is valuable to the policy maker even when that information would not impact policy in the absence of lobbying (Proposition 2). This can account for the puzzling observation that the government may choose to obtain information even if that information is redundant. Clark (2016) quotes an Appropriations Committee aide describing the CRS research as "quick and dirty analysis that is sometimes not perfect". This suggests that the evidence obtained internally may not be precise enough to determine policy choices. The model shows that 'quick and dirty analysis' can result in significant policy improvements in the presence of lobbyists, as the two sources can be strategic complements.

Proposition 5 also shows that, for a large enough level of expertise, confidentiality is no longer valuable to the policy maker. As a result, increases in expertise within the government can lead to more transparency of government information. This can arise independently of the role of transparency for accountability (as in Argenziano & Weeds (2019)). In addition, since expertise varies across policy areas (Howlett 2015), it is possible for transparent institutions (such as hearings) to be used in certain domains, and confidential ones (such as agency memos) in others.

Finally, since the value of confidentiality decreases with expertise when expertise is high (Proposition 5), we should observe empirically a positive correlation between expertise and transparency. This is consistent with the findings of Islam (2006) that transparency (measured by the timeliness of governments in releasing economic information and the presence of freedom of information laws) is correlated with the quality of governance. However, it would be incorrect to conclude that transparency necessarily causes improvements in governance. In particular, Proposition 5 indicates that, at low levels of expertise, transparency would lead to worse policy making in that case.

Risk of leaks under partial confidentiality. Under partial confidentiality, lobbyists are aware that the policy maker is obtaining some information. Publicising the design of this investigation can expose the policy maker to risk of leaks, as lobbyists could request to obtain the results of that investigation under freedom of information requests. Under full confidentiality, this is less likely as lobbyists do not know for sure that the policy maker has investigated. In the online appendix (section B), I analyse a model where the outcome of the investigation r can leak with some positive probability under partial confidentiality but not under full confidentiality. In this case, the policy maker continues to prefer distorting her preliminary investigation when her expertise is intermediate, but only if the risk of leaks is not too high. Since the gains from distortions only arise when the investigation's outcome remains confidential, distorting information becomes less valuable when the risk of leaks increase. In the presence of leaks, the policy maker would now strictly prefer the full confidentiality regime when expertise is low ($B \leq \underline{B}$) since both regimes induce the same behaviour from the lobbyist, but full confidentiality avoids the risk of damaging leaks. She would still prefer partial confidentiality otherwise. If the risk of leaks differs across policies areas, we should also expect different institutional designs. For instance, exempting some policy areas from having to publish public notice or fulfilling freedom of information requests on national security grounds reduces the ability of legislators to share both the design and the results of their investigation. These exemptions can be valuable when the risks of leaks are high.[31]

[31] Exemptions from the Administrative Procedure Act for example can be requested for 'Good cause' if the agency shows that following notice-and-comment rules is 'impracticable, unnecessary, or contrary to the public interest.' Garvey (2017).

Costly investigations. The analysis conducted so far assumed that investigations were costless, to highlight that the policy maker might want to restrict her investigation even in the absence of costs. Introducing costs can lead to further distortions. Suppose for example that the players face a fixed cost to generate information, independent of the precision of the investigation, but that the PM's investigation has limited precision as in the existing model. If the fixed costs are sufficiently low for both players, then the results presented so far would not change.[32] If the lobbyist's costs are large enough, the policy maker might prefer to restrict her information in order to induce the lobbyist to generate information. By restricting her information, she makes persuasion easier and sufficiently valuable for the lobbyist to justify the fixed cost. As long as the distortions are not too important, this strictly benefits the policy maker. If not, the policy maker might give up on the information provided by the lobbyist and choose the most informative investigation. The policy maker only gains from these restrictions under partial confidentiality. Under transparency, she never strictly benefits from the lobbyist's information and therefore does not want to incentivise the lobbyist to generate information. Under full confidentiality, she cannot credibly commit to these distortions. If introducing costs forces the policy maker to restrict her investigation beyond the restrictions already identified, then the more costly the lobbyist's investigation is, the less valuable confidentiality is to the policy maker. In the online appendix (section F), I show that there always exists costs low enough that the results above are unchanged, and provide an example where costs force the policy maker to reduce the precision of her investigation.[33]

6 Conclusion

This paper examined the effect of a policy maker's internal information on the provision of information by special interest groups. When policy makers can control their preliminary investigations, they can extract additional evidence from special interest groups by distorting these investigations. Internal information becomes valuable even when it is limited, as long as it is confidential. This makes confidentiality valuable to policy makers even in the absence of reputational concerns and explains why internal research is kept secret in many governments.

Governments can use confidential information to force special interest groups to adjust how they influence policy. This paper therefore highlights that influence cannot be simply measured based on

[32]With the caveat that the players would now strictly prefer not investigating whenever they are indifferent between all investigations.

[33]An alternative way to model costly investigations is to assume that costs are proportional to the precision of the information obtained. In such a situation, both players would increase the precision of their information until the marginal costs of doing so outweigh the marginal benefits, given the strategy of the other player. The results are therefore unchanged as long as the lobbyist finds it relatively more valuable to increase the precision of his information than the policy maker, and the policy maker finds it unprofitable to fully learn the state by herself. The policy maker might then want to distort her information for two reasons: either because the gains from extracting more information are too low relative to the costs, or because it induces the lobbyist to stop providing as much information.

whether policy changed or not. The definition of influence should consider what policy would have been chosen in the absence of lobbying. Given this definition, it is possible that influence and welfare increase at the same time, when government expertise or ideological alignment change. When the Congressional Research Service opens its research to the public, as is currently planned, it will increase the influence that interest groups exert on policy making. But if this move towards transparency is driven by an increase in expertise, then this increase in influence could be accompanied by an increase in welfare.

Understanding the control of governments over the production of internal information is therefore critical not only to the study of special interest groups but also to the relationship between transparency and the quality of government.

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Appendix

Proof of Lemma 1. This results follows directly from the characterisation of the optimal information structure from Kamenica & Gentzkow (2011). If μ^r is above $\frac{1}{2}$, any persuasion strategy such that $\mu^r_{s_0} \geq \frac{1}{2}$ gives the lobbyist the same expected utility of 1. If μ^r is below $\frac{1}{2}$, the optimal persuasion strategy induces beliefs on the concave closure of $V(\mu)$.

□

Proof of Proposition 1. Let $\widetilde{U}(\mu^r)$ the indirect expected utility of the PM given an interim belief μ^r and the lobbyist's best-response to that public belief (as described in Lemma 1):

$$\widetilde{U}\left(\mu^r\right) = \begin{cases} \mathbb{P}_{\pi_r}(s_0|r) + \mathbb{P}_{\pi_r}(s_1|r)\left(\frac{1}{2}\right) = 1 - \mu^r & \text{if } \mu^r < \frac{1}{2} \\ \mu^r & \text{if } \mu^r \geq \frac{1}{2} \end{cases}$$

This indirect expected utility is weakly convex. We can directly apply results from Kamenica & Gentzkow (2011) to conclude that an investigation inducing the most extreme beliefs is optimal, and it is therefore an equilibrium for the PM to choose $\bar{p}$ when her information is publicly available.

□

Proof of Lemma 2. There are two cases to consider depending on interim beliefs:

1. **Lobbyist needs to persuade both types:**

   Suppose $\mu^{r_0} < \mu^{r_1} < \frac{1}{2}$. To minimise the probability of s_0, the lobbyist's strategy induces $\mu^r_{s_0} = 0$ for any r. To maximise the probability of s_1, the lobbyist's strategy induces either $\mu^{r_0}_{s_1} = \frac{1}{2}$ or $\mu^{r_1}_{s_1} = \frac{1}{2}$. These observations completely characterise the two persuasion strategies π_G and π_T in definitions 1 and 2.

   When he chooses π_G, the lobbyist's expected utility is $\mathbb{P}_{\pi_G}(s_1)$ as s_1 persuades both types. When he chooses π_T, his expected utility is $\mathbb{P}(r_1)\,\mathbb{P}_{\pi_T}(s_1|r_1)$ as he only persuades type r_1 following realisation s_1. The lobbyist therefore chooses signal π_G if and only if:

$$\mathbb{P}_{\pi_G}(s_1) \geq \mathbb{P}(r_1)\,\mathbb{P}_{\pi_T}(s_1|r_1) \tag{5}$$

   Let $\mu^r_s(\pi)$ the posterior induced by $s \in \{s_0, s_1\}$ from signal $\pi \in \{\pi_G, \pi_T\}$, starting from interim $\mu^r \in \{\mu^{r_0}, \mu^{r_1}\}$, and $\mu_s(\pi)$ the posterior belief induced by $s \in \{s_0, s_1\}$ from signal $\pi \in \{\pi_G, \pi_T\}$, starting from the prior μ_0.

Using the Bayes plausibility constraint, inequality (5) becomes

$$\begin{aligned}
&\frac{\mu_0 - \mu_{s_0}(\pi_G)}{\mu_{s_1}(\pi_G) - \mu_{s_0}(\pi_G)} \geq \left(\frac{\mu_0 - \mu^{r_0}}{\mu^{r_1} - \mu^{r_0}}\right)\left(\frac{\mu^{r_1} - \mu^{r_1}_{s_0}(\pi_T)}{\mu^{r_1}_{s_1}(\pi_T) - \mu^{r_1}_{s_0}(\pi_T)}\right) \\
\Leftrightarrow \quad &\frac{\mu_0(1-\mu^{r_0}) + (1-\mu_0)\mu^{r_0}}{2(1-\mu^{r_0})} \geq \frac{\mu^{r_1}(\mu_0 - \mu^{r_0})}{(\mu^{r_1} - \mu^{r_0})} \\
\Leftrightarrow \quad & -(2(\mu^{r_1} - \mu_0) + 1)(\mu^{r_0})^2 + (3\mu^{r_1} - \mu_0)\mu^{r_0} - \mu_0\mu^{r_1} \geq 0 \qquad (6)
\end{aligned}$$

This defines a set of pairs of beliefs (μ^{r_0}, μ^{r_1}), denoted $G = \{(\mu^{r_0}, \mu^{r_1}) \mid \mu^{r_0} \geq m^*(\mu^{r_1})\}$ such that the lobbyist prefers π_G to π_T. The boundary of the set G is therefore given by a root of the equation:

$$H(\mu^{r_0}) = -(2(\mu^{r_1} - \mu_0) + 1)(\mu^{r_0})^2 + (3\mu^{r_1} - \mu_0)\mu^{r_0} - \mu_0\mu^{r_1} = 0 \qquad (7)$$

$H(x)$ is a quadratic function of x with two roots: $\underline{x}$ and $\bar{x}$. Its first derivative is positive up to some $x^* \in [\underline{x}, \bar{x}]$, then negative. Therefore, the function $H(x)$ is negative on $x \in [0, \underline{x}]$, positive on $[\underline{x}, \bar{x}]$, and negative on $[\bar{x}, 1]$.[34] Let, $m^*(\mu^{r_1})$ the lowest root of equation (7),

$$m^*(\mu^{r_1}) = \frac{3\mu^{r_1} - \mu_0 - \left[(\mu^{r_1} - \mu_0)(9\mu^{r_1} - 8\mu_0\mu^{r_1} - \mu_0\right]^{\frac{1}{2}}}{4(\mu^{r_1} - \mu_0) + 2}$$

The lobbyist therefore prefers π_G only if $\mu^{r_0} \geq m^*(\mu^{r_1})$. It is easy to verify that for any $\mu_0 \in [0,1]$ and $\mu^{r_1} \in [\mu_0, 1]$, we have $0 \leq m^*(\mu^{r_1}) \leq \mu_0$.

Finally, the highest root $\bar{x}$ is always greater than μ_0, so condition (6) is satisfied for all $\mu^{r_0} \in [m^*(\mu^{r_1}), \mu_0]$. As a result, for any $\mu^{r_0} \in [0, \mu_0]$, $H(\mu^{r_0})$ is positive if and only if $\mu^{r_0} \geq \underline{x}$, so the lobbyist prefers π_G if and only if $\mu^{r_0} \geq m^*(\mu^{r_1})$.

The left-hand side of the inequality just above condition (6) is increasing in μ^{r_0} while the right-hand side is decreasing in μ^{r_0}. As μ^{r_1} increases, the right-hand side shifts down. The value of μ^{r_0} that makes the two sides equal is therefore decreasing in μ^{r_1}, so $m^*(\mu^{r_1})$ is decreasing in μ^{r_1}.

2. **Lobbyist only needs to persuade lower type:**

   Suppose now that $\mu^{r_0} < \frac{1}{2} < \mu^{r_1}$. The lobbyist's strategy should induce $\mu^{r_0}_{s_1} = \frac{1}{2}$. If it induces a belief below $\frac{1}{2}$ then his payoff is weakly below that of providing no information. If it is strictly above $\frac{1}{2}$, then he could increase the probability of s_1 by reducing $\mu^{r_0}_{s_1}$ without reducing his payoff. Therefore the lobbyist now chooses between a strategy such that s_0 persuades no type ($\mu^{r_1}_{s_0} < \frac{1}{2}$) and one that still persuades the high type ($\mu^{r_1}_{s_0} = \frac{1}{2}$). This can be achieved with the conditional distributions π_G and π_T characterised in definitions 1 and 2. The lobbyist now chooses π_G if and

[34] Additional details available in the online appendix.

only if:

$$\begin{aligned}
&\mathbb{P}_{\pi_G}(s_1) \geq \mathbb{P}_{\pi_T}(s_1) + \mathbb{P}(r_1)\,\mathbb{P}_{\pi_T}(s_0|r_1) \\
\Leftrightarrow\quad & \frac{\mu_0 - \mu_{s_0}(\pi_G)}{\mu_{s_1}(\pi_G) - \mu_{s_0}(\pi_G)} \geq \left(\frac{\mu_0 - \mu_{s_0}(\pi_T)}{\mu_{s_1}(\pi_T) - \mu_{s_0}(\pi_T)}\right) + \left(\frac{\mu_0 - \mu^{r_0}}{\mu^{r_1} - \mu^{r_0}}\right)\left(\frac{\mu^{r_1}_{s_1}(\pi_T) - \mu^{r_1}}{\mu^{r_1}_{s_1}(\pi_T) - \mu^{r_1}_{s_0}(\pi_T)}\right) \\
\Leftrightarrow\quad & \frac{(1-\mu^{r_1})(1-2\mu^{r_0})\left[-(2(\mu^{r_1}-\mu_0)+1)(\mu^{r_0})^2 + (3\mu^{r_1}-\mu_0)\mu^{r_0} - \mu_0\mu^{r_1}\right]}{(1-\mu^{r_0})(\mu^{r_1}-\mu^{r_0})^2} \geq 0
\end{aligned}$$

This holds if and only if the following inequality is satisfied:

$$-(2(\mu^{r_1}-\mu_0)+1)(\mu^{r_0})^2 + (3\mu^{r_1}-\mu_0)\mu^{r_0} - \mu_0\mu^{r_1} \geq 0$$

The left-hand side of this inequality is $H(\mu^{r_0})$ from equation (7). The rest of the proof therefore follows the same logic as in the previous case.

□

Proof of Proposition 2. I first show that the PM's expected utility is always strictly higher when the lobbyist chooses π_G than when her information is public for a given pair of interim beliefs (μ^{r_0}, μ^{r_1}) ('if' statement). I then show that the PM's expected utility is the same when the lobbyist chooses π_T as when her information is public ('only if' statement).[35]

1. **If the incentive constraint is satisfied, confidentiality is strictly preferred:** If the PM's investigation induces $(\mu^{r_0}, \mu^{r_1}) \in G$, the lobbyist chooses a general persuasion strategy π_G, which yields the following expected utility for the PM

$$\begin{aligned}
U^G(\mu^{r_0}, \mu^{r_1}) &= \mathbb{P}(r_0)\left[\mathbb{P}_{\pi_G}(s_0|r_0) + \mathbb{P}_{\pi_G}(s_1|r_0)\,\frac{1}{2}\right] + \mathbb{P}(r_1)\left[\mathbb{P}_{\pi_G}(s_0|r_1) + \mathbb{P}_{\pi_G}(s_1|r_1)\mu^{r_1}_{s_1}\right] \\
&= (1-\mu_0)\frac{(1-2\mu^{r_0})}{(1-\mu^{r_0})} + \mu_0
\end{aligned}$$

The PM's expected utility under transparency is:

$$\begin{aligned}
U^P(\mu^{r_0}, \mu^{r_1}) &= \begin{cases} \mathbb{P}(s_0)\cdot 1 + \mathbb{P}(s_1)\cdot\left(\frac{1}{2}\right) & \text{if } \mu^{r_1} < \frac{1}{2} \\ \mathbb{P}(r_0)\left[\mathbb{P}_{\pi_{r_0}}(s_0|r_0)\cdot 1 + \mathbb{P}_{\pi_{r_0}}(s_1|r_0)\cdot\left(\frac{1}{2}\right)\right] + \mathbb{P}(r_1)\mu^{r_1} & \text{if } \mu^{r_1} \geq \frac{1}{2} \end{cases} \\
&= \begin{cases} 1-\mu_0 & \text{if } \mu^{r_1} < \frac{1}{2} \\ \left(\frac{\mu^{r_1}-\mu_0}{\mu^{r_1}-\mu^{r_0}}\right)(1-2\mu^{r_0}) + \mu_0 & \text{if } \mu^{r_1} \geq \frac{1}{2} \end{cases} \qquad (8)
\end{aligned}$$

[35] Further details on how the expected utilities are derived are available in the online appendix.

Therefore, π_G always makes the policy maker better-off as

$$U^G(\mu^{r_0},\mu^{r_1}) = (1-\mu_0)\frac{(1-2\mu^{r_0})}{(1-\mu^{r_0})} + \mu_0 > 1-\mu_0 = U^P(\mu^{r_0},\mu^{r_1}) \text{ if } \mu^{r_1} < \frac{1}{2}$$
$$U^G(\mu^{r_0},\mu^{r_1}) = (1-\mu_0)\frac{(1-2\mu^{r_0})}{(1-\mu^{r_0})} + \mu_0 > \left(\frac{\mu^{r_1}-\mu_0}{\mu^{r_1}-\mu^{r_0}}\right)(1-2\mu^{r_0}) + \mu_0 = U^P(\mu^{r_0},\mu^{r_1}) \text{ if } \mu^{r_1} \geq \frac{1}{2}$$

2. **If the incentive constraint is not satisfied, confidentiality is not strictly preferred:**

   If $(\mu^{r_0},\mu^{r_1}) \notin G$ the lobbyist chooses a targeted strategy which gives the PM

$$U^T(\mu^{r_0},\mu^{r_1}) = \begin{cases} \mathbb{P}(r_0)\left[\mathbb{P}_{\pi_T}(s_0|r_0) + \mathbb{P}_{\pi_T}(s_1|r_0)(1-\mu^{r_0}_{s_1})\right] & \\ \qquad + \mathbb{P}(r_1)\left[\mathbb{P}_{\pi_T}(s_0|r_1) + \mathbb{P}_{\pi_T}(s_1|r_1)\left(\tfrac{1}{2}\right)\right] & \text{if } \mu^{r_1} < \frac{1}{2} \\ \mathbb{P}(r_0)\left[\mathbb{P}_{\pi_T}(s_0|r_0)(1-\mu^{r_0}_{s_0}) + \mathbb{P}_{\pi_T}(s_1|r_0)\left(\tfrac{1}{2}\right)\right] & \\ \qquad + \mathbb{P}(r_1)\left[\mathbb{P}_{\pi_T}(s_0|r_1)\left(\tfrac{1}{2}\right) + \mathbb{P}_{\pi_T}(s_1|r_1)\mu^{r_1}_{s_1}\right] & \text{if } \mu^{r_1} \geq \frac{1}{2} \end{cases}$$
$$= \begin{cases} 1-\mu_0 & \text{if } \mu^{r_1} < \frac{1}{2} \\ \left(\frac{\mu^{r_1}-\mu_0}{\mu^{r_1}-\mu^{r_0}}\right)(1-2\mu^{r_0}) + \mu_0 & \text{if } \mu^{r_1} \geq \frac{1}{2} \end{cases} \tag{9}$$

   Therefore, for any (μ^{r_0},μ^{r_1}), we have $U^P(\mu^{r_0},\mu^{r_1}) = U^T(\mu^{r_0},\mu^{r_1})$

□

Proof of Proposition 3. It is useful to define $B_h(\mu_0) = \frac{1-\mu_0}{\mu_0}$, the value of B such that, given some $\mu_0 < \frac{1}{2}$, $\bar{\mu} = \frac{1}{2}$. Similarly, $B_H(\mu_0) = \frac{\mu_0}{1-\mu_0}$ is the value of B such that, given $\mu_0 \geq \frac{1}{2}$, $\underline{\mu} = \frac{1}{2}$.

1. **Lobbyist needs to persuade both types:** Suppose that $\bar{\mu} < \frac{1}{2}$.

   Claim 1: When $\bar{\mu} < \frac{1}{2}$, the PM is always better-off under π_G than π_T.

   Proof: When $\bar{\mu} < \frac{1}{2}$, the PM's expected utility under transparency, is $U^P(\mu^{r_0},\mu^{r_1}) = 1-\mu_0$ (equation (8)), which is independent of (μ^{r_0},μ^{r_1}) and always worse than π_G. Therefore,

$$U^G(\mu^{r_0},\mu^{r_1}) > U^P(\mu^{r_0},\mu^{r_1}) = U^P(\mu_0,\mu_0)$$

   In addition, recall that for any (μ^{r_0},μ^{r_1}): $U^T(\mu^{r_0},\mu^{r_1}) = 1-\mu_0 = U^P(\mu^{r_0},\mu^{r_1}) = U^P(\mu_0,\mu_0)$. Therefore, $\forall\ \mu^{r_0},\mu^{r_1},\mu^{r'_0},\mu^{r'_1}$, we have: $U^G(\mu^{r_0},\mu^{r_1}) > U^P(\mu_0,\mu_0) = U^T\left(\mu^{r'_0},\mu^{r'_1}\right)$.

   Claim 2: Given π_G, the PM prefers an investigation inducing the lowest possible sceptical belief μ^{r_0}, and is indifferent between inducing any μ^{r_1}.

Proof: $U^G(\mu^{r_0}, \mu^{r_1}) = (1-\mu_0)\frac{1-2\mu^{r_0}}{(1-\mu^{r_0})} + \mu_0$ is independent of μ^{r_1} and decreasing in μ^{r_0}:

$$\frac{\partial U^G(\mu^{r_0}, \mu^{r_1})}{\partial \mu^{r_0}} = -\frac{(1-\mu_0)}{(1-\mu^{r_0})^2} \leq 0$$

Claims 1 and 2 imply that the PM's choice of investigation is determined by whether the incentive constraint is binding or not. If it is not, she chooses the most informative investigation. If it is, she chooses the investigation that induces the lowest μ^{r_0} subject to the incentive constraint.

Let $\underline{B}$ solve $\underline{\mu} = m^*(\bar{\mu})$, that is: $\frac{\mu_0}{\mu_0 + \underline{B}(1-\mu_0)} = m^*\left(\frac{\underline{B}\mu_0}{\underline{B}\mu_0 + (1-\mu_0)}\right)$. Solving gives $\underline{B} = 1 + \sqrt{2}$, and the incentive constraint binds if and only if $B \geq \underline{B}$. Therefore,

(a) When $B < \underline{B}$, the incentive constraint does not bind ($m^*(\bar{\mu}) < \underline{\mu}$) and the optimal investigation induces $\mu^{r_0} = \underline{\mu}$. The PM is indifferent between any μ^{r_1}, so any $(\mu^{r_0}, \mu^{r_1}) \in \{\underline{\mu}\} \times \left[(m^*)^{-1}(\underline{\mu}), \bar{\mu}\right]$ can be in the support of an equilibrium investigation. **Therefore, when $B < \underline{B}$, it is an equilibrium for the PM to choose $\bar{p}$.**

(b) When $B > \underline{B}$, the constraint binds ($m^*(\bar{\mu}) > \underline{\mu}$) and the optimal investigation induces $\mu^{r_0} = m^*(\mu^{r_1})$. Since $m^*(\mu^{r_1})$ is decreasing in μ^{r_1} and $U^G(\mu^{r_0}, \mu^{r_1})$ is independent of μ^{r_1}, it is optimal to induce $\mu^{r_1} = \bar{\mu}$. **Therefore, when $B \geq \underline{B}$, the only equilibrium is for the PM to choose an investigation that induces $\mu^{r_0} = m^*(\bar{\mu})$ and $\mu^{r_1} = \bar{\mu}$.**

2. **Lobbyist only needs to persuade lower type:**

Suppose now that $\underline{\mu} < \frac{1}{2} < \bar{\mu}$. Note that $U^G(\mu^{r_0}, \mu^{r_1})$ is unchanged in this case. I show that the PM now sometimes prefer to induce π_T.

Claim 3: If the lobbyist were to choose π_T, the PM would choose $\bar{p}$.

Proof: Taking derivatives of $U^T(\mu^{r_0}, \mu^{r_1})$ (equation (9)) for the case $\frac{1}{2} < \mu^{r_1}$ shows that $U^T(\mu^{r_0}, \mu^{r_1})$ is increasing in μ^{r_1} and decreasing in μ^{r_0}. Therefore, the optimal investigation given π_T induces interim beliefs $(\underline{\mu}, \bar{\mu})$.

Claim 4: If $B < \underline{B}$, the PM strictly prefers $\bar{p}$.

Proof: As shown above, if $B < \underline{B}$, the PM induces the lobbyist to choose π_G even when using $\bar{p}$. From the proof of Proposition 2, we know that $U^G(\mu^{r_0}, \mu^{r_1}) > U^T(\mu^{r_0}, \mu^{r_1})$. Therefore $U^G\left(\underline{\mu}, \bar{\mu}\right) > U^T\left(\underline{\mu}, \bar{\mu}\right)$. From claim 3, we know that $U^T\left(\underline{\mu}, \bar{\mu}\right) \geq U^T(\mu^{r_0}, \mu^{r_1})$ for any feasible (μ^{r_0}, μ^{r_1}). Therefore,

$$U^G\left(\underline{\mu}, \bar{\mu}\right) > U^T\left(\underline{\mu}, \underline{\mu}\right) \geq U^T(\mu^{r_0}, \mu^{r_1})$$

Finally, from claim 2, we have $U^G\left(\underline{\mu}, \bar{\mu}\right) \geq U^G\left(\mu^{r_0}, \mu^{r_1}\right)$. Therefore if the incentive constraint does not bind ($B < \underline{B}$), the policy maker prefers $\bar{p}$.

Claim 5: If $B > \underline{B}$, there exists $\overline{B} > \underline{B}$ such that the PM prefers an investigation such that $\mu^{r_0} = m^*(\bar{\mu})$ and to induce the lobbyist to choose π_G if $B \leq \overline{B}$, and prefers an investigation such that $\mu^{r_0} = \underline{\mu}$ and to induce the lobbyist to choose π_T if $B \geq \overline{B}$.

Proof: If $B > \underline{B}$, the incentive constraint binds so given claim 2, the optimal investigation that induces π_G generates interim beliefs $\mu^{r_0} = m^*(\bar{\mu})$ and $\mu^{r_1} = \bar{\mu}$. Given claim 3, if the PM's investigation induces π_T, then it is optimal to generate interim beliefs $\mu^{r_0} = \underline{\mu}$ and $\mu^{r_1} = \bar{\mu}$. To show the existence and uniqueness of $\overline{B}$, I proceed in three steps.

Step 1: At $B = \underline{B}$, $m^*(\bar{\mu}) = \underline{\mu}$ so $U^G\left(m^*(\bar{\mu}), \bar{\mu}\right) = U^G\left(\underline{\mu}, \bar{\mu}\right) > U^T\left(\underline{\mu}, \bar{\mu}\right)$ by claim 4.

Step 2: $U^G(m^*(\bar{\mu}), \underline{\mu}) - U^T(\underline{\mu}, \bar{\mu})$ is strictly decreasing in B for $B > \underline{B}$. Indeed, we can write

$$U^G\left(m^*(\bar{\mu}), \underline{\mu}\right) - U^T\left(\underline{\mu}, \bar{\mu}\right) = \frac{1}{B+1} - \frac{2B}{3B + \sqrt{9B^2 - 10B + 1} - 1}\mu_0$$

And taking derivatives with respect to B proves the result.[36]

Step 3: As $B \to +\infty$, $U^G(m^*(\bar{\mu}), \underline{\mu}) < U^T(\underline{\mu}, \bar{\mu})$. We know that $\lim_{B\to+\infty}(\underline{\mu}, \bar{\mu}) = (0, 1)$, and $\lim_{B\to+\infty} m^*(\bar{\mu}) = m^*(1) = \frac{\mu_0}{1-2\mu_0}$ and since $U^G(\mu^{r_0}, \mu^{r_1})$ is continuous in μ^{r_0}, we have:

$$\lim_{B\to+\infty} U^G(m^*(\bar{\mu}), \bar{\mu}) = \lim_{B\to+\infty} (1-\mu_0)\frac{1 - 2m^*(\bar{\mu})}{(1 - m^*(\bar{\mu}))} + \mu_0 = 1 - \frac{\mu_0}{3}$$

In addition, $\lim_{B\to+\infty} U^T(\underline{\mu}, \bar{\mu}) = (1 - \mu_0) + \mu_0 = 1$. Therefore, we have:

$$\lim_{B\to+\infty} U^T(\underline{\mu}, \bar{\mu}) = 1 > 1 - \frac{\mu_0}{3} = \lim_{B\to+\infty} U^G(m^*(\bar{\mu}), \bar{\mu})$$

Therefore, $\lim_{B\to+\infty} U^T(\underline{\mu}, \bar{\mu}) > \lim_{B\to+\infty} U^G(m^*(\bar{\mu}), \bar{\mu})$ and the PM eventually prefers to give up trying to induce π_G.

Combining steps 1, 2 and 3 and the intermediate value theorem implies that there exists a unique $\overline{B}(\mu_0) > \underline{B}$ that satisfies claim 5.

Claim 6: If $\mu_0 \geq \frac{1+\sqrt{2}}{2+\sqrt{2}}$, then the PM always prefers an investigation such that $\mu^{r_0} = \underline{\mu}$ and to induce the lobbyist to choose π_T.

Proof: Let $B_1(\mu_0)$ such that $m^*(\bar{\mu}) = \frac{1}{2}$. Note that $B_1(\mu_0) < +\infty$ if and only if $\mu_0 < \frac{3}{4}$, since $m^*(\bar{\mu}) > \frac{1}{2}$ for any B whenever $\mu_0 > \frac{3}{4}$. Let $B_H(\mu_0)$ such that $\underline{\mu} = \frac{1}{2}$. If $\mu_0 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$, then $B_1(\mu_0) <$

[36]Further details available in the online appendix.

$B_H(\mu_0) < \underline{B}$, so it is always possible to generate $m^*(\bar{\mu}) < \frac{1}{2}$ whenever it is possible to generate some $\mu^{r_0} < \frac{1}{2}$, and the logic of Claim 5 applies. If $\mu_0 \in \left[\frac{1+\sqrt{2}}{2+\sqrt{2}}, \frac{3}{4}\right]$, then $B_H(\mu_0) < B_1(\mu_0) < \underline{B}$.

For $B \in (B_H(\mu_0), B_1(\mu_0))$, the PM receives no information if she induces $\mu^{r_0} \geq m^*(\mu^{r_1}) > \frac{1}{2}$. Therefore inducing the lobbyist to generate some information requires breaking the incentive constraint, and the optimal investigation is the most informative investigation, which induces the lobbyist to choose a targeted strategy.

If $B \geq B_1(\mu_0)$, then the PM can induce $m^*(\mu^{r_1}) < \frac{1}{2}$. However, at $B = B_1(\mu_0)$, we have:

$$U^G(m^*(\bar{\mu}), \bar{\mu}) - U^T(\underline{\mu}, \bar{\mu}) = U^G(\frac{1}{2}, \bar{\mu}) - U^T(\underline{\mu}, \bar{\mu}) = \mu_0 - U^T(\underline{\mu}, \bar{\mu}) < 0$$

And since by step 2 of Claim 5, we know that $U^G(m^*(\bar{\mu}), \bar{\mu}) - U^T(\underline{\mu}, \bar{\mu})$ is decreasing in B, we can conclude that it is never optimal for the PM to restrict her belief to $m^*(\bar{\mu})$ to induce π_G.

In this case, we can then define $\overline{B}(\mu_0) = \underline{B}$ to prove the statement in Proposition 3.

Finally, for any $\mu_0 > \frac{3}{4}$, $m^*(\bar{\mu}) > \frac{1}{2}$ for any B since $\lim_{B\to\infty} m^*(\bar{\mu}) = \frac{\mu_0}{3-2\mu_0} > \frac{1}{2}$ whenever $\mu_0 > \frac{3}{4}$. In this case, it is always optimal to choose $\bar{p}$ since any belief that would satisfy the incentive constraint is above $\frac{1}{2}$ and would therefore induce the lobbyist to produce no information. Setting $\overline{B}(\mu_0) = \underline{B}$ again proves the statement in Proposition 3.

Note that in these last two cases, the interval $[\underline{B}, \overline{B}]$ is empty and the PM always chooses $\bar{p}$.

3. **Lobbyist does not need to persuade any type:** Suppose that for any feasible pair of beliefs, $\frac{1}{2} < \mu^{r_0}, \mu^{r_1}$: in this case, the lobbyist provides no information for any choice of investigation of the policy maker. The policy maker is therefore indifferent between any preliminary investigation, so choosing $p = \bar{p}$ is an equilibrium. Setting $\overline{B}(\mu_0) = \underline{B}$ proves Proposition 3 for this case.

Claims 1 to 6 then imply that the policy maker makes full use of her expertise if either $B < \underline{B}$ or $B > \overline{B}(\mu_0)$ and otherwise distorts her investigation such that $\mu^{r_0} = m^*(\bar{\mu})$.

□

Proof of Proposition 4. First note that for any equilibrium investigation p, the lobbyist's best response is determined by Lemma 2. Deviating to a different strategy would not affect the choice of investigation by the PM (since she moves first), but would lower the probability of persuading her.

I next characterise features that any equilibrium must satisfy, and then show that there is always an equilibrium in which the PM chooses $p = \bar{p}$. Finally, I show that every other equilibrium yields the same payoff as this one.

Lemma 3. *1. If $B \leq \underline{B}$, there exists a set of equilibria in which the lobbyist chooses $\pi_{\mathbf{G}}$ and the PM chooses a preliminary investigation which must induce $\mu^{r_0} = \underline{\mu}$ but can induce any $\mu^{r_1} \in (\mu_0, \bar{\mu}]$. In particular $p = \bar{p}$ is an equilibrium strategy for the PM.*

2. Such equilibria exist only if $B \leq \underline{B}$.

3. Every equilibrium in this set yields the same payoff to the PM.

Proof. The proof proceeds in three steps.

Claim 1: If an equilibrium exists where $\pi_{\mathbf{G}}$ is played, then $\mu^{r_0} = \underline{\mu}$.

Proof: Suppose to the contrary that there was an equilibrium with $\mu^{r_0} > \underline{\mu}$ and a corresponding π_G. Then the PM's expected utility from choosing a p' inducing beliefs $(\mu^{r_0'}, \mu^{r_1})$ such that $\mu^{r_0'} \leq \mu^{r_0}$ is:

$$U^G(\mu^{r_0'}, \mu^{r_1}) = \mathbb{P}_{\pi_G}(s_0) + \left(\frac{\mu^{r_1} - \mu_0}{\mu^{r_1} - \mu^{r_0'}}\right) \left[\mu^{r_0'} + (1 - \mu^{r_0'}) \frac{\mu^{r_0}}{(1 - \mu^{r_0})}\right] \left(1 - \frac{\mu^{r_0'}(1 - \mu^{r_0})}{\mu^{r_0'}(1 - \mu^{r_0}) + (1 - \mu^{r_0'})\mu^{r_0}}\right)$$
$$+ \left(\frac{\mu_0 - \mu^{r_0'}}{\mu^{r_1} - \mu^{r_0'}}\right) \left[\mu^{r_1} + (1 - \mu^{r_1}) \frac{\mu^{r_0}}{(1 - \mu^{r_0})}\right] \left(\frac{\mu^{r_1}(1 - \mu^{r_0})}{\mu^{r_1}(1 - \mu^{r_0}) + (1 - \mu^{r_1})\mu^{r_0}}\right)$$

A deviation to $\mu^{r_0'} \leq \mu^{r_0}$ does not affect the strategy of the lobbyist, but changes (1) the relative likelihood of the two types of the PM and (2) the expected payoff conditional on r_0 and s_1, which now becomes $1 - \mu_{s_1}^{r_0'}$ instead of $\frac{1}{2}$. The derivative of this expected utility function with respect to $\mu^{r_0'}$ is negative and therefore it is always profitable to deviate to some $\mu^{r_0'} < \mu^{r_0}$.

Claim 2: In any strategy profile such that the PM chooses an investigation p that induces interim beliefs $(\underline{\mu}, \mu^{r_1}) \in G$ and the lobbyist chooses a persuasion strategy π_G, the PM has no incentives to deviate to p' such that $\mu^{r_0'} \geq \underline{\mu}$.

Proof: Such a deviation yields $U^G(\mu^{r_0'}, \mu^{r_1}) = \mathbb{P}_{\pi_G}(s_0) + \mu_0$. Deviating to $\mu^{r_0'} \geq \underline{\mu}$ changes the expected payoff conditional on r_0 and s_1, which becomes $\mu_{s_1}^{r_0'} \geq \frac{1}{2}$ instead of $\frac{1}{2}$. The indirect expected utility is linear in this region, so the deviation payoff is independent of $\mu^{r_0'}$ and there can be no gain.

Claim 3: In any strategy profile such that the PM chooses an investigation p that induces interim beliefs $(\underline{\mu}, \mu^{r_1}) \in G$ and the lobbyist chooses a persuasion strategy π_G, the PM has no incentives to deviate to p' such that $\mu^{r_1'} \neq \mu^{r_1}$.

Proof: Such a deviation gives an expected payoff of $U^G(\mu^{r_0}, \mu^{r_1'}) = \mathbb{P}_{\pi_G}(s_0) + \mu_0$. Deviating to $\mu^{r_1'} \neq \mu^{r_1}$ changes the expected payoff conditional on r_1 and s_1, which now becomes $\mu_{s_1}^{r_1'} \neq \mu_{s_1}^{r_1}$, but such that $\mu_{s_1}^{r_1'} \geq \frac{1}{2}$ (since $\mu_{s_1}^{r_1'} > \mu_{s_1}^{r_0} \geq \frac{1}{2}$). Because the indirect expected utility is linear in this region, the deviation payoff is independent of μ^{r_1} and there can be no gain.

Combining claims 2 and 3 implies that the PM does not deviate from any investigation inducing beliefs $(\mu^{r_0}, \mu^{r_1}) = (\underline{\mu}, \mu^{r_1}) \in G$ given that the lobbyist chooses π_G. Given Lemma 2, if $(\underline{\mu}, \mu^{r_1}) \in G$, that is, if $B \leq \underline{B}$ (and μ^{r_1} not too small), the lobbyist does want to play π_G so this is an equilibrium. **This proves the 'if' part of the existence statement.**

In addition, since this holds for any μ^{r_1} such that $(\underline{\mu}, \mu^{r_1}) \in G$, it holds in particular for $\mu^{r_1} = \bar{\mu}$, so $p = \bar{p}$ is an equilibrium. And by claim 3, **the expected utility of the PM** is the same for any μ^{r_1}, so it **is the same across all equilibria**.

If $B > \underline{B}$, then $(\underline{\mu}, \mu^{r_1}) \notin G$ for any $\mu^{r_1} \in [\mu_0, \bar{\mu}]$, so Lemma 2 implies that the lobbyist chooses π_T if the PM's strategy is such that $\mu^{r_0} = \underline{\mu}$. Suppose that the PM chose an investigation such that $(\mu^{r_0}, \mu^{r_1}) \in G$, then the lobbyist would choose strategy π_G, but claim 1 implies that the PM would then prefer to deviate to some $\mu^{r_0'} < \mu^{r_0}$. Therefore if $B > \underline{B}$ there does not exist an equilibrium in which π_G is played. **This proves the 'only if' part of the existence statement.**

□

Lemma 4. 1. *If $B > \underline{B}$, there exists a set of equilibria in which the lobbyist chooses $\pi_{\mathbf{T}}$ and the PM chooses an investigation which must induce $\mu^{r_1} = \bar{\mu}$ and some $\mu^{r_0} \in [\underline{\mu}, \mu_0)$. In particular $p = \bar{p}$ is an equilibrium strategy for the PM.*

2. *Such equilibria exist only if $B > \underline{B}$.*

3. *Every equilibrium in this set yields the same payoff to the PM, which is the same utility as if information was public.*

Proof. If $B > \underline{B}$, then Lemma 3 implies that the only possible equilibrium involves π_T.

Claim 1: If $\bar{\mu} \leq \frac{1}{2}$ $(B \leq B_h(\mu_0))$, $\mu^{r_1} = \bar{\mu}$ in any equilibrium where π_T is played.

Proof: By contradiction, suppose there was an equilibrium where $\mu^{r_1} < \bar{\mu}$. In such an equilibrium, the PM would get utility $1 - \mu_0$ because her posterior beliefs are always on the same linear portion of her expected utility function. If she deviates to p' inducing $(\mu^{r_0}, \mu^{r_1'})$ such that $\mu^{r_1} < \mu^{r_1'} < \bar{\mu}$, then her posterior belief following s_1 will be such that $\mu_{s_1}^{r_1'} > \frac{1}{2}$. This is therefore a profitable deviation.

Claim 2: If $\bar{\mu} \leq \frac{1}{2}$ $(B \leq B_h(\mu_0))$ the PM does not deviate from any investigation inducing $\mu^{r_1} = \bar{\mu}$, and any μ^{r_0} such that $(\mu^{r_0}, \bar{\mu}) \notin G$.

Proof: The PM's expected utility in equilibrium is $U^T(\mu^{r_0}, \mu^{r_1})$ as defined in equation (9). When $\mu^{r_1} = \bar{\mu}$, this is equal to $U^T(\mu^{r_0}, \bar{\mu}) = \mathbb{P}_{\pi_T}(s_0) + \frac{(1-\mu_0)\bar{\mu}}{1-\bar{\mu}} = 1 - \mu_0$. Deviating to $\mu^{r_1'} < \bar{\mu}$ gives the same expected utility $U^T(\mu^{r_0}, \mu^{r_1'}) = \mathbb{P}_{\pi_T}(s_0) + \frac{(1-\mu_0)\bar{\mu}}{1-\bar{\mu}} = 1 - \mu_0$, independently of $\mu^{r_1'}$, so the PM would not deviate. Deviating to $\mu^{r_0'} \neq \mu^{r_0}$ gives expected utility of $U^T(\mu^{r_0'}, \bar{\mu}) = \mathbb{P}_{\pi_T}(s_0) + \frac{(1-\mu_0)\bar{\mu}}{1-\bar{\mu}} = 1 - \mu_0$. This is also the same as the equilibrium utility, independently of $\mu^{r_0'}$, so the PM would not deviate.

Claim 3: If $\bar{\mu} > \frac{1}{2}$ $(B > B_h(\mu_0))$ an investigation inducing $\mu^{r_0} = \underline{\mu}$ and $\mu^{r_1} = \bar{\mu}$ and a persuasion strategy π_T is the only equilibrium strategy profile.

Proof: The PM's expected utility in equilibrium is $U^T(\underline{\mu}, \bar{\mu})$ as defined in equation (9). Deviating to an investigation that induces a pair of interim beliefs $(\mu^{r_0'}, \mu^{r_1'})$ such that $\mu^{r_0'} \geq \underline{\mu}$ and $\mu^{r_1'} \leq \bar{\mu}$ gives: $U^T(\mu^{r_0'}, \mu^{r_1'}) = \frac{\bar{\mu}(1+\mu_0-2\underline{\mu})-\mu_0(1-\underline{\mu})}{\bar{\mu}-\underline{\mu}}$. Which is the same as when $\mu^{r_0'} = \underline{\mu}$ and $\mu^{r_1'} = \bar{\mu}$, so the PM does not deviate to any $\mu^{r_0'} > \underline{\mu}$ and $\mu^{r_1'} < \bar{\mu}$. This is the only equilibrium. Suppose there was an equilibrium such that interim beliefs were (μ^{r_0}, μ^{r_1}) such that $\mu^{r_0} \geq \underline{\mu}$ and $\mu^{r_1} \leq \bar{\mu}$ with at least one inequality strict. The derivatives of each payoff function when deviating show that: (1) If $\mu^{r_0} > \underline{\mu}$, the PM would deviate to inducing $\mu^{r_0'} < \mu^{r_0}$, and (2) If $\mu^{r_1} < \bar{\mu}$, the PM would deviate to inducing $\mu^{r_1'} > \mu^{r_1}$.

Claims 1 and 2 imply that there exists a set of equilibria in which π_T is played when $\bar{\mu} < \frac{1}{2}$, that all these equilibria yield the same payoff to the PM and that in one of these equilibria, the PM chooses $p = \bar{p}$. Claim 3 implies that when $\bar{\mu} > \frac{1}{2}$, there exists a unique equilibrium in which the lobbyist chooses π_T and the PM chooses $p = \bar{p}$.

Finally, since the PM's expected utility is the same under confidentiality with π_T and transparency (Proposition 2), the two regimes yield the same utility whenever $B > \underline{B}$, so there are no gains from confidentiality in this case. □

Lemmas 3 and 4 imply Proposition 4: (1) If $B \leq \underline{B}$, then $\bar{p}$ and π_G is an equilibrium, all equilibria yield the same payoff to the PM as this one, and the PM's utility is strictly greater than under transparency. (2) If $\underline{B} < B$, then $\bar{p}$ and π_T is an equilibrium, and when multiple equilibria exist, they all yield the same payoff to the PM as this one and the same payoff as under transparency.

□

Proof of Proposition 5. I first derive the equilibrium value of confidentiality and then take derivatives with respect to B for each possible case. The probability of choosing the correct policy given some investigation p and strategy π for $i \in \{E, A\}$ is:

$$\begin{aligned}\mathcal{P}_i(p,\pi) =& \mu_0 \sum_{r\in\{r_0,r_1\}} \mathbb{P}_p(r|\omega=1) \sum_{s\in\{s_0,s_1\}} \mathbb{P}_\pi(s|r,\omega=1)x(\mu_s^r) \\ &+ (1-\mu_0) \sum_{r\in\{r_0,r_1\}} \mathbb{P}_p(r|\omega=0) \sum_{s\in\{s_0,s_1\}} \mathbb{P}_\pi(s|r,\omega=0)(1-x(\mu_s^r))\end{aligned}$$

Note that for any signals r and s, we have $\mathbb{P}_p(r)\,\mathbb{P}_\pi(s|r)\mu_s^r x(\mu_s^r) + \mathbb{P}_p(r)\,\mathbb{P}_\pi(s|r)(1-\mu_s^r)(1-x(\mu_s^r)) = \mu_0\,\mathbb{P}_p(r|\omega=1)\,\mathbb{P}_\pi(s|r,\omega=1)x(\mu_s^r) + (1-\mu_0)\,\mathbb{P}_p(r|\omega=0)\,\mathbb{P}_\pi(s|r,\omega=0)(1-x(\mu_s^r))$. Therefore, for a given pair of strategies p and π and some regime $j \in \{C, P\}$, the probability of choosing the correct policy is equal to the PM's expected utility: $\mathcal{P}^j(p,\pi) = U^j(\mu^{r_0}, \mu^{r_1})$ where (μ^{r_0}, μ^{r_1}) are the interim beliefs generated by p. We can therefore use the expressions for the PM's expected utility to derive the comparative statics of Proposition 5.

Let $\underline{U}^P(\underline{\mu}, \bar{\mu}) = 1-\mu_0$ and $\overline{U}^P(\underline{\mu}, \bar{\mu}) = \left(\frac{\bar{\mu}-\mu_0}{\bar{\mu}-\underline{\mu}}\right)(1-2\underline{\mu})+\mu_0$ the possible equilibrium expected utilities under transparency (equation (8)). When $B < \overline{B}$ and $\mu_0 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$, the value of confidentiality is:

$$W_i(B) = \begin{cases} 0 & \text{if } B < \min\{\underline{B}, B_H(\mu_0)\} \text{ and } \mu_0 \geq \frac{1}{2} \\ U^G(\underline{\mu}, \bar{\mu}) - \underline{U}^P(\underline{\mu}, \bar{\mu}) & \text{if } B < \min\{\underline{B}, B_h(\mu_0)\} \text{ and } \mu_0 < \frac{1}{2} \\ U^G(\underline{\mu}, \bar{\mu}) - \overline{U}^P(\underline{\mu}, \bar{\mu}) & \text{if } B \in (B_H(\mu_0), \underline{B}) \text{ or } B \in (B_h(\mu_0), \underline{B}) \\ U^G(m^*(\bar{\mu}), \bar{\mu}) - \underline{U}^P(\underline{\mu}, \bar{\mu}) & \text{if } B \in (\underline{B}, B_h(\mu_0)) \\ U^G(m^*(\bar{\mu}), \bar{\mu}) - \overline{U}^P(\underline{\mu}, \bar{\mu}) & \text{if } \max\{\underline{B}, B_h(\mu_0)\} < B < \overline{B} \end{cases}$$

For each case, we can simplify the expressions and take partial derivatives.[37]

1. Clearly if $B < \min\{\underline{B}, B_H(\mu_0)\}$ and $\mu_0 \geq \frac{1}{2}$, then $\frac{\partial W_i(B)}{\partial B} = 0$.
2. If $B < \min\{\underline{B}, B_h(\mu_0)\}$ and $\mu_0 < \frac{1}{2}$ $\frac{\partial W_i(B)}{\partial B} = \frac{\mu_0}{B^2} > 0$.
3. If $B \in (B_H(\mu_0), \underline{B})$ and $\mu_0 \geq \frac{1}{2}$ or if $B \in (B_h(\mu_0), \underline{B})$ and $\mu_0 < \frac{1}{2}$, $\frac{\partial W_i(B)}{\partial B} = \frac{\mu_0(2B+1) - B^2(1-\mu_0)}{(B(B+1))^2} \geq 0$ if and only if $B \leq \frac{\mu_0 + \sqrt{\mu_0}}{(1-\mu_0)}$.
4. If $B \in (\underline{B}, B_h(\mu_0))$, $\frac{\partial W_i(B)}{\partial B} = -(1-\mu_0)\frac{1}{(1-m^*(\bar{\mu}))^2}\frac{\partial m^*(\bar{\mu})}{\partial \bar{\mu}}\frac{\partial \bar{\mu}}{\partial B} > 0$, as $\frac{\partial m^*(\bar{\mu})}{\partial \bar{\mu}} < 0$ and $\frac{\partial \bar{\mu}}{\partial B} > 0$.
5. If $B > \max\{\underline{B}, B_h(\mu_0)\}$, $\frac{W_i(B)}{\partial B} = -\frac{1}{(B+1)^2} + \frac{10B - 2 + 2\sqrt{9B^2 - 10B + 1}}{(3B + \sqrt{9B^2 - 10B + 1} - 1)^2\sqrt{9B^2 - 10B + 1}}\mu_0 \leq 0$.

Finally, when $B \geq \overline{B}(\mu_0)$ (or $\mu_0 \geq \frac{1+\sqrt{2}}{2+\sqrt{2}}$), the PM uses the most informative investigation, the lobbyist either chooses a targeted strategy or provides no information, and the probability of error is the same under transparency and confidentiality. Therefore, the value of confidentiality is $W_i(B) = 0$ in all these cases.

To prove the second part of the proposition, let $\mu_0 < \frac{1}{2}$ the prior of an enemy, and $\mu_1 = 1 - \mu_0 > \frac{1}{2}$ the symmetric prior for an ally. I show that in each case, $W_E(B) \geq W_A(B)$.

1. If $\mu_1 \geq \frac{1+\sqrt{2}}{2+\sqrt{2}}$, then an ally always has $W_A(B) = 0$, while an enemy always has $W_E(B) \geq 0$.
2. If $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$ and $B \geq \max\{\overline{B}(\mu_0), \overline{B}(\mu_1)\}$, then $W_A(B) = W_E(0) = 0$.
3. If $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$ and $\overline{B}(\mu_1) < B < \overline{B}(\mu_0)$, then $W_E(B) > W_A(B) = 0$. Note that $\overline{B}(\mu_0) < B < \overline{B}(\mu_1)$ is not possible as $\overline{B}(\mu_0)$ is decreasing in μ_0 (see claim 5 in proof of proposition 3).
4. If $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$ and $B_h(\mu_0), \underline{B} < B < \min\{\overline{B}(\mu_1), \overline{B}(\mu_0)\}$ (note that $B_h(\mu_0) = B_H(\mu_1)$ since $\mu_1 = 1 - \mu_0$), then $W_i(B) = U^G(m^*(\underline{\mu}), \bar{\mu}) - \overline{U}^P(\underline{\mu}, \bar{\mu})$ which is strictly decreasing in μ_0 (see claim 5 in proof of proposition 3), so $W_A(B) < W_E(B)$.

[37] Further details on derivatives and inequalities are available in the online appendix.

5. If $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$ and $B_h(\mu_0) < B < \underline{B}$, then $W_i(B) = U^G(\underline{\mu}, \bar{\mu}) - \overline{U}^P(\underline{\mu}, \bar{\mu})$ which is strictly decreasing in μ_0 (see online appendix for details), so $W_A(B) < W_E(B)$. Note that $\underline{B} < B_h(\mu_0) = B_H(\mu_1)$ is not possible by definition of $B_H(\mu_1)$ when $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$.

6. Finally, when $B < \underline{B}$, then $W_E(B) = U^G(\underline{\mu}, \bar{\mu}) - \overline{U}^P(\underline{\mu}, \bar{\mu})$ while $W_A(B) = 0$.

□

Proof of Propositions 6. Substituting beliefs using the Bayes plausibility constraints in the influence function (expression (4) in the text) and re-arranging gives

$$F(B) = \begin{cases} 0 & \text{if } \mu_0 \geq \frac{1}{2} \text{ and } B < \min\{\underline{B}, B_H(\mu_0)\} \\ \frac{(B+1)\mu_0}{B} & \text{if } \mu_0 < \frac{1}{2} \text{ and } B < \min\{\underline{B}, B_h(\mu_0)\} \\ \mu_0 + (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} & \text{if } \mu_0 < \frac{1}{2} \text{ and } B \in (\underline{B}, B_h(\mu_0)) \\ \frac{(3\mu_0-1)B+\mu_0}{B(B+1)} & \text{if } \mu_0 < \frac{1}{2}, B \in (B_h(\mu_0), \underline{B}) \text{ or if } \mu_0 \in \left[\frac{1}{2}, \frac{1+\sqrt{2}}{2+\sqrt{2}}\right), B \in (B_H(\mu_0), \underline{B}) \\ \mu_0 + (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} - \frac{\mu_0 - \underline{\mu}}{\bar{\mu} - \underline{\mu}} & \text{if } \max\{\underline{B}, B_h(\mu_0)\} < B < \overline{B} \\ \frac{2\mu_0}{B+1} & \text{if } \mu_0 < \frac{1+\sqrt{2}}{2+\sqrt{2}} \text{ and } \overline{B} < B \text{ or if } \mu_0 \geq \frac{1+\sqrt{2}}{2+\sqrt{2}} \text{ and } B > B_H(\mu_0) \end{cases}$$

The full characterisation of the derivative of $F(B)$ with respect to B (and μ_0) is provided in the online appendix. To prove Proposition 6, it is enough to note that in **case 5**, when $\max\{\underline{B}, B_h(\mu_0)\} < B < \overline{B}$,

$$\frac{\partial F(B)}{\partial B} = \frac{\partial (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))}}{\partial B} - \frac{2\mu_0 - 1}{(B+1)^2}$$

This is greater than 0 if $\mu_0 < \frac{1}{2}$ and $\frac{\sqrt{9B^2-10B+1}(3B+\sqrt{9B^2-10B+1})^2}{2\sqrt{9B^2-10B+1}(3B+\sqrt{9B^2-10B+1})^2+(B+1)^2(10B-2+2\sqrt{9B^2-10B+1})} > \mu_0$.

The left-hand side is greater than 0 and can be greater than $\frac{1}{B+1}$ for B large enough. Therefore, it is possible to find μ_0 and B such that $\bar{\mu} > \frac{1}{2}$ and $B > \underline{B}$ and such that $\frac{\partial F(B)}{\partial B} > 0$. At the same time, note that on on $\left[B_h(\mu_0), \overline{B}\right]$, the PM's utility (and therefore the probability of choosing the correct policy) is either $U^G(\underline{\mu}, \bar{\mu})$ or $U^G(m^*(\bar{\mu}), \bar{\mu})$ and both functions are increasing in B (from the proof of Proposition 4). Therefore, when $\mu_0 < \frac{1}{2}$ and $B \in \left[B_h(\mu_0), \overline{B}\right]$, both influence and the probability of choosing the correct policy can be increasing.

□

Proof of Propositions 7. Let $\mu_0 < \frac{1}{2}$ the prior of an enemy, and $\mu_1 = 1 - \mu_0 > \frac{1}{2}$ the symmetric prior for an ally. Since we focus on the case where the influence on an ally is positive, we have $B > B_H(\mu_1) = B_h(\mu_0)$. Suppose $\mu_1 < \frac{1+\sqrt{2}}{2+\sqrt{2}}$. There are four possible cases:

1. If $B \in (B_h(\mu_0), \underline{B})$, $F_E(B) = \frac{(3\mu_0-1)B+\mu_0}{B(B+1)} < \frac{(3\mu_1-1)B+\mu_1}{B(B+1)} = F_A(B)$.

2. If $B \in [\underline{B}, \overline{B}(\mu_1))$, $F_E(B) = \mu_0 + (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} - \frac{\mu_0 - \underline{\mu}}{\bar{\mu}-\underline{\mu}} < \mu_1 + (1-\mu_1)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} - \frac{\mu_1 - \underline{\mu}}{\bar{\mu}-\underline{\mu}} + F_A(B)$, since $\frac{\partial F(B)}{\partial \mu_0} = \left(\frac{2B^2+8B+2\sqrt{9B^2-10B+1}-2}{(B+1)(3B+\sqrt{9B^2-10B+1}-1)}\right) > 0$ (see online appendix for details).

3. If $B \in [\overline{B}(\mu_1), \overline{B}(\mu_0))$, then we need to show that $F_E(B) = \mu_0 + (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} - \frac{\mu_0 - \underline{\mu}}{\bar{\mu}-\underline{\mu}} < \frac{2\mu_1}{B+1} = F_A(B)$. Since in this case, $F_E(B)$ is increasing in μ_0 and $F_A(B)$ is decreasing in μ_0 (increasing in $\mu_1 = 1-\mu_0$), we just need to show that at $\mu_0 = \frac{1}{2}$, $F_E(B) > F_A(B)$ for any $B \in [\overline{B}(\mu_1), \overline{B}(\mu_0))$. At $\mu_0 = \frac{1}{2}$, $F_E(B)$ simplifies to: $F_E(B) = \frac{(3B-1)-\sqrt{(B-1)(9B-1)}}{4(B+1)}$, so $F_E(B) > F_A(B)$ if and only if $\frac{1}{B+1} > \frac{(3B-1)-\sqrt{(B-1)(9B-1)}}{4(B+1)}$. This is equivalent to $18 + 6B^2 - 12B + 8\sqrt{(B-1)(9B-1)} > 0$, which always holds for any B.

4. If $B \geq \overline{B}(\mu_0)$, $F_E(B) = \frac{2\mu_0}{B+1} < \frac{2\mu_1}{B+1} = F_A(B)$

Suppose $\mu_1 \geq \frac{1+\sqrt{2}}{2+\sqrt{2}}$, since $\overline{B}(\mu_1) = \underline{B} < B_h(\mu_0) = B_H(\mu_1)$ in this situation, there are only two cases:

1. If $B \in (B_h(\mu_0), \overline{B}(\mu_0))$, $F_E(B) = \mu_0 + (1-\mu_0)\frac{m^*(\bar{\mu})}{(1-m^*(\bar{\mu}))} - \frac{\mu_0 - \underline{\mu}}{\bar{\mu}-\underline{\mu}} < \frac{2\mu_1}{B+1} = F_A(B)$ as in case 3.

2. If $B \geq \overline{B}(\mu_0)$, $F_E(B) = \frac{2\mu_0}{B+1} < \frac{2\mu_1}{B+1} = F_A(B)$.

$\square$