Signaling Competence Through Policy Revision

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Abstract

How do electoral incentives affect politicians' desire to revise existing policy? I study a model in which a party that is motivated by policy quality and electoral incentives conveys competence—the precision of its signal about a payoff-relevant state—through its decision whether to engage in costly revision of a status quo policy. First, I show that absent electoral incentives, sufficiently drastic revision conveys competence while the decision to retain the initial policy conveys incompetence. Then, I show that if a representative voter values competence, electoral incentives push the party to revise the status quo policy more frequently and with more extreme policies than it would without reelection concerns. Moreover, in equilibrium, the incompetent party and the competent party engage in "exaggerated revision"—they both make more extreme revisions than the signal they observe indicates is optimal—yet the voter reelects them. Finally, I examine the voter's welfare from policy and show that if the voter does not bear the cost of revision, increased electoral incentives exert a non-monotonic effect on the voter's welfare. I also show that if the voter bears a cost when the status quo is revised, she may benefit from the incumbent paying an increased cost to revise.

1 Introduction

Policy revision is extremely common within American politics. Many existing laws have had as least one provision repealed (Ragusa and Birkhead, 2020), and many others have been altered in other ways. These revisions range from small tweaks to much larger changes that make drastic alterations to existing policies or even entirely replace them. What role do electoral incentives play in the decision to revise existing policy?

In this paper, I study a formal model to answer this question. In particular I focus on a game with two parties and a voter, where the parties care about policy quality and winning election, and the voter values competence. At the start of the game, the incumbent party observes a signal about an unknown state of the world. The party may be competent or incompetent, and this affects the precision of the signal. After observing its signal, the party chooses whether to retain a status quo policy or to make a costly revision. The voter observes the status quo and the incumbent's decision whether to revise but not the outcome of the policy, and decides whether to reelect the incumbent or replace them with the challenger.

I begin by analyzing the model without electoral incentives. This reveals two things about how the voter learns from the party's revision decision. First, drastic revision conveys competence. When an incompetent party observes a signal, it places relatively more weight on its prior belief relative to its signal, whereas a competent party places relatively more weight on its signal. This means competent parties are more likely to believe a drastic revision is warranted. Therefore, when the voter observes a drastic revision, she believe it was more likely to be made by a competent party. Second, retaining the initial policy conveys incompetence. This is because incompetent incumbents are more likely to hold conditional expectations that are similar to the prior, and that is when the cost of revision outweighs the benefit of revision.

I proceed by analyzing the model with electoral incentives. To do so, I focus on equilibria where the voter uses a cutoff strategy. Although there is variation in the structure of the cutoff equilibria, all cutoff equilibria share some structural features. First, the voter reelects the incumbent party only if the incumbent party revises the status quo. In many equilibria, the voter reelects the incumbent party if and only if it revises, and in the equilibria where the incumbent party isn't reelected every time it revises, the voter only reelects the incumbent party if it makes a sufficiently drastic revision. Second, both types of incumbent optimally revise policy—implement policy equal to the conditional expectation of the state—when they see a signal far from the prior. Third, both types of incumbent retain the status quo when they observe a signal close to the prior. Finally, the support of policies implemented by an incumbent is the same regardless of its type. That is there are no policies that are only implemented by one type of incumbent.

When the cost of reelection is sufficiently low or the benefit of reelection is sufficiently high, I show that in any cutoff equilibrium, both types of incumbent engage in "exaggerated revision." When an incumbent engages in exaggerated revision, it implements a revision that is more extreme than its signal indicates is optimal. This result is similar to other results on "anti-pandering" in policymaking and Downsian competition (Kartik et al., 2015; Bils, 2023).

Relative to the benchmark without electoral incentives, in any cutoff equilibrium the probability of revision is (weakly) higher when there are electoral incentives compared to when there are not. This is consistent with empirical findings that electoral incentives push legislators to allocate effort to measures of observable productivity (Fouirnaies and Hall, 2022). I also show that electoral incentives push the incumbent party to implement weakly more extreme revisions.

Finally, I consider the effect of electoral incentives on the voter's welfare from policy quality. The effect of varying the cost of revision and the benefit of reelection on the voter's policy welfare depends on whether the voter also pays a cost when policy is revised. If the cost of revision is only paid by the incumbent party, the effect of increasing the incumbent's reelection incentive is non-monotonic. When the cost of revision for the incumbent is high, increased reelection incentives improve the voter's welfare since the incumbent is compensated for making additional revisions. But when the cost is relatively low, increased reelection incentive hurts the voter since it leads to the incumbent implementing additional exaggerated revision.

On the other hand, if the voter also pays a cost when the status quo is revised, if the incumbent has a reelection incentive, the voter is worse off relative to a benchmark when the incumbent does not care about reelection. Moreover, in some cases, the voter's policy welfare improves if the incumbent faces a higher cost of revision.

2 Literature

Relative to law creation, which has received considerable attention in American politics scholarship, what happens to legislation after passage has received relatively less attention. Recent work on repeal (**?**Ragusa and Birkhead, 2015, 2020; **?**; **?**) offers a corrective. Collectively, this work identifies a variety of factors related to when policies are repealed such as the strength of the coalition that enacted the policy (Maltzman and Shipan, 2008) and shifts in the gridlock interval (Ragusa and Birkhead, 2015). In tandem, this scholarship documents a relationship between repeal and the political environment, institutional features of the legislative environment, and bill level factors.

There is also theoretical work on legislative repeal (Delgado-Vega et al., 2023), policy revision via executive action (Judd et al., 2017), and on costly policy change more generally (Dziuda and Loeper, 2022; Gersbach and Tejada, 2018; Gersbach et al., 2023). My model is most similar to Dziuda and Loeper (2022), who study a dynamic model where, in each period, a voter elects a party that decides whether to retain the status quo policy or to replace it with a new policy. Two key features of their model are that all players incur a cost if the policy is changed, and the payoff from the policy depends on an ex ante unknown state of the world. As in my model, the desire to win the next election shapes the incumbent's incentives to change the policy. But in my model, this is because the parties differ in their competence, whereas in theirs the parties differ in their partisan preferences, which influences the voter's preference for electing one party versus the other.

My model is also related to a wealth of work on electoral accountability, and in particular models where voters care about the competence of policy makers (Canes-Wrone et al., 2001; Morelli and Van Weelden, 2013; Ashworth and Shotts, 2010). My model shares a similar setup to these models, in which an incumbent policymaker privately observes a signal that is informative about an unknown state of the world and then implements a policy. The voter infers something about the policymaker's quality from this choice, and then decides whether to retain the incumbent or replace them with the out-party. In many such models, the incompetent incumbent policymaker faces an incentive to pander to the voter by implementing policy that caters to the voter's prior even though the policymaker knows the policy is sub-optimal (Ashworth and Shotts, 2010; Canes-Wrone et al., 2001). Although my model begins with a similar setup, it is most similar to work that shows that under alternative assumptions about the distribution of the state and the signals the incumbent observes, the policymaker has an incentive to implement policies that *diverge* from the expected state (Bils, 2023; Lee and Hwang, 2022).

In particular, my model is most similar to Bils (2023) who studies a model with a continuous state and policy space where a competent policymaker learns everything about the state and an incompetent policymaker learns nothing. This information setting and policy and state spaces mean the incompetent policymaker finds it costly to enact policy that differs from what is optimal under the prior. As a result, enacting policy that differs from the prior conveys competence. Bils (2023) then solves for a mixed strategy equilibrium in which the incompetent policymaker postures and the competent policymaker overreacts. In my model, which was independently developed, the competent and incompetent parties both learn something about the state. As a result, there is no posturing, only overreacting in equilibrium. I also focus on pure-strategy equilibria and derive different welfare effects since revision is costly.

In showing that choosing drastic policies may convey competence, my model is related to models of Downsian competition where there is uncertainty about the optimal policy. Past work shows that pandering emerges in such models: the candidates have an incentive to choose policies that are optimal for the ex ante likely state of the world (Heidhues and Lagerlöf, 2003). But, recent work shows that under alternative assumptions about the state and the information the candidates receive, candidates have an incentive to engage in "anti-pandering" (Kartik et al., 2015; Honryo, 2013; McMurray, 2022). In this regard, my model is similar to Honryo (2013). In their model, candidates who value policy quality engage in Downsian competition where a payoff relevant state is unknown. Competent candidates learn the state so they sometimes choose policies that are optimal for an ex ante unlikely state. As a result, incompetent candidates have an incentive to pretend to be competent by choosing policies that are not usually optimal. The primary difference between our models is that Honryo (2013) studies a model with three states, and I study a model with a continuous state space. This leads to exaggerated revision by both types. Another significant difference is that both types of incumbent learn about the state in my model, whereas only the competent politician learns anything—in fact everything—about the state in Honryo (2013).

Finally, in a broad sense, this model is related to models of career concerns. Prendergast and Stole (1996) analyze a similar informational environment—the state is normally distributed, an investor observes a signal equal to the state plus normal noise, and the more competent the investor, the smaller the variance of the distribution of the noise—but focus on how the agent responds to information over time rather than in a single period like my model. This introduces additional concerns that are not relevant to the model I study here. This model also includes an incentive to overreact to information in some cases. In a different career concerns model, Majumdar and Mukand (2004) study a dynamic model in which electoral concerns affect the incentives for policy experimentation. Similar to my model, they find that electoral concerns and the desire to signal competence may lead to inefficient policies.

3 Model

3.1 Setup

Consider a model with a voter ("she"), an incumbent, Party B ("it), and a challenger, Party A ("it"). At the start of the game, nature draws a state $\theta \sim \mathcal{N}(0,1)$, and Party B privately observes a state-dependent noisy signal. In particular, $s_B = \theta + \epsilon_B$, where $\epsilon_B \sim \mathcal{N}(0, \frac{1}{\pi_B})$. The parameter π_B captures a notion of the precision of Party B's signal, and I assume $\pi_B \in \{\underline{\pi}, \overline{\pi}\}$, $0 < \underline{\pi} < \overline{\pi} \leq \infty$, and $\Pr(\pi = \overline{\pi}) = q_B$.[1] I refer to Party B as "competent" when $\pi = \overline{\pi}$, and denote B of type π_b as B_{π_B}.

At the start of the game there is a status quo policy, $y_{SQ} = 0$.[2] After observing its signal, Party B chooses whether to retain the status quo ($y_B = y_{SQ}$) or to revise the initial policy ($y_B \neq y_{SQ}$). Finally, the voter decides whether reelect Party B ($e = B$) or to elect Party A ($e = A$), where Party A is either competent (with probability q_A) or incompetent (with probability $1 - q_A$). I assume that $q_B < q_A$.

Payoffs Party B is concerned with policy quality, the cost of revising the initial policy, and the value of winning reelection. These considerations are incorporated in the following utility function:

$$u_{B_{\pi_B}} = -(\theta - y_B)^2 - \mathbb{1}_{y_B \neq y_{SQ}} k + \mathbb{1}_{e=I} r,$$

where $k > 0$ is the cost B incurs if it choose $y_B \neq y_{SQ}$ and $r > 0$ is the benefit B receives if it wins reelection.

The voter's only concern is the competence of the party she elects. I assume the voter reelects Party B if and only if

$$\Pr(\pi_B = \overline{\pi} | y_B) \geq q_A.$$

In Section 7.2, I provide a microfoundation for this assumption by assuming that the voter cares about policy and that there is a second policy making period. I show that in such a setting, the voter reelects Party B whenever the probability Party B is competent is larger than the probability Party A is competent.

[1] When $\overline{\pi} = \infty$, the competent incumbent learns the state with certainty. This is the assumption that is made in papers like Canes-Wrone et al. (2001) and Honryo (2013). Allowing Party B to learn the state has no affect on my results.

[2] I assume that existing policy represents a "best guess" at the optimal policy given available information represented by the prior distribution.

Equilibrium Slightly abusing notation, a strategy for B_{π_B}, $y_{B_{\pi_B}}$, maps $\mathbb{R} \times \mathbb{R} \times \{\underline{\pi}, \overline{\pi}\}$ into a distribution over $\mathbb{R}$, and a strategy for the voter, e, maps $\mathbb{R} \times \mathbb{R}$ into a distribution over $\{A, B\}$. A Perfect Bayesian equilibrium (referred to as an equilibrium) satisfies the following:

1. each player's strategy is sequentially rational given their beliefs and the other players' strategies,
2. and each player's beliefs satisfy Bayes' rule on the equilibrium path.

Normal-Normal Learning with Quadratic Loss Utility The normal-normal structure of the model implies the following well known facts.[3] First, given the prior distribution, the distribution of signals for Party B_{π_B} is $\mathcal{N}(0, 1 + \frac{1}{\pi})$. Second, given a signal s_B, Party B_{π_B}'s posterior distribution is

$$\theta | s_B \sim \mathcal{N}\left(\frac{\pi s_B}{1+\pi}, \frac{1}{1+\pi}\right).$$

Third, the normal-normal structure and quadratic loss utility over policy means that if Party B only cares about policy, the optimal revision decision is to choose $y_B = \mathbb{E}[\theta | s_B]$. This yields the following expected utility:

$$\mathbb{E}[u_{B_{\pi_b}} | y_B = \mathbb{E}[\theta | s_B]] = -\frac{1}{1+\pi}.$$

Finally, in general, given Party B's beliefs about the distribution of θ given s_B, Party B's expected utility from policy from choosing policy y_B is

$$\mathbb{E}[u_{B_{\pi_b}} | y_B = y_B, s_B] = -\left(y_B - \frac{\pi s_B}{1+\pi}\right)^2 - \frac{1}{1+\pi}.$$

3.2 Discussion of the Model

Policy Revision

I view this model as primarily applying to settings where an incumbent party chooses whether to revise a policy when the quality of that policy has not been revealed. This would occur if revision occured shortly after the initial passage of the status quo. Consider, for example, congressional Republicans' attempts to repeal the Affordable Care Act. One of the first votes that congressional Republicans took in 2011 after gaining control of both

[3]See DeGroot (2005).

houses of Congress was on repealing the ACA. Major portions of the legislation did not come into force until 2014, so this vote was held before the quality of the policy was revealed.

While repeals overturn large swathes of existing legislation, like the 1989 repeal of the Medicare Catastrophic Coverage Plan, which initially passed in 1988, in other cases repeal refers to making small changes to legislation. Returning to the example of the ACA, in 2011, some Democrats and all Republicans voted to repeal tax reporting requirements Ragusa and Birkhead (2020).

In addition to repeal, amending laws can be passed that strengthen or weaken existing legislation (Adler and Wilkerson, 2013). Moreover, legislation can be passed that shifts policy without focusing on amending existing policy. Because the policy space in this model is continuous, this model encompasses a broad notion of revision that includes repeal, amendment, and outright replacement. When Party B implements a revision, it chooses a real number, which might be relatively closer to the status quo or far away. This reflects that a revised policy could either be an entirely new policy or the original policy with alterations.

Costly Revision

I also view this model as applying to settings where enacting a revision is costly. This cost can be motivated by a variety of considerations. The cost might be the opportunity cost associated with focusing on revision—writing legislation, using valuable committee time, securing votes—instead of enacting new policies related to other issues. Or the cost might be incurred from engaging in politically costly fights with organized interests who support maintaining existing policy. For example, in 1990, Congress amended the Clean Air Act in an attempt to reduce acid rain. However, this revision was opposed by coal miners unions, including the United Mine Workers who claimed that imposing controls on sulfur dioxide emissions would leading to lost jobs (Patashnik, 2009). The cost paid by the incumbent party when they enact a revision need not only be paid by the party. Policy revision might lead voters to incur costs. For example, the cost of revision might come from compliance or adaptation frictions. In Section 6, I explore how different assumptions about who bears the cost affect the voter's welfare. In Section 7.1, I also relax the assumption that revision is costly.

Competence

In this model, Party B's competence refers to how accurate Party B's signal is about the state of the world. This is the same notion of competence that appears in the electoral accountability literature where the voter is unsure about the competence of an incumbent policymaker (Ashworth and Shotts, 2010; Canes-Wrone et al., 2001; Fox and Stephenson, 2011).

Applied to a political party, this notion of competence is related to the concept of issue ownership. Voters perceive political parties as being more competent on certain issues, and this is connected to vote choice (e.g. Ansolabehere and Iyengar (1994)). In this model, I assume that the Party B is ex ante less likely to be competent relative to Party A. So this model speaks to a possible pathway through which a party might gain ownership over an issue the opposing party historically had ownership over.

Incumbent's Preferences

One natural explanation for why parties revise existing legislation is ideological preferences. For example, congressional Republicans' tax reform bill during Trump administration can be understood as stemming from ideological preferences. But many votes in Congress are not on issues that have a clear ideological component, and this includes votes on policy revision (Lee, 2009). For example, during the 117th Congress, congressional Democrats, who held a majority in the House and the Senate, passed legislation to revise the Weather Research and Forecasting Innovation Act of 2017, and during the 114th, congressional Republicans revised the title 36 of the United States code to alter the congressional charter of the Disabled American Veterans organization.[4] Neither of these revisions moved policy in an obviously ideological direction—the revision to the Weather Research and Forecasting Innovation Act directed the National Oceanic and Atmospheric Administration to provide comprehensive and regularly updated information on precipitation and the revision to title 36, United States Code. While these reforms likely factor relatively little into voters' vote choice, other repeal attempts are more noteworthy even if they lack a clear ideological dimension. Returning to the ACA, the legislation's framework was based on legislation from Massachusetts that was passed by Democratic lawmakers and a Republican government Ragusa and Birkhead (2020). Despite the efforts by Republicans to repeal, the original piece of legislation did not necessarily have a strong ideological dimension.

Voter's Behavior

In the baseline model, I assume that the voter reelects Party B when Party B's probability of being competent exceeds Party A's probability of being competent. But this assumption does not mean the voter must value competence per se. Instead, one can interpret the voter as forward looking and concerned with policy quality. In Section 7.2, I consider a two-period version of the baseline model where the party that wins

[4]https://legiscan.com/US/bill/HB1437/2021, https://legiscan.com/US/bill/HB1755/2015

the election observes a noisy signal about a different independently drawn state of the world and enacts a new policy or chooses whether to retain a statue quo policy or revise. Recognizing this, the voter reelects Party B when its probability of being competent is higher than the challenger's. This is identical to the strategy used by the voter in the baseline model.

4 Revision Without Electoral Concerns

Before analyzing the full baseline model, it is instructive to consider two benchmark cases, first, when neither type of Party B faces a cost of revision or an electoral incentive; and second, where both types of Party B face a cost of revision but neither cares about being reelected. These benchmarks illustrate how information is conveyed through Party B's decision to revise or retain.

If neither type of Party B cares about reelection or faces a cost of revision, neither type considers the information conveyed by its decision to revise. Party B_{π_B} simply observes its private signal and revise the policy to its conditional expectation of the state. I refer to this strategy as Party B_{π_B}'s *efficient revision strategy*, and denote such a strategy for B_{π_B} as follows:

$$\tilde{y}_{B_{\pi_B}}(s_B) := \mathbb{E}[\theta|s_B].$$

Although Party B is not concerned with winning reelection, the voter still learns about its competence when she observes B's revision decision. Define the function $G(y_B)$ to be the probability that Party B is competent upon the voter observing y_B if both types of incumbent implement y_B using the efficient revision strategy. Lemma 1 establishes that there is a monotonic relationship between the "extremeness" or "drastic-ness" of policies implemented by the efficient revision strategy and the probability Party B is competent.

Lemma 1. *For any $\underline{\pi}$, $\overline{\pi}$, q_A, and q_B,*

(a) $G(y_B)$ is strictly increasing in $|y_B|$;

(b) $\lim_{|y_B|\to 0} G(y_B) < q_A$;

(c) and $\lim_{|y_B|\to\infty} G(y_B) = 1$.

The key intuition behind this result comes from the distribution of $\mathbb{E}[\theta|s_B]$ for B_{π_B}. The variance of this distribution is decreasing in the precision of B_{π_B}'s signal. This is because when B_{π_B}'s signal is not very precise, it puts relatively more weight on its prior than its signal when forming its posterior. On the other hand, when B_{π_B}'s signal is relatively more precise, it puts relatively more weight on its signal than its prior when forming its posterior. As a result, the more drastic the revision that Party B makes, the more likely B is competent. That is, *drastic revisions convey competence.*

The following definition is useful for analyzing the relationship between policies implemented by both types of Party B using the efficient revision strategy and Party B's probability of being competent.

Definition 1. *For a given $\overline{\pi}$, $\underline{\pi}$, q_B, and q_A, the policy $\hat{y}$, defined*

$$\hat{y}(\overline{\pi}, \underline{\pi}, q_A, q_B) := \sqrt{\frac{2\overline{\pi}\underline{\pi}\ln(\Sigma)}{2(\overline{\pi}-\underline{\pi})}},$$

where $\Sigma := \frac{q_A}{1-q_A}\frac{1-q_B}{q_B}\frac{\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}}{\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}}$, is the policy such that Party B's probability of being competent is equal to q_A if both types of Party B implement $\hat{y}$ using the efficient revision strategy

The assumption that Party A is ex ante more likely to be competent ensures that $\Sigma > 0$, which implies that $\hat{y} > 0$. This definition, along with Lemma 1, leads to the following corollary.

Corollary 1. *If both types of incumbent use the efficient revision strategy to implement y_B then $|y_B| \geq \hat{y}$ if and only if $G(y_B) \leq 1$, and $|y_B| < \hat{y}$ if and only if $G(y_B) > 1$.*

This corollary illustrates that there is a unique cutoff such that if both types of Party B use the efficient revision strategy to implement a policy and the policy is more extreme than the cutoff, the voter will reelect B, and if the policy is less extreme than the cutoff, the voter will elect A.

The following lemma provides insight into how $\hat{y}(\overline{\pi}, \underline{\pi}, q)$ depends the parties' prior probabilities of being competent.

Lemma 2. $\hat{y}(\overline{\pi}, \underline{\pi}, q_A, q_B)$ *is*

(a) strictly increasing in q_A;

(b) and strictly decreasing in q_B.

Lemma 2 illustrates that $\hat{y}$ varies with q_A and q_B in very intuitive ways.[5] The more likely Party B is competent, the less extreme of a policy needs to be implemented via

[5]When doing so does not lead to confusion, I write $\hat{y}(\overline{\pi}, \underline{\pi}, q)$ as $\hat{y}$.

efficient revision for the voter to believe the parties are equally likely to be competent. On the other hand, the more likely Party A is to be competent, the more extreme of a policy Party B needs to implement via efficient revision for the voter to believe it is as likely to be competent as Party A.

Lemma 1 and Corollary 1 are depicted in Figure 1, which plots Party B's probability of being competent as a function of y_B if y_B is implemented by both types of incumbent using the efficient revision strategy. The black horizontal lines denote $\hat{y}$.

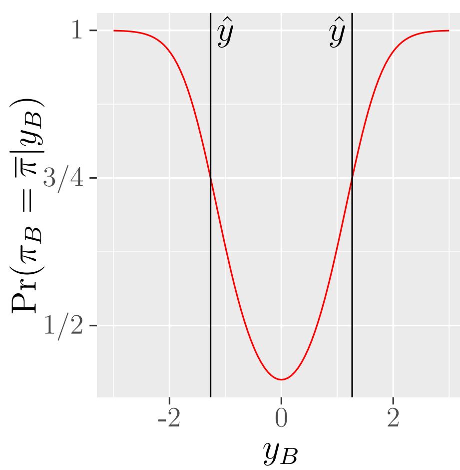

Figure 1: Probability Party B is competent when both types of incumbent implement y_B using the efficient revision strategy; vertical black lines denote $\hat{y}$; $\pi \in \{\frac{4}{10}, \frac{3}{2}\}$, $q_B = \frac{1}{2}$, and $q_A = \frac{3}{4}$.

To continue to build intuition, next consider a benchmark where there is no electoral incentive but there is a cost to revise the initial policy. In this case, B_{π_B} retains the initial policy when it observes a moderate signal and uses the efficient revision strategy when it observes an extreme signal. In particular, B_{π_B} retains if

$$|s_B| < \left(\frac{\pi + 1}{\pi}\right)\sqrt{c},$$

and uses the efficient revision strategy otherwise. Note that this means that even if the competent incumbent learns the state with certainty, as it will if $\overline{\pi} = \infty$, there will be moderate signals that lead it to retain the status quo because the cost of revision outweighs the benefit of revision.

In this benchmark, B's revision decision leads the voter to form one of two distinct types of beliefs. When B revises the policy, it uses the efficient revision strategy so B's probability of being competent is described by Lemma 1. But when B retains the initial policy, the voter knows B observed a moderate signal. Lemma 3 describes the effect of retaining the initial policy on B's probability of being competent.

Lemma 3. *Fix $x > 0$, and suppose that both types of B_{π_B} retain y_{SQ} when $|s_B| < (\frac{\pi+1}{\pi})x$. Then,* $\Pr(\pi_B = \overline{\pi}|y_B = y_{SQ}) < q_A$.

Lemma 3 illustrates that when both types of B retain when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c}$, retaining the initial policy has the opposite effect on B's probability of being competent than a drastic revision: *retaining conveys incompetence*. And when Party A is ex ante more likely to be competent, not only does retaining convey incompetence, but it always leads to A winning the election. The logic of this is closely related to the intuition behind Lemma 1. When Party B retains the initial policy, it is because its belief about the expected state is close to the prior, and an incompetent incumbent is more likely to believe the state is near the prior.

The following proposition characterizes the equilibrium of the benchmark without electoral concerns.

Proposition 1. *In the unique equilibrium when $b = 0$, for B_{π_B},*

$$y_B^* = \begin{cases} y_{SQ} & \textit{if } |s_B| < (\frac{\pi+1}{\pi})\sqrt{c} \\ \mathbb{E}[\pi|s_B] & \textit{if } |s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c}, \end{cases}$$

and

$$e^*(y_B) = \begin{cases} A \ \textit{if } y_B = y_{SQ} \\ A \ \textit{if } y_B \in [\sqrt{c}, \max\{\sqrt{c}, \hat{y}\}) \\ B \ \textit{if } y_B \geq \max\{\sqrt{c}, \hat{y}\}. \end{cases}$$

In the equilibrium described by Proposition 1, the voter reelects B when it revises to an extreme policy, and she elects A when B retains.[6] Whether B is reelected after any revision that occurs in equilibrium depends on the relationship between $\hat{y}$ and c. When c is relatively small ($\hat{y} > \sqrt{c}$), moderate revisions are made that are not extreme enough to signal sufficient competence for the voter to reelect Party B. And when c is relatively large ($\hat{y} \leq \sqrt{c}$), the most moderate revisions implemented are extreme enough that the voter reelects Party B when they are implemented.

[6]This equilibrium is robust to any off the equilibrium path beliefs in response to $y_B \in (0, \sqrt{c})$ since B does not care about reelection.

5 Cutoff Equilibria

In this section, I analyze the full baseline model. To do so, I focus on cutoff equilibria where the voter elects Party B if and only if $|y_B|$ is below (above) a cutoff. Proposition 2 formalizes an implication of Lemma 1 that simplifies the analysis of voter-cutoff equilibria.

Proposition 2. *No cutoff equilibria exist where the voter elects Party B if and only if $|y_B| < m$.*

This is a result of two forces. First, regardless of the cost of revision and the benefit of reelection, if B_{π_B} observes a significantly extreme signal, it will use its efficient revision strategy. This is because the cost of retaining the initial policy and receiving a bad policy payoff will outweigh all other considerations. Second, Lemma 1 illustrates that when both types of B utilize the efficient revision strategy, there is a cutoff such that when the implemented policy is more extreme than the cutoff, the voter reelects B. Together, these forces means there are always extreme policies that both types of B will implement using the efficient revision strategy, and at least the most extreme of these policies will be extreme enough that the voter will reelect B.

In light of Proposition 2, I focus on the possibility of cutoff equilibria where the voter elects Party B if and only if $|y_B| \geq m \geq 0$. Since this is the only type of voter-cutoff equilibrium that may exist, I refer to equilibria with this form as *cutoff equilibria*.

Suppose first that the cost of revision is relatively large compared to $\hat{y}$. In particular, assume that $\hat{y} > \sqrt{c}$. This is the setting where, in the benchmark without electoral incentives, Party B is reelected any time it makes a revision in equilibrium. The following proposition describes equilibria that arise when the benefit of reelection is small relative to the cost of changing the initial policy.

Proposition 3. *If $\hat{y} \leq \sqrt{c-r}$, a continuum of cutoff equilibria exist where $m^* \in (0, \sqrt{c-r}]$, and for B_{π_B},*

$$y_B^* = \begin{cases} y_{SQ} & \text{if } |s_B| < (\frac{\pi+1}{\pi})\sqrt{c-r} \\ \mathbb{E}[\theta|s_B] & \text{if } |s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c-r}. \end{cases}$$

Proposition 3 demonstrates that if c is sufficiently large ($\sqrt{c} > \hat{y}$) and r is sufficiently small, a cutoff equilibrium exists. Moreover, the cutoff equilibrium looks very similar to the benchmark without election incentives. When B_{π_B} observes a moderate signal, it retains, and when it observes an extreme signal, it uses the efficient revision strategy. In response, the voter reelects Party B if and only if it revises, and elects A when B retains.

The addition of reelection concerns pushes both types of B to revise the policy more often than when there aren not any electoral concerns. Suppose that in the absence of electoral incentives, when B_{π_B} observed s'_B it was essentially indifferent between revising and retaining. If revising leads to obtaining a small reelection payoff, then when B_{π_B} observes s'_B, it strictly prefers revision. This leads to more revision.

However, if the value of reelection is too large or the cost of revision is too small, a problem emerges. If $\hat{y} > \sqrt{c-r}$, both types of B implement revisions in the interval $[\sqrt{c-r}, \hat{y}]$. Since $m^* \leq \sqrt{c-r}$, the voter reelects Party B when it implements these policies. But because these policies are less extreme than $\hat{y}$, the voter does not believe Party B is likely enough to be competent to warrant reelection. So this cannot be an equilibrium. As a result, if $\hat{y} > \sqrt{c-r}$, m^* cannot be less than $\sqrt{c-r}$.

Another way to think about this issue is in terms of Party A's probability of being competent. Since $\hat{y}$ is increasing in q_A, if the probability Party A is competent is sufficiently high such that $\sqrt{c-b} > \hat{y}$, then this type of equilibrium does not exist. The issue is that while both types of Party B are willing to implement moderate revisions if they will be reelected as a result, Party A is sufficiently likely to be competent that the voter will not reelect Party B after these revisions. As a result, m^* must be larger than $\hat{y}$.

It remains to show what happens when the equilibria described by Proposition 3 do not exist. This occurs for two reasons: either because $\sqrt{c} > \hat{y}$ but r is sufficiently large—this is the case described in the previous paragraphs—or because $\sqrt{c} < \hat{y}$—in which case the continuum of equilibria described above do not exist for any b. The following lemma is helpful for analyzing the remaining cutoff equilibria.

Lemma 4. *Fix s_B. In any cutoff equilibrium with cutoff m^*, B_{π_B} chooses one of the following revision decisions:*

(a) Retain: $y_{B_{\pi_B}}(s_B) = y_{SQ}$;

(b) Efficient Revision: $y_{B_{\pi_B}}(s_B) = \tilde{y}_{B_{\pi_B}}(s_B)$;

(c) Exaggerated Revision:

$$y_{B_{\pi_B}}(s_B) = \begin{cases} m^* & \text{if } \mathbb{E}[\theta|s_B] > 0 \\ -m^* & \text{if } \mathbb{E}[\theta|s_B] < 0 \end{cases}$$

In any cutoff equilibrium, B_{π_B} either makes one of the revisions that occurs in the equilibrium described by Proposition 3 or engages in *exaggerated revision* where it implements a revision that is more extreme than its signal indicates is optimal, in terms of policy quality, since it will win reelection. Party B_{π_B} will find this to be a best response when it observes a signal such that its posterior is close to the voter's cutoff but is more moderate. As a result, if it use the efficient revision strategy it will not be reelected. However, if its conditional expectation of the state is sufficiently close to the cutoff, the cost of implementing sub-optimal policy that is just extreme enough to win reelection, will be outweighed by the benefit of reelection.

For exaggerated revision to be part of an equilibrium strategy for Party B of either type, it must be that when the voter observes exaggerated revision, she is willing to reelect Party B. The following definition is useful for characterizing such cases.

Definition 2. *If both types of Party B choose $y_B = m$ when $s_B \in ((\frac{\pi+1}{\pi})\phi(m), (\frac{\pi+1}{\pi})m)$, where*

$$\phi(m) = \begin{cases} \frac{m^2+c-r}{2m} & \text{if } m \in (\sqrt{\max\{c-r, r-k\}}\sqrt{c}+\sqrt{r}] \\ m-\sqrt{r} & \text{if } m > \sqrt{c}+\sqrt{r}, \end{cases}$$

then

$$M := \{m | \Pr(\pi_B = \overline{\pi} | y_B = m) \geq q_A\}.$$

The set M is the set of cutoffs such that Party B_{π_B} implements an exaggerated revision when it sees a particular set of moderate signals, the voter will believe Party B is likely enough to be competent to warrant reelecting when they see an exaggerated revision.

The following proposition describes two cutoff equilibria that exist when the equilibria described by Proposition 3 do not exist.

Proposition 4. *A cutoff equilibrium with cutoff m^* exists if*

(a) $m^* \in M$, $m^* \in (\max\{\sqrt{\max\{c-r, r-k\}}, \hat{y}\}, \sqrt{c}+\sqrt{r}]$, and for B_{π_B},

$$y_B^* = \begin{cases} y_{SQ} & \text{if } |s_B| < (\frac{\pi+1}{\pi})\frac{m^{*2}+c-r}{2m^*} \\ m^* & \text{if } s_B \in ((\frac{\pi+1}{\pi})\frac{m^{*2}+c-r}{2m^*}, (\frac{\pi+1}{\pi})m^*) \\ -m^* & \text{if } s_B \in (-(\frac{\pi+1}{\pi})m^*, -(\frac{\pi+1}{\pi})\frac{m^{*2}+c-r}{2m^*}) \\ \mathbb{E}[\theta | s_B] & \text{if } |s_B| \geq (\frac{\pi+1}{\pi})m^*; \end{cases}$$

(b) or if $m^* \in M$, $m^* \in [\max\{\sqrt{c}+\sqrt{r}, \hat{y}\}, \hat{y}+\sqrt{r})$, and for B_{π_B}

$$y_B^* \begin{cases} y_{SQ} & \text{if } |s_B| < (\frac{\pi+1}{\pi})\sqrt{c} \\ \mathbb{E}[\theta|s_B] & \text{if } |s_B| \in ((\frac{\pi+1}{\pi})\sqrt{c}, (\frac{\pi+1}{\pi})(m^* - \sqrt{r})) \\ m^* & \text{if } s_B \in ((\pi+1)(m^* - \sqrt{r}), (\frac{\pi+1}{\pi})m^*) \\ -m^* & \text{if } s_B \in (-(\frac{\pi+1}{\pi})m^*, -(\pi+1)(m^* - \sqrt{r})) \\ \mathbb{E}[\theta|s_B] & \text{if } |s_B| \geq (\frac{\pi+1}{\pi})m^*. \end{cases}$$

When a Party B_{π_B} observes a signal such that $\mathbb{E}[\theta|s_B] \geq \sqrt{c-r}$, it prefers to use its efficient revision strategy if it is able to do so and win reelection relative to retaining the status quo. This implies that if it is not able to use its efficient revision strategy to win reelection, but its conditional expectation is sufficiently close to m^*, Party B_{π_B} is willing to implement an exaggerated revision to win reelection. In the equilibria described in Proposition 4, this leads to both types of B using exaggerated revision, *even though that revision isn't the optimal policy given their signal.*

Of course, for this to be part of an equilibrium, the voter needs to believe that Party B is likely enough to be competent that she reelects Party B when B implements an exaggerated revision. For this to be the case, the voter's cutoff must be an element of M.

The primary difference between the two equilibria described in Proposition 4 is that in the second type, the voter's cutoff is especially extreme. As a result, there are signals that are extreme enough that B_{π_B} does not want to maintain the initial policy, yet are moderate enough that exaggerated revision would require implementing too inferior of a policy to make reelection worth it. As a result, B_{π_B} uses its efficient revision strategy even though it means it won't be reelected.

One additional thing to note is that multiple distinct types of equilibria can exist simultaneously. If $\hat{y} \leq \sqrt{c-r}$, the equilibria described by Proposition 3 exist as do the first type of equilibria described in Proposition 4. And when $\sqrt{c} > \hat{y}$, both types of equilibria in Proposition 4 may exist simultaneously.

The next proposition rules out the existence of other cutoff equilibria.

Proposition 5. *Any cutoff equilibrium is of the types described in Propositions 3 and 4.*

This proposition rules out cutoff equilibria where $m^* \in [0, \sqrt{r-c}]$. For equilibria with such a cutoff to exist, the voter would need to be willing to always elect B. But the assumption that Party A is ex ante more likely to be competent than Party B implies this is not the case.

5.1 Discussion of Cutoff Equilibria

While there is some variation in the structure of the different cutoff equilibria of this model, all cutoff equilibria share important features. First, in all cutoff equilibria, the support of the distribution of policies enacted by B_{π_B} is the same, regardless of its type. That is, there are no policies that perfectly reveal Party B's type. This is a feature of my model that differs from Bils (2023), who studies a similar setup. In the equilibrium analyzed in Bils (2023), an incompetent incumbent mixes between choosing the ex ante optimal policy, and two specific policies that will get them reelected with positive probability. To make them indifferent, when the voter observes a policymaker implement the policy the incompetent types implements that is not the ex ante likely policy, they mix between reelecting the incumbent and replacing them with the challenger (the competent policymaker also implements the specific policies with some probability which is why the voter is willing to mix). This equilibrium structure is due to the fact that an incompetent incumbent learns nothing about the state; that is, their conditional expectation is constant. In contrast, in my model, both types of incumbent learn about the state. Moreover, the policy portion of B_{π_B}'s expected utility can be separated into a bias and variance component, and the variance component is constant over all signals. This means that the key feature for determining B_{π_B}'s equilibrium action is their conditional expectation of the state and how close it is to the status quo policy and the voter's cutoff. As a result, both incumbents use the same cutoff strategy, but different signals induce different actions depending on type.

Second, in all cutoff equilibria, Party B is only reelected if it revises. The driving force behind this is the fact that the further a posterior belief is from the status quo policy, the more likely that belief is held by a competent party. This is similar to other models where taking an action signals competence (Patty, 2016; Spiegler, 2013; Bils, 2023), and lends credence to the folk theory that for a party to win reelection, they need to do something while in office.

A third feature is common to cutoff equilibria that exist when c is sufficiently small or when r is sufficiently large—those described by Proposition 4. In these equilibria, both types of Party B implement exaggerated revisions. The setup of this model shares many features with classical models of pandering in which a policymaker has an incentive to pander—implement a policy the voter believes to be in their best interest even though the policymaker expects a different policy is better for the voter (Ashworth and Shotts, 2010; Canes-Wrone et al., 2001). Classic works in pandering share three features: first, there is uncertainty about the state of the world and one state is ex ante more likely;

second, the policymaker observes a signal about the state prior to enacting policy and the quality of that signal depends on the policymakers' competence; third, the enacted policy's quality is not necessarily revealed before the voter decides whether to reelect Party B. An implication of Bayes' rule in this setting is that a policymaker whose signal agrees with the prior is more likely to be competent than incompetent (Ashworth and Shotts, 2010). This incentivizes pandering.

Yet, despite the similarities between this model and models in which pandering emerges, in my model neither type of incumbent is subject to an incentive to pander. In fact, both types of incumbent face an incentive to make exaggerated revisions. This exaggerated revision incentive arises due to the fact that incompetent incumbent puts more weight on their prior when forming a posterior belief.[7]. As a result, holding a posterior belief that diverges from the prior signals competence, and as shown by Lemma 1, this effect increases in the degree of divergence.

The emergence of exaggerated revision is also related to the probability Party A is competent. As the probability A is competent increases, $\hat{y}$ also increases. This means that when q_a is sufficiently large such that $\hat{y} > c$ or $\hat{y} > \sqrt{c-r}$, any cutoff equilibria that exist will have exaggerated revision. This is because when $\hat{y}$ is relatively large, the voter requires more drastic revisions for Party B to be reelected. If this is combined with a relatively small cost of revision or a relatively large benefit of reelection, Party B_{π_B} is willing to implement moderate revisions if it will be reelected, but Party A is too likely to be competent for moderate revisions to lead to Party B's reelection. Hence, exaggerated revision emerges because Party B_{π_B} is willing to implement sub-optimal policy to obtain reelection.

The addition of electoral incentives also produces similar effects across the cutoff equilibria. The following corollaries clarify the effect of introducing reelection incentives on the probability of revision and the "extremeness" of the revisions enacted.

Corollary 2. *Fix $q, k, \overline{\pi}$, and $\underline{\pi}$. In any equilibrium where $r > 0$, the probability Party B revises the status quo policy is weakly greater than the probability B revises the status quo policy in the benchmark with no electoral incentive.*

[7]This anti-pandering incentive also appears in Kartik et al. (2015), Bils (2023), and Honryo (2013). In Kartik et al. (2015), this effect emerges from the relationship between combining signals and the posterior mean the combined signals lead to. In Bils (2023) and Honryo (2013), this effect emerges in similar way, but is studied in a setting where an competent politician learns everything while an incompetent politician learns nothing. In Bils (2023), this means that only competent policymakers overreact to information while the incompetent policymakers "posture". In my model, this effect emerges even if the two types of incumbent are extremely similar in terms of the precision of their signal.

The implication of this corollary is that introducing value to reelection leads to more policy revision. This result resonates with empirical findings that individual electoral incentives push legislators to allocate effort toward measures of observable productivity (Fouirnaies and Hall (2022)).

Corollary 3. *Fix $q, c, b, \overline{\pi}$, and $\underline{\pi}$. If $y^{b>0*}_{B_{\pi_B}}(s_B)$ is B_{π_B}'s equilibrium strategy in an equilibrium where $b > 0$, and $y^{b=0*}_{B_{\pi_B}}(s_B)$ is B_{π_B}'s equilibrium strategy when $b = 0$,*

$$|y^{b=0*}_{B_{\pi_B}}(s_B)| \leq |y^{b>0*}_{B_{\pi_B}}(s_B)|,$$

for any s_B.

The addition of a reelection incentive has two effects on the policies that B_{π_B} implements in equilibrium. First, it may push Party B_{π_B} to revise when it otherwise would have retained. Second, it may push Party B_{π_B} to make an exaggerated revision which is more extreme policy than it would have implemented if it retained or if it used the efficient revision strategy.

6 Welfare from Policy Quality

The analysis in the preceding section illustrates that the addition of electoral incentives leads to a higher probability of revision, to more extreme policy implementation, and to the possibility of exaggerated revision. But what does this mean for the voter's welfare? In this section, I assume the voter cares about policy quality in addition to the competence of the party she elects at the end of the game. In particular, I assume the voter receives the following utility from policy quality:

$$u_{V_{PQ}}(r, c, c_V) = -(\theta - y_B)^2 - \mathbb{1}_{y_B \neq y_{SQ}} c_V,$$

where $c_V \geq 0$ is a cost the voter pays if Party B revises the status quo.[8] If c, the cost Party B pays if it revises, is the cost of enacting policy—drafting legislation, foregone time that could have been spent on fundraising, etc.—then c_V may be zero. But if c is the cost of adapting or complying with a new policy or the opportunity cost of not passing other important legislation, then $c_V > 0$. The voter's welfare from policy quality depends on the interpretation of c.

[8]Since the revision decision is made before the voter makes their election decision, this alteration to the voter's utility function does not affect their election decision. As a result, this will not affect Party B's revision decision.

As a reference, note that when $c_V = 0$, the voter's policy welfare is maximized when both types of Party B uses the efficient revision strategy for any s_B. And when $c_V > 0$, the voter's policy welfare is maximized when both types of Party B retain the status quo when $\mathbb{E}[\theta|s_B] < \sqrt{c_V}$, and uses the simple revision otherwise.

Proposition 6. *If $c = c_V > 0$, the voter's policy welfare is higher in the benchmark without electoral incentives than in any cutoff equilibrium when $r > 0$.*

When the voter and Party B pay the same cost when policy is revised, the introduction of reelection incentives decreases the voter's welfare from policy quality. There are two reasons for this. First, sometimes the value of reelection incentivizes Party B_{π_B} to make revisions when it sees more moderate signals rather than retaining the status quo. This makes the voter worse off because the cost exceeds the benefit of improved policy. Second, sometimes the value of reelection leads both types of Party B to engage in exaggerated revision. If, for the same signals, B_{π_B} would have otherwise engaged in efficient revision, this makes the voter worse off. Some combination of these two forces is present in any equilibria where $r > 0$ which leads to decreased policy welfare for the voter.

In Federalist 62, James Madison defends six year Senate terms by arguing

> "The internal effects of a mutable policy are still more calamitous. It poisons the blessing of liberty itself. It will be of little avail to the people, that the laws are made by men of their own choice, if the laws be so voluminous that they cannot be read, or so incoherent that they cannot be understood; if they be repealed or revised before they are promulgated, or undergo such incessant changes that no man, who knows what the law is to-day, can guess what it will be to-morrow. Law is defined to be a rule of action; but how can that be a rule, which is little known, and less fixed?" (Madison, 1788)

Tocqueville also feared excessive mutability of laws, stating "The mutability of the laws is an evil inherent in democratic government, because it is natural to democracies to raise men to power in vary rapid succession" (Tocqueville, 2003). In Tocqueville and Madison's view, voters have a preference for stability. In Madison's case, this preference comes from a desire to know what the law is and not fear that it will change tomorrow. By holding too frequent of elections, too much policy change will occur because elections bring new legislators into office who have different views about what policy is correct. In my model, when Party B and the voter have the same preference for stability, new beliefs about what the optimal party is are good because Party B only revises when they believe existing policy is insufficient, and when they revise they implement the optimal policy. The issue is revision conveys competence to the voter, so the addition of reelection incentives leads Party B to implement more revision and to implement exaggerated revisions to obtain reelection. Both of these make the voter worse off.

Proposition 7. *If $c = c_V$ are are sufficiently large, and $r > 0$, generically, in any cutoff equilibrium, if c is sufficiently small, the voter's policy welfare is increasing for small increases in c.*

Proposition 6 shows when $r > 0$, the voter's welfare from policy quality is lower relative to the benchmark when $r = 0$. Moreover, when c is sufficiently large, in any equilibrium, Party B's ex ante probability of implementing a revision is larger than the probability of revision in the benchmark case where $r = 0$. In this case, given the the specific equilibrium, if c is not too large, a small increase in c leads to both types of Party B retaining the status quo when they otherwise would have revised to a moderate policy or made an exaggerated revision. Given c_V, these are revisions the voter would prefer Party B not to make, so this improves the voter's welfare from policy.

Concerns about gridlock and Congress' inability to pass legislation are common in scholarship and among the media (Binder, 2004; Jacob et al., 2023). But, if voters pay a cost when policies are reformed, and if electoral incentives push the incumbent party to enact additional revisions, then making it harder to pass reforms may make the voter better off from the standpoint of improving policy quality.

So far, I have assumed that $c_V > 0$. But if the cost of revision is entirely borne by Party B or largely borne by Party B, $c_v = 0$ or c_V is relatively small. In this case, Party B's electoral incentive may improve the voter's welfare from policy quality.

Proposition 8. *If c is sufficiently large, c_V is sufficiently small, and r is sufficiently small, generically, in any cutoff equilibrium, if r is sufficiently small, the voter's policy welfare is increasing for small increases in r.*

When c_V is sufficiently small, the voter wants both types of Party B to make moderate revision that neither Party B wants to make because the cost it faces is too high. When $\sqrt{c} > \hat{y}$, there are two types of possible equilibria. In the first, Party B_{π_B} retains the status quo for moderate signals or implements efficient revisions for more extreme signals. Increasing r leads both types of Party B to make additional moderate revisions, and because c_V is sufficiently small, this improves the voter's policy welfare. In the second, both types of Party B also implement exaggerated revisions following intermediate signals.

While these revisions are not efficient in the sense that Party B_{π_B} does not implement the policy that maximizes the policy payoff, these revisions may improve the voter's policy welfare if the alternative is to retain the status quo. This is what happens when $r < c$. When r increases a small bit, both types of Party B implement additional exaggerated revisions, and this improves policy quality relative to retaining the status quo.

Proposition 9. *If $c_V = 0$, and c is sufficiently small or r is sufficiently large, generically, in any cutoff equilibrium, if r is sufficiently small, the voter's policy welfare is decreasing for small increases in r.*

Proposition 9 illustrates that a natural intuition—that electoral incentives hurt voters in an electoral accountability framework—emerges in this model (e.g. Judd et al. (2017)). When r is sufficiently large or c is sufficiently small, any cutoff equilibria involve exaggerated revision. Increasing the reelection incentive leads to both types of Party B engaging in more exaggerated revision—either in place of maintaining the status quo or in place of implementing efficient revisions. In the first case, when r is sufficiently large, increasing r means both types of Party B implement exaggerated revisions when the voter would prefer the maintain the status quo, and in the second case, increasing r means Party B implements exaggerated revisions when they would otherwise implement efficient revisions. In both cases, the voter is worse off.

7 Robustness

In this section, I assess the robustness of the baseline results by relaxing some assumptions from the baseline model.

7.1 Costless Revision

In the baseline model, I focus on a setting where Party B party pays a positive cost to revise the initial policy. I now focus on the case where $c = 0$.

Proposition 10. *If $c = 0$, then in any cutoff equilibrium $m^* \in M$, $m^* \in [\hat{y}, \hat{y} + \sqrt{r})$, and* *for* B_{π_B},

$$y_B^* = \begin{cases} \frac{s_B}{\pi+1} & \textit{if } |s_B| < (\frac{\pi+1}{\pi})(m^* - \sqrt{r}) \\ m^* & \textit{if } |s_B| \in ((\frac{\pi+1}{\pi})(m^* - \sqrt{r}), (\pi+1)m^*) \\ -m^* & \textit{if } |s_B| \in (-(\pi+1)m^*, -(\frac{\pi+1}{\pi})(m^* - \sqrt{r})) \\ \frac{\pi s_B}{1+\pi} & \textit{if } |s_B| \geq (\frac{\pi+1}{\pi})m^*. \end{cases}$$

When revision is costless to Party B, the equilibria look like the second type of equilibria in Proposition 4. The primary difference is that when $c = 0$, both types of incumbent almost surely revise the initial policy, whereas in the second type of equilibria in Proposition 4, both types of incumbent retain the initial policy following moderate signals.[9]

Proposition 10 clarifies that the cost of revision does not play a critical role in some aspects of the qualitative story told by the baseline model; particularly, the informational story. When $c = 0$, drastic revisions still convey competence, whereas small revisions do not lead to Party B's reelection. This is essentially the story of Bils (2023), who studies a model where there is no cost of policy making. In the equilibrium of Bils (2023), the policy maker is only reelected if they implement a sufficiently drastic policy.

In a model with a continuous state space and no cost to revise, the policy maker never retains the status quo. However, we observe many instances where policy is retained from the past. Moreover, in a model without a cost of revision, the reelection incentives unambiguously have a negative effect on policy quality because these incentives always lead to exaggerated revision. But when there are large costs of policy revision, increased moderately increasing reelection incentives improves policy quality.

7.2 Voter's Preference for Policy Quality

In the baseline model, I assume the voter reelects Party B if Party B's probability of being competent is greater than Party A's. In this section, I relax this assumption, and examine a setting where the voter is forward looking and cares about policy quality. This is the typical setting of many electoral accountability models (Canes-Wrone et al., 2001; Ashworth and Shotts, 2010). To study this setting, I consider an extension where after the baseline model ends, nature draws independently draws a new state, $\omega \sim \mathcal{N}(0, 1)$. Then Party $i \in \{A, B\}$—whichever party was elected by the voter at the end of the baseline model—privately observes a new signal $s_{i,\omega} = \omega + \epsilon_i$. If B won the election, the error

[9]Technically speaking, the probability Party B retains the initial policy is the probability it observes $s_B = 0$, which occurs with measure zero probability.

term for its signal is independently drawn from the same distribution as in the first period, and if A won the election, the error term is drawn from a standard normal distribution. Finally, the winner of the election chooses a policy $z_i \in \mathbb{R}$.

B_{π_B}'s utility function is the same as in the baseline except it also cares about the quality of policy z_i:

$$u_{B_{\pi_B}} = -(y_B - \theta)^2 - \mathbb{1}_{y_B \neq y_{SQ}} c + \mathbb{1}_{e=B} b - (z_i - \omega)^2,$$

Party A also cares about the quality of policy z_i and the cost it pays if it is in office and revises

$$u_C = -(z_i - \omega)^2$$

and the voter cares about policy quality as well,

$$u_V = -\left(y_B - \theta\right)^2 - \left(z_i - \omega\right)^2$$

This game is solved by backward induction. If B_{π_B} is the incumbent party in the second period, it will revise the status quo to $z_B = \mathbb{E}[\omega | s_{B,\omega}]$. And if Party A wins the election, it will revise the status quo to $z_A = \mathbb{E}[\omega | s_{A,\omega}]$.

Lemma 5. *The voter reelects Party B if and only if* $\Pr(\pi_B = \overline{\pi} | y_B) \geq q_A$.

Suppose that the second period policymaking has the same form as the baseline model: there's a status quo $z_{SQ} = 0$, and the incumbent party pays a cost c to revise.

Lemma 6. *If the second period incumbent chooses whether to make a costly revision to the status quo, the voter reelects Party B if and only if* $\Pr(\pi_B = \overline{\pi} | y_B) \geq q_A$.

Remarks 6 and 5 show that voter's assumed strategy in the baseline model can be microfounded by an extension where the voter cares about the parties' ability to enact quality policy in the future either via revision or as an entirely new policy.

8 Conclusion

I presented a simple formal model that highlights how policy revision interacts with uncertainty about competence. In equilibrium, drastic revisions convey competence, while retaining the original policy conveys incompetence. As a result, the voter rewards revision by reelecting parties that revise. This means that the reelection incentive motivates policy revision. This produces exaggerated revision in equilibrium.

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9 Appendix: Proofs

9.1 Proof of Lemma 1

Proof. If both types of B utilize the efficient revision strategy for all s_B, then for each B_{π_B}, $y_B \sim \mathcal{N}(0, \frac{1}{\pi+1})$. Then, if the voter observes y_B, which is implemented via the efficient revision strategy by both types of B, B's expected competence is given by

$$G(y_B) := \Pr(\pi_B = \overline{\pi} | y_B \neq y_{SQ}) = \frac{q_B \frac{1}{\sqrt{2\pi}\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}} e^{-\frac{y_B^2(1+\overline{\pi})}{2\overline{\pi}}}}{q_B \frac{1}{\sqrt{2\pi}\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}} e^{-\frac{y_B^2(1+\overline{\pi})}{2\overline{\pi}}} + (1-q_B)\frac{1}{\sqrt{2\pi}\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}} e^{-\frac{y_B^2(1+\underline{\pi})}{2\underline{\pi}}}}. \tag{1}$$

(a) Differentiating (1) with respect to y_B,

$$\frac{\partial \Pr(\pi_B = \overline{\pi} | y_B \neq y_{SQ})}{\partial y_B} = \frac{e^{\frac{(\overline{\pi}+\underline{\pi}+2\overline{\pi}\underline{\pi})y_B^2}{2\overline{\pi}\underline{\pi}}} \sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}(\overline{\pi}-\underline{\pi})\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}(1-q_B)q_B y_B}{\overline{\pi}\underline{\pi}(e^{\frac{(1+\overline{\pi})y_B^2}{2\overline{\pi}}}\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}(q_B-1) - e^{\frac{(1+\underline{\pi})y_B^2}{2\underline{\pi}}}\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}q_B)^2}$$

The derivative is positive when $y_B > 0$ and negative when $y_B < 0$. Therefore, $G(y_B)$ is increasing in $|y_B|$.

(b) This follows from taking the limit of $G(y_B)$ as $|y_B| \to 0$, which is

$$\lim_{y_B \to 0} = \frac{q_B \overline{\pi} \frac{1}{\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}}}{q_B \frac{1}{\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}} + (1-q_B)\frac{1}{\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}}}. \tag{2}$$

Expression (2) is smaller than q_B when

$$\frac{1}{\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}} < q_B \frac{1}{\sqrt{\frac{\overline{\pi}}{1+\overline{\pi}}}} + (1-q_B)\frac{1}{\sqrt{\frac{\underline{\pi}}{1+\underline{\pi}}}},$$

which is always satisfied because $\frac{1}{\sqrt{\frac{\pi}{1+\pi}}}$ is decreasing in π. Then, because $q_B < q_A$, Expression (2) $< q_A$.

(c) This follows from taking the limit of $G(y_B)$ as $y_B \to \infty$ and as $y_B \to -\infty$. In both cases, $G(y_B) \to 1$.

■

9.2 Proof of Lemma 2

Proof. This follows from differentiating $\hat{y}(\overline{\pi}, \underline{\pi}, q_A, q_B)$ with respect to q_A and q_B. To begin, note that $\sqrt{\frac{\overline{\pi}\underline{\pi}\ln(\Sigma)}{\overline{\pi}-\underline{\pi}}} > 0$ by Assumption ??. To simplify the expressions, define $\Delta = \sqrt{\frac{\overline{\pi}\underline{\pi}\ln(\Sigma)}{\overline{\pi}-\underline{\pi}}}$.

(a) With respect to q_A,

$$\frac{\partial \hat{y}(\overline{\pi}, \underline{\pi}, q_A, q_B)}{\partial q_A} = \frac{\overline{\pi}\underline{\pi}}{\sqrt{2}(\overline{\pi}-\underline{\pi})(1-q_A)q_A\Delta} > 0$$

(b) With respect to q_B,

$$\frac{\partial \hat{y}(\overline{\pi}, \underline{\pi}, q_A, q_B)}{\partial q_B} = -\frac{\overline{\pi}\underline{\pi}}{\sqrt{2}(\overline{\pi}-\underline{\pi})(1-q_b)q_B\Delta} < 0$$

∎

9.3 Proof of Lemma 3

Proof. Note that for each B_{π_B}, $s_B \sim \mathcal{N}(0, 1+\frac{1}{\pi})$. If both types of B retain y_B when $|s_B| < (\frac{\pi+1}{\pi})x$, then

$$\Pr(\pi_B = \overline{\pi} | y_B = y_{SQ}) = \frac{q_B \frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\overline{\pi}}}} \int_0^{(\frac{\overline{\pi}+1}{\overline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\overline{\pi}})}} dt}{q_B \frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\overline{\pi}}}} \int_0^{(\frac{\overline{\pi}+1}{\overline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\overline{\pi}})}} dt + (1-q_B)\frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\underline{\pi}}}} \int_0^{(\frac{\underline{\pi}+1}{\underline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\underline{\pi}})}} dt}$$

Then, $\Pr(\pi_B = \overline{\pi} | y_B = y_{SQ}) < q_A$, when

$$\frac{\frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\overline{\pi}}}} \int_0^{(\frac{\overline{\pi}+1}{\overline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\overline{\pi}})}} dt}{\frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\underline{\pi}}}} \int_0^{(\frac{\underline{\pi}+1}{\underline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\underline{\pi}})}} dt} < \frac{q_A}{1-q_A}\frac{1-q_B}{q_B}. \tag{3}$$

The CDFs on the LHS of 3 can be converted to standard normal distributions using Z-scores. Therefore, (3) is equivalent to

$$\frac{\frac{1}{\sqrt{2\pi}} \int_0^{\frac{(\frac{\overline{\pi}+1}{\overline{\pi}})x}{\sqrt{1+\frac{1}{\overline{\pi}}}}} e^{-\frac{t^2}{2}} dt}{\frac{1}{\sqrt{2\pi}} \int_0^{\frac{(\frac{\underline{\pi}+1}{\underline{\pi}})x}{\sqrt{1+\frac{1}{\underline{\pi}}}}} e^{-\frac{t^2}{2}} dt} < \frac{q_A}{1-q_A}\frac{1-q_B}{q_B}. \tag{4}$$

The expression $\frac{(\frac{\pi+1}{\pi})x}{\sqrt{1+\frac{1}{\pi}}}$ is decreasing in π:

$$\frac{\partial}{\partial \pi}\frac{(\frac{\pi+1}{\pi})x}{\sqrt{1+\frac{1}{\pi}}} = -\frac{x}{2\pi^{\frac{3}{2}}\sqrt{1+\pi}} < 0$$

for $x > 0$. Therefore, the LHS of 4 is smaller than one for any $x > 0$. Moreover, by the assumption $q_A > q_B$, $\frac{q_A}{1-q_A}\frac{1-q_B}{q_B} > 1$. Hence, the voter will elect A whenever B retains using a cutoff strategy of the form retain if and only if $|s_B| < (\frac{\pi+1}{\pi})x$. ■

9.4 Proof of Proposition 1

Proof. The best responses for both types of B are described in the text. Fix both type of of Party B's strategy. By Lemma 1, if $|y_B| \in [\sqrt{c}, \infty)$ and $|y_B| \geq \hat{y}$, the voter will elect B, and if $|y_B| \in [\sqrt{c}, \infty)$ and $|y_B| < \hat{y}$, the voter will elect A. Finally, by Lemma 3, the voter elects A when B retains y_B. ■

9.5 Proof of Proposition 2

Proof. Suppose not. Then there exists a $m \geq 0$ such that when $|y_B| \leq m$, the voter elects B and when $|y_B| > m$, the voter elects A.

Suppose first that $m > 0$. Then suppose that B observes s_B such that $|\frac{\pi s_B}{1+\pi}| > m$. B will use their efficient revision strategy when

$$-\frac{1}{1+\pi} - k \geq -\frac{1}{1+\pi} - \left(\frac{\pi s_B}{1+\pi}\right)^2 + b$$
$$\Leftrightarrow |s_B| \geq \left(\frac{\pi+1}{\pi}\right)\sqrt{r+c}.$$

Therefore, if $|\frac{\pi s_B}{1+\pi}| \geq \max\{\hat{y}, \sqrt{r+c}\}$, both types of Party B will use their efficient revision strategy and the voter will elect B. This is a contradiction.

Now suppose $m = 0$. B_{π_B} will use its efficient revision strategy when

$$-\frac{1}{1+\pi} - k \geq -\frac{1}{1+\pi} - \left(\frac{\pi s_B}{1+\pi}\right)^2$$
$$\Leftrightarrow |s_B| \geq \left(\frac{\pi+1}{\pi}\right)\sqrt{c}.$$

Therefore, if $|\frac{\pi s_B}{1+\pi}| \geq \max\{\hat{y}, \sqrt{c}\}$, both types of Party B will use their efficient revision strategy and the voter will elect B. This is a contradiction. ■

9.6 Proof of Proposition 3

Proof. Fix $m \in (0, \sqrt{c-r}]$. Note, this requires $c > r$. Lemma 4 implies that B_{π_B} will utilize the efficient revision strategy when $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c-r}$, and will retain y_B otherwise.

Fix B_{π_B}'s strategy as described above. m is a best response if

$$\mathbb{E}[\pi | y_B = y_{SQ}] > 1$$
$$\mathbb{E}[\pi || y_B| \in [\sqrt{c-r}, \infty)] \leq 1.$$

The first condition is ensured by Lemma 3, and the second condition is satisfied if $\hat{y} \leq \sqrt{c-r}$.

To confirm existence, consider the following example: $q_A = \frac{1}{3}$, $q_B = \frac{1}{4}$, $\pi \in \{\frac{1}{2}, 1\}$, $c = 2$, and $r = \frac{1}{2}$. Then $\hat{y} \approx 1.1029$ and $\sqrt{c-r} \approx 1.22$. Therefore, for any $m^* \leq \sqrt{c-r}$, this equilibrium exists. ■

9.7 Proof of Lemma 4

Proof. Fix $m \geq 0$. B_{π_B} has three possible strategies:

(a) Retain the status quo: $y_B = y_{SQ} = 0$

(b) Change the policy to the mean of their posterior $y_B = \mathbb{E}[\theta | s_B]$

(b) Change the policy to a policy that is not the mean of their posterior $y_B \neq \frac{s_B}{2\pi+1}$ and $y_B \neq 0$.

Now suppose that B_{π_B} observes a signal that is sufficiently extreme (given m) that it can implement its conditional expectation and win reelection. In this case, it will either implement its conditional expectation or retain the initial policy since any other strategy will yield a lower expected utility since changing to any other policy at least lowers the policy payoff while incurring the cost to change policy. Then, B_{π_B} implements the mean of their posterior as long as

$$-\frac{1}{1+\pi} - k + b \geq -\left(\frac{\pi s_B}{1+\pi}\right)^2 - \frac{1}{1+\pi}$$
$$\Leftrightarrow |s_B| \geq \left(\frac{\pi+1}{\pi}\right)\sqrt{c-r},$$

and retains otherwise.

Now suppose that B_{π_B} observes a signal that is sufficiently moderate that when it implements its conditional mean, it loses reelection. Then B will retain the initial policy, implement an efficient revision, or choose $y_B = m$. Comparing each of these strategies, B_{π_B} implement an efficient revision when

$$|s_B| \in \left(\left(\frac{\pi+1}{\pi}\right)\sqrt{c}, \left(\frac{\pi+1}{\pi}\right)(m - \sqrt{r})\right),$$

will retain the initial policy when

$$|s_B| < \min\left\{\left(\frac{\pi+1}{\pi}\right)\frac{m^2+c-r}{2m}, \left(\frac{\pi+1}{\pi}\right)\sqrt{c}\right\},$$

and will change the policy to $y_B = m$ (or $y_B = -m$ when its conditional expectation is negative), which I refer to as "exaggerated revision" when

$$|s_B| > \max\left\{\left(\frac{\pi+1}{\pi}\right)(m-\sqrt{r}), \left(\frac{\pi+1}{\pi}\right)\frac{m^2+c-r}{2m}\right\}.$$

Hence, for any m and any s_B, B_{π_B} either retains, implements an exaggerated revision, or implements the efficient revision.

■

9.8 Proof of Proposition 4

Proof. Consider the following cases:

(a) Fix $m \in (\max\{\sqrt{c-r}, \sqrt{r-c}\}, \sqrt{c}+\sqrt{r}]$. Lemma 4 implies B_{π_B} will implement an efficient revision when $|s_B| \geq (\frac{\pi+1}{\pi})m$, will implement an exaggerated revision when $|s_B| \in ((\frac{\pi+1}{\pi})\frac{m^2+c-r}{2m}, (\frac{\pi+1}{\pi})m)$ because

$$m > \max\left\{\frac{m^2+c-r}{2m}, m-\sqrt{r}\right\}$$

and will retain y_B when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c}$ because

$$m > \min\left\{\sqrt{c}, \frac{m^2+c-r}{2m}\right\}.$$

Fix B's strategy as described above. Cutoff m is a best response for the voter if

$$\begin{aligned}
\Pr(\pi_B = \overline{\pi}|y_B = 0) &< q_A \\
\Pr(\pi_B = \overline{\pi}|y_B = y'_B \;\&\; |y'_B| \in (m,\infty)) &> q_A \\
\Pr(\pi_B = \overline{\pi}|y_B = m) &> q_A \\
\Pr(\pi_B = \overline{\pi}|y_B = -m) &> q_A
\end{aligned}$$

The first condition is satisfied by Lemma 3, the second is satisfied if $\hat{y} \leq m$, and the third and fourth are satisfied if $m \in M$.

It remains to show existence.

To confirm existence, consider the following example: $q_A = \frac{1}{3}$, $q_B = \frac{1}{4}$, $\pi \in \{\frac{1}{2}, 1\}$, $c = 2$, and $r = \frac{1}{2}$. Then $\hat{y} \approx 1.1029$ and $\sqrt{c-r} \approx 1.22$. If $m = 2.1$, then $\frac{m^2+c-r}{2m} = 1.4775$. Moreover, $m < \sqrt{c}+\sqrt{r}$. Finally, $\Pr(\pi_B = \overline{\pi}|y_B = m) \approx 1.517 >$

q_A. Hence, this equilibrium exists. Additionally, this shows that multiple types of equilibria may exist simultaneously since for these parameters a continuum of equilibria exist of the form described in Proposition 3.

Now, suppose $q_A = \frac{1}{3}$, $q_B = \frac{1}{4}$, $\pi \in \{\frac{1}{2}, 1\}$, $c = 2.5$, and $r = 3$. Then $\max\{\sqrt{c-r}, 0\} < \hat{y}$. If $m = 3$, then $\frac{m^2+c-r}{2m} \approx 1.467$. Moreover, $m < \sqrt{c} + \sqrt{r}$. Finally, $\Pr(\pi_B = \overline{\pi}|y_B = m) \approx 515 > q_A$. Hence, this equilibrium exists. Additionally, a equilibrium described by Proposition 3 does not exist for these parameters because $c < b$.

(b) Fix $m > \sqrt{c}+\sqrt{r}$. B_{π_B} will implement an efficient revision when $|s_B| \geq (\frac{\pi+1}{\pi})m$, will implement an exaggerated revision when $|s_B| \in ((\frac{\pi+1}{\pi})m, (\frac{\pi+1}{\pi})(m - \sqrt{r}))$ because

$$m > \max\left\{\frac{m^2 + c - r}{2m}, m - \sqrt{r}\right\},$$

will implement an efficient revision when $|s_B| \in ((\frac{\pi+1}{\pi})\sqrt{c}, (\frac{\pi+1}{\pi})(m - \sqrt{r}))$ because

$$\sqrt{c} < m - \sqrt{r},$$

and will retain y_B when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c}$ because

$$\sqrt{c} < \frac{m^2 + c - r}{2m}.$$

Fix B's strategy as described above. The cutoff m is a best response for the voter if

$$\begin{aligned}
\Pr(\pi_B = \overline{\pi}|y_B = 0) &< q_A, \\
\Pr(\pi_B = \overline{\pi}|y_B = y'_B \;\&\; |y'_B| \in (\sqrt{c}, m - \sqrt{r})) &< q_A \\
\Pr(\pi_B = \overline{\pi}|y_B = y'_B \;\&\; |y'_B| \in (m, \infty)) &\geq q_A, \\
\mathbb{E}[\pi|y_B = m] &\geq q_A \\
\mathbb{E}[\pi|y_B = -m] &\geq q_A
\end{aligned}$$

The first condition is satisfied by Lemma 3, the second condition is satisfied as long as $\hat{y} > m - \sqrt{r}$, the third condition is satisfied as long as $\hat{y} \leq m$, and the fourth and fifth conditions are satisfied as long as, $m \in M$.

Prior to showing existence, note that this type of equilibrium cannot exist simultaneously with the equilibrium in Proposition 3. For the second type of equilibrium described in this proposition to exist, it must be that $m^* < \hat{y} + \sqrt{r}$ and $m^* \geq \sqrt{c} + \sqrt{r} \Leftrightarrow \hat{y} > \sqrt{c}$. But, recall that for the equilibrium described in Proposition 3 to exist, $\hat{y} \leq \sqrt{c-r}$. This is a contradiction.

It remains to show existence. Suppose $q_A = \frac{1}{2}$, $q_B = \frac{2}{5}$, $\pi \in \{\frac{1}{2}, \frac{3}{2}\}$, $c = \frac{1}{2}$, and $r = 1$. Then $\sqrt{c} < \hat{y} \approx 0.76$. If $m = \frac{3}{2}$, then $m - \sqrt{r} = \frac{1}{2}$. Moreover, $m > \sqrt{c}+\sqrt{r}$, $m > \hat{y}$, and $\hat{y} > m - \sqrt{r}$. Finally, $\Pr(\pi_B = \overline{\pi}|y_B = m) \approx 0.53 > q_A$. Hence, this equilibrium exists.

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9.9 Proof of Proposition 5

Proof. Consider the remaining cases:

(a) Fix $m = 0$. Then B_{π_B} implements an efficient revision as long as $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c}$, and retains y_B otherwise. But Lemma 3 shows that the voter will never elect B when B retains the initial policy using a cutoff strategy of this form due to the assumption $q_A > q_B$. This is a contradiction.

(b) Fix $m \in (0, \sqrt{r-c})$. Note, this requires $r - c > 0$. Then B will use its efficient revision strategy when $|s_B| \geq (\frac{\pi+1}{\pi})m$, and will use exaggerated revision when $|s_B| < (\frac{\pi+1}{\pi})m$ since

$$\min\left\{\frac{m^2+c-r}{2m}, \sqrt{c}\right\} < 0,$$
$$\sqrt{c} > (m - \sqrt{r}).$$

Fix B's strategy as above. $m \in (0, \sqrt{r-c})$ is a best response if

$$\Pr(\pi_B = \overline{\pi} | y_B = m) \geq q_A,$$
$$\Pr(\pi_B = \overline{\pi} || y_B| = y'_B \ \& \ y'_b \in (m, \infty)) \geq q_A$$

That is, if $\hat{y} \leq m$ and

$$\frac{\frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\overline{\pi}}}}\int_0^{(\frac{\overline{\pi}+1}{\overline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\overline{\pi}})}}dt}{\frac{1}{\sqrt{2\pi}\sqrt{1+\frac{1}{\underline{\pi}}}}\int_0^{(\frac{\underline{\pi}+1}{\underline{\pi}})x} e^{-\frac{t^2}{2(1+\frac{1}{\underline{\pi}})}}dt} \geq \frac{q_A}{1-q_A}\frac{1-q_B}{q_B}.$$

By a similar argument to that used in Lemma 3, this is never satisfied. This is a contradiction.

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9.10 Proof of Proposition 6

Proof. Suppose that $c = c_V > 0$ and $r = 0$. Then the voter's policy welfare is maximized in equilibrium. Now suppose that $b > 0$. There are three cases to consider.

(a) $\sqrt{c-r} > 0$ and $m^* < \sqrt{c-r}$: In this case, for any m^* such that an equilibrium exists, both types of Party B use their efficient revision strategy when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c-r}$ rather than when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c_V}$. This means that for $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c_V}$ and when $|s_B| < (\frac{\pi+1}{\pi})\sqrt{c-r}$, B_{π_B} acts in a way that maximizes the voter's welfare. But when $|s_B| \in ((\frac{\pi+1}{\pi})\sqrt{c-r}, (\frac{\pi+1}{\pi})\sqrt{c_V})$, the voter's welfare is maximized if Party B_{π_B} retains the status quo because the cost of revision is larger than the benefit of increased policy. Instead, both types of Party B use implement efficient revisions. Hence, the voter's policy welfare is lower.

(b) $m^* \in (\sqrt{\max\{c-r, r-c\}}, \sqrt{c}+\sqrt{r})$: In this case, for any m, $\frac{m^2+c-b}{2m} < \sqrt{c}$. This means that for $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c_V}$ and when $|s_B| < (\frac{\pi+1}{\pi})\frac{m^{*2}+c-b}{2m^*}$, B_{π_B} acts in a way that maximizes the voter's welfare. But when $|s_B| \in ((\frac{\pi+1}{\pi})\frac{m^{*2}+c-b}{2m^*}, (\frac{\pi+1}{\pi})\sqrt{c_V})$, both types of B_{π_B} implement exaggerated revisions rather than maintaining the status quo. Hence, the voter's policy welfare is lower.

(c) $m^* \in [\max\{\sqrt{c}+\sqrt{r}, \hat{y}\}, \hat{y}+\sqrt{r})$: In this case, for any m, the voter revises when iff $|s_B| \geq \sqrt{c_V}$. This means that for $|s_B| < (\frac{\pi+1}{\pi})(m^*-\sqrt{r})$ and when $|s_B| \geq (\frac{\pi+1}{\pi})m^*$, B_{π_B} acts in a way that maximizes the voter's welfare. But when $|s_B| \in ((\frac{\pi+1}{\pi})(m^* - \sqrt{r}), (\frac{\pi+1}{\pi})m^*)$, both types of Party B implement exaggerated revision rather than implementing efficient revisions. Hence, the voter's policy welfare is lower.

■

9.11 Proof of Proposition 7

Proof. Suppose that $\sqrt{c} \geq \hat{y}$ and $c = c_V$. Then the only cutoff equilibria that may exist are the equilibria described by Proposition 3 and the first type of equilibria described by Proposition 4. Therefore, there are two cases to consider.

(a) $\sqrt{c-r} > 0$ and $m^* < \sqrt{c-r}$: Begin by noting that $u_{V_{PQ}}(r, c, c_V) < u_{V_{PQ}}(0, c, c_V)$ because Party B_{π_B} revises when $|s_B| \in (\frac{\pi+1}{\pi}\sqrt{c-r}, \frac{\pi+1}{\pi}\sqrt{c})$, which yields the voter lower utility than if Party B_{π_B} retained the status quo. Note, that when $|s_B| \in (\frac{\pi+1}{\pi}\sqrt{c-r}, \frac{\pi+1}{\pi}\sqrt{c})$, the voter prefers that Party B_{π_B} retain the status quo

Increasing c leads to both types of Party B retaining for more moderate signals rather than implementing efficient revisions. Therefore,

$$u_{v_{PQ}}(r, c+\epsilon, c_V) > u_{v_{PQ}}(r, c, c_V)$$

for $\epsilon > 0$ such that $\sqrt{c+\epsilon-r} \geq \sqrt{c_v}$. Hence, for any $r > 0$, there exists ϵ that satisfy this condition $\implies$ increases in c lead to increased voter welfare from policy.

(b) $m^* \in (\sqrt{\max\{c-r, r-c\}}, \sqrt{c}+\sqrt{r})$: Begin by defining $\bar{c}(\hat{m^*})$ to be the largest c such that m^* is an equilibrium.

In this case, for any m^*, $\frac{m^{*2}+c-b}{2^*m} < \sqrt{c}$. This implies that both types of Party B revise more often than the voter would prefer. In particular, both types of Party B implement exaggerated revisions when they observe $|s_B| \in ((\frac{\pi+1}{\pi})\frac{m^{*2}+c-b}{2^*m}, (\frac{\pi+1}{\pi})\sqrt{c_V})$, when the voter's welfare would be maximized by Party B_{π_B} retaining the status quo. Increasing c increases the lower bound of this interval since B_{π_B} retains the status quo for moderate signals. Therefore,

$$u_{v_{PQ}}(r, c+\epsilon, c_V) > u_{v_{PQ}}(r, c, c_V)$$

for $\epsilon > 0$ such that $c + \epsilon \leq \overline{c}(m^*)$.

■

9.12 Proof of Proposition 8

Proof. Given $c_v \geq 0$, the voter's policy welfare is maximized when both types of Party B implement efficient revisions for all s_B such that $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c_V}$. When $\sqrt{c} \geq \hat{y}$, there are two possible equilibria:

(a) $\hat{y} \leq \sqrt{c-r}$ and $m^* \leq \sqrt{c-r}$: In this case, for any c, r, and m^* that satisfy these conditions, Party B_{π_B}'s equilibrium strategy is consistent with maximizing the voter's policy welfare when $|s_B| \geq (\frac{\pi+1}{\pi})\sqrt{c-r}$ and when $|s_B| < \sqrt{c_V}$. But when $|s_B| \in ((\frac{\pi+1}{\pi})\sqrt{c_V}, (\frac{\pi+1}{\pi})\sqrt{c-r})$, B_{π_B} retains the status quo when implementing an efficient revision would increase the voter's welfare. Therefore,

$$u_{v_{PQ}}(r+\epsilon, c, c_V) > u_{v_{PQ}}(r, c, c_V)$$

for $\epsilon > 0$ such that $\sqrt{c-r-\epsilon} \geq \sqrt{c_v}$, which ensures the voter prefers more revision, and $\sqrt{c-r-\epsilon} \geq \hat{y}$, which ensures this equilibrium exists. Rearranging, $u_{v_{PQ}}(r+\epsilon, c, c_V) > u_{v_{PQ}}(r, c, c_V)$ for $\epsilon \leq \min\{c-r-c_V, c-r-\hat{y}\}$.

(b) $m^* \in [\sqrt{c-r}, \sqrt{c}+\sqrt{r})$: Begin by defining $\overline{r}(m^*)$ to be the largest r such that m^* is an equilibrium.

In this case, for any c, r, and m^* that satisfy these conditions, Party B_{π_B}'s equilibrium strategy is consistent with maximizing the voter's policy welfare when $|s_B| \geq (\frac{\pi+1}{\pi})m^*$. For $|s_B| < (\frac{\pi+1}{\pi})m^*$, both types of Party B retain the status quo for moderate signals and implement exaggerated revisions for relatively more extreme signals. Given those two strategies, the voter's welfare is higher from exaggerated revision as long as

$$-Var(\pi) - \left(m - \frac{\pi s_B}{\pi+1}\right)^2 > -Var(\pi) - \left(0 - \frac{\pi s_B}{\pi+1}\right)^2$$
$$\Leftrightarrow s_B > \frac{m}{2}.$$

Therefore,

$$u_{v_{PQ}}(r+\epsilon, c, c_V) > u_{v_{PQ}}(r, c, c_V)$$

as long as $\epsilon > 0$, and

$$\frac{m^2 + c - r - \epsilon}{2m} \geq \frac{m}{2}$$
$$\overline{r}(m^*) \geq r + \epsilon$$

which is equivalent to $\epsilon \leq \min\{\overline{r}(m^*) - r, c - r\}$. Hence, if the increase in r is small enough, the voter's welfare from policy increases

■

9.13 Proof of Proposition 9

Proof. Given $c_v = 0$, the voter's policy welfare is maximized when both types of Party B implement efficient revisions for all s_B. When $\sqrt{c} < \hat{y}$, there are two possible equilibria:

(a) $m^* \in [\sqrt{c-r}, \sqrt{c} + \sqrt{r})$: Recall that $\overline{r}(m^*)$ is the largest r such that m^* is an equilibrium. Therefore,

$$u_{v_{PQ}}(r+\epsilon, c, c_V) < u_{v_{PQ}}(r, c, c_V)$$

for $\epsilon > 0$, ϵ such that $r + \epsilon \leq \overline{r}(m^*)$, and $r \geq c$ where the last condition ensures the voter would prefer B_{π_B} to retain the status quo given the alternative is exaggerated revision.

(b) $m^* \in [\max\{\sqrt{c} + \sqrt{r}, \hat{y}\}, \hat{y} + \sqrt{r})$: Recall that $\overline{r}(m^*)$ is the largest r such that m^* is an equilibrium. Therefore,

$$u_{v_{PQ}}(r+\epsilon, c, c_V) < u_{v_{PQ}}(r, c, c_V)$$

for $\epsilon > 0$ and ϵ such that $r + \epsilon \leq \underline{r}(m^*)$ because the direct effect of increasing r is for both types of Party B to implement an exaggerated revision for additional signals rather than implementing an efficient revision.

■

9.14 Proof of Proposition 10

Proof. Fix $m > 0$. Then suppose $\mathbb{E}[\theta|s_B] \geq m$. Then Party B_{π_B} will use the efficient revision strategy as long as

$$-\frac{1}{1+\pi} + b \geq -\left(0 - \frac{\pi s_B}{1+\pi}\right)^2 - \frac{1}{1+\pi},$$

which is always satisfied.

Now suppose $\mathbb{E}[\theta|s_B] < m$. Then Party B_{π_B} either implements an exaggerated revision or uses the efficient revision strategy since retaining the initial policy always yields a payoff lower than the efficient revision strategy. Party B_{π_B} will use the efficient revision strategy as long as

$$\begin{aligned} -\frac{1}{1+\pi} \geq -\left(m^* - \frac{\pi s_B}{1+\pi}\right)^2 - \frac{1}{1+\pi} + b \\ \Leftrightarrow (\frac{\pi+1}{\pi})(m-\sqrt{r}) \end{aligned}$$

Fix Party B's strategy. Then m is a best response if

$$\begin{aligned} \Pr(\pi_B = \overline{\pi}|y_B = y' \ \& \ |y'| \in [0, m^* - \sqrt{r}]] < q_A \\ \Pr(\pi_B = \overline{\pi}|y_B = m^*] \geq q_A \\ \Pr(\pi_B = \overline{\pi}|y_B = -m^*] \geq q_A \\ \mathbb{E}[\pi|y_B > m^*] \geq q_A. \end{aligned}$$

The first condition is satisfied if $\hat{y} > m^* - \sqrt{r}$, the fourth condition is satisfied if $m^* \geq \hat{y}$, and the second and third conditions are satisfied if $m^* \in M$.

To show existence, suppose

It remains to show existence. Suppose $q_A = \frac{1}{2}$, $q_B = \frac{2}{5}$, $\pi \in \{\frac{1}{2}, \frac{3}{2}\}$, $c = \frac{1}{2}$, and $r = 1$. If $m = \frac{3}{2}$, then $m - \sqrt{r} = \frac{1}{2}$. Moreover, $m > \sqrt{c} + \sqrt{r}$, $m > \hat{y}$, and $\hat{y} > m - \sqrt{r}$. Finally, $\Pr(\pi_B = \overline{\pi}|y_B = m) \approx 0.53 > q_A$. Hence, this equilibrium exists. ■

9.15 Proof of Lemma 5

Proof. Given the elected party's best response, the expected utility of the voter electing $i \in \{A, B\}$ is equivalent to the sum of the negatives of the variance of the posterior distribution of the state for the competent and incompetent type weighted by the prior that the party is competent. Therefore, the voter will elect B if

$$\begin{aligned} -\hat{q}_b Var(\overline{\pi}) - (1-\hat{q}_B)Var(\underline{\pi}) \geq -q_A Var(\overline{\pi}) - (1-q_A)Var(\underline{\pi}) \\ \Leftrightarrow (q_A - \hat{q}_B)Var(\overline{\pi}) \geq (q_A - \hat{q}_B)Var(\underline{\pi}), \end{aligned}$$

where $\hat{q}_B$ is the probability B is competent given the previous game play. This condition is satisfied if and only if $\hat{q}_B \geq q_A$. ■

9.16 Proof of Lemma 6

Proof. The proof of this remark is identical to the previous remark except that the voter's expected utility is different. However, for a given type, regardless of whether they are Party B or Party A, the voter's expected utility is the same. ■