# Uncertain Policy Implementation with Public Information

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**Abstract**

I analyze the effects of policy vetting on a politician's incentive to implement her proposal. In my model, the voter and the politician are uncertain both about the politician's competence and whether her proposal is good for the voter. Vetting provides a public signal about the probability the policy will benefit the voter. More competent politicians are more likely to propose good policies, so the voter can use the results of vetting to update his beliefs about the politician's competence. I find that the politician is only willing to take a risk by implementing her policy when the beliefs about her are sufficiently poor. Consequently, public vetting can create a perverse incentive for the politician to implement her policy proposal only if it is sufficiently unlikely to help the voter. If only the politician observes the results of vetting, she implements her policy only when its expected outcome is sufficiently high, because her policy information does not directly affect the voter's beliefs about her. Consequently, public vetting may impede efficient policymaking and leave voters worse off.

**JEL Classifications:** D72, D83

**Keywords:** Electoral Accountability, Policy Implementation, Transparency, Voting, Reputation Concerns

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# 1 Introduction

Politicians must often propose policies without perfect information about the effects they may have on voters. To fill some of this informational gap, non-partisan organizations, academics, and the media often vet politician's proposals. This vetting provides information to policymakers about the likely results of their policies before they are implemented, to encourage the passage of good policies and discourage the passage of bad ones. Because this information is public, vetting may also help voters to learn more about the competence of their politicians, so that they may make better electoral decisions. Policy vetting is a major way in which economists interact with policymakers and the public, but little is known about its effects on policy implementation and voters' welfare.

My paper analyzes the effects of policy vetting on a politician's incentive to implement her proposal. A crucial feature of policy vetting is that it creates public information about the quality of the politician's proposal. The existing literature focuses on the case in which politicians receive private information about the likely effects of their proposal (Canes-Wrone, Herron, and Shotts 2001; Fox and Stephenson 2011; Fox and Van Weelden 2015; Majumdar and Mukand 2004). However, politicians do not necessarily have significant amounts of private information on many domestic policy issues. For example, projections about a tax reform's expected impact come from publicly accessible sources such as the Congressional Budget Office, which voters can observe through media coverage.

The politician's desire to be re-elected interacts with public information about the quality of her proposal, due to the voter's desire to elect competent politicians. The voter and a politician are uncertain both about the politician's competence and the suitability of her policy. First, there is a public signal which provides information about the probability that the politician's proposal will benefit the representative voter. Because competent politicians are more likely to generate good policy proposals, the voter can use the signal to update his beliefs that the politician is competent, according to Bayes' rule. The lack of private information implies that the politicians actions are not informative of her type on their own. Further learning about the policy's suitability, and consequently about the politician's competence, can only occur if the politician implements her policy proposal, so that voters may observe its outcome. Because the voter prefers to elect the candidate more likely to be competent, the politician's degree of electoral advantage is determined by the voter's beliefs. Then, the politician decides whether or not to implement her policy, given the voter's beliefs about her competence. The voter then observes the outcomes of her policy if it is implemented, and updates her beliefs further. Lastly, the identity of the challenger is revealed, and the voter elects the more candidate more likely to be competent.

I find that public vetting of policies can discourage the passage of good policies and encourage the passage of bad ones. The politician's electoral prospects are determined by the voter's belief that she is competent. A policy that is vetted and appears very likely to work increases this belief, putting the politician at an electoral advantage. While she could increase her advantage even further if she implements her policy and it benefits voters, there is always a risk that it will fail to do so. Since she is already very likely to win the election, she has little incentive to take a risk by implementing her policy. Consequently, public vetting that reveals her policy is very likely to work may cause that policy not to be implemented, because it also raises the probability that the incumbent is competent. Conversely, a policy that is vetted and appears unlikely to work places her at an electoral disadvantage. She may make matters worse by implementing her policy, but there is a chance it could succeed and show that she is competent. Hence, public vetting that reveals her policy is likely to fail may cause her to implement that policy, because of its effects on voter's beliefs about her. This finding should be interpreted as the effect of electoral motivations on a politician's decision, which may be decisive for a politician who is otherwise on the margin about implementing her policy.

I further find that private vetting of policies encourages the passage of good policies and discourages the passage of bad ones. Private information prevents the results of vetting from directly influencing the belief that the politician is competent. Consequently, a politician can only benefit from a good proposal by implementing it. Conversely, a politician can avoid some of the harm from a bad proposal by choosing not to implement it.

The model I consider is most closely related to that of Dewan and Hortala-Vallve (2017). They also consider a politician without private information who must decide whether or not to implement an uncertain reform, which may reveal information about her competence. However, they assume that the voter can set an exogenous reelection probability associated with the status quo, and that additional information about the politician will arrive during the election. In my model, reelection probabilities are endogenously determined by the reputation of the politician and the distribution of challengers, and information about the politician's competence arrives before her implementation decision. Further, I consider how private information may change the politicians behavior in this environment.

My paper adds to the transparency literature by determining if the politician uses her information more responsibly when it is public rather than private, and explores a new dimension of transparency. Majumdar and Mukand (2004) consider privately informed policymakers who must choose whether or not to implement an uncertain reform task. They find that a desire to signal competence implies "reckless experimentation" and an unwillingness to back down on policies that are publicly failing because it would suggest that the politician had received negative private information. I show that public information does not lead to efficiency and may make matters worse. Other strands of the literature have established in many contexts that politicians often ignore valuable private information in order to signal competence when voters can observe politician's actions or their outcomes (Canes-Wrone, Herron, and Shotts 2001; Fox and Stephenson 2011; Fox and Van Weelden 2015). However, the effect of making policy information itself transparent has not been explored. Comparing the public information case to the private case in my model illustrates the effects of transparency of information, and my results suggest that it does not necessarily make voters better off.

My paper contributes to the Bayesian persuasion literature by relaxing the assumption that experiment outcomes are independent of initial popularity, and considering constraints on the ability to experiment. In that literature, it is commonly assumed that the outcomes of the politician's experiment are independent of her initial popularity (Izzo 2018; Alonso and Câmara 2016). This independence is used extensively in characterizing the politician's behavior. However, I consider a situation in which the outcomes of experimentation via policy implementation are dependent upon the initial level of popularity. This occurs because the outcomes are updated beliefs about the politician which are necessarily a function of the current beliefs about her. Further, it is commonly assumed that the politician can craft optimal experiments to elicit the outcomes most favorable to her (Alonso and Câmara 2016). I consider a case in which there is only one experiment – the politician's proposed policy – which she may either implement or not.

My paper also contributes to the broader literature on reputation-concerned decision-makers, as initiated by Holmström (1999). I consider a novel utility function for reputation, the CDF of others' reputations, which models situations in which decision-makers' future employment prospects depend on their reputations relative to other applicants. I show this utility function implies the decision-maker acts nearly opposite to the desires of the principal in this situation, the voter. While there has been some exploration of policy implementation under reputational concerns, such as Fu and Li (2014), these models consider private information. I show that reputational concerns can still cause inefficient policy-making even in the absence of private information.

In Section 2, I describe the public information model. In Section 3, I characterize the public information equilibrium and show that it is inefficient. In Section 4, I consider the private information model and perform a welfare comparison. In Section 5, I discuss possible extensions and implications. All proofs are in Appendix A, while all generalizations are in Appendix B.

## 2 The Public Information Model

The players are a politician (N), a challenger (C), and a representative voter (V). Politicians are referred to by feminine pronouns and the representative voter by masculine pronouns. There are two periods, $t \in \{1, 2\}$. The sequence of events is shown in Figure 1.

Each period, the politician, who is either competent or incompetent, may either implement her policy proposal ($x_t = \theta_t$), or maintain the status quo ($x_t = s_t$). For brevity, I may refer to $x_t = \theta_t$ as *implementation* and $x_t = s_t$ as *inaction*. At the beginning of period one, before the politician's implementation decision, the politician and the voter receive an imperfect public signal about the suitability of the politician's policy. At the end of the first period, the representative voter observes the choice of the politician $x_1$. With a probability of $1-\gamma$, the voter is able to observe the outcome of the politician's policy if it has been implemented, $y_1$. He then decides whether to retain the

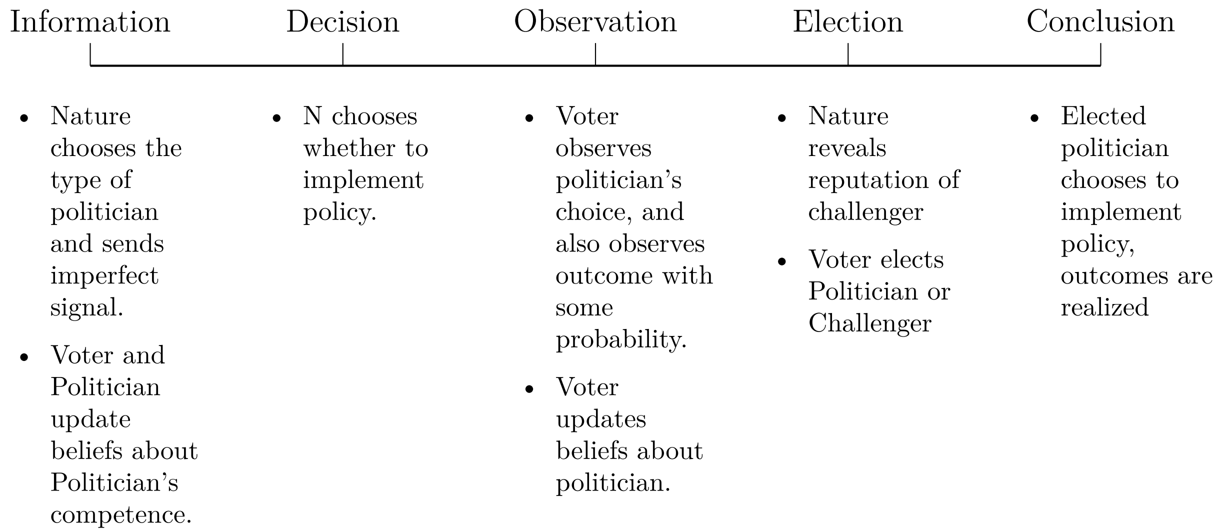


Figure 1: The sequence of events for the public information model.

incumbent politician or to elect the challenger. The solution concept for this and all other models considered in the paper is Perfect Bayesian Nash Equilibrium.

## 2.1 Competence and Outcomes

The politician may be either *competent* ($\tau = H$), or *incompetent* ($\tau = L$). Competence in this model is the ability of the politician to choose and implement policies that generate good outcomes for the representative voter. The politician's policy for the issue at time $t$, $\theta_t$, is a policy which she has publicly committed to in some way, either in her campaign, or in a public announcement, prior to the start of the game. The outcome of the policy proposal $\theta_t$ if it is implemented is denoted $y_t$, and is identically equal to the utility it gives the voter in that period. A *good outcome* is $y_t = 1$, while a *bad outcome* is $y_t = -1$. At a minimum, competence implies $P(y_t = 1|\tau = H) > P(y_t = 1|\tau = L)$. *In the main text, I consider the special case in which* $P(y_t = 1|\tau = H) = 1$ *and* $P(y_t = 1|\tau = L) = 0$, *so that* $P(y_t = 1) = P(\tau = H)$. This assumption is for ease of exposition, as it greatly simplifies the proof of the main result. In Appendix B.2, I consider the more general case. As is common in models of policy choice, there is a probability $\gamma \in (0, 1)$ that the that the voter observes $y_t = 0$ when a policy is implemented rather than its true outcome.

Both the voter and the politician are uncertain about the outcome of the policy if it is implemented, and the politician's competence. Policy uncertainty comes from the inherent difficulty in knowing the true effects of a policy, and what details are required to make it work in a particular situation. Statistical evidence at best informs us about the average effect of a similar policy in a different context. Even if a policy is known to be good in principle, a policy proposal must specify the specific details of how the policy should be implemented, and there is little hard evidence about how to choose these. The politician, if she is competent, brings additional local knowledge and insight that allows her to identify good policies and put them into practice. Whether someone has that knowledge may only be revealed through experience. It is possible in reality, however, that the politician has some additional information about her own competence. I explore this case in Appendix B.4, and find qualitatively similar results.

## 2.2 Policy Vetting and Reputation

The voter and the politician know the prior probability that her policy may work, $\pi_y$, and the prior probability that the politician is competent, $\pi_\tau$. Then, both receive an imperfect public signal $\sigma \in (0,1)$ about her policy's effectiveness. This signal is conditionally independent of the politician's competence, in the sense that $P(\sigma|y_t = 1) = P(\sigma|y_t = 1, \tau)$. This assumption can be interpreted as saying that the signal only contains information about the merits of the policy. However, because good policies are more likely to come from a competent politician than an incompetent politician, whenever a signal increases the belief that the policy will be effective, it must also increase the belief that the politician proposing it is competent, and conversely for a signal that lowers the belief that the policy will be effective. This does not require my stronger assumption that policy proposal succeeds if and only if the politician is competent.

**Lemma 1.** *If $P(y_t = 1|\sigma) > \pi_y$, then $P(\tau = H|\sigma) > \pi_\tau$. Conversely, If $P(y_t = 1|\sigma) < \pi_y$, then $P(\tau = H|\sigma) < \pi_\tau$.*

As is standard in the literature, I refer to the probability that the politician is competent given the available information as her *reputation*. Lemma 1 implies that the public signal about the politician's policy has a direct impact on her reputation, even if those signals are conditionally independent of her competence, as long competent politicians are at least more likely to propose good policies than incompetent politicians.

Under the assumption that the policy succeeds if and only if the politician is competent, and the voter observes the probability that the policy succeeds if implemented, the value of reputation after the signal is received, $P(\tau = H|\sigma)$, is simply $P(y_1 = 1|\sigma)$. For notational ease, signals are referred to by the reputation they imply. That is, $P(\tau = H|\sigma) \equiv \sigma$.[1]

Based on his observation of the politician's action and its outcome, the voter updates the politician's reputation at the end of period one to $r$. The challenger's reputation is unknown when policy is chosen. At the end of period one, before the election, a challenger with reputation $r^c$ is drawn from the continuously differentiable CDF $F$, with support $(0,1)$. I assume $F$ is *strictly unimodal*. That is, there exists a unique mode $m \in (0,1)$, such that $F$ is strictly convex on $(0,m)$ and strictly concave on $(m,1)$. I also assume the density function satisfies $f(0) < 1$, $f(1) < 1$ and $f(r^c) > 0$, $\forall r^c \in (0,1)$. The strict unimodality and continuous differentiablity of $F$ also implies that $f$ is a continuous, strictly quasiconcave function.

1. Assumptions on the distribution of $\sigma$ are not required in the public information model, and so they are introduced when they are needed in Section 4.

## 2.3 Preferences

The voter's utility is the weighted sum of policy outcomes,

$$Y(y_1, y_2) = y_1 + \beta y_2,$$

where $\beta \geq 0$ indicates the relative importance of the second period policy decision to the first. If the issue in the first period is relatively minor, then $\beta$ may be greater than one. If the policy chosen in the first period is expected to remain in effect for a long time, $\beta$ may be very small.

Consider the expected outcome for the voter when the politician implements a policy in the first period. There is a probability $\sigma$ that the politician is competent, and so her policy delivers a good outcome, plus a probability of $1 - \sigma$ that she is incompetent, and her policy generates a bad outcome. Hence, the voter's expected utility is given by

$$v_1(\sigma) \equiv \mathbb{E}(y_1 | \sigma, x_1 = \theta_1) = \sigma \cdot 1 + (1 - \sigma) \cdot (-1) = 2\sigma - 1.$$

Similarly, the voter's expected utility from a policy implemented in the second period by a politician with reputation $r$ is

$$v_2(r) \equiv \mathbb{E}(y_2 | r, x_2 = \theta_2) = r \cdot 1 + (1 - r) \cdot (-1) = 2r - 1$$

To emphasize their office motivation, I assume that politicians strictly prefer whichever policy choice has the highest probability of re-election. If the two policies are equivalent in their probability of re-election, the politician prefers $x_t = \theta_t$ to $x_t = s_t$.

In the second period, the politician has no possibility of re-election regardless of her choice of $x_2$. Hence, whomever holds office in period two chooses $x_2 = \theta_2$. Therefore, the representative voter re-elects the politician if and only if $r \geq r^c$.

# 3 First Period Strategies Under Public Information

In this section, I characterize the incentives of the politician to implement her policy in the first period. Because the voter prefers the candidate with the highest reputation, the politician would like to manipulate her reputation to improve her expected outcome in the election. Because further learning about her competence occurs only if she implements her policy, she does so only when she would like voters to learn more about her. This is only true when her reputation would be sufficiently low in the absence of new information. Consequently, vetting can cause a good policy to go undone and a bad policy to be pushed forward.

## 3.1 Implementation and Reputation

If the politician implements her policy and the voter observes a good outcome, then he is certain that the politician is competent and $r = 1$. If the politician implements her policy and the voter observes a bad outcome, then the politician is certainly incompetent and $r = 0$.

Let $r(y_1)$ represent the politician's reputation after outcomes are observed. The assumption that the voter and the politician are symmetrically informed implies that if the politician chooses inaction, nothing can be inferred from her choice not, so $r(0) = \sigma$. If she implements her policy and it generates a good outcome, she is proven to be competent, so $r(1) = 1$. If she implements her policy and a bad outcome results, she is proven to be incompetent, so $r(-1) = 0$.

The payoff to the politician of a given reputation is the probability of re-election associated with each reputation. Consequently, the value to the politician of a reputation of $r$ is $F(r)$, the probability that the challenger has a reputation less than $r$. Because the support of $r^c$ is $(0, 1)$, $F(0) = 0$ and $F(1) = 1$.

## 3.2 The Incentive To Implement.

Implementing her policy is a gamble for the politician, because she does not know if she is competent. With a probability of $\sigma$, she is competent, so her policy creates a good outcome and she is re-elected for sure. With a probability of $(1 - \sigma)$, she is incompetent, so her policy generates a bad outcome, and she has no chance of re-election. If the outcome is not revealed, which occurs with probability $\gamma$, voters learn nothing about her, and she wins re-election with probability $F(\sigma)$. Hence, the expected probability of re-election of implementation given $\sigma$ is

$$(1 - \gamma)\sigma + \gamma F(\sigma)$$

On the other hand, inaction is a safe choice for the politician, because she can keep her current reputation for sure, and be re-elected with a probability of $F(\sigma)$. Implementation implies a higher expected probability of re-election than inaction if

$$(1 - \gamma)\sigma + \gamma F(\sigma) > F(\sigma),$$

or equivalently, if

$$\sigma \geq F(\sigma).$$

This condition says that the politician prefers to implement her policy whenever the probability she is competent is greater than the probability she will face a challenger with a lower reputation than her signal. Note that when $\sigma = F(\sigma)$, the probability of re-election is equal for $\theta_1$ and $s_1$, so the politician prefers $\theta_1$.

To develop the intuition for when this inequality is satisfied, consider Figure 2. The politician prefers implementation if $\sigma \geq F(\sigma)$, and this is only true when $\sigma$ is sufficiently small; namely, to the left of the intersection point of $y = \sigma$ and the $F$. The politician prefers inaction if $F(\sigma) > \sigma$. This is true to the right of that intersection point. Hence, the politician only implements her policy when $\sigma$ is sufficiently low; otherwise, she prefers to avoid taking a gamble. Formally, let $\sigma_{pub}$ be a value of $\sigma \in [0, 1]$ satisfying $\sigma_{pub} = F(\sigma_{pub})$. In equilibrium, the politician implements her policy if and only if $\sigma$ is less than $\sigma_{pub}$.

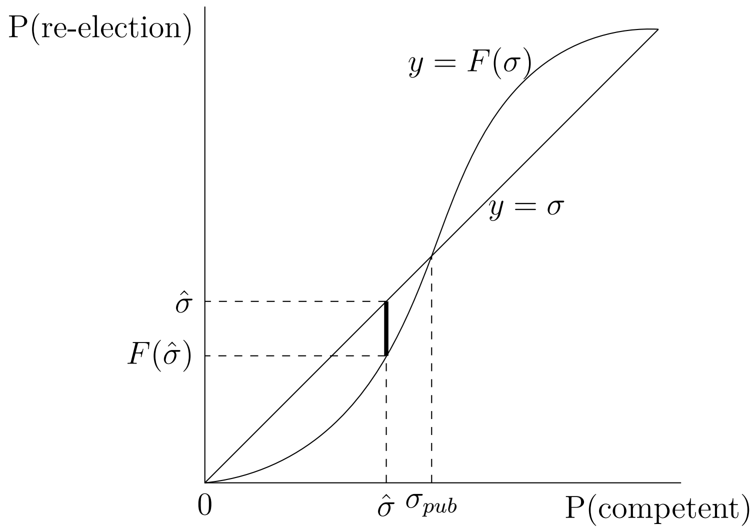


Figure 2: A politician with signal $\hat{\sigma}$ has a greater expected probability of re-election from implementation ($y = \hat{\sigma}$) than from inaction ($y = F(\hat{\sigma})$), and would for any $\sigma \leq \sigma_{pub}$.

**Theorem 1.** *In the public information model, the politician chooses $x_1 = \theta_1$ if and only if $\sigma \leq \sigma_{pub}$, and $x_2 = s_1$ otherwise. The representative voter re-elects the politician if and only if $r(y_1) \geq r^c$. In the second period, both the politician and challenger choose $x_2 = \theta_2$.*

Theorem 1 implies that when the signal about the politician's policy is public knowledge, the politician only implements her policy when the expected outcome is sufficiently poor.

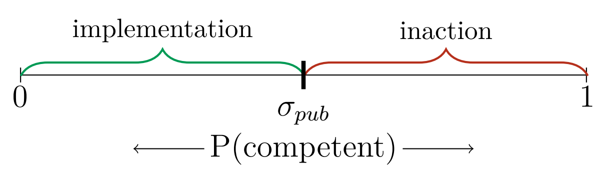


Figure 3: The politician only has an incentive to implement her policy if $\sigma$ is sufficiently low.

That a single policy outcome is decisive for the politician's re-election is a special case, and one which makes the gamble very stark for the politician. In reality, good policies may fail sometimes, and bad policies may occasionally appear to work. The voter may find the challenger to be unpalatable despite her talents, or like her despite her incompetence. There may be other issues on which the politician has already proven herself. Further, the politician may know the quality of the challenger. In Appendix B.2, I allow for valence, other policy issues, and less informative policy outcomes, and it remains the case that the politician only implements her policy when her signal is sufficiently low.

The fact that the value to the politician of retaining the status quo increases in her signal is what drives these results, and this in turn is driven by the fact that the voter observes her signal. As the politician's signal increases, reflecting a higher probability that the politician's policy will generate a good outcome, the probability that she ends up with a good reputation from implementing her policy increases. The difficulty is that the voter knows this signal as well, before the policy is implemented, and he uses it to update his beliefs about the politician. As the signal increases, the politician's reputation also increases. As she can take this reputation into the election with certainty if she chooses the status quo, her payoff from choosing the status quo is also increasing in her signal. The value of the outside option eventually overtakes the value of implementing policy, leading to the politician's pathological incentives.

In the special case in which $F$ is also symmetric on $[0,1]$, the median must be located at $r^c = \frac{1}{2}$, and hence, $F(\frac{1}{2}) = \frac{1}{2}$, and therefore $\sigma_{pub} = \frac{1}{2}$.

**Corollary 1.** *In the public information model, if $F$ is symmetric in addition to strictly unimodal, $\sigma_{pub} = \frac{1}{2}$.*

## 3.3 The Impact of Vetting

Public vetting of a policy has a reputational effect that pushes office-motivated politicians to act contrary to the voter's interests. In this subsection, I show that vetting either has no effect or causes the politician to act contrary to the voter's interests.

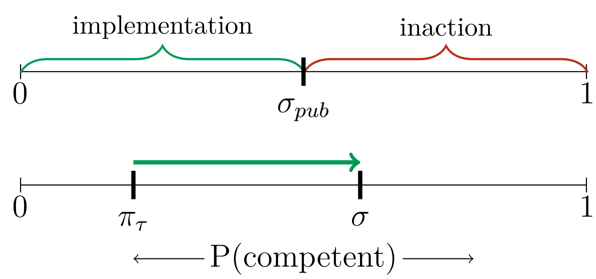


Figure 4: Positive vetting increases the probability the politician is competent from its prior, $\pi_\tau$, to $\sigma$, which may cause a change from implementation to inaction.

Suppose vetting reveals positive information about the policy. Voters then update favorably about the incumbent, so that $\sigma > \pi_\tau$. This discussion is depicted in Figure 4. First suppose that $\pi_\tau$, the prior about the politician, is less than $\sigma_{pub}$. If $\sigma$, the updated reputation of the incumbent after voters observe the results of policy vetting, remains less than $\sigma_{pub}$, then the politician's behavior is unchanged. She would have implemented the policy in the absence of vetting, and she continues to do so afterward. If $\sigma > \sigma_{pub}$, then the politician now has an incentive to choose the status quo, when she previously would have implemented the policy. If $\pi_\tau > \sigma_{pub}$, then the incumbent chooses inaction no matter how good the news is about her policy. Hence, vetting that reveals positive information about a policy either has no effect, or encourages the politician to maintain the status quo when she would have implemented the policy in the absence of vetting.

Conversely, suppose vetting reveals negative information about the policy, so that $\sigma < \pi_\tau$. This discussion is depicted in Figure 5. First suppose $\pi_\tau > \sigma_{pub}$. If $\sigma$ remains greater than $\sigma_{pub}$, then

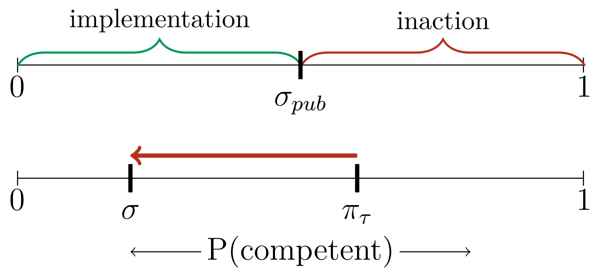


Figure 5: Negative vetting decreases the probability the politician is competent from its prior, $\pi_\tau$, to $\sigma$, which may cause a change from inaction to implementation

the politician's behavior is unchanged. She would have chosen the status quo in the absence of vetting, and she continues to do so afterward. If $\sigma < \sigma_{pub}$, then the politician now has an incentive to implement the policy when she would have chosen not to in the absence of vetting. Lastly, if $\pi_\tau < \sigma_{pub}$, then the incumbent chooses to implement her policy no matter how bad the news is about her policy. Hence, vetting that reveals positive information about a policy either has no effect, or encourages the politician to maintain the status quo when she would have implemented the policy in the absence of vetting.

### 3.4 Inefficient Implementation Under Public Information

When a politician implements her policy, it generates valuable information about her competence, but potentially at a cost. In this subsection, I consider this trade off and show that implementation is only optimal for the voter if the policy signal is sufficiently high.

If the politician chooses the status quo, then the voter has only the signal $\sigma$ with which to make his decision. In that event, an incompetent politician may be retained when she should have been replaced by a challenger, and a competent politician may be replaced when she should have been retained. When the politician implements her policy, she reveals her competence, eliminating those mistakes and leading to higher second period welfare. Consequently, policy implementation always generates valuable information about the incumbent.

To show the value of information formally, consider the expected second period utility for the voter before the election has occurred, given that the politician has a reputation of $r$, denoted by $\Omega(r)$. The voter has the option to retain the politician, in which case her expected utility is $v_2(r)$, or elect the challenger, in which case her expected utility is $v_2(r^c)$. If $r > r^c$, which occurs with a probability of $F(r)$, the voter elects the politician and his his second period expected utility is $v_2(r)$. If $r^c > r$, which occurs with a probability of $1 - F(r)$, the voter elects the challenger and his second period expected utility is $v_2(r^c)$. Taking the expectation across realizations of $r^c$, conditional on $r^c > r$, implies that second period expected utility if the challenger is elected is $\mathbb{E}(v_2(r^c)|r^c > r)$. Hence, the expected second period utility of the voter given a politician with a reputation of $r$ before the election is

$$\Omega(r) = F(r)v_2(r) + (1 - F(r))\mathbb{E}(v_2(r^c)|r^c > r).$$

Now suppose the politician implements her policy and its outcome is observed. There is a probability $\sigma$ that the policy succeeds and $r = 1$, and a probability $1 - \sigma$ that it fails and $r = 0$. The expected value of $\Omega(r)$ is

$$\sigma\Omega(1) + (1 - \sigma)\Omega(0) = \sigma v_2(1) + (1 - \sigma)\mathbb{E}(v_2(r^c)),$$

which by definition of $v_2$ is

$$\sigma[1] + (1 - \sigma)[2\mathbb{E}(r^c) - 1].$$

Lemma 2 shows that second period welfare is greater on average when the politician implements her policy and the outcome is observed.

**Lemma 2.** *For every $\sigma \in (0, 1)$, $\sigma + (1 - \sigma)[2\mathbb{E}(r^c) - 1] > \Omega(\sigma)$.*

In the event that a politician attempts to implement her policy but the voter does not observe its outcome, the voter does not learn anything. His information is the same as if the politician had deliberately chosen the status quo. Consequently, the improvement in second period expected utility from first period policy implementation is only realized with probability $(1 - \gamma)$. I now add the expected first period outcome, $v_1(\sigma) = 2\sigma - 1$, to arrive at the *net benefit of policy implementation,*

$$NB(\sigma) = 2\sigma - 1 + (1 - \gamma)\beta[\sigma + (1 - \sigma)[2\mathbb{E}(r^c) - 1] - \Omega(\sigma)].$$

The net benefit of policy implementation is the increase in the voter's two-period expected utility when the politician chooses to implement her policy, rather than maintain the status quo. It is optimal for a politician with signal $\sigma$ to implement her policy if and only if $NB(\sigma) \geq 0$. This is true only if $\sigma$ is sufficiently large.

**Theorem 2.** *There exists $\sigma_{opt} \in (0, \frac{1}{2})$ such that $NB(\sigma)$ is positive for $\sigma > \sigma_{opt}$ and negative for $\sigma < \sigma_{opt}$.*

The intuition for Theorem 2 is as follows. When the politician has a signal above $\frac{1}{2}$, her policy is expected to improve first period welfare as well. Hence, in that case the voter gets more information and better policy when the politician implements her policy; there is no trade-off between information and policy outcomes.[2] As $\sigma$ falls below $\frac{1}{2}$, information about the politician comes at the cost of a negative expected policy outcome. Once $\sigma$ is low enough, the costs outweigh the benefits and the politician should maintain the status quo.

Theorem 2 demonstrates the incompatibility of rational, office seeking behavior with optimal policy implementation. The politician seeking re-election wants to implement her policy if and

2. In many related two-period models, such as the one considered by Canes-Wrone, Herron, and Shotts (2001) and Morelli and Van Weelden (2013), even an incompetent politician improves policy outcomes on average, so there is no trade-off between information and policy outcomes.

only if her signal is sufficiently low. Optimal experimentation requires the politician to implement her policy if and only if her signal is sufficiently high. This result is differs from that of Dewan and Hortala-Vallve (2017), because in their model, reforms too often when her signal is high, and too little when her signal is low.

# 4 Private Information

In this section, I consider the behavior of the politician when policy information is private. The voter cannot update his beliefs about the politician's competence on the basis of the realized policy signal, and she must instead rely on an equilibrium expectation. This in turn implies that the politician's electoral chances if she chooses the status quo do not vary with the policy signal, and consequently, she only implements her proposal if the signal is sufficiently high.

## 4.1 Setup

I assume only the politician can observe the signal, while the voter only knows the distribution of possible signals. Specifically, $\sigma$ is distributed according to a continuous, differentiable CDF $G$ such that $g(\sigma) > 0,\ \forall \sigma \in [0, 1]$. The expectation of a distribution of Bayesian posterior probabilities is the prior probability, so $\mathbb{E}(\sigma)$ must be $\pi_\tau$, the prior probability that the politician is competent. I assume for this section that $\pi_\tau = \frac{1}{2}$. That is, the politician is equally likely to be competent or incompetent in the absence of any further information. This assumption is relaxed in Appendix B.4. The challenger has a publicly observable reputation of $r^c$, as in the public information case. *I also impose that $F$ is a symmetric distribution,* so that $\mathbb{E}(r^c) = m = \frac{1}{2}$. An interpretation of these assumptions is that neither the politician nor the challenger is at any a priori advantage, and without more information, the voter does not have any knowledge if either will make things better or worse for them in the next period. Also note that by Corollary 1, symmetry of $F$ implies that $\sigma_{pub} = \frac{1}{2}$. A more general analysis, which allows for less informative policy outcomes, is available in Appendix B.3.

I initially assume that the voter is able to observe the actions of the politician; however, I show that this is unlikely to hold in equilibrium. *Consequently, when I characterize equilibrium in section Section 4.4, I assume the voter cannot observe the politician's actions.*

## 4.2 The Voter's Decision Rule

If the politician implements her policy and its outcome is revealed, it remains fully informative if the outcome is observed, so that $r = 1$ if $y_1 = 1$ and $r = 0$ if $y_1 = -1$. In this case the voter re-elects the politician if $r \geq r^c$. Should the voter observe $y_1 = 0$, the voter forms an expectation of the contents of the signal based upon the equilibrium strategy profile, equal to $\mathbb{E}(\sigma | x_1 = \theta_1, y_1 = 0)$

if the politician attempted to implement her policy, or $\mathbb{E}(\sigma|x_1 = s_1)$ otherwise. Because $v_2(r)$ is linear in $r$, and $r = \sigma$ whenever $y_1 = 0$, the voter re-elects the politician if $\mathbb{E}(\sigma|x_1, y_1 = 0) \geq r^c$.

### 4.3 The Politician's Decision Rule

Whereas in the public information case, choosing the status quo implies a reputation equal to the public signal, in the private information case, choosing the status quo implies a reputation equal to the expected value of reputation implied by the signal contained in the report, $\mathbb{E}(\sigma|s_1)$. I refer to this as the *expected reputation* for brevity. A politician with signal $\sigma$ prefers implementation when the expected probability of re-election from implementation meets or exceeds the probability from the status quo reputation.

I now consider when the politician prefers to implement her policy. With a probability of $\sigma$, she is competent, so her policy creates a good outcome and she is re-elected for sure. With a probability of $(1-\sigma)$, she is incompetent, so her policy generates a bad outcome, and she has no chance of re-election. If the outcome is not revealed, which occurs with probability $\gamma$, voters evaluate her using $\mathbb{E}(\sigma|\theta_1, y_1 = 0)$, and she wins re-election with probability $F(\mathbb{E}(\sigma|\theta_1, y_1 = 0))$. Hence, the expected probability of re-election of implementation given $\sigma$ is

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|\theta_1, 0))$$

If the politician chooses inaction, she is re-elected with a probability of $F(\mathbb{E}(\sigma|s_1))$. This expected utility is greater than the utility from maintaining the status quo if

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|\theta_1, 0)) > F(\mathbb{E}(\sigma|s_1)).$$

Note that both expectations are constant with respect to sigma. Hence, the left hand side is strictly increasing in $\sigma$ while the right hand side is a constant. It follows that the equilibrium strategies of the politician are described by a cut-off. Let $\sigma^* \in [0, 1]$ be the cut-off value of $\sigma$, which satisfies the following inequalities:

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|\theta_1, 0)) > F(\mathbb{E}(\sigma|s_1)) \text{ if } \sigma > \sigma^*,$$

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|\theta_1, 0)) < F(\mathbb{E}(\sigma|s_1)) \text{ if } \sigma < \sigma^*.$$

**Proposition 1.** *In the private information model, the politician chooses $x_1 = \theta_1$ if and only if $\sigma > \sigma^*$.*

Proposition 1 implies the politician prefers to implement her policy when information is private only if $\sigma$ is sufficiently large, whereas when information is public, she prefers to implement her policy when her signal is sufficiently small. That the politician has such a fundamental change in her incentives from private information is due to the fact that the value of maintaining the status quo—the probability of re-election she has if she chooses inaction—is now a constant, rather than an increasing function of her signal. I show in Appendix B.3 that this feature of private information holds also for more general assumptions.

Because the politician only chooses the status quo if $\sigma < \sigma^*$, $E(\sigma|s_1) = E(\sigma|\sigma < \sigma^*)$. Further, the politician only chooses to implement her policy if $\sigma \geq \sigma^*$, $E(\sigma|\theta_1, 0) = E(\sigma|\sigma > \sigma^*)$. Consequently, the politician's expected reputation is strictly higher if she is observed to have attempted her policy to no avail than if she is observed to choose the status quo.

Consequently, a politician who prefers inaction will want to make it appear that she had actually attempted to implement her policy and failed. Consequently, when the voter observes $y_1 = 0$, he may find it difficult to determine if this observation is the result of an insincere effort to implement the policy, or a sincere effort to enact the policy that was prevented by forces beyond the politician's control. This facade makes it difficult for the voter to discern the politician's action whenever there is no observed change in outcomes.

*Consequently, for the remainder of the analysis, I assume that the voter is unable to observe $x_1$, and instead must make his electoral decision on the basis of $y_1$ alone.* The case in which the action is observed is covered in Appendix B.3. Under this assumption, the politician prefers to implement her policy if:

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|y_1 = 0)) > F(\mathbb{E}(\sigma|y_1 = 0)),$$

or, equivalently, if

$$\sigma > F(\mathbb{E}(\sigma|y_1 = 0)).$$

To develop the intuition for when this inequality is satisfied, consider Figure 6. Because $\mathbb{E}(\sigma|y_1 = 0)$ is constant with respect to $\sigma$, $F(\mathbb{E}(\sigma|y_1 = 0))$ is constant. Hence, the value of choosing the status quo is represented by a horizontal line that intersects the vertical axis at a value of $F(\mathbb{E}(\sigma|y_1 = 0))$. The politician prefers implementation if $\sigma > F(\mathbb{E}(\sigma|y_1 = 0))$. This is true only when $\sigma$ is sufficiently large; namely, to the right of the intersection point of $y = \sigma$ and the horizontal line. The politician prefers inaction if $F(\mathbb{E}(\sigma|y_1 = 0)) > \sigma$. This is true to the left of that intersection point. Therefore, $\sigma^*$ is the intersection point of $y = \sigma$ and $F(\mathbb{E}(\sigma|y_1 = 0))$.

## 4.4 Equilibrium Behavior

In this subsection, I combine the decision rules of the voter and the politician with the expectations implied by their actions, and characterize the equilibrium cutoff.

In order for a given cutoff $\sigma^*$ to be an equilibrium, it must be the case that given $\mathbb{E}(\sigma|y_1 = 0)$, the politician does not want to change her strategy given any $\sigma$, and it must also be the case that $\mathbb{E}(\sigma|y_1 = 0)$ is consistent with the equilibrium behavior.

To ensure there is no incentive for deviation, it must be the case that $F^{-1}(\sigma^*) = \mathbb{E}(\sigma|s_1)$. If $F^{-1}(\sigma^*) < \mathbb{E}(\sigma|y_1 = 0)$, then there exists $\sigma > \sigma^*$ but arbitrarily close to $\sigma^*$ such that $F^{-1}(\sigma) < \mathbb{E}(\sigma|y_1 = 0)$, so a politician with $\sigma$ would deviate to inaction. If $F^{-1}(\sigma^*) > \mathbb{E}(\sigma|y_1 = 0)$, then there is a signal such that $\sigma < \sigma^*$ but arbitrarily close to $\sigma^*$ such that $F^{-1}(\sigma) > \mathbb{E}(\sigma|y_1 = 0)$, so a politician with $\sigma$ would deviate to action.

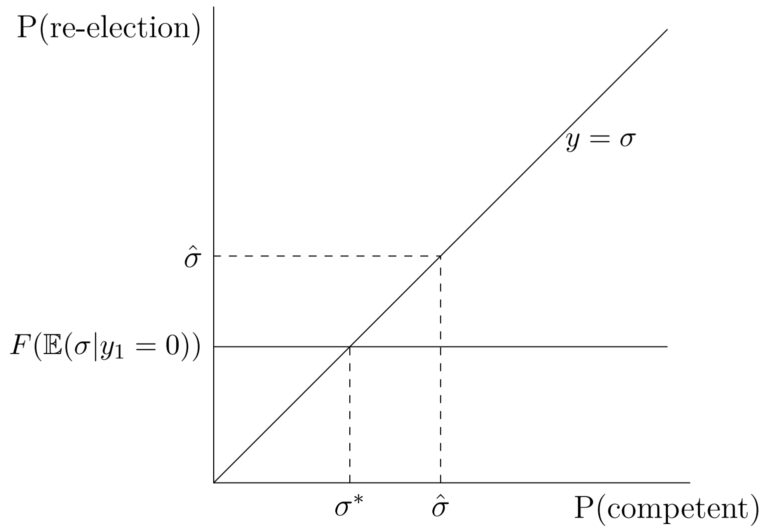


Figure 6: A politician with a signal $\hat{\sigma}$ has a higher expected probability of re-election from implementation ($\hat{\sigma}$) than from choosing the status quo ($F(\mathbb{E}(\sigma|y_1 = 0))$), as she would for any $\sigma > \sigma^*$.

For an arbitrary value of $\sigma^*$, the value of $\mathbb{E}(\sigma|y_1 = 0)$ consistent with equilibrium behavior is

$$ER(\sigma^*) = \frac{\mathbb{E}(\sigma|\sigma \leq \sigma^*)G(\sigma^*) + \mathbb{E}(\sigma|\sigma \geq \sigma^*, y_1 = 0)\gamma(1 - G(\sigma^*))}{G(\sigma^*) + \gamma(1 - G(\sigma^*))}.$$

The denominator is the total probability of observing $y_1 = 0$, which is the probability that inaction was deliberately chosen, given by $G(\sigma^*)$, plus the probability that no policy change occurred despite an effort to implement policy, given by $\gamma(1-G(\sigma^*)$. The first term in the numerator is the expected value of the signal given that the politician chose inaction, weighted by the probability inaction was chosen. The second term is the expected value of the signal for given that the politician chose to implement policy but no change in outcomes resulted, weighted by the probability that this occurs.

Let the equilibrium value of $\sigma^*$ be $\sigma_{pri}$. The preceding discussion has established that $\sigma_{pri}$ is the solution to $F^{-1}(\sigma_{pri}) = ER(\sigma_{pri})$, or the intersection point of $F^{-1}$ and $ER$.

To determine the location of this intersection point, it is necessary to establish some properties of $ER$. As $\sigma^*$ increases, two things occur. First, the incumbent deliberately chooses inaction more often, which increases the weight placed on $\mathbb{E}(\sigma|\sigma \leq \sigma^*)$ and reduces the weight placed on $\mathbb{E}(\sigma|\sigma \geq \sigma^*)$, which reduces the value of $ER(\sigma^*)$. Second, the values of $\mathbb{E}(\sigma|\sigma \leq \sigma^*)$ and $\mathbb{E}(\sigma|\sigma \geq \sigma^*)$ increase, which has a positive effect on the value of $ER(\sigma^*)$. Lemma 3 shows that for small values of $\sigma^*$, the negative effects dominate, but then after a critical value $\tilde{\sigma}$, the positive effects dominate. It further shows that $ER$ is decreasing in $\sigma^*$ whenever $ER(\sigma^*) > \sigma^*$, and that $ER$ is increasing in $\sigma^*$ whenever $ER(\sigma^*) < \sigma^*$. These properties are illustrated in Figure 7.

**Lemma 3.** *The expected reputation $ER(\sigma^*)$ is strictly decreasing on $(0, \tilde{\sigma})$ and strictly increasing on $(\tilde{\sigma}, 1)$. Further, $ER(\sigma^*) > \sigma^*$ for $\sigma^* < \tilde{\sigma}$, and $ER(\sigma^*) < \sigma^*$ for $\sigma^* > \tilde{\sigma}$.*

The location of $\sigma_{pri}$ is identified by the intersection of $F^{-1}$ and $ER$. The intuition of Theorem 3

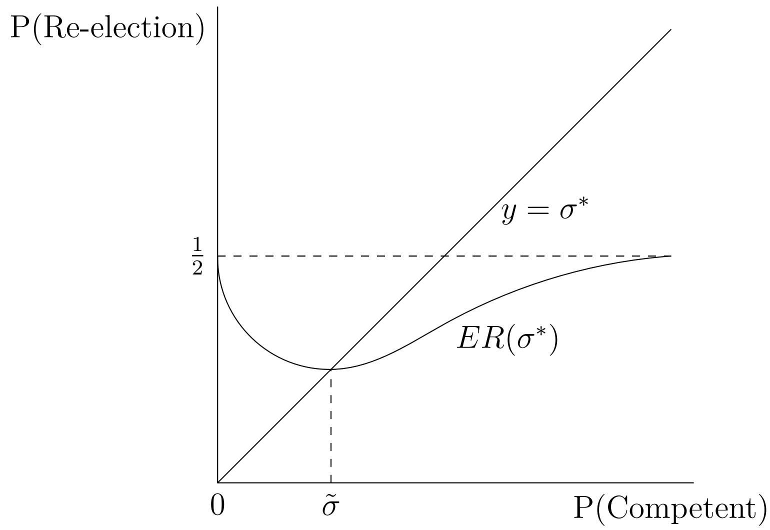


Figure 7: As the cutoff $\sigma^*$ increases from 0, $ER$ decreases until its minimum at $\tilde{\sigma}$, then increases to the unconditional expectation of $\sigma$.

is as follows, and is illustrated in Figure 8. Because $F^{-1}(\sigma^*) > \frac{1}{2}$ whenever $\sigma^* > \frac{1}{2}$, while $ER$ is bounded above by $\frac{1}{2}$, this intersection must be at a value less than $\frac{1}{2}$. In this region, $F^{-1}(\sigma^*)$ is strictly greater than $\sigma^*$, and therefore the intersection must occur where $ER(\sigma^*) > \sigma^*$, which is to the left of $\tilde{\sigma}$. In this region, $F^{-1}$ is strictly increasing, while $ER$ is strictly decreasing, which implies a unique intersection, and therefore a unique equilibrium cut-off $\sigma_{pri}$.

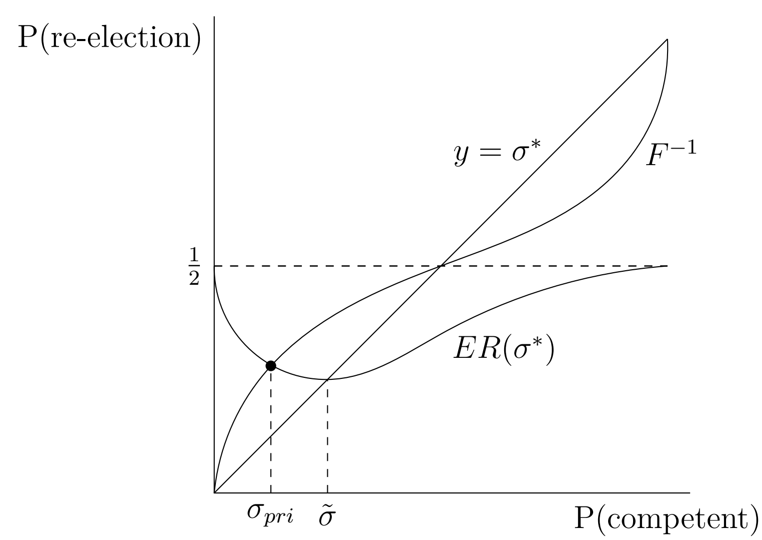


Figure 8: The equilibrium cut-off $\sigma_{pri}$ is determined by the intersection of $F^{-1}$ and $ER(\sigma^*)$.

**Theorem 3.** *In the private information model, there is a unique value $\sigma_{pri} \in (0, \frac{1}{2})$ such that the politician chooses $x_1 = \theta_1$ if $\sigma \geq \sigma_{pri}$, and chooses $x_1 = s_1$ if $\sigma < \sigma_{pri}$.*

Theorem 3 implies that, as one might intuitively expect, a politician implements her policy if she believes it is sufficiently likely to work. The higher is the politician's signal, the more likely that

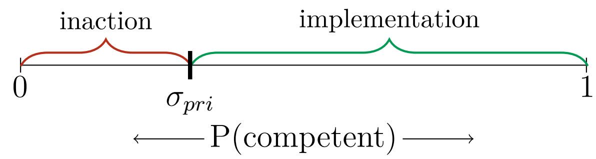


Figure 9: A privately informed politician implements her policy only if it is sufficiently likely she is competent.

implementing her policy results in a good reputation, and the more incentive she has to implement it. Unlike the public information model, her reputation if she chooses to do nothing is unaffected by her signal, because the voter does not observe it. Hence, as the politician's signal increases, implementing her policy becomes more lucrative while the payoff from inaction is constant. Hence, only a politician with a sufficiently high signals wishes to implement her policy.

## 4.5 The Impact of Private Vetting

When the results of vetting are only shown to the politician, her incentive to implement her proposal only when the probability of success is sufficiently high implies that positive policy information makes implementation more likely, and that negative policy information makes implementation less likely.

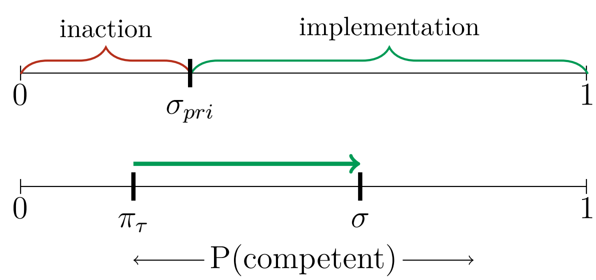


Figure 10: Positive vetting increases the probability that the politician is competent from its prior, $\pi_\tau$, to $\sigma$, which may cause a change from inaction to implementation.

Suppose vetting reveals positive information about the policy, so that $\sigma > \pi_\tau$. This discussion is depicted in Figure 10. First suppose that $\pi_\tau$ is less than $\sigma_{pri}$. If $\sigma$ remains less than $\sigma_{pri}$, then the politician's behavior is unchanged. She maintains the status quo whether the policy is vetted or not. If $\sigma > \sigma_{pri}$, then the politician now has an incentive to implement her policy, when she previously would have maintained the status quo. If $\pi_\tau > \sigma_{pri}$, then the incumbent chooses to implement her policy regardless. Hence, vetting that reveals positive information about a policy either has no effect, or encourages the policy to be implemented when it would not have been otherwise.

Conversely, suppose vetting reveals negative information about the policy, so that $\sigma < \pi_\tau$. This discussion is depicted in Figure 11. First suppose $\pi_\tau > \sigma_{ppri}$. If $\sigma$ remains greater than $\sigma_{pri}$, then

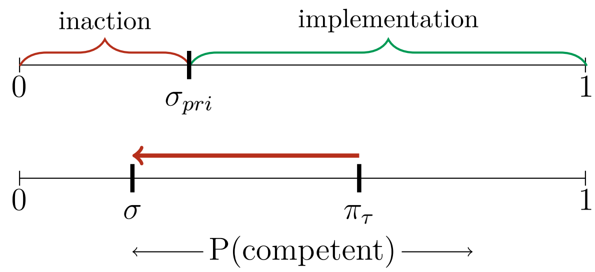


Figure 11: Negative vetting decreases the probability that the politician is competent from its prior, $\pi_\tau$, to $\sigma$, which may cause a change from implementation to inaction.

the politician's behavior is unchanged. She would have implemented her policy in the absence of vetting, and she continues to do so afterward. If $\sigma < \sigma_{pri}$, then the politician now has an incentive to choose the status quo, when she would have chosen not to in the absence of vetting. Lastly, if $\pi_\tau < \sigma_{pri}$, then the incumbent chooses not to implement her policy. Hence, private vetting that reveals negative information about her policy either results in no change in behavior, or causes a policy not to be implemented when it would have been otherwise.

## 4.6 Private Vetting Can Improve Welfare in Both Periods

The strategies chosen by the politician in the first period in the private information model and the effects of betting both accord with what one would intuitively think is best for the voter, because the politician only implements a proposal that is sufficiently likely to work. However, the information available in the absence of an observed policy outcome is worse, the voter may be worse off in the second period. In this section, I consider the circumstances in which the voter is better off in both periods.

In the first period, whenever the politician has a signal greater than $\frac{1}{2}$, so that the politician's policy benefits the voter in expectation, she implements her policy when information is private, but does not when information is public. Conversely, a politician with a signal less than $\sigma_{pri}$, whose policy harms the voter in expectation, does not implement her policy when information is private, but does when information is public. Overall, this change in strategies is an unambiguous improvement for the voter's first period welfare compared to the public information case.

**Lemma 4.** *The voter's expected first period welfare is greater when information is private than when it is public.*

While it is possible for the voter's overall welfare to improve even if second period welfare deteriorates because of the gains in the first period, I focus on the case in which private information leads to improvements in both periods. If it is the case that second period welfare is higher, then it follows that private information on the part of the politician led to improved selection, because second period behavior is identical in both models.

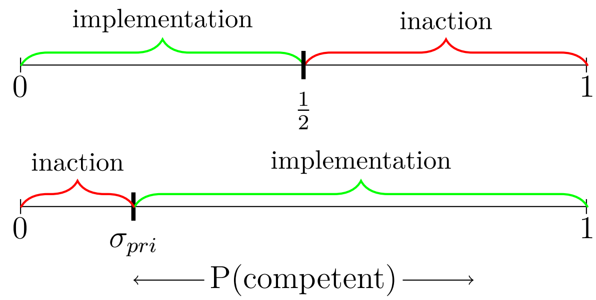


Figure 12: The differences in equilibrium behavior between the public information and private information case.

There are informational benefits to private information. Because $\sigma_{pri} < \frac{1}{2}$, the politician implements her policy whenever $\sigma > \frac{1}{2}$, and she would not have done so when information was public. This choice reveals her competence and improves selection. Hence, the benefit of private information relative to public is

$$(1-\gamma)\int_{\frac{1}{2}}^{1} \sigma - \Omega(\sigma) dG(\sigma).$$

On the other hand, whenever information about the politician is not revealed, the voter is worse off than before, as she knows only the expected reputation of the politician, rather than her actual signal. This leads to more electoral mistakes and consequently worse second period welfare. Let $\tilde{\Omega}(ER(\sigma_{pri}), \sigma)$ be the expected second period utility when a politician with signal $\sigma$ has reputation $ER(\sigma_{pri})$. Specifically,

$$\tilde{\Omega}(ER(\sigma_{pri}), \sigma) \equiv F(ER(\sigma_{pri}))(2\sigma - 1) + (1 - F(ER(\sigma_{pri})))[2\mathbb{E}(r^c | r^c > ER(\sigma_{pri})) - 1].$$

The first term is the probability that a politician with reputation $ER(\sigma_{pri})$ is re-elected, times the expected utility from that politician in the second term. The second term is the probability the politician with reputation $ER(\sigma_{pri})$ is not re-elected, times the expected utility from a challenger that is elected over the politician.

**Proposition 2.** *For every $\sigma \in (0,1)$ such that $\sigma \neq ER(\sigma_{pri})$, $\Omega(\sigma) > \tilde{\Omega}(ER(\sigma_{pri}), \sigma)$.*

This proposition establishes the possible information loss faced by the voter whenever outcomes are not observed. This loss of information manifests itself in two ways. First, because the politician does not implement policy when $\sigma < \sigma_{pri}$, whenever such the politician would have revealed her competence under public information, the voter is now going to observe only the expected signal. Second, even when the politician is not changing her behavior, information is lost because the voter only observes expected reputation when the status quo occurs. This unintentional loss happens with probability $\gamma$ whenever the politician implements her policy, and also whenever she chooses to maintain the status quo. Hence, the cost to the voter of private information is

$$(1-\gamma)\int_{0}^{\sigma_{pri}} \sigma - \tilde{\Omega}(\sigma) dG(\sigma) + \gamma \int_{0}^{1} \Omega(\sigma) - \tilde{\Omega}(ER(\sigma_{pri}), \sigma) dG(\sigma).$$

Whether the benefits outweigh the costs is ambiguous in general. Further, while the benefits of policy implementation are monotonically decreasing in $\gamma$, the relationship between the costs and $\gamma$ is far more complex, because $\sigma_{pri}$ and $ER(\sigma_{pri})$ also vary with $\gamma$. However, it can be established that when $\gamma$ is very small, private information provides higher expected second period welfare, relative to public information. This occurs because $\sigma_{pri}$ is continuously increasing in $\gamma$. Intuitively, as it becomes more likely that inaction results when policy implementation is chosen, inaction is increasingly likely when the politician has a high signal. This change raises the value of $ER$, and therefore moves the intersection point in Figure 8 to the right.

**Lemma 5.** *The equilibrium value $\sigma_{pri}$ is continuously increasing in $\gamma$, and $\sigma_{pri} \to 0$ as $\gamma \to 0$.*

If $\gamma$ is small, then Lemma 5 implies $\sigma_{pri}$ is small, so the politician the politician chooses inaction only for very small $\sigma$, and it is extremely likely that when the politician chooses to implement her policy, her competence is revealed. Further, there is knowledge gained whenever $\sigma > \frac{1}{2}$, because the politician now chooses to implement policy. Hence, the voter gets the benefit of having the politician reveal her competence far more often, and suffers the loss of observing only the expected reputation very infrequently.

**Theorem 4.** *Second period voter utility is higher under private information than public information if $\gamma$ is arbitrarily small.*

# 5 Conclusion

I have shown that while making policy information public may enable voters to make a better electoral choice in the event a policy is not implemented, this comes at a high cost, as it encourages pathological implementation of policies. A crucial ingredient in these results is the use of a standard notion of competence from the literature. Politicians are competent if and only if they receive a signal for the right policy. If a politician does not have an idea the voter views as correct, the politician can only demonstrate competence by implementing her policy and showing it was the right one. The voter can reward good ideas, rather than good policies, because of the publicity of information, but his inclination to do so arises from this notion of competence. If instead, competence meant an ability to learn from information, or an ability to propose new policies when existing proposals appear to be a poor fit, then public information may be incentive enhancing.

In terms of policy implications, my findings suggest that public vetting may induce reputational incentives to act contrary to the voter's interests. These incentives do not materialize when the results of vetting are shown privately to politicians. Consequently, experts engaged in vetting must consider whether there is a good reason to make information public rather than private. There are certainly circumstances in which publicizing information is more effective, and identifying those situations is a promising direction for future research. However, my findings suggest it is not a given.

Further, my findings imply that efforts to increase the transparency of information may have undesirable side-effects. Laws such as the Freedom of Information Act are fundamentally about enabling the public to see the government's private information, and legislative attempts have been put forth in recent years to make currently confidential Congressional Research Service reports public. While in any particular election, more information about the data underlying the politician's policies is always useful, the equilibrium effects of such disclosure can encourage extremely inefficient behavior on the part of the politician.

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# A Proofs of Results

*Proof of Lemma 1.* Consider a signal $\sigma$ for which $P(y_t = 1|\sigma) > \pi_y$. Bayes' rule implies

$$\frac{P(\sigma|y_t = 1)\pi_y}{P(\sigma|y_t = 1)\pi_y + P(\sigma|y_t = -1)(1 - \pi_y)} > \pi_y. \tag{1}$$

Dividing by $\pi_y$ and multiplying both sides of (1) by the denominator, it follows that

$$P(\sigma|y_t = 1) > P(\sigma|y_t = 1)\pi_y + P(\sigma|y_t = -1)(1 - \pi_y). \tag{2}$$

Subtracting the first term on the right hand side from both sides, (2) is equivalent to

$$P(\sigma|y_t = 1) > P(\sigma|y_t = -1). \tag{3}$$

Now consider the inequality $P(\tau = H|\sigma) > \pi_\tau$. Bayes' rule implies

$$\frac{P(\sigma|\tau = H)\pi_\tau}{P(\sigma|\tau = H)\pi_\tau + P(\sigma|\tau = L)(1 - \pi_\tau)} > \pi_\tau. \tag{4}$$

By similar arithmetic to the inequality for $y$, (4) is satisfied if and only if

$$P(\sigma|\tau = H) > P(\sigma|\tau = L). \tag{5}$$

By the conditional independence of $\sigma$ and $\tau$, the following equivalences hold:

$$P(\sigma|\tau = H) = P(\sigma|y_t = 1)P(y_t = 1|\tau = H) + P(\sigma|y_t = -1)(1 - P(y_t = 1|\tau = H)) \tag{6}$$

$$P(\sigma|\tau = L) = P(\sigma|y_t = 1)P(y_t = 1|\tau = L) + P(\sigma|y_t = -1)(1 - P(y_t = 1|\tau = L)). \tag{7}$$

Hence, (5) is equivalent to

$$\begin{aligned} &P(\sigma|y_t = 1)P(y_t = 1|\tau = H) + P(\sigma|y_t = -1)(1 - P(y_t = 1|\tau = H)) \\ &> P(\sigma|y_t = 1)P(y_t = 1|\tau = L) + P(\sigma|y_t = -1)(1 - P(y_t = 1|\tau = L)) \end{aligned} \tag{8}$$

Subtracting the left hand side of the inequality on both sides and combining like terms implies (8) is equivalent to

$$(P(\sigma|y_t = 1) - P(\sigma|y_t = -1))[P(y_t = 1|\tau = H) - P(y_t = 1|\tau = L)] > 0 \tag{9}$$

By assumption, $P(y_t = 1|\tau = H) > P(y_t = 1|\tau = L)$. Hence, it follows that (9) is satisfied if $P(\sigma|y_t = 1) - P(\sigma|y_t = -1) > 0$. Consequently, whenever $P(y_t = 1|\sigma) > \pi_y$, $P(\tau = H|\sigma) > \pi_\tau$. The case when $P(y_t = 1|\sigma) < \pi_y$ is symmetric. □

*Proof of Theorem 1.* Define $D(\sigma) \equiv \mathbb{E}(F(r)|\sigma, x_1 = \theta_1) - F(\sigma)$. The politician prefers $x_1 = \theta_1$ if $D(\sigma) \geq 0$ and prefers $x_1 = s_1$ if $D(\sigma) < 0$. Note that at $D(\sigma) = 0$, both alternatives give the politician equal re-election probabilities, and so she prefers to implement her policy. The proof proceeds by showing that there is a critical value $\sigma_{pub} \in (0, 1)$ for which $D(\sigma_{pub}) = 0$ so that both implementation and inaction have equal expected probabilities of re-election. It is then shown that $D$ is positive for $\sigma$ less than this critical value, and negative for $\sigma$ greater than this critical value, implying that implementation is preferred if and only if $\sigma \leq \sigma_{pub}$.

By substitution, $D(\sigma) = \sigma - F(\sigma)$. Note that $D(0) = 0 \cdot (1) - F(0) = 0$ and $D(1) =$

$1 \cdot (1) - F(1) = 0$. Differentiating $D$ with respect to $\sigma$ shows that $D'(\sigma) = 1 - f(\sigma)$. Hence, it must be the case that $f(\sigma) = 1$ for any stationary point of $D$. Suppose there exist at least two additional roots of $D$ in the interval $(0, 1)$, $\sigma^1$ and $\sigma^2$, chosen arbitrarily if there are more than two, labeled such that $\sigma^1 < \sigma^2$. By Rolle's Theorem, there must exist a stationary point of $D$ in each interval $(0, \sigma^1), (\sigma^1, \sigma^2)$, and $(\sigma^2, 1)$. Hence, there must exist at least three stationary points of $D$, each of which must satisfy $f(\sigma) = 1$. This situation is impossible by the strict quasi-concavity of $f$, and therefore there is at most one stationary point of $D$, and further, at most one root of $D$ on $(0, 1)$.

Because $1 > f(1)$ and $1 > f(0)$, it follows that $D'(0) > 0$ and $D'(1) > 0$. Recall that $D(0) = 0$ and $D(1) = 0$. Therefore, for a positive $\sigma$ located arbitrarily close to 0, $D(\sigma) > 0$. For $\sigma < 1$ but arbitrarily close to 1, $D(\sigma) < 0$. Thus, by the Intermediate Value Theorem, there must exist at least one point $\sigma_{pub} \in (0, 1)$ such that $D(\sigma_{pub}) = 0$. Hence, there is exactly one $\sigma_{pub}$.

Further, because $D(\sigma) < 0$ for $\sigma$ arbitrarily close to 1 and $\sigma_{pub}$ is the unique root of $D$ on $(0, 1)$, it must be the case that $D(\sigma) < 0$ for every $\sigma > \sigma_{pub}$, and by a symmetric argument, $D(\sigma) > 0$ for every $\sigma < \sigma_{pub}$.

Because the politician prefers to implement her policy if and only if $D(\sigma) \geq 0$ and the status quo if and only if $D(\sigma) < 0$, the politician has a strict preference for $x_1 = \theta_1$ when $\sigma \leq \sigma_{pub}$ and a strict preference for $x_1 = s_1$ when $\sigma > \sigma_{pub}$.

The second period and electoral behavior is established in the text. □

*Proof of Corollary 1.* This corollary is established in the text immediately preceding it. □

*Proof of Lemma 2.* Given $\sigma$, pick $r^c \in (0, 1)$. There are two cases. First, suppose $\sigma \geq r^c$ so that the politician is retained in the absence of further information. Then second period expected voter utility is $2\sigma - 1$. If the politician were to instead implement her policy, then second period expected voter utility is $\sigma[1] + (1 - \sigma)[2r^c - 1]$. Note that the following inequalities are equivalent:

$$\sigma + (1 - \sigma)[2r^c - 1] > 2\sigma - 1 \tag{10}$$

$$(1 - \sigma)[2r^c - 1] > \sigma - 1 \tag{11}$$

$$2r^c - 1 > -1. \tag{12}$$

The last inequality is satisfied because $r^c > 0$.

Second, suppose $\sigma < r^c$ so that the politician is not retained in the absence of further information. Then second period expected voter utility is $2r^c - 1$. If the politician were to instead implement her policy, then second period expected voter utility is $\sigma + (1 - \sigma)[2r^c - 1]$. Note that the following inequalities are equivalent:

$$\sigma + (1 - \sigma)[2r^c - 1] > 2r^c - 1 \tag{13}$$

$$\sigma - \sigma[2r^c - 1] > 0 \tag{14}$$

$$1 > 2r^c - 1. \tag{15}$$

The last inequality is satisfied because $r^c < 1$.

I now take the expectation over all possible realizations of $r^c$. If $r^c \leq \sigma$, then the politician will be retained in the election if $x_1 = s_1$, so I integrate both sides of the inequality (10) to establish that

$$\int_0^\sigma \big[\sigma + (1-\sigma)(2r^c - 1)\big] dF(r^c) > \int_0^\sigma (2\sigma - 1) dF(r^c). \tag{16}$$

If $r^c > \sigma$, then the politician will be replaced in the election if $x_1 = s_1$, so I integrate both sides of (13) to establish that

$$\int_\sigma^1 \big[\sigma + (1-\sigma)(2r^c - 1)\big] dF(r^c) > \int_\sigma^1 (2r^c - 1) dF(r^c). \tag{17}$$

Summing (16) and (17) yields

$$\int_0^1 \big[\sigma + (1-\sigma)(2r^c - 1)\big] dF(r^c) > \int_0^\sigma (2\sigma - 1) dF(r^c) + \int_\sigma^1 (2r^c - 1) dF(r^c) \tag{18}$$

or, equivalently,

$$\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) > (2\sigma - 1)F(\sigma) + (1 - F(\sigma))[2\mathbb{E}(r^c | r^c > \sigma) - 1]. \tag{19}$$

Subtracting the right hand side of (19) on both sides implies that

$$\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) - (2\sigma - 1)F(\sigma) - (1 - F(\sigma))[2\mathbb{E}(r^c | r^c > \sigma) - 1] > 0. \tag{20}$$

By the definition of $\Omega(\sigma)$ and $v_2(r)$, (20) is equivalent to

$$\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) - \Omega(\sigma) > 0. \tag{21}$$

□

*Proof of Theorem 2.* First, observe that $NB(0) = -1 + (1-\gamma)\beta[0 + (1-0)[2\mathbb{E}(r^c) - 1] - \Omega(0)] = -1 + (1-\gamma)[2\mathbb{E}(r^c) - 1]$, because $\Omega(0) = 0$. Because $\mathbb{E}(r^c) < 1$ by the assumption that $F$ has full support on $[0,1]$, $NB(0) < 0$. Further, $NB(\frac{1}{2}) > 0$, because by Lemma 2, $\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) - \Omega(\sigma) > 0$ and $\sigma \geq \frac{1}{2}$ implies $2\sigma - 1 \geq 0$. Hence, because $NB(\sigma)$ is continuous, there must exist at least one point, $\sigma_{opt} \in (0, \frac{1}{2})$, such that $NB(\sigma_{opt}) = 0$.

I now prove that there is at most one such point. Suppose there is any other point $\hat{\sigma} \neq \sigma_{opt}$ for which $NB(\sigma) = 0$. Then by Rolle's Theorem, there must exist at least two stationary points of $NB(\sigma)$. Recalling the definition of $NB(\sigma)$, and substituting for $\Omega(\sigma)$ shows that $NB(\sigma)$ is equivalent to:

$$\begin{aligned} &= 2\sigma - 1 \\ &+ \beta(1-\gamma)\Big[\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) - [(2\sigma - 1)F(\sigma) + (1 - F(\sigma))[2\mathbb{E}(r^c | r^c > \sigma) - 1]\Big]. \end{aligned} \tag{22}$$

Using the definition of a conditional expectation, (22) is equivalent to

$$
\begin{aligned}
&2\sigma - 1 \\
&+ \beta(1-\gamma)\Big[\sigma + (1-\sigma)(2\mathbb{E}(r^c) - 1) - (2\sigma - 1)F(\sigma) - 2\int_\sigma^1 r^c dF(r^c) + (1 - F(\sigma))\Big]. \qquad (23)
\end{aligned}
$$

Differentiating (23) expression with respect to $\sigma$ implies

$$
NB'(\sigma) = 2 + \beta(1-\gamma)\Big[1 - (2\mathbb{E}(r^c) - 1) - 2F(\sigma) - 2\sigma f(\sigma) + 2\sigma f(\sigma)\Big]. \qquad (24)
$$

Equation 24 simplifies to

$$
NB'(\sigma) = 2 + \beta(1-\gamma)\Big[2 - 2\mathbb{E}(r^c) - 2F(\sigma)\Big]. \qquad (25)
$$

Consequently, $NB'(\sigma)$ is strictly decreasing in $\sigma$ because $F(\sigma)$ is strictly increasing in $\sigma$. Therefore there is at most one point for which $NB'(\sigma) = 0$, contradicting the existence of multiple roots of $NB(\sigma)$. Hence, there is at most one $\sigma_{opt}$. Further, because $NB(0) < 0$, $NB(\frac{1}{2}) > 0$, and the only root is $\sigma_{opt} \in (0, \frac{1}{2})$, it must be that $NB(\sigma) < 0$ for all $\sigma < \sigma_{opt}$ and $NB(\sigma) > 0$ for all $\sigma > \sigma_{opt}$. □

*Proof of Proposition 1.* This corollary is established in the text immediately preceding it. □

*Proof of Lemma 3.* Substitution of the definitions of the expected values into $ER(\sigma^*)$ gives that

$$
ER(\sigma^*) = \frac{\int_0^{\sigma^*} \sigma dG(\sigma) + \gamma \int_{\sigma^*}^1 \sigma dG(\sigma)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))}. \qquad (26)
$$

Differentiation of (26) with respect to $\sigma^*$ implies

$$
\begin{aligned}
ER'(\sigma^*) = \frac{1}{\big(G(\sigma^*) + \gamma(1 - G(\sigma^*))\big)^2}\Bigg[&\big[g(\sigma^*)\sigma^* - \gamma g(\sigma^*)\sigma^*\big]\big(G(\sigma^*) + \gamma(1 - G(\sigma^*))\big) \\
&- \Big[\int_0^{\sigma^*} \sigma dG(\sigma) + \gamma \int_{\sigma^*}^1 \sigma dG(\sigma)\Big]\big(g(\sigma^*) - \gamma g(\sigma^*)\big)\Bigg]. \qquad (27)
\end{aligned}
$$

Using the definition of $ER(\sigma^*)$, (27) simplifies to

$$
ER'(\sigma^*) = \frac{\big[g(\sigma^*)\sigma^* - \gamma g(\sigma^*)\sigma^*\big] - ER(\sigma^*)\big(g(\sigma^*) - \gamma g(\sigma^*)\big)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))}. \qquad (28)
$$

Factoring out $(1-\gamma)g(\sigma^*)$ on the left hand side, it follows that

$$
ER'(\sigma^*) = \frac{(1-\gamma)g(\sigma^*)\big(\sigma^* - ER(\sigma^*)\big)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))}. \qquad (29)
$$

Let $\Delta(\sigma^*) \equiv \sigma^* - ER(\sigma^*)$, so that (29) may be written as

$$
ER'(\sigma^*) = \frac{(1-\gamma)g(\sigma^*)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))}\Delta(\sigma_{cuxt}). \qquad (30)
$$

Hence, $ER$ is decreasing, stationary, or increasing as $\Delta$ is less than, equal to, or greater than 0.

I now show that $\Delta$ has a unique root. Note that

$$ER(0) = \frac{\gamma \int_0^1 \sigma dG(\sigma)}{G(0) + \gamma(1 - G(0))} = \frac{\int_0^1 \sigma dG(\sigma)}{1} = \mathbb{E}(\sigma) = \frac{1}{2} \tag{31}$$

and

$$ER(1) = \frac{\int_0^1 \sigma dG(\sigma)}{G(1) + \gamma(1 - G(1))} = \frac{\int_0^1 \sigma dG(\sigma)}{1} = \mathbb{E}(\sigma) = \frac{1}{2}. \tag{32}$$

Consequently, $\Delta(0) < 0$ and $\Delta(1) > 0$. Hence, there must exist at least one $\tilde{\sigma} \in (0, 1)$ such that $\Delta(\tilde{\sigma}) = 0$ by the Intermediate Value Theorem.

Suppose there existed multiple solutions to $\Delta(\tilde{\sigma}) = 0$. Order these solutions from least to greatest as $\tilde{\sigma}_1, \tilde{\sigma}_2, ..., \tilde{\sigma}_n$. Differentiating reveals that $\Delta'(\sigma^*) = 1 - ER'(\sigma^*)$. If $\Delta(\tilde{\sigma}) = 0$, then $\sigma^* = ER(\sigma^*)$, and therefore $ER'(\sigma^*) = 0$. Consequently, $\Delta'(\tilde{\sigma}_1) = 1$. Therefore $\Delta(\sigma^*) > 0$ for any $\sigma^* \in (\tilde{\sigma}_1, \tilde{\sigma}_2)$, because $\Delta$ is continuous, $\Delta'(\tilde{\sigma}_1) > 0$, and there are not other roots on $(\tilde{\sigma}_1, \tilde{\sigma}_2)$. However, $\Delta'(\tilde{\sigma}_2) = 1$, so for $\sigma^* < \tilde{\sigma}_2$ but sufficiently close, $\Delta(\sigma^*) < 0$, contradicting the existence of $\tilde{\sigma}_2$. Hence, $\tilde{\sigma}$ is unique.

Therefore, $\Delta(\sigma^*) < 0$ for all $\sigma^* < \tilde{\sigma}$, and $\Delta(\sigma^*) > 0$ for all $\sigma^* > \tilde{\sigma}$. Consequently, $ER'(\sigma^*) < 0$ for all $\sigma^* < \tilde{\sigma}$, and $ER'(\sigma^*) > 0$ for all $\sigma^* > \tilde{\sigma}$. Further, by definition of $\Delta$, it follows that $ER(\sigma^*) > \sigma^*$ for $\sigma^* < \tilde{\sigma}$, and $ER(\sigma^*) < \sigma^*$ for $\sigma^* > \tilde{\sigma}$. □

*Proof of Theorem 3.* Because $ER(0) = \frac{1}{2}$ and $ER'(\sigma^*) < 0$ whenever $\sigma^* < \tilde{\sigma}$, it must be the case that at $\tilde{\sigma}$, $ER(\tilde{\sigma}) < \frac{1}{2}$. Because $ER(\tilde{\sigma}) = \tilde{\sigma}$, it must be that $\tilde{\sigma} < \frac{1}{2}$.

Now, note that $F^{-1}(0) - ER(0) < 0$. Further, because $F^{-1}(\sigma^*) > \sigma^*$ on $(0, \frac{1}{2})$, it must be the case that

$$F^{-1}(\tilde{\sigma}) - ER(\tilde{\sigma}) = F^{-1}(\tilde{\sigma}) - \tilde{\sigma} > 0. \tag{33}$$

Hence, by the Intermediate Value Theorem, there exists a $\sigma_{pri} \in (0, \tilde{\sigma})$ for which $F^{-1}(\sigma_{pri}) - ER(\sigma_{pri}) = 0$. Further, $\sigma_{pri} < \frac{1}{2}$.

Because $\tilde{\sigma}$ is the unique root of $\Delta(\sigma^*)$, and $\Delta(\sigma^*) > 0$ for every $\sigma^*$ greater than $\tilde{\sigma}$ by Lemma 3, it must be the case that $\sigma^* > ER(\sigma^*)$. Because $F^{-1}(\sigma^*) > \sigma^*$ for $\sigma^* \in (0, \frac{1}{2})$, there is no possibility of a second point for which $ER(\sigma^*) = F^{-1}(\sigma^*)$ in $(\sigma^*, \frac{1}{2})$. Hence, there is a unique value of $\sigma_{pri}$, and it must lie in $(0, \frac{1}{2})$.

Because $F^{-1}(\sigma) < ER(\sigma_{pri})$ for every $\sigma < \sigma_{pri}$, a politician with such a signal prefers to maintain the status quo. Because $F^{-1}(\sigma) > ER(\sigma_{pri})$ for every $\sigma > \sigma_{pri}$, a politician with such a signal prefers to implement her policy. □

*Proof of Lemma 4.* When information is public, the voter's expected first period utility is given by

$$\int_0^{\frac{1}{2}} 2\sigma - 1 dG(\sigma). \tag{34}$$

When information is private, the voter's expected first period utility is given by

$$\int_{\sigma_{pri}}^{1} 2\sigma - 1dG(\sigma). \tag{35}$$

Taking the difference of (35) and (34) gives

$$\int_{\frac{1}{2}}^{1} 2\sigma - 1dG(\sigma) - \int_{0}^{\sigma_{pri}} 2\sigma - 1dG(\sigma). \tag{36}$$

Note that $2\sigma - 1 > 0$ for all $\sigma \in (\frac{1}{2}, 1]$ and that $2\sigma - 1 < 0$ for all $\sigma \in [0, \sigma_{pri}]$. Hence, the first integral in (36) is positive, while the second is negative, making the difference positive. □

*Proof of Proposition 2.* By definition, $\Omega(\sigma) > \tilde{\Omega}(ER(\sigma_{pri}), \sigma)$ if and only if

$$\begin{aligned}&(2\sigma - 1)F(\sigma) + (1 - F(\sigma))[2\mathbb{E}(r^c|r^c > \sigma) - 1]\\ >&(2\sigma - 1)F(ER(\sigma_{pri})) + (1 - F(ER(\sigma_{pri})))[2\mathbb{E}(r^c|r^c > ER(\sigma_{pri})) - 1]\end{aligned} \tag{37}$$

Distributing the negative one on each side and simplifying, it follows that

$$\begin{aligned}&2\sigma F(\sigma) + (1 - F(\sigma))[2\mathbb{E}(r^c|r^c > \sigma)]\\ >&2\sigma F(ER(\sigma_{pri})) + (1 - F(ER(\sigma_{pri})))[2\mathbb{E}(r^c|r^c > ER(\sigma_{pri}))].\end{aligned} \tag{38}$$

Subtracting the left hand side of (38) from both sides and combining like terms, it follows that

$$\begin{aligned}&2\sigma(F(\sigma) - F(ER(\sigma_{pri}))) + (1 - F(\sigma))2\mathbb{E}(r^c|r^c > \sigma)\\ &-(1 - F(ER(\sigma_{pri})))2\mathbb{E}(r^c|r^c > ER(\sigma_{pri})) > 0.\end{aligned} \tag{39}$$

Using the definitions of the conditional expectations and dividing by 2, (39) is equivalent to

$$\sigma\big(F(\sigma) - F(ER(\sigma_{pri}))\big) + \int_{\sigma}^{1} r^c dF(r^c) - \int_{ER(\sigma_{pri})}^{1} r^c dF(r^c) > 0 \tag{40}$$

First assume $\sigma > ER(\sigma_{pri})$. Then the first term of (40) is positive. Further the integrals can be combined so that

$$\sigma\big(F(\sigma) - F(ER(\sigma_{pri}))\big) - \int_{ER(\sigma_{pri})}^{\sigma} r^c dF(r^c) > 0 \tag{41}$$

which is equivalent to

$$\sigma\big(F(\sigma) - F(ER(\sigma_{pri}))\big) - \mathbb{E}(r^c|r^c \in [ER(\sigma_{pri}), \sigma])\big(F(\sigma) - F(ER(\sigma_{pri}))\big) > 0. \tag{42}$$

Division of both sides of (42) by $F(\sigma) - F(ER(\sigma_{pri}))$ implies

$$\sigma - \mathbb{E}\big(r^c|r^c \in [ER(\sigma_{pri}), \sigma]\big) > 0, \tag{43}$$

which is true.

Now assume $\sigma < ER(\sigma_{pri})$. Then the first term of (40) is negative. Further, the integrals can be combined so that

$$\sigma\big(F(\sigma) - F(ER(\sigma_{pri}))\big) + \int_{\sigma}^{ER(\sigma_{pri})} r^c dF(r^c) > 0 \tag{44}$$

which is equivalent to

$$\sigma\big(F(\sigma)-F(ER(\sigma_{pri}))\big)+\mathbb{E}(r^c|r^c\in[\sigma,ER(\sigma_{pri})])\big(F(ER(\sigma_{pri}))-F(\sigma)\big)>0. \tag{45}$$

Division on both sides of (45) by $F(\sigma)-F(ER(\sigma_{pri})$ implies

$$\sigma-\mathbb{E}\big(r^c|r^c\in[\sigma,ER(\sigma_{pri})]\big)<0, \tag{46}$$

which is true. $\square$

*Proof of Lemma 5.* Consider the response of $\sigma_{pri}$ to changes in $\gamma$. It is known that $\sigma_{pri}$ solves

$$ER(\sigma_{pri})-F^{-1}(\sigma_{pri})=0. \tag{47}$$

The partial derivative of (47) with respect to $\gamma$ is

$$\begin{aligned}\frac{\partial ER(\sigma_{pri})}{\partial\gamma}=&\frac{1}{\big(G(\sigma_{pri})+\gamma(1-G(\sigma_{pri}))\big)^2}\Bigg[\Big[\int_{\sigma_{pri}}^1\sigma dG(\sigma)\Big]\big(G(\sigma_{pri})+\gamma(1-G(\sigma_{pri}))\big)\\&-\Big[\int_0^{\sigma_{pri}}\sigma dG(\sigma)+\gamma\int_{\sigma_{pri}}^1\sigma dG(\sigma)\Big]\big(1-G(\sigma_{pri})\big)\Bigg],\end{aligned} \tag{48}$$

which simplifies to

$$\frac{\partial ER(\sigma_{pri})}{\partial\gamma}=\frac{\big[\int_{\sigma_{pri}}^1\sigma dG(\sigma)\big]G(\sigma_{pri})-\big[\int_0^{\sigma_{pri}}\sigma dG(\sigma)\big]\big(1-G(\sigma_{pri})\big)}{\big(G(\sigma_{pri})+\gamma(1-G(\sigma_{pri}))\big)^2}. \tag{49}$$

This derivative is positive if and only if

$$\Big[\int_{\sigma_{pri}}^1\sigma dG(\sigma)\Big]G(\sigma_{pri})>\Big[\int_0^{\sigma_{pri}}\sigma dG(\sigma)\Big]\big(1-G(\sigma_{pri})\big). \tag{50}$$

By dividing both sides of (50), it follows that

$$\frac{\int_{\sigma_{pri}}^1\sigma dG(\sigma)}{\big(1-G(\sigma_{pri})\big)}>\frac{\int_0^{\sigma_{pri}}\sigma dG(\sigma)}{G(\sigma_{pri})}. \tag{51}$$

Using the definition of a conditional expectation, (51) is equivalent to

$$\mathbb{E}(\sigma|\sigma>\sigma_{pri})>\mathbb{E}(\sigma|\sigma<\sigma_{pri}). \tag{52}$$

Hence, $\frac{\partial ER(\sigma_{pri})}{\partial\gamma}$ is positive. Further, the partial derivative of (47) with respect to $\sigma_{pri}$ is

$$\frac{\partial ER(\sigma_{pri})}{\partial\sigma_{pri}}=\frac{\partial ER(\sigma_{pri})}{\partial\sigma_{pri}}-\frac{\partial F^{-1}}{\partial\sigma_{pri}} \tag{53}$$

Because it is known that $\sigma_{pri}<\tilde{\sigma}$, it must be that $\frac{\partial ER(\sigma_{pri})}{\partial\sigma_{pri}}<0$. Further, because $\frac{\partial F^{-1}}{\partial\sigma_{pri}}>0$, the entire derivative must be negative. Therefore, by the Implicit Function Theorem, $\sigma_{pri}$ is continuously increasing in $\gamma$.

Recall that

$$ER(\sigma^*)=\frac{\int_0^{\sigma^*}\sigma dG(\sigma)+\gamma\int_{\sigma^*}^1\sigma dG(\sigma)}{G(\sigma^*)+\gamma(1-G(\sigma^*))}. \tag{54}$$

Taking the limit as $\gamma$ approaches 0 reveals that $ER(\sigma^*)$ approaches $\mathbb{E}(\sigma|\sigma\leq\sigma^*)$ for any value of

$\sigma^* > 0$:

$$\lim_{\gamma\to 0} \frac{\int_0^{\sigma^*} \sigma dG(\sigma) + \gamma \int_{\sigma^*}^1 \sigma dG(\sigma)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))} = \frac{\int_0^{\sigma^*} \sigma dG(\sigma)}{G(\sigma^*)} = \mathbb{E}(\sigma|\sigma \leq \sigma^*). \tag{55}$$

Choose any $\sigma^* > 0$. Because $\mathbb{E}(\sigma|\sigma \leq \sigma^*) < \sigma^*$, it follows that $\mathbb{E}(\sigma|\sigma \leq \sigma^*) < F^{-1}(\sigma^*)$ for any $\sigma^* \in (0, \frac{1}{2})$. Further, $ER(0) = \frac{1}{2} > F^{-1}(0)$ whenever $\gamma > 0$. Consequently, by the Intermediate Value Theorem, $\sigma_{pri} \in (0, \sigma^*)$. Because this holds for any choice of $\sigma^* > 0$, $\sigma_{pri}$ must be arbitrarily small. □

*Proof of Theorem 4.* I now show that if $\gamma$ is arbitrarily small, the voter's expected utility is higher in the second period under private information than under public information.

The voter's second period welfare under private information is

$$\int_0^{\sigma_{pri}} \tilde{\Omega}(ER(\sigma_{pri}), \sigma)dG(\sigma) + \gamma \int_{\sigma_{pri}}^1 \tilde{\Omega}(ER(\sigma_{pri}), \sigma)dG(\sigma) + (1 - \gamma) \int_{\sigma_{pri}}^1 \sigma dG(\sigma) \tag{56}$$

Taking the limit as $\gamma \to 0$, $\sigma_{pri} \to 0$ and $ER(\sigma_{pri}) \to 0$. Hence, (56) approaches

$$\int_0^0 \tilde{\Omega}(0, \sigma)dG(\sigma) + 0 \int_{\sigma_{pri}}^1 \tilde{\Omega}(0, \sigma)dG(\sigma) + (1 - 0) \int_0^1 \sigma dG(\sigma) = \mathbb{E}(\sigma) = \frac{1}{2} \tag{57}$$

The voter's second period welfare under public information is

$$\int_{\frac{1}{2}}^1 \Omega(\sigma)dG(\sigma) + \gamma \int_0^{\frac{1}{2}} \Omega(\sigma)dG(\sigma) + (1 - \gamma) \int_0^{\frac{1}{2}} \sigma dG(\sigma) \tag{58}$$

Taking the limit as $\gamma \to 0$, (58) approaches

$$\int_{\frac{1}{2}}^1 \Omega(\sigma)dG(\sigma) + \int_0^{\frac{1}{2}} \sigma dG(\sigma). \tag{59}$$

Because $\sigma > \Omega(\sigma)$, (59) must be strictly less than

$$\int_{\frac{1}{2}}^1 \sigma dG(\sigma) + \int_0^{\frac{1}{2}} \sigma dG(\sigma) = \mathbb{E}(\sigma) = \frac{1}{2} \tag{60}$$

□

# B Extensions

## B.1 Notation and Assumptions

For the more general versions of the models in the main text, I make use of the following new assumptions and notation.

1. **General Outcomes.** The possible outcomes of the policy are $y_t \in \{y_-, y_+\}$, with the restriction that $y_- < 0 < y_+$.

2. **Presence of Environmental Factors.** Let $P(y_t = y_+|\tau = H) = \alpha_H$ and let $P(y_t = y_+|\tau = L) = \alpha_L$, where $0 < \alpha_L < \alpha_H < 1$. The probability that an implemented policy has outcome

$y_+$ is therefore $p(\sigma) = \sigma\alpha_H + (1-\sigma)\alpha_L$.

3. **Relevance of Competence.** I require that $\alpha_H$ and $\alpha_L$ are such that $p(0)y_+ + (1-p(0))y_- < 0$ and $p(1)y_+ + (1-p(1))y_- > 0$. That is, incompetent types cause deterioration of outcomes on average, while competent types cause improvement in outcomes on average.

4. **Reputational Signals.** Because the value of $P(\tau = H|\sigma)$ can be computed given $P(y_t = y_+|\sigma)$, for ease of exposition I assume that the public signal simply tells the recipient the politician's probability of competence directly — that is, $\sigma \equiv P(\tau = H|\sigma)$. This allows for easier comparisons with the main text.

5. **Partially Informative Policy.** The voter's beliefs are $r_+(\sigma) = \frac{\sigma\alpha_H}{\sigma\alpha_H + (1-\sigma)\alpha_L}$ when $y_+$ is observed, and $r_-(\sigma) = \frac{\sigma(1-\alpha_H)}{\sigma(1-\alpha_H)+(1-\sigma)(1-\alpha_L)}$ when $y_-$ is observed. Importantly, these are both strictly increasing functions of $\sigma$. This is from the application of Bayes' rule when environmental factors are present.

6. **Convex Expected Utility.** The voter's second period expected utility, $v_2$, may be any strictly increasing and convex function that is unbounded above and below, including linear.

7. **Additive Valence.** The challenger, in addition to her reputation, may have an additive valence advantage over the politician $s^c \in \mathbb{R}$, so that the utility of electing a challenger with reputation $r^c$ and valence $s^c$ is $v_2(r^c) + s^c$. Let the challenger's *quality*, $q^c$, be defined as a value of reputation such that $v_2(q^c) = v_2(r^c) + s^c$. Let $q^c$ be distributed according to strictly unimodal CDF $F : \mathbb{R} \to \mathbb{R}_+$, with mode $m$. Note that the support of $F$ is no longer only $[0, 1]$, and consequently, $F(1) < 1$ and $F(0) > 0$. The politician is preferred by the voter if and only if $r > q^c$. Hence, as in the main text,the re-election probability is given by $F(r)$.

Additive valence also captures a known valence advantage or policy advantage on other issues, either for the politician or challenger. In the event that the challenger has an a priori advantage over the politician, $m > \pi_\tau$. If the politician has the a priori advantage, then $m < \pi_\tau$.

Convexity of $v_2$ may arise if the politician is policy motivated as a secondary concern. For example, suppose that in the second period, the politician prefers to implement policy if and only if $\mathbb{E}(y_2|r) > 0$, and that as in the main text, $y_+ = 1$ and $y_- = -1$. Otherwise, the politician prefers to maintain the status quo. Further suppose that with probability $\epsilon$, there is an emergency which forces the politician to implement a policy. In that case, expected second period utility is $\epsilon[2r - 1]$ whenever $r < \frac{1}{2}$ and $2r - 1$ whenever $r \geq \frac{1}{2}$, which is a convex function of $r$.

## B.2 Generalization of Public Information Equilibrium

In this subsection, I maintain assumptions 1 thru 7. I also allow the possibility of strong (but not perfect) information about the attributes of the challenger. I show that the behavior of the politician is characterized by a cutoff, wherein the politician only implements her policy if the signal is sufficiently low.

There are two main ways in which the analysis differs when policy is only partially informative and valence is a factor, in comparison to the analysis in the main text. First, the reputation associated with each outcome is now a function of $\sigma$. Consequently, as $\sigma$ changes, not only does the probability of each outcome change, but so do the reputations associated with each outcome. This dependency renders the direct approach used for the main text intractable. Second, $r_+(\sigma) < 1$ and $r_-(\sigma) > 0$, for any $\sigma \in (0, 1)$, so $F(r_+) < 1$ and $F(r_-) > 0$. Even if $r = 1$ or $r = 0$, it is no longer necessary that $F(0) = 0$ or that $F(1) = 1$. Due to valence shocks, even a politician certain to be competent may lose to a sufficiently well liked challenger, and even a politician certain to be incompetent may win against a sufficiently disliked challenger.

The proof proceeds in two major steps. First, I show that for any particular $\sigma$ and corresponding $r_-(\sigma)$ and $r_+(\sigma)$, the politician prefers to implement her policy if and only if $\sigma$ is less than or equal to a critical value $\sigma_{\succeq}$. Hence, the politician's preference for implementation for any given $\sigma$ is characterized by its relation to $\sigma_{\succeq}$. Second, I show that $\sigma_{\succeq}$ is a continuously decreasing function of $\sigma$. Consequently, there exists a critical value $\sigma_{pub}$ so that the politician prefers to implement her policy if and only if $\sigma < \sigma_{pub}$.

### B.2.1 Characterizing Politician Preference

As in the main text, the politician may either keep her current reputation for sure by choosing inaction, or reveal additional information about herself with probability $(1 - \gamma)$ by implementing policy. Also, the voter elects the politician in the election with the highest reputation, so that the probability of re-election is $F(r)$.

In the analysis that follows, consider a particular signal $\sigma$ and the reputations associated with it, $r_+$ and $r_-$. Holding $r_-$ and $r_+$ fixed, let $\sigma_{\succeq} \in [0, 1]$ be a value of the signal for which the politician would be indifferent between implementation and inaction. Recall that, because the expectation of Bayesian posteriors is equal to the prior,

$$p(\sigma)r_+ + (1 - p(\sigma))r_- = \sigma. \tag{61}$$

This is solved by $p(\sigma) = \frac{\sigma - r_-}{r_+ - r_-}$ Define

$$D(\sigma; r_-, r_+) \equiv \frac{\sigma - r_-}{r_+ - r_-}F(r_+) + (1 - \frac{\sigma - r_-}{r_+ - r_-})F(r_-) - F(\sigma). \tag{62}$$

This expression is positive if and only if the expected utility of implementing an policy, given $\sigma$, exceeds the expected utility of the status quo given a *fixed* $r_-$ and $r_+$.[3] Consequently, $\sigma_{\succeq}$ must solve $D(\sigma, r_-, r_+) = 0$.

To identify $\sigma_{\succeq}$, I begin my analysis by deriving properties of $D$ given fixed values for $r_+$ and $r_-$. Because I only differentiate with respect to and evaluate at varying values of $\sigma$ in the following

3. Note that, as in the main text, $1 - \gamma$ cancels out and does not influence the preference for $\theta_t$ relative to $\sigma_t$.

lemmas, I write $D(\sigma) \equiv D(\sigma; r_-, r_+)$ as long as $r_-$ and $r_+$ remain fixed. I first establish that $D$ has exactly two stationary points, $r'$ and $r''$, which characterize the intervals of increase and decrease.

**Lemma 6.** *There exist values $r'$ and $r''$, with $r' < r''$ such that*

*(i) $D'(\sigma) < 0$ if and only if $\sigma \in (r', r'')$*

*(ii) $D'(\sigma) > 0$ if and only if $\sigma \notin (r', r'')$*

*(iii) $D'(\sigma) = 0$ if and only if $\sigma \in \{r', r''\}$*

*Further, $D(\sigma) \to \infty$ as $\sigma \to \infty$ and $D(\sigma) \to -\infty$ as $\sigma \to -\infty$*

*Proof.* Differentiation of $D$ implies

$$D'(\sigma) = \frac{F(r_+) - F(r_-)}{r_+ - r_-} - f(\sigma) \tag{63}$$

Hence, $D'(\sigma)$ is positive when $\frac{F(r_+)-F(r_-)}{r_+-r_-} > f(\sigma)$, negative when $\frac{F(r_+)-F(r_-)}{r_+-r_-} < f(\sigma)$, and zero when $\frac{F(r_+)-F(r_-)}{r_+-r_-} = f(\sigma)$. Because $\frac{F(r_+)-F(r_-)}{r_+-r_-}$ is a constant with respect to $\sigma$, the intervals of increasing and decreasing for $D$ are lower and upper sets of $f$.

I first prove that the upper set, $L_u = \{\sigma \in \mathbb{R} | \frac{F(r_+)-F(r_-)}{r_+-r_-} < f(\sigma)\}$, is nonempty. Suppose $L_u$ were empty. Then it must be the case that $\frac{F(r_+)-F(r_-)}{r_+-r_-} \geq \max_\sigma f(\sigma)$. Because $f$ is unimodal, the maximum is attained at $m$. Consequently, it must be that $\frac{F(r_+)-F(r_-)}{r_+-r_-} \geq f(m)$. This implies $F(r_+) - F(r_-) \geq f(m)(r_+ - r_-)$, or equivalently $\int_{r_-}^{r_+} f(\sigma)d\sigma \geq \int_{r_-}^{r_+} f(m)d\sigma$. Since $f(m) > f(\sigma)$ for every $\sigma \neq m$, this is impossible. Hence $\frac{F(r_+)-F(r_-)}{r_+-r_-} < f(m)$, and therefore $L_u$ is nonempty. By the strict quasiconcavity of $f$, the upper set is an interval, denoted $(r', r'')$. Hence, for any $\sigma \in (r', r'')$, $D'(\sigma) < 0$. Strict quasiconcavity of $f$ implies that $\frac{F(r_+)-F(r_-)}{r_+-r_-} > f(\sigma)$ for $\sigma \notin [r', r'']$. Hence, by continuity, $\frac{F(r_+)-F(r_-)}{r_+-r_-} = f(\sigma)$ at $r'$ and $r''$. Consequently, $D'(\sigma) = 0$ if $\sigma \in \{r', r''\}$ and $D'(\sigma) > 0$ whenever $\sigma \notin (r', r'')$.

Lastly, to compute the limits of $D$ as $\sigma$ goes to infinity, note that (62) may be rewritten as

$$D(\sigma) = F(r_-) + \frac{\sigma}{r_+ - b-}[F(r_+) - F(r_-)] - \frac{r_-}{r_+ - r_-}[F(r_+) - F(r_-)] - F(\sigma). \tag{64}$$

Taking the limit as $\sigma \to \infty$, the second term becomes arbitrarily large, while $F(\sigma) \to 1$. Hence, $D(\sigma)$ becomes arbitrarily large. Taking the limit as $\sigma \to -\infty$, the second term becomes arbitrarily negative, while $F(\sigma) = 1$. Hence, $D(\sigma)$ becomes arbitrarily negative. $\square$

I now more precisely define $\sigma_\succeq$. Let $\sigma_\succeq$ be a value of $\sigma$ such that $D(\sigma_\succeq) = 0$ and either (i) $\sigma_\succeq \notin \{r_-, r_+\}$ or (ii) $\sigma_\succeq \in \{r_-, r_+\}$ and $D'(\sigma_\succeq) = 0$. That is, $\sigma_\succeq$ is a signal for which a politician would be indifferent between implementing the policy and the status quo, and distinct from $r_-$ and $r_+$ except in knife-edge cases. In those knife edge cases, either $r_-$ or $r_+$ is a stationary point, and that value is chosen to be $\sigma_\succeq$. I now show that $\sigma_\succeq$ always exists, is unique, and that the politician prefers implementation if and only if $\sigma \leq \sigma_\succeq$.

**Lemma 7.** *Given $\sigma$ and corresponding $r_-$ and $r_+$, there exists a unique $\sigma_{\succeq}$ such that implementation is preferred if and only if $\sigma \leq \sigma_{\succeq}$ and inaction is preferred if and only if $\sigma > \sigma_{\succeq}$, for any $\sigma \in (r_-, r_+)$.*

*Proof.* Note that $D(r_-) = D(r_+) = 0$. By Rolle's theorem, there must exist a stationary point of $D$ in $(r_-, r_+)$. Because $r' < r''$, there are three cases to consider:

1. $r' \in (r_-, r_+)$ and $r'' \geq r_+$
2. $r' \leq r_-$ and $r'' \in (r_-, r_+)$
3. $r' \in (r_-, r_+)$ and $r'' \in (r_-, r_+)$

Because $D(\sigma_{\succeq}) = 0$, whenever $\sigma_{\succeq} \notin \{r_-, r_+\}$, Rolle's Theorem also implies the following necessary conditions:

(a) If $\sigma_{\succeq} > r_+$, there must be a stationary point of $D$ in the open interval $(r_+, \sigma_{\succeq})$.

(b) If $\sigma_{\succeq} < r_-$, there must be a stationary point of $D$ in the open interval $(\sigma_{\succeq}, r_-)$.

(c) If $r_- < \sigma_{\succeq} < r_+$, then $r' \in (r_-, \sigma_{\succeq})$ and $r'' \in (\sigma_{\succeq}, r_+)$.

(d) There is at most one $\sigma_{\succeq} \notin \{r_-, r_+\}$ such that $D(\sigma_{\succeq}) = 0$.

Recall that $r'$ and $r''$ are the only stationary points of $D$. In the first case, it cannot be that $\sigma_{\succeq} \neq r_-$ and $\sigma_{\succeq} < r_+$, because neither (b) nor (c) hold. Further $D'(r_-) \neq 0$, because $r_- < r'$, and by Lemma 6, this implies $D'(r_-) < 0$, so it cannot be the case that $\sigma_{\succeq} = r_-$. If $r'' = r_+$, then $r_+ = \sigma_{\succeq}$. There cannot be another $\sigma_{\succeq} > r_+$ by requirement (a), so $\sigma_{\succeq}$ is unique. If $r'' > r_+$, then $D'(r_+) < 0$. Thus for $\sigma > r_+$ but arbitrarily close, $D(\sigma) < 0$. Further, Lemma 6 implies that as $\sigma \to \infty$, $D(\sigma) \to \infty$. Hence, by the Intermediate Value Theorem, there must exist $\sigma_{\succeq} \in (r_+, \infty)$ such that $D(\sigma_{\succeq}) = 0$. By (d), there cannot be another $\sigma_{\succeq} \neq r_-, r_+$, and neither $D'(r_+)$ nor $D'(r_-)$ is 0. Hence, $\sigma_{\succeq}$ must be unique. Note that $D(\sigma) > 0$ for all $\sigma \in (r_-, r_+)$, because $D'(r_-) > 0$, $D(\sigma) > 0$ is continuous, and there are not other roots of $D(\sigma)$ in $(r_-, r_+)$. for every $\sigma \in (r_-, r_+)$. Hence, in case one, $\sigma \leq \sigma_{\succeq}$ for any $\sigma \in (r_-, r+)$, and the politician prefers to implement her policy.

The second case is symmetric to the first.

In the third case, by (a) and (b) it must be that $\sigma_{\succeq} \in (r_-, r_+)$, because there are no stationary points of D outside of that interval. Note that $D'(r_-) > 0$ because $r_- < r'$, which implies for $\sigma > r_-$ but arbitrarily close, $D(\sigma) > 0$. Similarly, $D'(r_+) > 0$, which implies that for $\sigma < r_+$ but arbitrarily close, $D(\sigma) < 0$. Hence, by the Intermediate Value Theorem, there must exist $\sigma_{\succeq} \in (r_-, r_+)$ such that $D(\sigma_{\succeq}) = 0$. Because neither $D'(r_+)$ nor $D'(r_-)$ equal 0, and by (d) there cannot be another $\sigma_{\succeq} \notin \{r_-, r_+\}$, $\sigma_{\succeq}$ is unique. Because $D'(r_-) > 0$ and $D(\sigma)$ is continuous, and there are not any other roots of $D$ on $(r_-, \sigma_{\succeq})$ , it must be that $D(\sigma) > 0$ for all $\sigma \in (r_-, \sigma_{\succeq})$.

Similarly, $D'(r_+) > 0$ implies $D(\sigma) < 0$ for all $\sigma \in (\sigma_{\succeq}, r_+)$. Consequently, implementation is preferred if and only if $\sigma \leq \sigma_{\succeq}$.

The three cases presented are exhaustive. Hence, $\sigma_{\succeq}$ is always defined and unique, and for any $\sigma \in (r_-, r_+)$, the politician prefers to implement her policy if and only if $\sigma \leq \sigma_{\succeq}$. $\square$

### B.2.2 The Critical Cutoff

What I have shown in Lemma 7 is that so for each $\sigma$ and implied $r_-$ and $r_+$, one can define a value $\sigma_{\succeq}$ that characterizes candidate preference. I now show that as $\sigma$ increases, this cutoff decreases. Consequently, there is a cutoff $\sigma_{pub}$ such that $\sigma \leq \sigma_{pub}$ implies a preference for action and $\sigma > \sigma_{pub}$ implies a preference for the status quo, for the policy lottery consistent with $\sigma$.

Formally, I now consider

$$\hat{D}(\sigma, r_+(\sigma), r_-(\sigma)) = \frac{\sigma - r_-(\sigma)}{r_+(\sigma) - r_-(\sigma)} F(r_+(\sigma)) + \left(1 - \frac{\sigma - r_-(\sigma)}{r_+(\sigma) - r_-(\sigma)}\right) F(r_-(\sigma)) - F(\sigma). \tag{65}$$

The function $\hat{D}$ gives the utility difference between policy implementation and the status quo for the lottery faced by a politician with reputation $\sigma$. By Lemma 7, there exists a unique $\sigma_{\succeq}$ for this lottery such that the politician prefers $x_1 = \theta_1$ if and only if $\sigma \leq \sigma_{\succeq}$ and $x_1 = s_1$ if and only if $\sigma \geq \sigma_{\succeq}$. The following theorem shows that $\sigma_{\succeq}$ is a decreasing function of $\sigma$, so that if a lottery is accepted at reputation $\sigma$, it will also be accepted for any lower $\sigma$, and similarly, if the status quo is preferred at any $\sigma$, then it is also preferred for any greater $\sigma$. Hence, there exists a value of the signal, $\sigma_{pub} \in [0, 1]$, that divides these cases.

**Theorem 5.** *There exists $\sigma_{pub}$ such that $\sigma \leq \sigma_{pub}$ implies policy implementation is preferred and $\sigma \geq \sigma_{pub}$ implies the status quo is preferred.*

*Proof.* Because $\sigma_{\succeq}$ must satisfy $\hat{D}(\sigma_{\succeq}) \equiv 0$, I use the Implicit Function Theorem. An increase in $\sigma$ increases both $r_+$ and $r_-$. In general, the increase in $r_+$ and $r_-$ may have a positive or negative effect on the value of $\hat{D}$. However, I will show that the effect of an increase in $\sigma_{\succeq}$ is always of the same sign, so that the conditions of the Implicit Function Theorem required to show that $\sigma_{\succeq}$ is a decreasing function of $\sigma$ are met.

Differentiation of (65) implies the following derivatives:

$$\frac{\partial \hat{D}}{\partial \sigma}\Big|_{\sigma=\sigma_{\succeq}} = \frac{F(r_+) - F(r_-)}{r_+ - r_-} - f(\sigma_{\succeq}) \tag{66}$$

$$\frac{\partial \hat{D}}{\partial r_+}\Big|_{\sigma=\sigma_{\succeq}} = \frac{-1}{r_+ - r_-}\frac{\sigma_{\succeq} - r_-}{r_+ - r_-} F(r_+) + \frac{\sigma_{\succeq} - r_-}{r_+ - r_-} f(r_+) + \frac{1}{r_+ - r_-}\frac{\sigma_{\succeq} - r_-}{r_+ - r_-} F(r_-) \tag{67}$$

$$\frac{\partial D}{dr_-}\Big|_{\sigma=\sigma_{\succeq}} = \frac{\sigma_{\succeq} - b^+}{(r_+ - r_-)^2} F(r_+) + \frac{r_+ - \sigma_{\succeq}}{(r_+ - r_-)^2} F(r_-) - \frac{r_+ - \sigma_{\succeq}}{r_+ - r_-} f(r_-) \tag{68}$$

The derivative with respect to $\sigma$, (66), is positive if and only if

$$\frac{F(r_+) - F(r_-)}{r_+ - r_-} > f(\sigma_{\succeq}) \tag{69}$$

or equivalently, if

$$\frac{dD}{d\sigma}\Big|_{\sigma=\sigma_{\succeq}} < 0. \tag{70}$$

The derivative with respect to $r_+$, (67), is positive if and only if

$$-\frac{\sigma_{\succeq} - r_-}{r_+ - r_-}F(r_+) + (\sigma_{\succeq} - r_-)f(r_+) + \frac{\sigma_{\succeq} - r_-}{r_+ - r_-}F(r_-) > 0. \tag{71}$$

Factoring out $(\sigma_{\succeq} - r_-)$ simplifies (71) to

$$(\sigma_{\succeq} - r_-)[f(r_+) - \frac{F(r_+) - F(r_-)}{r_+ - r_-}] > 0. \tag{72}$$

Dividing both sides by $-1$ and substituting the definition of $D$, it follows that (72) is equivalent to

$$(r_- - \sigma_{\succeq})[\frac{\partial D}{d\sigma}\Big|_{\sigma=r_+}] < 0. \tag{73}$$

Inequality (73) holds if $\sigma_{\succeq} > r_-$ and $\frac{\partial D}{d\sigma}\Big|_{\sigma=r_+} < 0$, or if $\sigma_{\succeq} < r_-$ and $\frac{\partial D}{d\sigma}\Big|_{\sigma=r_+} > 0$.

The derivative with respect to $r_-$, (68), is positive if and only if

$$\frac{\sigma_{\succeq} - r_+}{(r_+ - r_-)}F(r_+) + \frac{r_+ - \sigma_{\succeq}}{(r_+ - r_-)}F(r_-) + (r_+ - \sigma_{\succeq})f(r_-) > 0. \tag{74}$$

Dividing on both sides of (74) by $-1$, it is equivalent to

$$\frac{r_+ - \sigma_{\succeq}}{(r_+ - r_-)}F(r_+) - \frac{r_+ - \sigma_{\succeq}}{(r_+ - r_-)}F(r_-) - (r_+ - \sigma_{\succeq})f(r_-) < 0. \tag{75}$$

Factoring out $(r_+ - \sigma_{\succeq})$ simplifies (75) to

$$(r_+ - \sigma_{\succeq})[\frac{F(r_+) - F(r_-)}{r_+ - r_-} - f(r_-)] < 0. \tag{76}$$

Substituting the definition of $D$, it follows that (76) is equivalent to

$$(r_+ - \sigma_{\succeq})[\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-}] < 0. \tag{77}$$

Inequality (77) satisfied if $\sigma_{\succeq} > r_+$ and $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} > 0$ or if $\sigma_{\succeq} < b^+$ and $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} < 0$.

I proceed by considering each possible case for the location of $\sigma_{\succeq}$, as in Lemma 7.

In case (i), $\sigma_{\succeq} \geq r_+ > r_-$, so $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_+} \leq 0$ and $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} > 0$. By (73) and (77), this implies $\frac{\partial\hat{D}}{\partial r_+}\Big|_{\sigma=\sigma_{\succeq}} \geq 0$ and $\frac{\partial\hat{D}}{\partial r_-}\Big|_{\sigma=\sigma_{\succeq}} > 0$. Further, because $\sigma_{\succeq} < r'$ in case (i), (70) implies that $\frac{\partial\hat{D}}{\partial\sigma}\Big|_{\sigma=\sigma_{\succeq}} > 0$. Hence, by the Implicit Function Theorem, $\frac{d\sigma_{\succeq}}{d\sigma} < 0$, and $\sigma_{\succeq}$ varies continuously with $\sigma$.

In case (ii), $\sigma_{\succeq} \leq r_- < r_+$, $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_+} > 0$ and $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} \leq 0$. By (73) and (77), this implies $\frac{\partial\hat{D}}{\partial r_+} > 0$ and $\frac{\partial\hat{D}}{\partial r_-} \geq 0$. Further, because $\sigma_{\succeq} > r''$, (70) implies that $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=\sigma_{\succeq}} > 0$. Hence, by the Implicit Function Theorem, $\frac{d\sigma_{\succeq}}{d\sigma} < 0$, and $\sigma_{\succeq}(\sigma)$ varies continuously with $\sigma$.

In case (iii), $r_- < \sigma_{\succeq} < r_+$, $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} > 0$, and $\frac{\partial D}{\partial\sigma}\Big|_{\sigma=r_-} < 0$.By (73) and (77), this implies $\frac{\partial\hat{D}}{\partial r_+} < 0$ and $\frac{\partial\hat{D}}{\partial r_-} < 0$. Because $\sigma_{\succeq} \in (r_-, r_+)$, (70) implies that $\frac{dD}{d\sigma}\Big|_{\sigma=\sigma_{\succeq}} < 0$. Hence, by the Implicit Function Theorem, $\frac{d\sigma_{\succeq}}{d\sigma} < 0$, and $\sigma_{\succeq}(\sigma)$ varies continuously with $\sigma$.

Hence, $\sigma_{\succeq}(\sigma)$ is a decreasing, continuous function of $\sigma$. If $\sigma_{\succeq}(0) \leq 0$, the politician prefers the status quo for any $\sigma$, and $\sigma^*_{\succeq} = 0$. If $\sigma_{\succeq}(1) \geq 1$, then the politician prefers to implement her policy for any $\sigma$, and $\sigma^*_{\succeq} = 1$. If $\sigma_{\succeq}(0) > 0$ and $\sigma_{\succeq}(1) < 1$, there is a unique point $\sigma_{pub} \in (0,1)$ such that $\sigma_{\succeq}(\sigma_{pub}) = \sigma^*_{pub}$, and for all $\sigma < \sigma_{pub}$ it holds that $\sigma < \sigma_{\succeq}(\sigma)$ and the politician prefers to implement her policy, while for all $\sigma > \sigma^*_{pub}$, it holds that $\sigma > \sigma_{\succeq}(\sigma)$, and the politician prefers the status quo. $\square$

Theorem 5 shows that even if policy implementation becomes less informative of competence and additive valence plays a factor, the result that the politician prefers to implement her policy only when the expected outcome is sufficiently low remains. Further, $\sigma_{pub} \in (0,1)$.

**Corollary 2.** *The cutoff $\sigma_{pub}$ is strictly between* 0 *and* 1

*Proof.* As $\sigma \to 1$, $r_- \to 1$, and consequently, both $r_-$ and $r_+$ must be on the concave portion of $F$. Because $\sigma$ is the expected value of $r_-$ and $r_+$, by Jensen's inequality, $F(\sigma)$ must be greater than the expected $F$ from implementation. Hence for sufficiently high $\sigma$, inaction is preferred. Therefore, $\sigma_{pub} < 1$. Conversely, as $\sigma \to 0$, $r_+ \to 0$, and therefore both $r_-$ and $r_+$ are on the convex portion of $F$. Again by Jensen's inequality, $F(\sigma)$ must be less than the expected $F$ from implementation. Hence for sufficiently low $\sigma$, implementation is preferred. Therefore, $\sigma_{pub} > 0$. $\square$

This corollary implies that, as long as $F$ is strictly unimodal, there are some high signals for which the politician will not implement her policy, despite it being extremely likely to generate good outcomes, and simultaneously, low signals that induce the politician to implement a policy despite it being extremely likely to generate bad outcomes.

## B.3 Generalization of Private Information Equilibrium

In this subsection, I show that the politician only implements her policy when her private signal is sufficiently high in a more general context than the main text.

### B.3.1 Behavior when action is observable

In this analysis, contrary to the main text, I assume the voter is capable of observing the politician's actions, so that $x_1 = s_1$ is a different information set from $x_1 = \theta_1$, even if the outcome is observed for neither. I make use of assumptions 1 thru 7. It is not necessary to assume $F$ is symmetric for this analysis.

The voter prefers the politician to the challenger if and only if her expected second period utility from the politician, given his observation of the politician's action and its consequence, is greater than her expected second period utility from the challenger. Note that because the voter does not observe $\sigma$, he must take the expectation over the possible values of sigma. Hence, the voter prefers to re-elect the politician if

$$\mathbb{E}(v_2(r_y(\sigma)|x_1, y_1) > v_2(q^c), \tag{78}$$

or equivalently if

$$v_2^{-1}(\mathbb{E}(v_2(r)|x_1,y_1)) > q^c. \tag{79}$$

Consequently, the probability of re-election conditional on the politician's choice and its outcome is $F(v_2^{-1}(\mathbb{E}(v_2(r)|x_1,y_1)))$. If the politician chooses the status quo, then $x_1 = s_1$ and $y_1 = 0$, and her probability of re-election is $F(v_2^{-1}(\mathbb{E}(v_2(r)|s_1)))$. If the politician chooses to implement her policy, then $x_1 = \theta_1$ for certain, but the outcome may be positive, negative, or unobserved. The expected probability of re-election across these outcomes is

$$\begin{aligned}&\gamma F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,0))) + (1-\gamma)[p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,1)))\\ &+ (1-p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,-1))).\end{aligned} \tag{80}$$

Consequently, the politician prefers to implement her policy if and only if

$$\begin{aligned}&\gamma F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,0))) + (1-\gamma)[p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,1)))\\ &+ (1-p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1,-1))).\\ &\geq F(v_2^{-1}(\mathbb{E}(v_2(r)|s_1)))\end{aligned} \tag{81}$$

Note that the only terms on the left hand side of (81) that depend upon $\sigma$ are $p(\sigma)$ and $1-p(\sigma)$; all other terms on the left hand side are constant with respect to the politician's realization of $\sigma$. Because $\mathbb{E}(v_2(r)|\theta_1,1) > \mathbb{E}(v_2(r)|\theta_1,-1)$, the left hand side is strictly increasing in $\sigma$. Consequently, the equilibrium is characterized by a cut-off, $\sigma^*$, for the politician prefers the status quo whenever $\sigma < \sigma^*$, and prefers to implement her policy whenever $\sigma > \sigma^*$. Thus, it remains the case that the politician prefers to implement her policy only when she has a sufficiently high signal under private information, even when I allow for a more general distribution, voter utility function, and partially informative results of policy implementation.

I now use this characterization of equilibrium behavior to derive an equilibrium. The conditional expectations can be written as follows:

$$\mathbb{E}(v_2(r)|\theta_1,0) = \mathbb{E}(v_2(r)|\sigma \geq \sigma^*) = \frac{\int_{\sigma^*}^1 v_2(\sigma)dG(\sigma)}{1-G(\sigma^*)} \tag{82}$$

$$\mathbb{E}(v_2(r)|\theta_1,1) = \mathbb{E}(v_2(r)|\sigma \geq \sigma^*,1) = \frac{\int_{\sigma^*}^1 v_2(r_+(\sigma))dG(\sigma)}{1-G(\sigma^*)} \tag{83}$$

$$\mathbb{E}(v_2(r)|\theta_1,-1) = \mathbb{E}(v_2(r)|\sigma \geq \sigma^*,-1) = \frac{\int_{\sigma^*}^1 v_2(r_-(\sigma))dG(\sigma)}{1-G(\sigma^*)} \tag{84}$$

$$\mathbb{E}(v_2(r)|s_1,0) = \mathbb{E}(v_2(r)|\sigma \leq \sigma^*) = \frac{\int_0^{\sigma^*} v_2(\sigma)dG(\sigma)}{G(\sigma^*)} \tag{85}$$

Suppose that $\sigma^* = 0$. Then evaluating (82) thru (85), it follows that (81) is equivalent to

$$\begin{aligned}\gamma F(v_2^{-1}(\mathbb{E}(v_2(\sigma)))) + (1-\gamma)[p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|1))) + (1-p(\sigma))F(v_2^{-1}(\mathbb{E}(v_2(r)|-1))\\ \geq F(v_2^{-1}(0)).\end{aligned} \tag{86}$$

Given that $r_-(\sigma) > 0$ for any $\sigma > 0$, it follows that every expectation on the left hand side of

(86) exceeds $v_2^{-1}(0)$. Consequently, because $F$ is strictly increasing, the left hand side of (86) must be strictly larger than the right, and there is an equilibrium in which $\sigma^* = 0$. Intuitively, when $\sigma^* = 0$, the politician implements her policy no matter the value of $\sigma$ because if she chooses the status quo, she is believed to be incompetent. Because this discourages the politician from ever choosing to maintain the status quo, this suspicion is never disproven in equilibrium.

### B.3.2 Special case: $\sigma_{pri} = 0$ is unique

I now revisit the private information model in the main text, but allow for $x_1$ to be observable. I otherwise maintain the main text assumptions. In this context, $\sigma_{pri} = 0$ is the unique equilibrium. Because the politician only chooses the status quo if $\sigma < \sigma^*$, $E(\sigma|s_1) = E(\sigma|\sigma < \sigma^*)$. Further, the politician only chooses to implement her policy if $\sigma > \sigma^*$, so $E(\sigma|\theta_1, 0) = E(\sigma|\sigma > \sigma^*)$. Hence, a politician prefers to implement her policy if

$$(1-\gamma)\sigma + \gamma F(\mathbb{E}(\sigma|\sigma \geq \sigma^*)) \geq F(\mathbb{E}(\sigma|\sigma \leq \sigma^*)). \tag{87}$$

Equivalently, she prefers to implement her policy if

$$(1-\gamma)[\sigma - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))] + \gamma[F(\mathbb{E}(\sigma|\sigma \geq \sigma^*)) - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))] \geq 0. \tag{88}$$

I now show that it must be the case that the politician prefers to implement her policy for any $\sigma \in [0,1]$. Note that $[F(\mathbb{E}(\sigma|\sigma \geq \sigma^*)) - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))] > 0$ because $\mathbb{E}(\sigma|\sigma \geq \sigma^*) > \mathbb{E}(\sigma|\sigma \leq \sigma^*)$. Recall that $\mathbb{E}(\sigma|\sigma \leq \sigma^*) \leq \frac{1}{2}$, and consequently, $F(\mathbb{E}(\sigma|\sigma \leq \sigma^*)) \leq \frac{1}{2}$. For $\sigma^* > \frac{1}{2}$, $[\sigma^* - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))] > 0$, and the left hand side of the inequality (88) is strictly positive. Hence, such a value of $\sigma^* > 0$ cannot be an equilibrium. For $\sigma^* \leq \frac{1}{2}$ but non-negative, the first term of the inequality (88) must be positive because $F(\mathbb{E}(\sigma|\sigma \leq \sigma^*)) < F(\sigma^*) \leq \sigma^*$ by convexity of $F$ on $(0, \frac{1}{2})$. Consequently, $[\sigma - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))]$ is non-negative while $[F(\mathbb{E}(\sigma|\sigma \geq \sigma^*)) - F(\mathbb{E}(\sigma|\sigma \leq \sigma^*))]$ is positive. Hence, $\sigma^* = 0$ is the only solution, and the politician prefers to implement her policy for any $\sigma \in [0,1]$.

### B.3.3 Behavior When Action is Unobservable

Returning to the main text assumption that $x_1$ is not observable, but making use of assumptions 1 thru 7, the politician would implement if and only if

$$\begin{aligned}\gamma F(v_2^{-1}(\mathbb{E}(v_2(r)|0))) + (1-\gamma)[p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1, 1))) + (1-p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1, -1)))\\ \geq F(v_2^{-1}(\mathbb{E}(v_2(r)|0)))\end{aligned} \tag{89}$$

or equivalently if

$$p(\sigma)F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1, 1))) + (1-p(\sigma))F(v_2^{-1}(\mathbb{E}(v_2(r)|\theta_1, -1))) \geq F(v_2^{-1}(\mathbb{E}(v_2(r)|0))). \tag{90}$$

As in the case when action is observable, the left hand side is strictly increasing in $\sigma$ and the right hand side is constant, and hence there exists a cut-off that characterizes the equilibrium strategies by the same argument.

## B.4 Partially Asymmetric Information

In this modification of the main text version of the private information model, the politician observes $\sigma$, which contains both the public knowledge in the report about her policy and her own knowledge of her competence. However, the voter only observes the public information about her, which indicates the expected probability that she is competent, $\pi_\tau$. Whenever $\pi_\tau > \pi'_\tau$, I assume that the distribution of $\sigma$ given $\pi_\tau$ strictly first order stochastically dominates (FOSDs) the distribution given $\pi'_\tau$ on $[0,1]$. I also add the assumption that $\sigma_{pri}$ is unique, as the proof of uniqueness used in the main text required that the expected $\sigma$ be equal to $\frac{1}{2}$. All other assumptions are maintained from Section 4.

As $\pi_\tau$ increases, the voter expects the politician to have better signals, and consequently the expected signal for any given cutoff is higher.

**Lemma 8.** *If $\pi_\tau > \pi'_\tau$, $ER(\sigma^*|\pi_\tau) > ER(\sigma^*|\pi'_\tau)$.*

*Proof.* Let the distribution for $\sigma$ given $\pi_\tau$ be $g$ and the distribution given $\pi'_\tau$ be $h$. By assumption, $g$ strictly FOSDs $h$ on $[0,1]$. Using the definition of $ER$, I want to show

$$\frac{\int_0^{\sigma^*} \sigma dG(\sigma) + \gamma \int_{\sigma^*}^1 \sigma dG(\sigma)}{G(\sigma^*) + \gamma(1 - G(\sigma^*))} > \frac{\int_0^{\sigma^*} h(\sigma)\sigma d\sigma + \gamma \int_{\sigma^*}^1 h(\sigma)\sigma d\sigma}{H(\sigma^*) + \gamma(1 - H(\sigma^*))} \tag{91}$$

Observe that because $\sigma$ is a strictly increasing function of $\sigma$, First order stochastic dominance implies

$$\int_0^{\sigma^*} \sigma dG(\sigma) > \int_0^{\sigma^*} h(\sigma)\sigma d\sigma \tag{92}$$

and

$$\int_{\sigma^*}^1 \sigma dG(\sigma) > \int_{\sigma^*}^1 h(\sigma)\sigma d\sigma \tag{93}$$

Consequently, the numerator of the left hand side must be larger than the numerator of the right hand side. Further, $G(\sigma^*) < H(\sigma^*)$ for any $\sigma^*$ by First Order Stochastic Dominance. Hence, the denominator of the left hand side must be smaller than that of the right hand side as well. □

Recall that $\sigma_{pri}$ solves $F^{-1}(\sigma_{pri}) = ER(\sigma_{pri})$. Hence, when the right hand side increases because of an increase in $\pi_\tau$, $F^{-1}(\sigma_{pri})$ must also increase. Consequently, because $F^{-1}(\sigma)$ is strictly increasing, the value of $\sigma_{pri}$ must be greater for $\pi_\tau$ than for $\pi'_\tau$. Hence, as $\pi_\tau$ increases, the value of $\sigma_{pri}$ increases. When the politician has a higher $\pi_\tau$, she implements the policy only for larger realizations of $\sigma$. Because $\sigma$ is the probability of success, the politician is effectively becoming more risk averse as $\pi_\tau$ increases, as a strictly higher probability is required for the lottery of policy implementation to be acceptable to them.