Disproportionate Policy Responses and Executive Expertise*

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September 1, 2018

Abstract

Executive policymakers are often given authority on the premise that they have the expertise to craft effective solutions to difficult policy issues. Scholars frequently criticize executives, however, for choosing disproportionate policies that exaggerate the degree of action required to address a situation. In this paper, I develop a model of elections in which officeholders face reelection and differ in their expertise. I find that disproportionate responses are driven by competitive elections and exacerbated by ideological polarization between the candidates. Electoral accountability motivates politicians to enact disproportionate to appear informed to voters. The model also makes a number of empirical predictions which can be used to distinguish disproportionate policy response from other policymaking behaviors by elected officials.

1 Introduction

Many political institutions grant executive policymakers authority on the premise that they have the expertise to craft effective solutions to difficult policy issues.[1] Scholars frequently criticize executives, however, for choosing disproportionate policies that exaggerate the degree of action required to address a situation. Typically, these policies arise out of two scenarios.

First, the executive may overreact to policy-relevant information. In his first term in office, Ronald Reagan led a massive increase in U.S. defense spending. CIA estimates of Soviet military spending at the time suggest that, while Soviet military expenditures were significant, the extent of Reagan's response was unnecessary (Holzman (1989)).

Second, the executive may have little policy-relevant information, and yet posture by acting boldly, instead of proceeding cautiously in the face of uncertainty (Gersen and Stephenson (2014)). For example, in 1975 the Khmer Rouge seized the American cargo ship the SS *Mayaguez*. Forgoing more measured options, Gerald Ford quickly decided to "do something" and ordered military action, despite having very little information about the on-going situation (Bohn (2016)).

Disproportionate responses undermine the expertise-based rationale for delegation. Furthermore, the consequences for implementing policies that are poorly suited to a given situation can be severe. In the case of the Reagan build-up, later studies argue there is little evidence that the degree to which the U.S. increased military spending helped cause the collapse of the Soviet Union, with some claiming it prolonged tensions by emboldening hardliners in the U.S.S.R. (e.g., Chernoff (1991); Fitzgerald (2001); Wilson (2008)). As for the *Mayaguez* incident, Ford's handling of the situation led to numerous civilian deaths, and was ultimately criticized as an excessive use of force. Given the repercussions for implementing disproportionate polices, it is important to understand the conditions and the policy areas for which such responses are most likely to be problematic.

What causes disproportionate policy responses and how do features of the executive's environment influence their likelihood and severity? Intuitively, a key element is likely the relationship between the executive and those whose support she relies on: the electorate.[2] Hence, to address these questions, I develop a model of elections. I find that disproportionate responses are driven by competitive elections and exacerbated by ideological polarization

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[1]This rationale underlies the trustee theory of representation which, briefly put, argues that politicians should choose policies that they deem best (see, for example, Mill (1861); Fox and Shotts (2009)). Delegation of policymaking authority to the bureaucracy is also often justified on the grounds that bureaucrats have superior expertise (e.g., Holmstrom et al. (1982); Gailmard and Patty (2012)).

[2]I focus on the relationship between voters and executive politicians. Accountability arises in many political hierarchies, however, and I elaborate on alternative applications of the theory when warranted.

between the candidates. Electoral accountability motivates politicians to disproportionately react to appear informed to voters. By explicitly modeling this mechanism, I am able to analyze how disproportionate policy responses are impacted by changes in ideological extremism, electoral competitiveness, and executive characteristics. In many instances, altering these variables can have nuanced and differential effects.

The equilibrium analysis also yields a number of empirical implications. Two sets of findings stand out.

First, the model predicts there should be less variance in the policy choices of term-limited executives, relative to those who can run for reelection. It also implies executives implement policies that are more popular ex ante in their final term, compared to their first. These findings differ from commonly studied models that analyze pandering or adverse selection over ideology (e.g., Canes-Wrone et al. (2001); Bernhardt et al. (2004)).

Second, the model suggests that the effect of valence on policy extremism depends on whether valence discrepancies are rooted in expertise or personal characteristics. Increasing expertise leads to more extreme policies, in expectation. Non-expertise valence characteristics have a non-monotonic effect on policy extremism, however, and a moderate advantage maximizes extremism, in expectation. Together, these results suggest that aggregating measures of valence may obscure the effects of executive characteristics on observed policy extremism.

These results emerge from a two-period model of executive policymaking and accountability. In each period, there is uncertainty over which policy delivers the best outcome. The officeholder is either high quality, and knows the correct action to take, or low quality, and uncertain about which policy should be chosen. After the incumbent chooses the first period policy, the voter decides to reelect the incumbent or to elect a challenger of unknown quality. The voter's decision is not straightforward, however, as he does not learn the effectiveness of the first-period policy before the election, and must infer the incumbent's quality from only her policy choice.

The strategic tension arises from the low-quality type attempting to appear informed in order to get reelected, without knowing the correct policy. These uninformed officeholders favor moderate policies because they face greater uncertainty about the type of policy response required. By contrast, an informed politician is relatively more willing to choose an extreme policy in the direction of her information. Consequently, extreme policies signal expertise to voters. Thus, the model provides a logic for why proportionate responses may be viewed unfavorably by the public, even if the public does not believe an extreme response is necessary. For example, when Ford discussed taking military action against Cambodia with his advisors, he worried that voters would view him as incompetent if he took a more

measured approach (Bohn (2016)).

In equilibrium, these incentives lead voters to endogenously favor extreme policy responses: the voter reelects the incumbent if and only if she chooses a policy far from the ex ante optimum. When the incumbent learns that the correct action is close to the ex ante optimum, she chooses the closest policy that ensures reelection. If the incumbent learns that the optimal policy is far from the ex ante optimum, she simply enacts that policy and is reelected. Finally, uninformed officeholders mix between choosing a disproportionate policy that ensures reelection, and choosing the ex ante optimal policy, which results in removal.

Under this characterization, the incumbent can successfully pursue electorally motivated disproportionate policymaking by moving policy in either direction away from the ex ante optimal policy. This has several interpretations. First, moving in either direction can be interpreted as changing policy along a liberal-conservative dimension. For example, following a mass shooting, the incumbent could overreact to her information in one direction by significantly deregulating firearms, or overreact to her information in the other direction by drastically restricting access to firearms. Alternatively, the direction could indicate the degree of action, with higher policies indicating more aggressive interventions. Thus, an executive deciding how to address a public health crisis could do too much to prevent the spread of a disease, or do too little. Here, a disproportionate policy in one direction would correspond to the classic idea of an overreaction, and the other direction an underreaction to the situation.

Next, I extend the model to include ideological heterogeneity between the incumbent, challenger, and voter. I show that policy disagreements play an important in role in determining the extent of disproportionate policy responses. More precisely, I find that changing the ideology of the executive has a non-monotonic effect on disproportionate policy reactions. If the election is competitive, in the sense that neither candidate is much more extreme than the other relative to the voter, then increasing polarization between candidates exacerbates overreaction and posturing by policymakers. A more extreme challenger makes the incumbent more motivated to retain office and prevent the challenger from making policy. If either the incumbent or challenger is overly extreme relative to the other, however, then disproportionate policy reactions disappear. In this case, the voter always prefers one of the politicians over the other, which removes the officeholder's incentive to distort policy to win reelection. One consequence of this result is that voter welfare can be highest with a biased incumbent, when the challenger is moderate and office benefits are high.

I extend the model further to allow for the incumbent to have an advantage (or disadvantage) that is non-ideological. Specifically, the incumbent and challenger may differ in their ex ante probability of being high quality, i.e., expertise, or one of the politicians may

have a valence advantage in terms of personal characteristics. As noted, I show that the nature of executive characteristics where a discrepancy exists has important consequences for their effect on policy reactions. Increasing the incumbent's expertise increases posturing, but not overreaction to information. On the other hand, increasing the challenger's expertise increases both types of disproportionate responses. In contrast to expertise advantages, valence has a non-monotonic effect on disproportionate responses.

The model developed in this paper is most similar to those found in the literature on electoral accountability. In particular, it is related to models in which there is uncertainty over the optimal policy choice and politicians differ in their expertise (e.g., Canes-Wrone et al. (2001)).[3] Correspondingly, the model's insights best apply to policy areas in which competence and information are crucial for obtaining successful outcomes, e.g., responding to an economic crisis, rather than areas in which preferences over policies are solely a matter ideological taste.

Given that the disproportionate policy responses I highlight arise from executives either overreacting to information or posturing, my model has commonalities with a number of other works. For example, Fox and Stephenson (2011) analyze when judicial review acts to prevent posturing by officeholders. Levy (2004) studies a similar "anti-herding" behavior, and finds conditions under which executives forgo advice from advisors. Judd (2017) shows that executives may take unilateral action, even when this leads to inferior policy. Beyond focusing on a different set of issues, in these papers there is a binary policy space, which precludes overreacting to information. Alternatively, Prendergast and Stole (1996) find a similar two-sided effect of overreacting to information, in a model of investment decisions in which the manager cares about his reputation. However, as the agent is unable to be replaced, they study different issues, such as when the manager is incentivized to stick to a chosen policy, rather than how differences between the incumbent and challenger affect disproportionate polices or voter welfare. Furthermore, Prendergast and Stole focus on fully separating equilibria, while the opportunity for the low-quality type to pool with some high-quality types plays an important role in my analysis.

The predominant accountability failure studied in the literature is that elections can incentivize politicians to pander to the electorate. That is, politicians try to improve their reelection chances by choosing the policy that voters believe is ex ante optimal (Harrington Jr (1993); Canes-Wrone et al. (2001); Maskin and Tirole (2004); Morelli and Van Weelden (2013)). In these papers, while politicians may choose the "wrong" policy, there is no overreacting to information. Building on this point, for pandering to explain disproportionate

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[3]For general overviews of the electoral accountability literature see Ashworth (2012) and Duggan and Martinelli (2017).

policy responses requires the voter to ex ante believe that the extreme policy is more likely to be correct. By contrast, the necessity of reelecting incumbents who adopt extreme policies in my model is independent of the voter's prior belief that the policy is optimal and, thus, I derive an apparent voter preference for extreme actions that is fully endogenous to equilibrium play.[4] Finally, my model generates disproportionate policies in two directions, whereas pandering to the voters' prior would imply the incumbent only ever distorts policy in one direction.[5] Relatedly, however, in my model the direction of action that is most popular with the voter influences the frequency with which different types of disproportionate policies are observed.

Outside the accountability literature, my model is linked to work studying policy distortions in Downsian models of electoral competition with uncertainty over optimal policy choices in which candidates commit to policies. Two papers in particular are related. First, Honryo (2013) shows there sometimes exist equilibria in which an informed politician chooses the left or right policy despite learning that the moderate policy is optimal. As with the disproportionate responses I study, this distortion is generated by trying to signal competence. However, as there is not a continuous policy space, politicians do not overreact in the direction of their information. Second, Kartik et al. (2015) study overreactions, and also use a continuous policy space. In their paper, the mechanism that candidates to overreact to their information is very different from that studied in this paper. In Kartik et al. there is no difference in competence; as such, there is no posturing and overreacting to information is not generated by politicians trying to signal expertise. Instead, the voter aggregates information from both candidates' policies and this updating can create a situation where the voter prefers policies that are more extreme than the unbiased choice of either individual candidate. On the other hand, politicians in my model are always at least weakly better informed than the voter. Additionally, neither paper investigates the effects of polarization and ideological extremism studied here.[6] Moving beyond elections, Patty and Turner (2017) study how expert policy choices are influenced by a political superior who can veto the policy, rather one who can replace the expert. They show that oversight creates incentives for the agent to overly large policy changes in order to convince the overseer that the status quo

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[4]In fact, the model in this paper would generate disproportionate policy reactions even if extreme actions are never optimal, and this is known by all the players ahead of time.

[5]Acemoglu et al. (2013) and Duggan and Martinelli (2015) study pandering with a continuous policy space. In these models, politicians choose overly extreme, or populist, policies as a means of signaling competence or congruence. Politicians, however, all choose policies in the same direction. Their models also differ from mine in that there is not incomplete information over the optimal policy for the voter. Thus, the substantive interpretation of an extreme policy choice in these papers is different from a disproportionate policy in this paper.

[6]Kartik et al. do show that their main results are robust to the introduction of some degree of policy preferences, but do not further analyze the effects of ideology.

should be revised.

Finally, previous theories of elections argue that overreactions arise from differences in the types of available policies rather than information, as in my model. For example, some authors argue that executives overreact to terrorist attacks due to the observability of different actions to the public (De Mesquita (2007); Dragu (2017)). Others argue that leaders take drastic actions that are risky and hope for a positive turnout (Downs and Rocke (1994)). Still others use psychological theories to explain disproportionate policy responses, such as over-confidence on the part of the politician (Maor (2012)). In contrast to all these explanations, I provide an institutional theory and show that accountability alone may be sufficient for politicians to overreact to information. While my results do not require these other features to be present, they are not mutually exclusive. In practice, it may be that the accountability mechanism I find works in tandem with these previously studied features to generate further policy distortions.

2   Baseline Model

There are two periods, $t \in \{1, 2\}$. In each period an executive makes a policy choice $x_t \in X = \mathbb{R}$. At the end of the first period a representative voter decides whether to reelect the incumbent or elect an untried challenger. Thus, there are three actors in the model: an incumbent (I), a challenger (C), and a voter (V).

In each period, there is a state of the world that determines the optimal policy choice. All players want the chosen policy to match the state of the world, however, the state is unknown. In period t the state is given by ω_t drawn independently from a distribution F with mean 0, finite variance σ^2, full support over $\mathbb{R}$, and pdf f.[7]

Each politician is either high quality or low quality. If the politician is high quality, then she knows ω_t in each period. By contrast, low quality politicians are uninformed and have no private information about the realization of ω_t. A politician's quality is her private information. A politician is high quality with probability $q \in (0, 1)$ and low quality with probability $1 - q$.

To start, Nature (N) determines the state of the world, as well as the quality of the incumbent and challenger. Next, the incumbent chooses the first period policy $x_1 \in \mathbb{R}$.

Following the officeholder's choice, the voter decides to reelect the incumbent or elect the challenger. The outcome of the incumbent politician's policy choice, however, is not revealed. Thus, the voter must decide to reelect the politician having observed the policy choice x_1,

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[7]Similar results hold if ω persists across periods.

Figure 1: Summary of electoral game
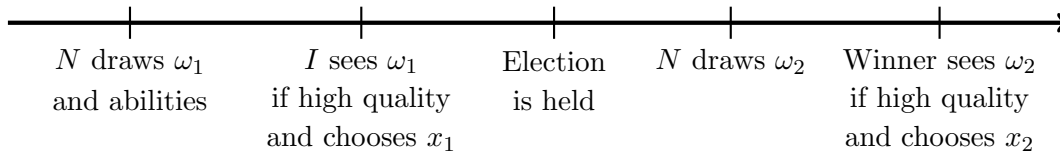
but without knowing the quality of the policy choice.[8] On many important issues it may take years for voters to learn whether a policy is a success or failure, e.g., the effectiveness of a financial bailout.

Nature next draws the second period policy choice. If the winner of the election is high quality she observes ω_2. Finally, the second period officeholder chooses a policy $x_2 \in \mathbb{R}$, the game ends, and utilities are realized.

In the baseline model, I assume players have the same policy preferences, which are represented by an ideal point at ω_t. Utility is quadratic over policy and given by $u_i(x_t) = -(x_t - \omega_t)^2$. Additionally, a politician gets an office benefit $\beta > 0$ for each period in which she holds office. Dynamic payoffs are given by the sum of utility each period.[9]

I now precisely define disproportionate policy responses. If the incumbent learns that $\omega > 0$ and chooses a policy $x > \omega$, or if $\omega < 0$ and she chooses a policy $x < \omega$, then I say the incumbent overreacts to her information. This definition is akin to the definition of overreaction used in Prendergast and Stole (1996) and Kartik et al. (2015). When the executive is uninformed, she should choose the policy that is ex ante expected to be correct, i.e., $x = 0$. If the uninformed type instead chooses a different policy, $x \neq 0$, I say that the incumbent postures. This definition of posturing extends the behavior studied in Fox and Stephenson (2011) to a continuous policy space. In either of these cases, the policy reaction is disproportionate.

3   Accountability and Disproportionate Policies

As there is incomplete information over ability and the state of the world, I study perfect Bayesian equilibrium of the model. Given the continuous action space, many behaviors can potentially be supported as equilibrium. As such, I focus my analysis on equilibria that survive the D1 refinement (Cho and Kreps (1987)). For the voter a mixed strategy

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[8]In Section 6, I incorporate a probability that the state is revealed before the election.

[9]I assume no discounting between periods as it does not qualitatively affect the results and reduces notation.

is a mapping $\rho : X \to [0,1]$, where $\rho(x_1)$ indicates the probability of reelection following policy choice x_1. A mixed strategy for the officeholder in period t is given by the mapping $\pi_t : \mathbb{R} \cup \{\phi\} \to \Delta(X)$, where $\Delta(X)$ denotes the space of probability measures on X and ϕ indicates the politician is uninformed.

To start, consider the optimal policy choice for each politician based only on her policy preferences. If the politician is informed, then the action that maximizes her policy utility is the policy that matches the state of the world, $x_t = \omega_t$. On the other hand, if the politician is uninformed then, by quadratic utility, her optimal policy choice is the expectation of the distribution of the state, $x_t = 0$. In the last period the politician does not face any reelection constraints. Thus, the winner of the election chooses $x_2 = \omega_2$, when she is high quality, and chooses $x_2 = 0$, when she is low quality.

Given second period policymaking, the voter's expected utility for electing a high quality incumbent is 0, and his expected utility for a low quality incumbent is $\int_{\mathbb{R}} -\omega^2 dF(\omega) = -\sigma^2$. Therefore, the voter's decision is based on his belief about the incumbent officeholder's ability. Let $\tilde{q}(x_1)$ be the voter's belief that the incumbent is high quality, following policy choice x_1, which is updated according to Bayes' rule whenever possible. In equilibrium, if $\tilde{q}(x_1) > q$, then the voter must reelect the incumbent. If $\tilde{q}(x_1) < q$, then he must elect the challenger. Finally, if $\tilde{q}(x_1) = q$, then the voter is indifferent and, as such, he can reelect the incumbent with any probability $\rho(x_1) \in [0,1]$.

For the remainder of the section I study first-period policy choices.

3.1   First-best Outcomes

I begin by characterizing the first-best outcome for the voter. That is, given the officeholder's information, what is the best policy choice for the voter? As the voter only cares about policy outcomes, this is equivalent to the incumbent making the myopically optimal policy choice given her information. Consequently, the first-best outcome is for an informed incumbent to choose $x_t = \omega_t$ and an uninformed incumbent to choose $x_t = 0$.[10] Figure 2 illustrates these policy choices.

In this case, there is no distortion in policy outcomes. The only loss in voter welfare is from an uninformed type being unable to match the state. Furthermore, under such a configuration the voter always reelects the incumbent after seeing any policy $x \neq 0$, as this indicates the incumbent is high quality. The voter always removes the incumbent after seeing $x_1 = 0$, as with probability 1 the policy was chosen by the uninformed type. This reelection decision is depicted in figure 3. Thus, this configuration of policy choices provides the

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[10]In the second period, it is clear that the officeholder optimally chooses the policy that is best for the voter.
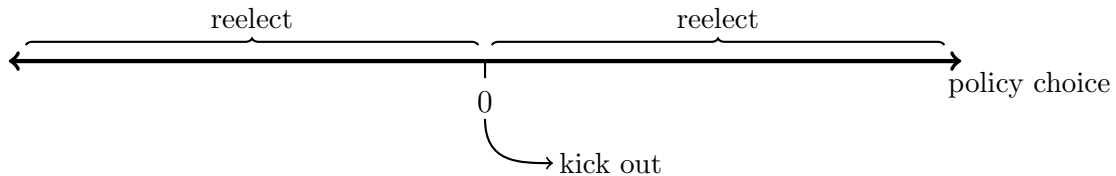
Figure 2: First-best policy choices.
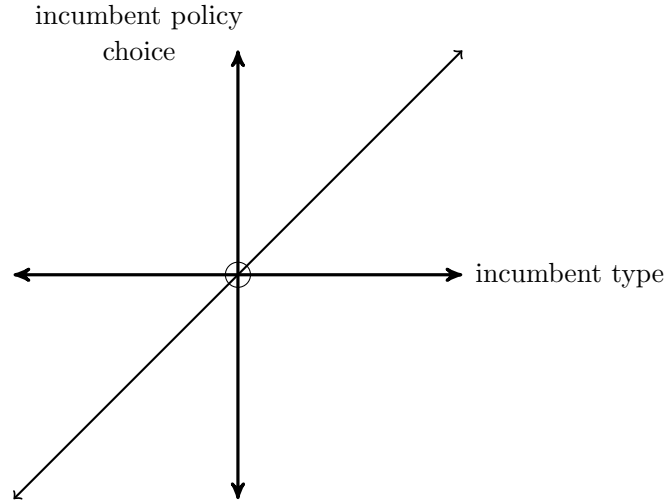
Note: Figure 2 depicts the policy choices for the incumbent in a first-best strategy profile. The line gives the policy choices for an informed incumbent as a function of her information. The circle represents the policy choice of an uninformed incumbent. As shown, in the first-best outcome for the voter policy choices for informed types lie on the 45 degree line and the uninformed type chooses the expectation of the state.

voter with his highest static and dynamic payoffs because he also always keeps an informed incumbent and always removes an uninformed incumbent.[11] While this profile of actions is optimal for the voter, is it possible to support such behavior as an equilibrium? That is, when would the incumbent not deviate from playing such a strategy profile?

Figure 3: Voting with first-best outcomes

Note: Figure 3 shows which policy choices lead to reelection for the incumbent under the first-best outcome.

Under the first-best strategy profile a high quality incumbent never deviates, as she

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[11]Note, the voter removes from office the $\omega_1 = 0$ type of informed incumbent — meaning he does not actually perfectly screen the types. Additionally, in analyzing when the low quality type would not deviate from the first-best strategy, this is technically not an equilibrium, as the $\omega_1 = 0$ type has a best-response problem. I ignore the issue, as this type has measure zero and, hence, does not affect the voter's welfare. Furthermore, if there was a messaging stage where the incumbent could state if she was high or low quality, then a separating equilibrium exists, which is sufficient for the discrepancy to disappear. Finally, this issue does not arise in the main equilibrium analysis.

obtains her best policy outcome and gets the office benefit, in each period. Therefore, all that remains is to verify that the low quality type of the incumbent does not want to choose a different policy. In particular, the low quality incumbent must prefer choosing her ideal policy and getting removed from office over choosing any other policy and getting reelected. Formally, this holds if

$$-\sigma^2 + \beta - (1-q)\sigma^2 \geqslant -2\sigma^2 + 2\beta,$$
$$\Leftrightarrow q\sigma^2 \geqslant \beta. \tag{1}$$

Equation (1) reveals that the first-best outcome can be supported as an equilibrium when office benefits are not too high. This is possible because the incumbent cares about policy outcomes. As such, the uninformed type is willing to forgo reelection so that a potentially high quality challenger can make policy in the second period, when office benefits are sufficiently low.

3.2 Equilibrium Policy Reactions

What if office benefits are not low? For many positions in which the executive has significant decision-making power it is natural to think that office benefits are quite high and, all else equal, that the incumbent prefers to get reelected, even if she is low quality. The remainder of the section is devoted to studying the policymaking distortions that arise in this case. Moving forward, assume $\beta > q\sigma^2$.

For characterizing behavior, it is convenient to define $\overline{x}$ and $\underline{x}$ as the positive and negative solutions, respectively, to

$$-\sigma^2 + \beta - (1-q)\sigma^2 = -x^2 - 2\sigma^2 + 2\beta. \tag{2}$$

The left-hand side of equation (2) gives the expected utility to a low quality incumbent for choosing $x = 0$ and being removed from office. The right-hand side gives the low quality type's expected utility for choosing policy x and being reelected. Thus, $\underline{x}$ and $\overline{x}$ make the uninformed type indifferent between choosing her ideal policy and getting kicked out, or choosing one of these cut-points and being retained in office.

With these cut-points in hand, the first proposition characterizes equilibrium behavior for the voter and incumbent.

Proposition 1. *The following characterization of behavior constitutes a perfect Bayesian equilibrium of the model:*

1. *Voting Behavior:*

(a) *If* $x_1 \in (-\infty, \underline{x}]$ *or* $x_1 \in [\overline{x}, \infty)$, *then the voter reelects the incumbent,* $\rho(x_1) = 1$.

(b) *If* $x_1 \in (\underline{x}, \overline{x})$, *then the voter kicks out the incumbent,* $\rho(x_1) = 0$.

2. *Informed Incumbent:*

(a) *If* $\omega_1 \in (-\infty, \underline{x})$ *or* $\omega_1 \in (\overline{x}, \infty)$, *then I chooses the optimal policy,* $x_1 = \omega_1$

(b) *If* $\omega_1 \in [0, \overline{x}]$, *then I exaggerates policy to the right and chooses* $x_1 = \overline{x}$.

(c) *If* $\omega_1 \in [\underline{x}, 0)$, *then I exaggerates policy to the left and chooses* $x_1 = \underline{x}$.

3. *Uninformed Incumbent:*

(a) *I chooses* $x_1 = \underline{x}$ *with any probability* $\underline{\pi} \in [0, F(0) - F(\underline{x})]$.

(b) *I chooses* $x_1 = \overline{x}$ *with any probability* $\overline{\pi} \in [0, F(\overline{x}) - F(0)]$.

(c) *I chooses* $x = 0$ *with probability* $1 - \underline{\pi} - \overline{\pi}$.

Off the path of play assume the voter believes the incumbent is uninformed with probability 1. These equilibria survive the D1 refinement.

Proposition 1 demonstrates that policy choices are distorted compared to the first-best outcome, when $\beta > q\sigma^2$.

If the first-period policy is in the interval $[\underline{x}, \overline{x}]$, then the voter chooses to elect the challenger rather than the incumbent. In equilibrium, the voter cannot reelect the incumbent following policies that are too moderate, as the low quality type would deviate and always choose this policy. For this reason, the voter reelects the incumbent when the policy is sufficiently extreme, $x_1 > \overline{x}$ or $x_1 < \underline{x}$, because the low quality type is unwilling to choose such extreme policies. Furthermore, the voter is willing to reelect when $x_1 = \overline{x}$ or $x_1 = \underline{x}$, as the uninformed type chooses these boundaries with low enough frequency. Figure 4 illustrates electable policies.

If the incumbent learns that the state of the world is extreme relative to the expected state, $\omega_1 \leqslant \underline{x}$ or $\omega_1 \geqslant \overline{x}$, then she chooses the optimal policy and is reelected. Hence, there is no distortion in policymaking by these types.

On the other hand, if the incumbent knows that the correct policy choice is a moderate action near 0, then she overreacts to this information. Specifically, if the incumbent learns $\omega_1 \in [0, \overline{x})$, then she exaggerates policy in the direction of this information, and chooses $x_1 = \overline{x}$. As $\overline{x}$ makes a low quality incumbent indifferent between choosing $x_1 = \overline{x}$ and choosing $x_1 = 0$, the high quality incumbent strictly prefers choosing $x_1 = \overline{x}$ and being reelected over choosing $x = \omega_1$ and being kicked out. This is because $\overline{x}$ is closer to ω_1 than it is to 0, and so a high quality incumbent is more willing to choose $\overline{x}$ than the low quality

Figure 4: Equilibrium voting
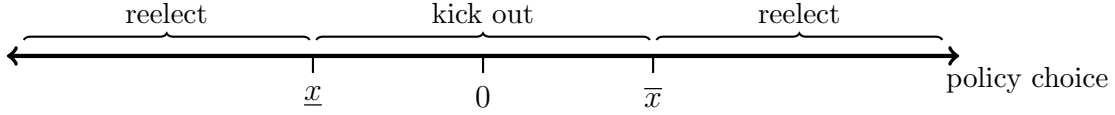
Note: Figure 4 shows which policy choices lead to reelection in equilibrium. If x_1 is below the lower cut-point $\underline{x}$ or above the upper cut-point $\overline{x}$ then the voter reelects the incumbent. On the other hand, if x_1 is between $\underline{x}$ and $\overline{x}$, then the voter instead elects the challenger.

incumbent. Furthermore, an informed incumbent is more motivated to get reelected relative to a low quality type, because her reelection ensures that the second period policy choice is made by a high quality type. Analogous reasoning explains why the officeholder chooses $x_1 = \underline{x}$, when $\omega_1 \in (\underline{x}, 0)$. Figure 5 summarizes policy choices as a function of the incumbent politician's information.

Figure 5: Equilibrium policy choices
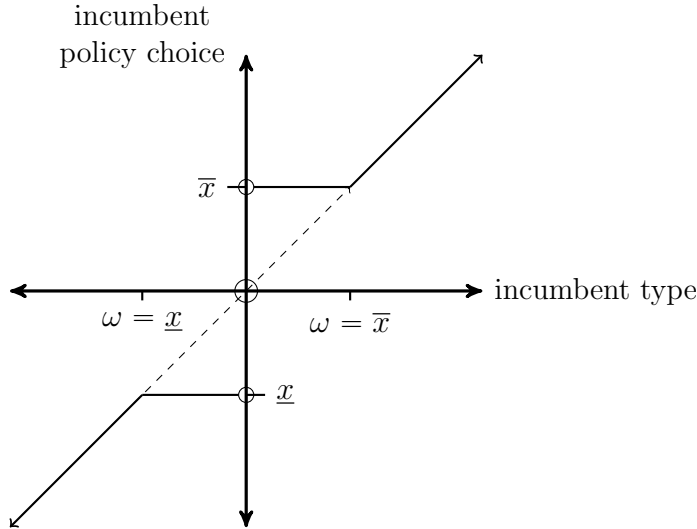
Note: The black arrows represent policy choices by an informed incumbent. The circles depict the policies over which an uninformed incumbent mixes. The dashed line shows the first-best policy choice, given the officeholder's information.

Finally, consider policymaking by a low quality incumbent. As this type of incumbent is indifferent over $\underline{x}$, 0, and $\overline{x}$, she is willing to mix with any probability over these policies. An uninformed incumbent would never choose a policy more extreme than $\overline{x}$ or $\underline{x}$, as this yields strictly worse policy utility and does not change her probability of reelection. Similarly, she would never choose a policy that is more extreme than 0 but more moderate than $\underline{x}$

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and $\overline{x}$. When the uninformed type chooses $\overline{x}$ or $\underline{x}$, she postures by adopting an extreme policy, despite having no information that suggests the correct policy lies in that direction. Alternatively, choosing $x = 0$ signals that she is uninformed and, thus, she is removed from office for certain. The incumbent is willing to forgo reelection in this case, as she obtains her highest expected policy payoff.

Given this interval characterization, politicians may choose policies that overreact to the left or right, or posture in either direction. Consider the stylized example of a policymaker deciding how to respond to an economic crisis. Assume the public believes government spending should be moderately increased in order to combat the crisis. The executive, however, has information suggesting that a somewhat larger increase in spending is optimal. The incumbent overreacts to this information if she implements a much larger stimulus plan than both what the public expects and what her information suggests. If the policymaker instead learns that the best method for navigating the crisis is a small increase in government spending, then she can overreact to this information by adopting severe austerity measures.

3.3 Voter Welfare

Disproportionate policy responses distort outcomes away from the first-best, thereby decreasing voter welfare. Disproportionate reactions can increase in two ways. First, the probability of a disproportionate response can increase. This probability increases if the set of types that overreact to information increases, or if the uninformed type postures more often. In equilibrium, the probability of a disproportionate response is given by $q\left(F(\overline{x}) - F(\underline{x})\right) + (1 - q)\left(\underline{\pi} + \overline{\pi}\right)$. Second, the degree to which policy is disproportionate can increase. The equilibrium degree of disproportionate reaction by the incumbent is the distance between what her information suggests is the optimal policy and the policy that she actually implements. For an informed incumbent, this is $|\overline{x} - \omega_1|$ or $|\underline{x} - \omega_1|$ while, for an uninformed type, this is simply $\overline{x}$ or $|\underline{x}|$.

As the bounds of the non-reelection interval make the uninformed type indifferent between choosing the bound and getting reelected, or choosing $x_1 = 0$ and getting kicked out, these end-points are affected by her incentives for reelection. This is particularly the case for office benefits. Intuitively, if office benefit increases, then the voter must only reelect for more extreme bounds to maintain indifference. The next result summarizes this effect.

Corollary 1. *Increasing office benefit increases $\overline{x}$, $\frac{\partial \overline{x}}{\partial \beta} > 0$, and decreases $\underline{x}$, $\frac{\partial \underline{x}}{\partial \beta} < 0$. Furthermore, if $\beta \to \infty$, then $\underline{x} \to -\infty$ and $\overline{x} \to \infty$.*

If $\overline{x}$ increases and $\underline{x}$ decreases, then both the probability of a disproportionate response and extremism of the response increase. The second part of corollary 1 demonstrates that,

as office benefit becomes large the incumbent overreacts to information with probability 1, and the degree of the distortion becomes arbitrarily large. Furthermore, more extreme bounds result in more posturing. This is because the uninformed type is now taking an action even further from the ex ante optimal policy. Additionally, both $F(\bar{x}) - F(0)$ and $F(0) - F(\underline{x})$ increase which, by proposition 1, implies that the highest probability with which the uninformed type can choose each bound increases.

4 Executive Environment

4.1 Ideological Disagreement

I now incorporate ideological disagreement between the incumbent, voter, and challenger into the model. Therefore, the players may disagree over the extent of action that is warranted, even if the state of the world is known. Assume the incumbent has bias R, the challenger bias L, and $L < 0 < R$. In state ω_t, the payoff for policy x is $-(x - \omega_t - R)^2$ to the incumbent, and is $-(x - \omega_t - L)^2$ to the challenger. The voter's payoff remains $-(x - \omega_t)^2$. In order to simplify expressions, define $\underline{R}$, $\overline{R}$, and ω^* as

$$
\begin{aligned}
\underline{R} &= \sqrt{\max\{0, L^2 - q\sigma^2\}}, \\
\overline{R} &= \sqrt{L^2 + (1 - q)\sigma^2}, \\
\omega^* &= \sqrt{\beta - q\sigma^2 + (R - L)^2}.
\end{aligned}
$$

With the introduction of ideology, the voter may always prefer a politician from the ideologically closer party. If $R < \underline{R}$, then the voter prefers to reelect a low quality incumbent over the challenger. Alternatively, if $R > \overline{R}$, then the voter prefers the challenger, even if the incumbent is high quality. The incumbent is advantaged in the former case and disadvantaged in the latter. In either case, I say the election is *lopsided*. Otherwise, if $\underline{R} \leqslant R \leqslant \overline{R}$, then the election is *competitive*. Proposition 2 summarizes lopsided elections.

Proposition 2. *Assume the election is lopsided. If the incumbent is high quality, then* $x_1 = R + \omega$. *If the incumbent is low quality, then* $x_1 = R$. *The voter always reelects the incumbent when she is advantaged. By contrast the voter always elects the challenger when the incumbent is disadvantaged.*

Disproportionate reactions disappear when the incumbent has a strong electoral advantage due to ideology. As the voter always reelects the incumbent, the latter's incentives to distort policy disappear, and she chooses her myopically optimal policy. A similar conclusion

holds if the incumbent is ideologically disadvantaged. In this case, the voter always removes the incumbent from office, as the voter prefers to elect an untried challenger with ideology L over a a known high quality incumbent with ideology R. Again this removes the incentive for an uninformed type to try and posture to get reelected which, in turn, eliminates overreacting by a high quality incumbent.

Figure 6: Lopsided election policy choices
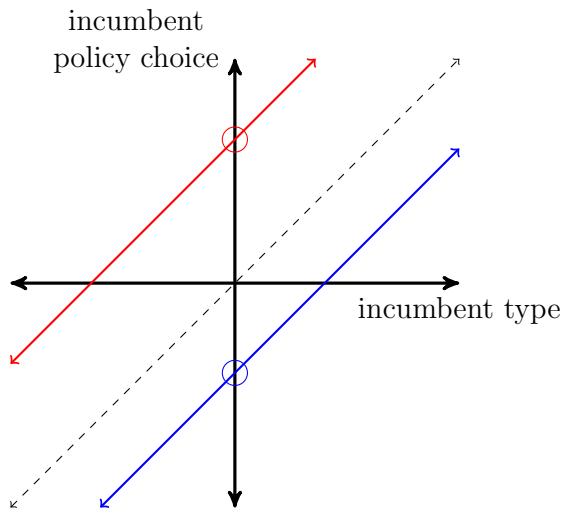
Note: The red arrow gives policy choices by an incumbent with bias R in a lopsided election. The blue arrow gives policy choices by an incumbent with bias L. The red and blue circles represent the policy chosen by an uninformed incumbent from party R and L, respectively. The dashed line illustrates the optimal policy choice for the voter.

In a competitive election, however, a politician of either ideology can be elected if the voter thinks it is sufficiently likely the incumbent is low or high quality. The next proposition characterizes equilibrium behavior in competitive elections, and explores how changes in the ideological polarization between the parties affects policymaking.

Proposition 3. *Assume the election is competitive. Define $\overline{x}_R = R + \omega^*$ and $\underline{x}_R = R - \omega^*$.*

1. *If $x_1 \geqslant \overline{x}_R$ or $x_1 \leqslant \underline{x}_R$, then the voter reelects the incumbent. If $x_1 \in (\underline{x}_R, \overline{x}_R)$, then the voter elects the challenger.*

2. *Assume I is informed. If $\omega_1 \in (-\omega^*, 0)$, then she chooses $x_1 = \underline{x}_R$. If $\omega_1 \in [0, \omega^*)$, then she chooses $x_1 = \overline{x}_R$. Otherwise, I chooses $x_1 = \omega_1$.*

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3. *Assume I is uninformed. I chooses $x_1 = \overline{x}_R$ with any probability*

$$\overline{\pi}_R \in \left[0, \left(\frac{q}{1-q}\frac{1-q-\frac{R^2-L^2}{\sigma^2}}{q+\frac{R^2-L^2}{\sigma^2}}\right)\left(F(\omega^*) - F(0)\right)\right].$$

I chooses $x_1 = \underline{x}_R$ with any probability

$$\underline{\pi}_R \in \left[0, \left(\frac{q}{1-q}\frac{1-q-\frac{R^2-L^2}{\sigma^2}}{q+\frac{R^2-L^2}{\sigma^2}}\right)\left(F(0) - F(-\omega^*)\right)\right].$$

Finally, I chooses $x_1 = R$ with probability $1 - \overline{\pi}_R - \underline{\pi}_R$.

4. *Increasing $|R - L|$ increases overreaction. That is, $\partial \omega^* / \partial |R - L| > 0$.*

Similar to the model without ideology, behavior can be characterized by an interval of policies, where the bounds of the interval, $\underline{x}_R$ and $\overline{x}_R$, make the low quality type indifferent between choosing her ideal policy and getting kicked out or choosing the bound and getting reelected. In this case, the interval is shifted to center around R. Informed incumbents who learn that the state is in the corresponding interval of states overreact to this information, and choose the closest bound, while informed incumbents outside the interval choose their ideal policy. An uninformed incumbent mixes over $\underline{x}_R$, R, and $\overline{x}_R$. Figure 7 illustrates voting behavior, while figure 8 shows policy choices by an ideologically biased incumbent.

Figure 7: Voting in competitive elections
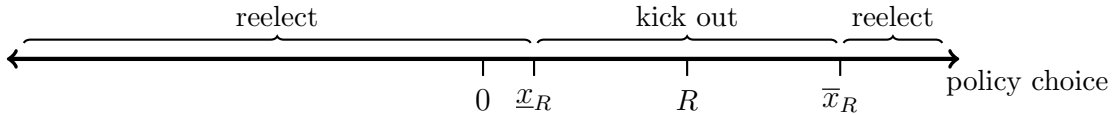
Note: Figure 7 shows which policy choices lead to reelection when the incumbent has an ideological bias and the election is competitive. If x_1 is below the lower cut-point $\underline{x}_R$ or above the upper cut-point $\overline{x}_R$ then the voter reelects the incumbent. If x_1 is in between then the voter instead elects the challenger.

Part 4 of proposition 3 analyzes the effects of increasing polarization between the candidates, while maintaining a competitive election. It shows that greater polarization increases disproportionate policy responses by the incumbent. This effect exists because increasing polarization makes losing the election worse for the incumbent, as the challenger implements an ideologically more distant policy in the second period. This increases the incumbent officeholder's incentive to get reelected. As a consequence, the cut-points $\underline{x}_R$ and $\overline{x}_R$ push further apart, increasing the frequency and extent of disproportionate policies.

Figure 8: Policy choices in competitive elections
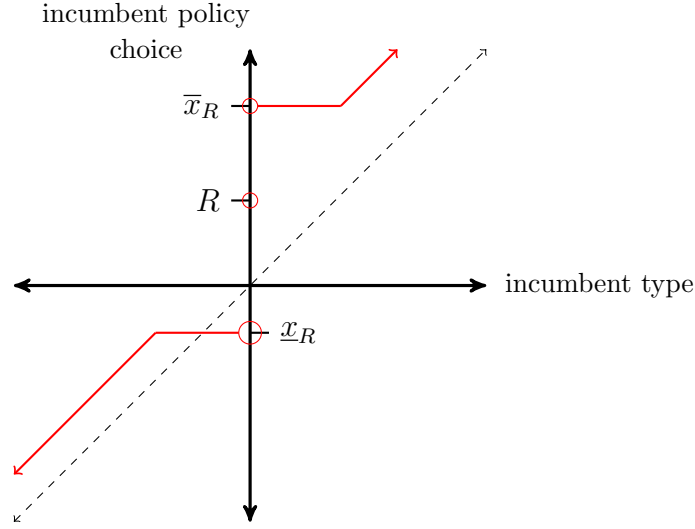
Note: The red arrows depict the policy choices of a high quality incumbent with bias R in a competitive election. If $\omega \in (-\omega^*, \omega^*)$, then the incumbent overreacts to her information. The circles represent mixing over $\underline{x}_R$, R, and $\overline{x}_R$ by an uninformed incumbent.

Proposition 3 also provides insight into the type of politicians likely to be reelected as a function of how extreme R is relative to L. If the incumbent is ideologically closer to the voter than the challenger, $|R| < |L|$, then the voter is willing to reelect the incumbent, even if she is less likely to be high quality than the challenger. As such, the uninformed type is able to posture more frequently and still get reelected. By contrast, consider when the incumbent favors more extreme interventions relative to the challenger, $|R| > |L|$. In this case, the voter is more inclined to elect the challenger, which means the uninformed type cannot posture as frequently. Therefore, there is better selection of high quality types from an incumbent more biased than the challenger, relative to the voter's preference.

Corollary 2 pulls together propositions 2 and 3 to study the overall effect of incumbent extremism on policymaking.

Corollary 2. *For $R < \underline{R}$ there are no disproportionate policy choices. If $\underline{R} \leqslant R \leqslant \overline{R}$, then increasing R strictly increases under- and overreaction. Finally, for $R > \overline{R}$ there is again no policy distortions.*

The logic for why disproportionate responses are non-monotonic in the ideological extremism of the incumbent follows from propositions 2 and 3. When the incumbent is much further from the voter than the challenger, there is no distortion. As R moves in, and the incumbent gets closer to the voter ideologically, eventually the election becomes competitive

which creates disproportionate policy choices. As the incumbent continues to move closer to the voter, however, polarization between the parties decreases, shrinking the distance between $\overline{x}_R$ and $\underline{x}_R$ and decreasing disproportionate reactions. Finally, as R approaches 0 either $\overline{x}_R - \underline{x}_R$ reaches its minimum value or the incumbent becomes much closer to the voter than the challenger and the election becomes lopsided.

The non-monotonicity of disproportionate responses in ideology indicates that voter welfare may also be non-monotonic in the ideology of the incumbent. This further suggests that the relationship between ideological extremism and voter welfare may not be straightforward. Proposition 4 examines this possibility.

Proposition 4. *Assume office benefit is sufficiently large. If $L^2 < q\sigma^2$, then the voter prefers an incumbent with a biased ideology. Specifically, voter welfare is maximized at $R = \overline{R} > 0$. Otherwise, if $L^2 > q\sigma^2$, then voter welfare is maximized when the incumbent has a matching ideology, $R = 0$.*

Surprisingly, voter welfare can be higher when the incumbent has an ideological bias different from the voter. This is the case if office benefits are high and L is not overly extreme. A lopsided election removes disproportionate policy responses and, consequently, the voter does better enduring more ideologically extreme policies in order to eliminate distortions. Figure 9 depicts the discontinuity in voter welfare that creates this effect. If the challenger is relatively moderate, then this trade-off is reversed. Under this scenario, the distortions from accountability are less severe; hence, the voter now prefers the incumbent be ideologically congruent. Finally, if the challenger is ideologically distant, then an incumbent with matching bias, $R = 0$, delivers the best of both worlds. When the challenger is ideologically extreme, setting $R = 0$ removes distortions due to ideology and creates a lopsided election which removes distortions due to accountability.

4.2   Valence Characteristics

In the analysis of ideology, I showed that distortions disappear when the election is lopsided. However, advantages in this case were determined based on ideological congruency with the voter. In general, electoral advantages for the incumbent may arise in a number of ways. Here, I consider two other forms of divergence between the incumbent and challenger: advantages due to issue expertise or other personal characteristics. To isolate these effects, again assume that the players share the same ideology.

The incumbent may have a valence advantage, or disadvantage, due to politician specific characteristics such as charisma. To model this, assume that by reelecting the incumbent the

Figure 9: Voter welfare and incumbent ideology
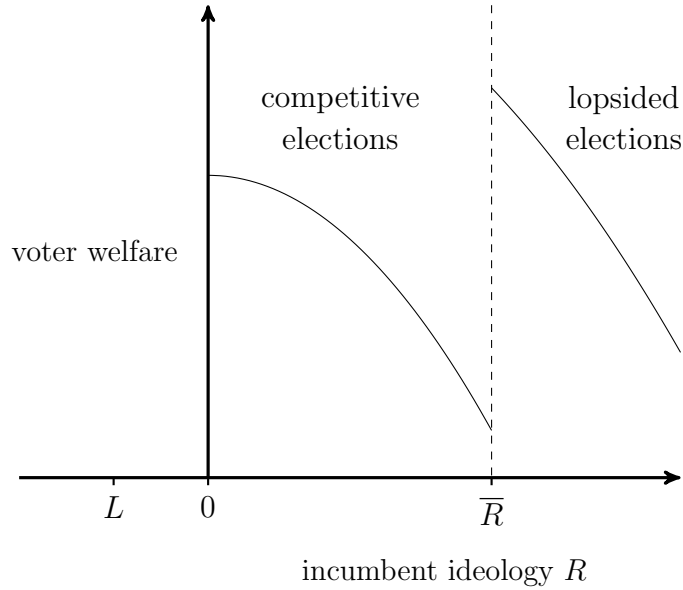
Note: Figure 9 illustrates voter welfare as a function of the incumbent politician's ideology when office benefit is high and the challenger is relatively moderate. In particular, it shows that in this case voter welfare is highest when the incumbent has a more extreme ideology.

voter obtains a known payoff, $v \in \mathbb{R}$, where $v > 0$ represents that the incumbent is advantaged and $v < 0$ represents that the incumbent is disadvantaged relative to the challenger.[12]

Similar to the case of ideology, valence has a non-monotonic effect on disproportionate responses. If v is high, then the voter always reelects the incumbent, while if v is low, then the voter always elects the challenger. In either case, policy distortions are eliminated. When v is moderate, neither politician is overly advantaged, equilibrium behavior is characterized by an interval of unelectable policies, and, hence, disproportionate policy responses exists. However, in contrast to ideology, changing v has no effect on the severity of the responses, or the probability of overreacting to information. This is because there is no spillover effect due to the incumbent caring about the policy choice the challenger implements if she wins. As a result, increasing v does not change the officeholder's motivation for reelection, which leaves fixed the interval characterizing equilibrium behavior. Intermediate changes in v can, however, affect the probability that an uninformed incumbent postures and chooses a disproportionate policy. If $v > 0$, then the voter is willing to reelect the incumbent even if the voter believes she is less likely to be high quality than the challenger. If $v < 0$, then the voter only reelects the incumbent if, after observing x_1, the incumbent has a higher

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[12] In other applications, v could also represent search costs for finding a replacement.

probability of being high quality than the challenger. Overall, increasing v increases how frequently an uninformed incumbent can get reelected in equilibrium.

Second, there may be differences in the voter's belief about the ex ante probability each politician is informed. I model this difference by assuming the voter has two separate priors over politician competence. That is, he believes the incumbent is high quality with probability $q_I \in (0, 1)$ and the challenger is high quality with probability $q_C \in (0, 1)$. In this case, disproportionate policy responses always exists, as the voter is always willing to elect a known high quality incumbent over an untried challenger.

As with changing v, increasing q_I has no effect on the degree to which policies are disproportionate, and no effect on informed incumbents. This is because q_I does not change the incumbent politician's incentive to get reelected. Changing q_I can, however, affect posturing by an uninformed incumbent. Similar to the case of valence, if the incumbent is more likely to be informed, then the uninformed type is able to choose the bounds of the interval more often, and have the voter still be willing to reelect.

Changing the probability the challenger is informed does affect disproportionate policy responses. In particular, increasing q_C decreases disproportionate policy responses because if the challenger becomes more likely to be high quality, then losing the election becomes less costly to the incumbent. This shrinks the interval of policies for which an informed incumbent overreacts to information, and decreases the frequency for which an uninformed incumbent can posture. Thus, high quality challengers dissuade disproportionate policies, while retaining the selection benefits of accountability.

The expertise advantage differs from an ideological, or characteristic, advantage. Under an expertise advantage it is always possible for the incumbent to be elected or kicked out if her action has a sufficiently large impact on the voter's belief. By contrast, the ideological or valence advantage can be sufficiently large that the voter's decision does not depend on her beliefs about the incumbent. On the other hand, an ideological or expertise advantage for the challenger directly affects the incumbent, whereas a valence advantage for the challenger only impacts the incumbent through the voter's behavior. In sum, the exact form of a politician's advantage or disadvantage has an important effect on policymaking, and on distortions due to accountability.

5 Discussion

5.1 Comments on the Model

Before proceeding, a few comments on the model are in order. In particular, I discuss two important features of the model.

First, although stylized, the set-up of the model captures an incentive problem in which the incumbent must try to appear informed to the voter while also balancing her policy payoffs. Additionally, the set-up remains comparable to previous work on the subject, such as, Harrington Jr (1993), Canes-Wrone et al. (2001), Levy (2004), and Fox and Stephenson (2011), making it possible to identify the assumptions driving new results. One important difference with these previous works is that I model a richer policy space. Indeed, many policy areas of interest, particularly when concerned with overreaction, are best characterized by allowing multiple degrees of response, e.g., military spending, economic stimulus. While previous models contain similar ingredients, i.e., they incorporate accountability, an unknown optimal policy, and differing politician abilities, they often assume a binary policy space. This rules out overreacting to information and studying the extent to which actions are disproportional. Furthermore, note that the important point of departure is that the policy space is richer, and not that there is a continuum of states of the world. To see this, consider there being only two states of the world, but the policy space is the real line. In this case, the low quality type is still incentivized to choose a moderate policy and mitigate her risk, while high quality types are relatively more willing to choose extreme policies in the direction of the true state.

Second, a key assumption of the model for studying polarization and policy reactions in Section 4 is that the incumbent cares about the second period policy even if she loses the election. This assumption is a cornerstone of citizen-candidate models of electoral accountability (e.g., Osborne and Slivinski (1996); Besley and Coate (1997); Duggan (2000)). It is also similar in spirit to the assumption that the loser of a Downsian election still incurs utility from the winner's policy. Indeed, a similar assumption drives the finding in Bernhardt et al. (2009) that party competition can make officeholders more responsive to voters. In Bernhardt et al., however, this effect leads to beneficial moderation by officeholders, whereas here it incentivizes detrimental extremism. Additionally, consistent with the observation that officeholders in high level executive positions often continue caring about policy outcomes after leaving office. For example, John Adams is said to have worked until midnight on his last day in office approving judicial appointments in order to curb the influence of the incoming Thomas Jefferson. More recently, after leaving office Barack Obama criticized later attempts to repeal the Affordable Care Act, Donald Trump's decisions to withdraw

from the Paris Accord, and the decision to withdraw from the Iran nuclear deal.[13,14,15]

5.2   Policy Responses

I now highlight some implications of equilibrium behavior useful for the empirical work studying executive policy choices.

On many issues where the decision is over the degree of reaction, scholars are mostly concerned about overreaction. For example, following terrorist attacks it is often observed that governments overreact to the threat, rather than underreact (e.g., Mueller (2006)). In this case, the bidirectional nature of the equilibrium may seem at odds with what is observed empirically. However, the following implication shows how predominantly overreactions can arise in the model, and provides insight into when this is the case.

Implication 1. Assume F is a left-skewed normal distribution. The probability of observing an overreaction is greater than that of an underreaction.

Thus, the beliefs of the players play an important role for understanding the empirical frequency of overreactions.[16,17] When the distribution is asymmetric, with more probability placed on the necessary action being greater than the expectation, this results in overre-actions being observed more often than underreactions. The direct effect of skewing the distribution is that politicians observe a state greater than 0 more often and, thus, overreact more often. As a consequence, uninformed politicians are able to overreact with a higher frequency and still get reelected, compared to underreacting.

It is challenging to empirically assess disproportionate reactions. First, it is tough to distinguish posturing from overreacting to information. This must be the case as, otherwise, posturing would not be a successful reelection strategy. Recalling Ford's response to the capture of the *Mayaguez*, because voters were initially unaware of the civilian casualties, at first many viewed Ford's aggressive approach favorably. Second, disproportionate responses are relative to some benchmark, and this benchmark depends on the circumstances of the issue. Based on both of these issues, concluding that a policy was disproportionate requires

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[13]Alana Abramson, "Barack Obama Criticizes '50th or 60th' Attempt to Repeal the Affordable Care Act," *Time Magazine*, September 20, 2017, http://time.com/4949837/obamacare-repeal-barack-obama-graham-cassidy/.

[14]Eugene Scott, "Obama touts Paris accord despite 'temporary absence of US leadership'" *CNN*, July 4, 2017, https://www.cnn.com/2017/07/03/politics/obama-korea-speech-trump/index.html.

[15]Alana Abramson, "'So Misguided.' Barack Obama Weighs In On Trump's Decision to Pull U.S. From Iran Nuclear Deal" *Time Magazine*, May 18, 2018, http://time.com/5270065/obama-iran-deal-trump/.

[16]This result on skewness also holds for other distributions.

[17]In Section 6, the extension to policy feedback shows how theses beliefs can result in more severe overre-actions, compared to underreactions, as well.

a good deal of background information and context that may not be amenable to large N analysis. Correspondingly, most work on disproportionate responses has focused on case studies (e.g., Maor (2012); Maor et al. (2017); Peters et al. (2017); see De Francesco and Maggetti (2018) for an exception). Therefore, it may be easier to look for more indirect evidence.

Fortunately, the model makes predictions about policy choices that are distinct from related theories. They could be used to identify issues on which politicians appear likely to enact disproportionate proportions. The different theories also have very different policy prescriptions for improving voter welfare. Thus, it is important to know on which issues disproportionate policies arise.

Implication 2. The variance in policy choices of term-limited executives is less than the variance in policy choices for executives who can run for reelection.

In the second period, the politician tries to match the state. As such, if policy is initially disproportionate, then there is an overall reversion to the mean effect. Thus, the model predicts that the variance in the distribution of second period policy choices is less than the variance in the distribution of first period policies.

The next implication is similar, but considers the preferences of voters as it relates to policy choice.

Implication 3. In expectation, the executive chooses a policy that is ex ante more popular in her final term.

Both of these implications stand in contrast to Canes-Wrone et al. (2001), in which there is uncertainty over expertise but pandering is the accountability failure of interest. Specifically, with pandering, in the first period politicians are more often picking the popular policy, resulting in less variance. Similarly, if the incumbent panders in the first period, then she is choosing the most popular policy and, thus, the officeholder becomes more likely to choose the policy not ex ante preferred by the voters when not facing reelection. This is also in contrast to models with uncertainty over ideology (e.g., Bernhardt et al. (2004); Duggan and Martinelli (2017)). In these models, the incumbent is incentivized to choose policies closer to the median to get reelected. For example, if office benefit is high, then all incumbents converge to the median in the first period. Thus, there is no variance in the policy choice and all incumbents choose the most popular policy. However, in her final term the officeholder chooses her most preferred policy, which creates variation in the policy choices, and is less popular than the median's ideal.

Previous studies have tried to account for the effect of candidate and challenger characteristics on election outcomes and officeholder policies, e.g., Stone and Simas (2010). The

following implication highlights the difference between expertise and non-expertise valence advantages on policy outcomes.

Implication 4. Assume F is a skewed normal distribution. Expected policy extremism is non-monotonic in v, and greatest for moderate v. If q_I increases or q_C decreases, then expected extremism increases. Increasing v, increasing q_I, or decreasing q_C increases the probability that the incumbent wins reelection.

As expected, if the incumbent has a stronger valence advantage over the challenger, then she wins reelection more often. Less straight-forward, however, is the effect on policy extremism, which can be non-monotonic and depend on the form of the advantage. The model suggests that measures of valence should distinguish job-related advantages from unrelated advantages, such as personal integrity, rather than aggregate these traits into an overall valence score. Furthermore, empirical analysis of policymaking and character advantages should incorporate a quadratic term to account for the non-monotonicity of extremism in v-related advantages.

5.3   Delegation

Disproportionate reactions distort policy outcomes. Consequently, corollary 1 implies that increasing office benefit decreases voter welfare. This does not necessarily imply, however, that accountability is always bad for the voter. Indeed, elections help the voter select high quality officeholders for policymaking in the second period.[18] If authority is not delegated, e.g., the ex ante optimal policy is simply maintained by the bureaucracy, decided via direct democracy, or chosen by the principal in non-electoral applications, then there are no distortions due to disproportionate reactions. This is costly, however, as policymaking is poorly informed in both periods for certain.

Implication 5. If office benefit, β, is sufficiently low, then the executive should be delegated authority. Otherwise, the executive should not be given policymaking authority.

Overall, the voter is willing to incur some distortion by the incumbent, in order to reap the benefits of informed second-period policymaking, but this willingness has a limit.

Giving the policymaker tenure to remove accountability is an alternative mechanism also explored in the literature (e.g., Maskin and Tirole (2004); Aghion and Jackson (2016)). In this case, a similar implication holds, as there is a cut-off in office benefit above which

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[18]This finding reinforces the point made by Fearon (1999) and subsequent authors that there may be a tension in controlling versus selecting politicians.

the voter does better with tenure, and below which holding the policymaker electorally accountable is optimal.[19]

Now alter the model so that the voter selects the ideology of the incumbent at the start of the game and, if the incumbent is replaced, then the voter is able to choose the ideology of the challenger as well.[20] This set-up may be particularly applicable to appointments, where the voter is the president and the politician an agency head.

Implication 6. If office benefit is sufficiently high, then the voter chooses an executive in the first period with non-congruent preferences. Furthermore, if q is also sufficiently high, then the voter prefers a biased executive with policymaking authority, over removing the executive's power.

In the last period, if the voter replaces the incumbent, then he would choose a policymaker who shares his ideal point, i.e., $L = 0$. Anticipating this choice, corollary 4 implies that, with high office benefits, the voter should choose a first-period politician with a relatively extreme ideal point, i.e., $R = \overline{R}$.[21] Therefore, if the voter is influential in selecting the ideology of the politicians, then this can endogenously result in a biased first-period officeholder. Furthermore, the second part of the implications suggests that the voter is willing to delegate authority to an extremist, if the executive is likely to be high quality. Applying the model to study appointments, this implication predicts that presidents should appoint ideologically extreme agency heads in their first term in office, and appoint ideologically congruent agency heads in their second term.

6 Extensions

In this section I discuss a number of extensions to the baseline model. While equilibrium continue to be characterized by an interval of disproportionate policy responses, these extensions reveal new insights into the model.

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[19]Note, the voter always does better giving the officeholder tenure, rather than retaining authority, although this no longer holds if the officeholder is ideologically extreme.

[20]Van Weelden (2013) models elections similarly, also allowing the voter to both retain the incumbent and choose the ideology of the replacements

[21]If the voter can commit to choosing the ideologies of both politicians ahead of time, then he should choose an incumbent with a matching ideology and a challenger with an extreme ideology. This yields the first-best outcome as an equilibrium. Thus, under both commitment and non-commitment the voter does best by creating ideological disagreement between the incumbent and challenger.

6.1 Executive Constraints

Now assume that the policy space is bounded, $X = [\underline{X}, \overline{X}]$. A bounded policy space could represent that the policymaker has limited discretion to unilaterally shift policy. If office benefit is low, then equilibrium can be characterized similar to before. When office benefit becomes sufficiently high, however, the cut-points $\overline{x}$ and $\underline{x}$ hit the lower and upper bounds of the policy space. To maintain the uninformed type's indifference, the voter must mix over reelecting the incumbent and electing the challenger. Consequently, the incumbent when uninformed must mix on the bounds of the policy space with high enough frequency to make the voter indifferent, i.e. chooses $\underline{x}$ with probability $F(0)$ and $\overline{x}$ with probability $1 - F(0)$. Therefore, when office benefit is high the voter must kick out the incumbent with a high probability, in order to maintain indifference. As result, higher office benefits lead to more turnover.

6.2 Infinite-horizon with Term Limits

Here, I consider how the equilibrium characterization in the baseline model changes if policymaking repeats over an infinite-horizon, and the politician faces a two-period term limit. It is not immediate that the results in the two-period model should carry over. If the voter elects the challenger, then the newly elected officeholder is now in the first period. Thus, the expected utility of a challenger is endogenous to the characterization of first term play. Due to this endogeneity, the extent of disproportionate responses is bounded. If policy outcomes in the first period were too distorted, then the voter would always reelect the incumbent. However, this would cause the incumbent to deviate from distorting policy in the first place, knowing that she will always be reelected.[22] Thus, the voter's welfare is bounded below, implying that welfare is higher in the infinite-horizon model.

6.3 Policy Feedback

Up to this point, I have assumed that the voter never learns the outcome of the incumbent executive's policy choice before the election. In reality, voters may actually have the opportunity to observe the outcome of policy choices. Following Canes-Wrone et al. (2001) and Maskin and Tirole (2004), modify the model so with probability r the state ω is revealed before the election, and with probability $1 - r$ it is never revealed. Furthermore, assume

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[22] In this model, it is possible to show that there exists a stationary PBE characterized similarly to the two-period model. In this equilibrium, however, the end-points of the interval are bounded below and above by a voter indifference condition. Furthermore, these result in a lower bound of $\frac{-\sigma^2}{1-\delta}$ for the continuation value of a challenger.

that the distribution of states, F, is log-concave. Introducing r creates a new incentive for uninformed types. If F is not symmetric around 0, then $\overline{x}$ and $\underline{x}$ may no longer be equidistant from 0. The reason for this imbalance is that, if $\overline{x} = |\underline{x}|$, then it is not necessarily the case that $F(\overline{x}) - F(0) = F(|\underline{x}|) - F(0)$. As the state is revealed with probability r, the uninformed is incentivized to try and get lucky by choosing the bound which has the higher probability to be "correct". In response, to maintain indifference, one bound must move further away from 0 than the other.

7   Conclusion

Public policy is rife with examples where analysts, either concurrently or retrospectively, note that executives have seemingly acted in a disproportionate matter in addressing a real world problem. Whether this is responding to information by exaggerating the degree of action required or acting decisively despite a lack of information, many have found such actions problematic.

In this paper I have shown how electoral accountability incentivizes politicians to implement policies not proportionate to their information. The key driver of this behavior is that low quality politicians have the most motivation to choose moderate policies. As a consequence, high quality politicians adopt disproportionate policy responses to signal their competence. These distortions are further exacerbated when the officeholder and the challenger have strong ideological disagreements. These results suggest that, under some conditions, voter welfare is higher when the incumbent is not held accountable. Furthermore, I find that voters can prefer an incumbent with biased policy preferences over an ideologically congruent politician. Empirically, the model implies that policy issues prone to disproportionate responses are characterized by high variance in the policy choices of incumbents facing competitive elections.

In the future, there are a number of directions in which this analysis could be extended. First, while I have examined when the voter is better off with the politician having full authority, it may be possible to structure executive powers such that the offficeholder has an intermediate level of authority. That is, to study the delegation sets that optimally constrain the executive's policy choices. Similarly, it would be interesting to analyze how other features of the political environment, such as judicial review or the media, may limit or exacerbate disproportionate policy responses. Second, incorporating information acquisition by the executive may uncover new insights. For example, it may be optimal to have high office benefit to encourage information acquisition, even at the cost of increased policy distortion. Third, building in adverse selection over ideology may help identifty conditions under which

the incentives to appear competent by choosing extreme policies overcomes the incentives to appear congruent by choosing moderate policies. This may provide further guidance for empirically studying disproportionate policy responses. Finally, the policy distortion studied here should be robust to a number of generalizations, e.g., a policy space with multiple dimensions. It may be valuable to pursue such generalizations in order to understand the extent to which accountability creates incentives for experts to choose disproportionate policies.

A   Proofs of Main Results

A.1   Proofs of Proposition 1 and Corollary 1

To start, note that solving equation 2 yields explicit solutions $\overline{x} = \sqrt{\beta - q\sigma^2}$ and $\underline{x} = -\sqrt{\beta - q\sigma^2}$, from which corollary 1 immediately follows.

I first show that the strategies given in proposition 1 form a PBE. Following this, I prove that every PBE satisfying D1 is characterized by these strategies.

The expected first-period policy utility to an uninformed incumbent for policy x is $-x^2 - \sigma^2$. Hence, choosing $x \in (\underline{x}, \overline{x})/\{0\}$ and getting kicked out is strictly worse than choosing $x = 0$. Likewise, choosing $x > \overline{x}$ or $x < \underline{x}$ and getting reelected is strictly worse than choosing $\overline{x}$ or $\underline{x}$ and getting reelected. By construction, $\underline{x}$ and $\overline{x}$ make an uninformed incumbent indifferent between choosing $x_1 = \underline{x}$, $x_1 = \overline{x}$, and $x_1 = 0$. Therefore, an uninformed incumbent will not deviate from mixing over $\underline{x}$, $\overline{x}$, and 0.

Next consider an informed incumbent. If $\omega_1 \leqslant \underline{x}$ or $\omega_1 \geqslant \overline{x}$, then choosing $x_1 = \omega_1$ and getting reelected with certainty is clearly optimal. Next, assume $\omega_1 \in [0, \overline{x})$. The best policy payoff for choosing an x_1 that leads to reelection is $x_1 = \overline{x}$. The incumbent's greatest policy utility from a policy that leads to removal from office is $x_1 = \omega_1$. The expected utility for choosing $x_1 = \omega_1$ and being removed from office is $\beta - (1 - q)\sigma^2$, while the expected utility for choosing $x_1 = \overline{x}$ and being reelected is $-(\overline{x} - \omega_1)^2 + 2\beta$. As the expected utility for choosing $\overline{x}$ is strictly decreasing in ω_1, if the $\omega_1 = 0$ type prefers $\overline{x}$ over choosing $x_1 = 0$ then every type $\omega_1 \in (0, \overline{x})$ will also prefer to choose $x_1 = \overline{x}$. This yields

$$-\overline{x}^2 + 2\beta > \beta - (1 - q)\sigma^2 \tag{3}$$

$$(1 - q)\sigma^2 + \beta > \overline{x}^2 \tag{4}$$

$$(1 - q)\sigma^2 + \beta > \beta - q\sigma^2 \tag{5}$$

$$\sigma^2 > 0. \tag{6}$$

Where (3) follows from rearranging the inequality (4), (5) follows from substituting in $\overline{x}$, and (6) from reducing (5). An analogous argument yields the optimality of choosing $\underline{x}$ if $\omega_1 \in (\underline{x}, 0)$.

Finally, given the strategy of the incumbent, the voter must be willing to reelect the incumbent following $x_1 \geqslant \overline{x}$ and $x_1 \leqslant \underline{x}$ and be willing to elect the challenger following $x_1 \in (\underline{x}, \overline{x})$. If $x_1 \in (\underline{x}, \overline{x})/\{0\}$ this is off the path of play, thus, assigning any belief $\tilde{q}(x_1) \leqslant q$ it is optimal for the voter to elect the challenger. Anticipating the demands of $D1$, moving forward assume $\tilde{q}(x_1) = 0$ for $x_1 \in (\underline{x}, \overline{x})/\{0\}$. As only the uninformed type ever chooses

$x = 0$ the voter updates that $q(0) = 0 < q$ and kicks out the incumbent as required. On the other hand, $x_1 > \overline{x}$ or $x_1 < \underline{x}$ is only ever chosen by the informed type. In this case, $q(x_1) = 1 > q$ and the voter reelects as required. If $x_1 = \overline{x}$ for it to be optimal for the voter to reelect the incumbent requires

$$\tilde{q}(\overline{x}) \geqslant q \tag{7}$$

$$\frac{q\Big(F(\overline{x}) - F(0)\Big)}{q\Big(F(\overline{x}) - F(0)\Big) + (1-q)\overline{\pi}} \geqslant q \tag{8}$$

$$F(\overline{x}) - F(0) \geqslant q\Big(F(\overline{x}) - F(0)\Big) + (1-q)\overline{\pi} \tag{9}$$

$$F(\overline{x}) - F(0) \geqslant \overline{\pi}. \tag{10}$$

Where (7) is the optimality requirement. (8) follows by using Bayes rule to find $\tilde{q}$. (9) rearranges (8) and (10) rearranges (9). Finally, (10) holds from the definition of $\overline{\pi}$. Similarly, it is optimal for the voter to reelect the incumbent following $x_1 = \underline{x}$.

I now show that an equilibrium characterized by proposition 1 survives D1. Specifically, that it puts probability 0 on a deviation to $\hat{x} \in (\underline{x}, \overline{x})$ coming from an informed type. An arbitrary incumbent type is given by $\tau \in \mathbb{R} \times \{\phi\}$. Define $R_\sigma(\tau, x)$ as the set of reelection probabilities ρ for which the τ type strictly prefers choosing policy x and getting reelected with probability ρ over getting their equilibrium payoff in a PBE σ. Similarly, define $R_\sigma^0(\tau, x)$ as those reelection probabilities that make τ indifferent. If $\hat{x}$ is off the path of play, then D1 requires putting probability 0 on a type τ if there exists a type τ' such that $R_\sigma(\tau, \hat{x}) \cup R_\sigma^0(\tau, \hat{x}) \subseteq R_\sigma(\tau', \hat{x})$. This simply states that the voter should not believe the deviation came from type τ if there is another type τ' who is willing to deviate to $\hat{x}$ and win reelection with a lower probability.

I first show that if the incumbent is informed, then the $\omega_1 = 0$ type has the strongest incentive to choose an off path action, thus, the voter should not believe that the deviation came from any type $\omega_1 \in \mathbb{R}/\{0\}$. Second, I eliminate that the deviation should come from the $\omega_1 = 0$ type by showing that the uninformed type is willing to deviate for a larger set of reelection probabilities.

Clearly the voter should never believe that a deviation came from a type such that $\omega_1 \geqslant \overline{x}$ or $\omega_1 \leqslant \overline{x}$, as these types obtain their highest possible payoff and would not deviate to $\hat{x} \in (\underline{x}, \overline{x})$ for any reelection probability. Next, consider a type $\omega_1 \in [0, \overline{x}]$. In this case, in equilibrium she chooses $x_1 = \overline{x}$ and her equilibrium payoff is

$$-(\overline{x} - \omega_1)^2 + 2\beta.$$

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If she deviates to $x_1 = \hat{x}$ her payoff, given reelection probability $\rho_{\hat{x}}$, is

$$-(\hat{x} - \omega_1)^2 + \beta + \rho_{\hat{x}}\beta - (1 - \rho_{\hat{x}})(1 - q)\sigma^2.$$

Comparing these payoffs and rearranging, we get that for any $\hat{x}$ the ω_1 type has an incentive to deviate from choosing $\overline{x}$ if

$$\rho_{\hat{x}} > \frac{(\hat{x} - \omega_1)^2 - (\overline{x} - \omega_1)^2 + \beta + (1 - q)\sigma^2}{\beta + (1 - q)\sigma^2}. \tag{11}$$

Differentiating the RHS of (11) with respect to the type ω_1 yields

$$\frac{\partial RHS(11)}{\partial \omega_1} = \frac{2(\overline{x} - \hat{x})}{\beta + (1 - q)\sigma^2} > 0.$$

Therefore, the RHS of (11) is minimized at $\omega_1 = 0$ and and so D1 requires putting probability 0 on the deviation coming from any type $\omega_1 \in (0, \overline{x})$, as the set of reelection probabilities for which these types strictly prefer or are indifferent to deviating to $\hat{x}$ is a subset of the reelection probabilities for which the $\omega_1 = 0$ type will deviate.

Now consider the incentive for a type $\omega_1 \in (\underline{x}, 0)$ to deviate to an off path action $\hat{x} \in (0, \overline{x})$. In this case, she is willing to deviate if

$$\rho_{\hat{x}} > \frac{(\hat{x} - \omega_1)^2 - (\underline{x} - \omega_1)^2 + \beta + (1 - q)\sigma^2}{\beta + (1 - q)\sigma^2}. \tag{12}$$

Now differentiating (12) with respect to ω_1 yields

$$\frac{\partial(12)}{\partial \omega_1} = \frac{2(\underline{x} - \hat{x})}{\beta + (1 - q)\sigma^2} < 0,$$

where the inequality follows from $\underline{x} < 0$. Thus, increasing $\omega_1 \in (\underline{x}, 0)$ decreases the RHS of (12). As letting $\omega_1 \to 0$ converges to the $\omega_1 = 0$ type's payoff by D1 we must place probability 0 on a deviation to $\hat{x} \in (0, \overline{x})$ coming from any type $\omega_1 \in (\underline{x}, 0)$. Analogous arguments show that for a deviation to $\hat{x} \in (\underline{x}, 0)$ D1 places probability 0 on it coming from any informed type $\omega_1 \in (\underline{x}, \overline{x})/\{0\}$.

Finally, consider the uninformed type's incentive to choose $\hat{x} \in (0, \overline{x})$. Her equilibrium payoff is equivalent to choosing $\overline{x}$ and being reelected, i.e.,

$$-\overline{x}^2 - 2\sigma^2 + 2\beta.$$

Choosing $x_1 = \hat{x}$ and getting reelected with probability $\rho_{\hat{x}}$ gives an expected payoff

$$-\hat{x}^2 - \sigma^2 + \beta + \rho_{\hat{x}}(\beta - \sigma^2) + (1 - \rho_{\hat{x}})(-(1 - q)\sigma^2).$$

Comparing these payoffs and rearranging we get that the uninformed type will deviate to $\hat{x}$ for any $\rho_{\hat{x}}$ such that

$$\rho_{\hat{x}} > \frac{\hat{x}^2 - \overline{x}^2 + \beta - q\sigma^2}{\beta - q\sigma^2}. \tag{13}$$

We need to show that the lower bound on the reelection probabilities for which the uninformed type deviates is lower than the lower bound for which the $\omega_1 = 0$ type deviates. Setting $\omega_1 = 0$ in equation (11) and comparing to (13) yields

$$\frac{\hat{x}^2 - \overline{x}^2 + \beta + (1 - q)\sigma^2}{\beta + (1 - q)\sigma^2} > \frac{\hat{x}^2 - \overline{x}^2 + \beta - q\sigma^2}{\beta - q\sigma^2} \tag{14}$$

$$(\beta - q\sigma^2)(y + \beta + (1 - q)\sigma^2) > (\beta + (1 - q)\sigma^2)(y + \beta - q\sigma^2) \tag{15}$$

$$-\sigma^2(\hat{x}^2 - \overline{x}^2) > (\beta + (1 - q)\sigma^2)(\beta - q\sigma^2) - (\beta - q\sigma^2)(\beta + (1 - q)\sigma^2) \tag{16}$$

$$\sigma^2(\overline{x}^2 - \hat{x}^2) > 0. \tag{17}$$

Equation (14) is the condition that must hold. Equations (15) - (17) follow from manipulating the previous equation. Finally, (17) holds by $\overline{x} > \hat{x}$. Analogous arguments shows that a similar relationship holds for an off path action $\hat{x} \in (\underline{x}, 0)$. Thus, by D1 the voter puts probability 0 on an off path policy choice $\hat{x} \in (\underline{x}, \overline{x})$ coming from an informed type, thus, $\tilde{q}(\hat{x}) = 0$ and the voter kicks out the incumbent as required.

A.2 Proofs of Propositions 2 and 3 and Corollary 2

For proposition 2 note that because the voter always kicks out or always elects the incumbent the incumbent maximizes her policy payoff by choosing $x_1 = R + \omega_1$ if informed and $x_1 = R$ if uninformed.

Under the characterization in proposition 3, if the incumbent is uninformed her expected utility from choosing R is $-\sigma^2 + \beta - (L - R)^2 - (1 - q)\sigma^2$. Her expected utility for choosing $\overline{x}$ is $-(\overline{x} - R)^2 - 2\sigma^2 + 2\beta$. Similarly, her expected utility for $\underline{x}$ is $-(\underline{x} - R)^2 - 2\sigma^2 + 2\beta$. From the definitions of $\overline{x}$ and $\underline{x}$ we have that the uninformed type is indifferent between choosing $\overline{x}$, $\underline{x}$, or R. Using analogous arguments as before it is clear that the uninformed type will not deviate from mixing over these policies.

If the incumbent is informed and learns $\omega_1 \notin (-\omega^*, \omega^*)$, then choosing $x_1 = \omega_1 + R$ yields

her highest policy payoff and she gets reelected. Thus, there is not a profitable deviation. If the incumbent is informed and she learns $\omega_1 \in (0, \omega^*)$, then her equilibrium payoff from choosing $\overline{x}_R$ is

$$-(\omega^* - \omega_1)^2 + 2\beta.$$

Her most profitable deviation is to instead choose $x_1 = R + \omega_1$ and be removed from office, which yields

$$\beta - (1 - q)\sigma^2 - (L - R)^2.$$

Comparing expected utilities we have that the incumbent will not deviate from $\overline{x}_R$ if

$$-(\omega^* - \omega_1)^2 + 2\beta \geqslant \beta - (1 - q)\sigma^2 - (L - R)^2, \tag{18}$$

$$\beta + (1 - q)\sigma^2 + (L - R)^2 \geqslant (\omega^* - \omega_1)^2, \tag{19}$$

$$\beta + (1 - q)\sigma^2 + (L - R)^2 \geqslant (\omega^*)^2. \tag{20}$$

Where (18) is the incentive constraint, (19) follows from manipulating (18), and (20) from noting that because $\omega_1 \in (0, \omega^*)$ if (20) holds then (19) will hold as well. Finally, note that the last inequality holds by the definition of ω^*. Therefore, the $\omega_1 \in (0, \omega^*)$ type incumbent does not want to deviate from her equilibrium action. Similarly, neither will a type such that $\omega_1 \in (-\omega^*, 0)$.

After observing x_1 and updating his belief, the voter's expected utility for reelecting the incumbent is

$$-R^2 - (1 - \tilde{q}(x_1))\sigma^2.$$

On the other hand, if the voter elects the challenger, then his expected utility is

$$-L^2 - (1 - q)\sigma^2.$$

Comparing, we get that the voter will reelect the incumbent if

$$-R^2 - (1 - \tilde{q}(x_1))\sigma^2 \geqslant -L^2 - (1 - q)\sigma^2 \tag{21}$$

$$\Leftrightarrow \tilde{q}(x_1) \geqslant q + \frac{R^2 - L^2}{\sigma^2}. \tag{22}$$

Note, because the election is competitive the RHS of (22) is strictly less than 1 and greater

than 0. If (22) holds with equality, then the voter can reelect with any probability and if the inequality is reversed, then he must elect the challenger.

As only high quality types choose $x_1 \notin (\underline{x}_R, \overline{x}_R)$ the voter's belief following such a policy is $q(x_1) = 1$ and, hence, he reelects as required. As only the low quality type ever chooses $x_1 = R$, $q(R) = 0$ and electing the challenger is optimal. If $x_1 \in (\underline{x}_R, \overline{x}_R)$ this is off the path of play and assuming for x_1 off the path of play we have $q(x_1) = 0$, then the voter will kick out the incumbent. Finally, if $x_1 = \overline{x}_R$ the voter's updated belief that the incumbent is high quality is

$$\tilde{q}(\overline{x}_R) = \frac{q\Big(F(\omega^*) - F(0)\Big)}{q\Big(F(\omega^*) - F(0)\Big) + (1-q)\overline{\pi}_R}. \tag{23}$$

Substituting (23) into equation (22), the voter will reelect the incumbent if

$$\frac{q\Big(F(\omega^*) - F(0)\Big)}{q\Big(F(\omega^*) - F(0)\Big) + (1-q)\overline{\pi}_R} \geqslant q + \frac{R^2 - L^2}{\sigma^2}, \tag{24}$$

$$\left(\frac{q}{1-q} \frac{1 - q - \frac{R^2 - L^2}{\sigma^2}}{q + \frac{R^2 - L^2}{\sigma^2}}\right)\Big(F(\omega^*) - F(0)\Big) \geqslant \overline{\pi}_R. \tag{25}$$

where (25) simply rearranges (24). Inequality (25) is the definition of $\overline{\pi}_R$ and, thus, the voter is willing to reelect following $x_1 = \overline{x}_1$, as well as for $x_1 = \underline{x}_R$.

Part 4 of proposition 3 follows straightforwardly by differentiating ω^* with respect to $R - L$.

Corollary 2 is an immediate consequence of propositions 2 and 3.

A.3 Proof of Proposition 4

To begin, note that if $L > q\sigma^2$, then at $R = 0$ the election is lopsided. As such, the voter's welfare from an incumbent with ideology $R = 0$ is $-(1-q)\sigma^2$, which is his payoff under first-best outcomes and, thus, optimal.

Next, if $R \geqslant \overline{R}$, then the voter always replaces the incumbent and welfare is $W(R \geqslant \overline{R}) = W_{\geqslant}(R)$, given by

$$W_{\geqslant}(R) = -R^2 - (1-q)\sigma^2 - L^2 - (1-q)\sigma^2.$$

As $W_{\geqslant}(R)$ is strictly decreasing in R, it is maximized at $R = \overline{R}$.

If $R < \overline{R}$, then, because $L < q\sigma^2$, the election is always competitive. Here, welfare is

more complicated as the voter's first period payoff depends on the realization of the state and he may or may not reelect the incumbent. In this case, voter welfare is $W(R < \overline{R}) = W_<(R)$

$$W_<(R) = q\Big[\Big(1 - F(\omega^*) + F(-\omega^*)\Big)\Big(-2R^2\Big) + \int_{-\omega^*}^0 \Big(-(\underline{x}_R - \omega)^2 - R^2\Big)f(\omega)d\omega$$

$$+ \int_0^{\omega^*}\Big(-(\overline{x}_R - \omega)^2 - R^2\Big)f(\omega)d\omega\Big] + (1-q)\Big[\overline{\pi}_R\Big(-\overline{x}_R^2 - \sigma^2 - R^2 - \sigma^2\Big)$$

$$+ \underline{\pi}_R\Big(-\underline{x}_R^2 - \sigma^2 - R^2 - \sigma^2\Big) + (1 - \overline{\pi}_R - \underline{\pi}_R)\Big(-R^2 - \sigma^2 - L^2 - (1-q)\sigma^2\Big)\Big]$$

If $\beta \to \infty$, then $\omega^* \to \infty$ and $W_< \to -\infty$. As $W_<$ is continuous in β, there exists $\overline{\beta} < \infty$ such that if $\beta > \overline{\beta}$, then $W_<(R) < W_\geqslant(\overline{R})$.

A.4 Valence

First, consider the incumbent having advantage (or disadvantage) given by $v \in \mathbb{R}$, an additive payoff for the voter. This does not affect an uninformed incumbent's utility for policy choices, thus, $\underline{x}$ and $\overline{x}$ can be defined as before. Consider, however, the voter's problem. In this case, his expected utility for reelecting the incumbent following x_1 is $-(1 - \tilde{q}(x_1))\sigma^2 + v$, while his utility for the challenger is $-(1 - q)\sigma^2$. Thus, the voter will reelect the incumbent if

$$\tilde{q}(\overline{x}) \geqslant q - \frac{v}{\sigma^2}. \tag{26}$$

If $v > q\sigma^2$, then the voter reelects the incumbent even if the he believes the incumbent is uninformed. Hence, the election is lopsided, the incumbent chooses her myopically optimal policy and gets reelected. On the other hand, if $v < -\sigma^2(1 - q)$, then the voter will not reelect the incumbent even if he believes the incumbent is high quality. Hence, the incumbent has no incentive to choose any policy other than her myopically optimal policy, as different policies do not lead to different reelection probabilities. Finally, if $v \in [-\sigma^2(1 - q), q\sigma^2]$ then by similar arguments as before equilibria can be characterized by the interval $[\underline{x}, \overline{x}]$, with

the uninformed type choosing $\overline{x}$ with probability $\overline{\pi}_v$ such that

$$\tilde{q}(\overline{x}) \geqslant q - \frac{v}{\sigma^2} \tag{27}$$

$$\frac{q\Big(F(\overline{x}) - F(0)\Big)}{q\Big(F(\overline{x}) - F(0)\Big) + (1-q)\overline{\pi}_v} \geqslant q - \frac{v}{\sigma^2} \tag{28}$$

$$\frac{F(\overline{x}) - F(0)}{1 - \frac{v}{q\sigma^2}} \geqslant q\Big(F(\overline{x}) - F(0)\Big) + (1-q)\overline{\pi} \tag{29}$$

$$\frac{F(\overline{x}) - F(0)}{1 - q}\left(\frac{1}{1 - \frac{v}{q\sigma^2}} - q\right) \geqslant \overline{\pi}_v. \tag{30}$$

Clearly, $\underline{x}$ and $\overline{x}$ are not changing in v, however, increasing v increases the highest probability for which the uninformed type can choose an end-point of the interval and get reelected. A similar derivation shows that the same holds for the lower bound.

Now consider the incumbent and challenger differing in their ex ante probability of being high quality. The voter reelects the incumbent if

$$-(1 - \tilde{q}(x_1))\sigma^2 \geqslant -(1 - q_C)\sigma^2 \qquad\qquad \tilde{q}(x_1) \geqslant q_C.$$

As $q_C \in (0,1)$, there are always beliefs sufficiently high such that the voter reelects the incumbent, and beliefs sufficiently low such that he kicks out the incumbent. Using similar arguments as early, we have that there is a class of PBE characterized by $[\underline{x}_q, \overline{x}_q]$, where, in this case, the uninformed type's indifference condition yields

$$\underline{x}_q = \sqrt{\beta - q_C\sigma^2}$$
$$\overline{x}_q = \sqrt{\beta - q_C\sigma^2}.$$

Additionally, the uninformed type cannot choose $\overline{x}_q$ with probability greater than $\overline{\pi}_q$, where $\overline{\pi}_q$ is found as follows:

$$\tilde{q}(\overline{x}_q) \geqslant q_C \tag{31}$$

$$\frac{q_I\Big(F(\overline{x}) - F(0)\Big)}{q_I\Big(F(\overline{x}) - F(0)\Big) + (1-q_I)\overline{\pi}_v} \geqslant q_C \tag{32}$$

$$\frac{q_I[F(\overline{x}) - F(0)]}{q_C} \geqslant q_I\Big(F(\overline{x}) - F(0)\Big) + (1-q_I)\overline{\pi}_q \tag{33}$$

$$\frac{q_I[F(\overline{x}) - F(0)]}{[1 - q_I]}\left(\frac{1}{q_C} - 1\right) \geqslant \overline{\pi}_q. \tag{34}$$

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Increasing q_I clearly increases the LHS of (34), while increasing q_C decreases it. A similar derivation shows that the same effect is true for the highest probability for which the uninformed type can choose the lower bound.

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