Ideology and Information in Policymaking*

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Abstract

We consider how the incentives for politicians to pander to public opinion depend on preference heterogeneity and information. As there is greater opportunity for voters to update their beliefs about the politician's type on a more divisive issue, politicians are more likely to pander on divisive issues than on issues with only a small minority. As pandering involves ignoring socially valuable information which goes against the ex-ante preferred policy of the majority, increasing the size of the minority can then lead to policy outcomes more biased towards the action ex-ante preferred by the majority. In addition, because the updating about the politician's type is dampened when the voters are uncertain about the state of the world, politicians are more likely to pander when voters are more informed about which action is in their interest. It is then possible that increasing the information available to the voters, by increasing the likelihood of pandering by politicians, can make all voters worse off.

Keywords: Pandering, Information, Preference Heterogeneity, Welfare.

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1 Introduction

A well known (e.g. Canes-Wrone et al. 2001, Maskin and Tirole 2004) incentive problem of representative democracy is "pandering" by politicians, which consists of taking actions which they believe are misguided in order to enhance their electoral prospects. We consider how the incentives to pander are influenced by the distribution of preferences in, and the information available to, the electorate. To study this question, we consider an

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adaptation of the model introduced in Maskin and Tirole (2004), in which politicians are more informed than voters about the true state of the world, but may or may not share the policy preferences of the majority of the voters. In contrast to Maskin and Tirole (2004) we allow for heterogeneity in voters' opinions and politician valence, so that, when the politician chooses which action to take, her re-election will be uncertain. The politician, being both policy and office motivated, will then have the least incentive to pander on issues on which pandering provides the smallest electoral benefit.

While we might think that politicians would have the greatest incentive to pander to the voters on issues on which voters are united – after all, those are the issues on which the most voters can be won over – we find the opposite. When the size of minority is not too large, increasing the size of the minority will increase the probability that politicians pander in equilibrium. In addition, if politicians put sufficient weight on being re-elected, we will always have pandering on issues on which the voters are divided, but politicians will always behave sincerely when the electorate is sufficiently united. When there is little disagreement on an issue, if the politician goes against the prior, the voters will believe this is more likely to be because the state of the world is such that it is worthwhile to take that action than that the politician is the minority type. Consequently, there will be little damage to the politician's re-election prospects.[1] Conversely, on an issue with greater division of opinions, going against the prior will greatly increase the probability with which the politician is perceived to be a minority type, so she is more likely to be punished at the polls. As such, on more divisive issues, politicians are less likely to act on information which goes against the majority's ex-ante preferred action.

While the incentives for politicians to pander are also influenced by how informed voters are about which action is in their interest, pandering is not eliminated with a more informed electorate. In fact, politicians have a *greater* incentive to pander when they have less of an informational advantage over voters. When voters face considerable uncertainty about which policy is in their interest, they (potentially) update their beliefs about the state of the world considerably based on the policy chosen. As this dampens the updating they can do about the politician's type, the electoral damage from sincere behavior is lower the greater the informational advantage politicians have over voters. Consequently, when voters are more informed about which action is in their interest, politicians are more likely to pander. In addition, since pandering is more likely when voters are more informed, in

[1] A similar effect emerges in Morris (2001) in which, when the receiver has little uncertainty about the type of the sender, the sender will be less likely to send the "politically correct" message. Morelli and Van Weelden (2011) study the related incentive for politicians to "posture" by over-providing effort to address divisive issues, at the expense of more important common value issues, due to the greater opportunity for signaling that divisive issues provide.

some cases a more informed electorate can lead politicians to take actions which are less desirable for all voters, including those in the majority. Further, as pandering also impedes learning about the incumbent's type, for such parameters, a more informed electorate can result in decreased welfare in the current period, as well as a decreased ability to select majority-type candidates for the future.

In our model, politicians are more likely to pander on issues on which the electorate is divided and on issues on which politicians have little informational advantage. We would then expect more pandering by politicians on issues on which the major source of conflict is differing moral values and the information politicians possess is unlikely to change voters' opinions. On social issues, such as abortion and same-sex marriage, voters have different opinions about what is morally "right". While politicians may be better informed than voters about the consequences and effectiveness of specific policies related to these issues, voters' moral judgements are unlikely to be changed by any information or expertise politicians may have. Our model then predicts that politicians would be likely to pander on these issues. Conversely, when politicians have a significant informational advantage about an issue – this could be either because the issue has many technical elements (e.g. monetary policy, healthcare reform) or because relevant information is classified or withheld from the public (e.g. foreign affairs) – and which action is in the voters' interest is likely to depend on this information, we are less likely to see pandering by politicians. These theoretical predictions are consistent with empirical findings on the relationship between candidate positioning and voter information (Canes-Wrone and Shotts 2004), and we discuss this connection more below.

The paper is organized as follows. Section 2 presents the model, with the results presented in Section 3. Section 4 discusses the implications of our results and the relationship with the literature, and Section 5 concludes. All proofs are in the Appendix.

2 Model

The model we consider is an extension of Maskin and Tirole (2004). There are two periods, and in each period, $t \in \{0, 1\}$, a politician chooses a policy $\omega_t \in \{a, b\}$. In between the two periods the voters vote by majority rule on whether or not to re-elect the politician. There are three states of the world $\theta_t \in \{a, b, n\}$ in each period, where θ_t is i.i.d. across periods with $Pr(\theta_t = a) = Pr(\theta_t = b) = \sigma \in (0, 1/2)$. In state a all voters have a preference for policy a, and in state b all voters have a preference for policy b. In state n, or the normal state, voters disagree about the preferred policy. While politicians know the state of the world, voters know only the prior distribution on the state. We assume that voters can be one of two types, $x \in \{a, b\}$, which determines the voter's preferred policy in the normal state. We assume that the fraction of voters who are type a is $\pi \in (1/2, 1)$.

Similarly, politicians can be either type, $x \in \{a, b\}$. Consistent with the idea that politicians are citizens as well (e.g. Osborne and Slivinski 1996, Besley and Coate 1997), we assume that the distribution of politician types is the same as the distribution of voter types. Hence, politicians also are type a with probability π.[2] Finally, we assume that politicians also vary in their quality or valence, v, where v is a continuous, symmetric, mean-0 random variable. We let F be the distribution function of v, with density $f(v) = F'(v)$, and assume that $f(v) > 0$ for all $v \in \mathbb{R}$. The addition of heterogeneity in the valence of policymakers (e.g. Groseclose 2001, Ashworth and Bueno de Mesquita 2009) means that, while a voters are more likely to prefer a candidate who is ideologically closer to themselves, if the valence advantage is large enough, they may prefer a different candidate who is ideologically more distant. The introduction of a valence component is one difference between our paper and Maskin and Tirole (2004) and will serve to smooth the re-election probabilities: in our model, the probability the incumbent will be re-elected will vary continuously with the voters' belief about her type.

The payoff to each voter depends on her type, $x \in \{a, b\}$, the policy chosen, $\omega_t \in \{a, b\}$, the state of the world, $\theta_t \in \{a, b, n\}$, and the politician's valence, $v \in \mathbb{R}$. We assume that in state a, all voters prefer policy a, and in state b all voters prefer policy b. It is only in state n – the normal state – that there is disagreement among voters. In state n the type a voters prefer policy a and type b voters prefer policy b. The normal state is to be interpreted as the state in which there are important tradeoffs – e.g. low taxes vs. improved services, jobs vs. the environment, security vs. maintaining freedoms – and individuals may have differing willingness to accept this tradeoff. For example, consider the decision of whether to implement a new environmental regulation (a) or stick with the status quo (b). State a then occurs when the regulation would improve the environment without damaging industry or costing jobs, state b when the regulation would prove ineffective (perhaps causing a shift to less efficient production) while being economically damaging, and state n when the regulation would achieve its objectives, but at a cost to industry and job creation. We would expect almost universal agreement that the regulation is desirable in state a and undesirable in state b, but disagreement in state n.

[2]If we allow the fraction π^p of politicians with preference for a to be different from the fraction π^e of citizens in the electorate who prefer a to b, all the results about π in the paper go through with respect to π^p. However, since there is no *a priori* reason to believe that π^p and π^e should differ in any systematic way, we drop this distinction from what follows.

The preferred action of a type x voter in state θ is then

$$\omega_\theta^x = \begin{cases} a \text{ if } \theta = a, \\ b \text{ if } \theta = b, \\ x \text{ if } \theta = n, \end{cases}$$

and the stage game payoff for a voter of type x is

$$u^x(\omega,\theta) = \begin{cases} v & \text{if } \omega = \omega_\theta^x, \\ -\frac{1}{1-2\sigma} + v & \text{if } \omega \neq \omega_\theta^x. \end{cases}$$

So we have that a voter receives policy payoff of 0 if the chosen policy matches her preferred policy choice in this period, and $-\frac{1}{1-2\sigma}$ otherwise. In addition, the voter receives positive payoff the higher the politician's valence. The parameter σ reflects how uncertain voters are about their preferred policy. When σ is close to 1/2 there is much uncertainty about the true state of the world, but when σ is close to 0 voters are almost certain of which policy they prefer. A high σ issue would therefore be one with many technical elements (e.g. monetary policy) or classified information (e.g. foreign policy), whereas a low σ issue would be one on which preference heterogeneity is driven by different moral judgements and on which politicians are unlikely to have any special expertise in making such judgements (e.g. same-sex marriage or abortion).

The weight $\frac{1}{1-2\sigma}$ is introduced to ensure that the intensity of disagreement does not vary with σ. In this set-up, the difference in expected utility between a politician of the same type and a different type – given that the politician takes her preferred action in a given period – is always 1: the expected payoff from a politician who is congruent with the voter is 0, and from a politician who is not is -1, and how the voters trade off congruence and valence does not vary with σ. In addition, the ex-ante difference between the expected payoff from taking action a and action b is 1 for all σ. As such, σ can be interpreted as the degree of informational advantage politicians have over voters, and is separate from how much of a common values element there is to the issue. Finally note that the ex-ante expected payoff from action a to a type a voter is $\frac{-\sigma}{1-2\sigma}$, so the less informed the voters the greater the potential benefit from an informed politician.

The difference we introduce between our model and Maskin and Tirole (2004) by having three states of the world rather than two has little effect on the mechanics of the equilibrium, but allows for a model of policy disagreement in which voters know which side of an issue they are on but the politician's expertise can still play a valuable role in determining policy. In Maskin and Tirole (2004) a politician can be "congruent" or "non-congruent", in which case they always want the opposite of the voters. With homogenous voters all that matters is how likely the politician is to prefer the same policy as the voters, which is well captured by such a model. When voters are heterogenous, however, it is less natural to assume that voters of different types know they will always be on opposite sides of the issue, but are unsure as to which side they will be on. In our setting, voters know which direction they are biased in, but as each voter's preferred policy depends on the state, the expertise the politician has in identifying the state of the world is potentially valuable.

We assume that politicians know the state of the world, θ_t, but that voters know only the prior on the state. In addition, politicians' types are private information. Finally, we assume that, at time-0, neither the candidate or the voters know the candidate's valence, but this is revealed when the candidate is in office. We assume that all voters, and all politicians, discount their second period utility by some factor $\beta \in (0, 1)$.

The timing of the game is as follows:

1. At time-0 nature determines the type of the incumbent politician $x \in \{a, b\}$, the state of the world $\theta_0 \in \{a, b\}$, and the politician's valence $v \in \mathbb{R}$. The politician observes x and θ_0 but not v, while the voters do not observe the realization of any of these variables.

2. The politician chooses action $\omega_0 \in \{a, b\}$, which is observed by the voters.

3. The voters and politician observe the politician's valence v.

4. The voters vote, by majority rule, on whether to retain the politician or replace her with a random draw from the population of politicians.

5. All players receive their payoff from the initial period.

6. At time $t = 1$ the politician in office observes $\theta_1 \in \{a, b\}$ and chooses policy $\omega_1 \in \{a, b\}$, and all players receive their payoff for this period.

Notice that, in the above timing, the first period state of the world is not revealed to the voters until after they have voted on whether the retain the incumbent. In addition, since voting takes place by majority rule, the incumbent will be re-elected if and only if the majority type voter wishes to re-elect her. The mechanics of the equilibrium are then identical to one with a representative voter of the majority type. By allowing for heterogeneity in voter ideal points, however, we can link the disagreement in the electorate with the prior on the incumbent's type. We discuss this more below.

Following Maskin and Tirole (2004) we assume that the politician receives utility G from implementing her preferred action – i.e. the policy which gives payoff 1 to voters of her type – and receives payoff R simply from holding office. We assume, to keep the algebra as simple as possible as well as for consistency with Maskin and Tirole (2004), that candidates are unconcerned with the valence of the candidates in office as well as the policy implemented if not in office. Again, following Maskin and Tirole (2004), we define

$$\delta = \beta \frac{G + R}{G},$$

which will be a key parameter for determining the politician's behavior in the first period. In the second period, the politician in office always chooses the action she prefers, and hence will receive payoff $G + R$ in that period. The voters know that the politician will pursue the policy preferred by her type in the next period, and update their beliefs about the politician's type based on the action taken in the first period. Note that, as voting takes place by majority rule, the politician will be re-elected if and only if the majority type of voter prefers her to a random replacement.

As politicians have two dimensions of private information, there are now six types of politicians, $(x, \theta_0) \in \{a, b\} \times \{a, b, n\}$. Note, however, that, in terms of payoffs, the only difference is whether the politician has a preference for action $\omega_0 = a$ or $\omega_0 = b$. We can then define the variable $x_0 \in \{a, b\}$, to be a if the politician receives benefit G from setting $\omega_0 = a$ in state θ_0 and b if the politician receives payoff G from setting $\omega_0 = b$ in state θ_0. We refer to x_0 as the time-0 informed type of the politician, and consider only equilibria in which the politician's action, and the voters' beliefs, only depend on the informed type.

Assumption 1 *For any* (x, θ_0) *and* (x', θ_0') *such that* $x_0 = x_0'$*,*

$$Pr(\theta_0 = a | x, \theta_0) = Pr(\theta_0 = a | x', \theta_0').$$

Further, the voters use this when calculating beliefs, including at off-path information sets.

We now consider the politician's behavior. In the second period, as the politician is no longer accountable to the electorate, she will choose the policy which maximizes her utility. Hence both politician types will choose $\omega_1 = a$ in state $\theta_1 = a$ and $\omega_1 = b$ in state $\theta_1 = b$. In state $\theta_1 = n$ the politician will choose $\omega_1 = x$. We now turn to analyzing politician behavior in the first period.

When $\delta < 1$, the payoff to the politician from being re-elected, and choosing her preferred policy tomorrow, is less than from implementing her preferred policy today – hence, even if it guaranteed defeat, the politician would always choose her preferred policy in the initial period. When $\delta > 1$, if the probability of being re-elected is decreased enough, the politician can be induced to forgo implementing her preferred policy. This then creates the possibility of a pandering equilibrium, in which, in an effort to appear to be in the majority, politicians choose policy a, even in state b.[3]

[3]For certain parameters, and appropriate off-path beliefs, it would be possible to support equilibria

Definition 1 ***Pandering and Sincere Equilibria***
A Perfect Bayesian Equilibrium is:

1. *a* ***sincere equilibrium*** *if all politicians choose* $\omega_0 = x_0$ *at time* 0.

2. *a* ***pandering equilibrium*** *if all politicians choose* $\omega_0 = a$ *regardless of the state of the world.*

3. *a* ***partial-pooling equilibrium*** *if politicians with* $x_0 = a$ *choose* $\omega_0 = a$ *and politicians with* $x_0 = b$ *randomize with a non-degenerate probability.*

We now consider when equilibria of each form exist.

3 Results

In this section we show that it is possible to support a separating equilibrium if and only if δ is not too large, and it is possible to support a pandering equilibrium if and only if δ is not too small. For intermediate values of δ we have a partial-pooling equilibrium. As there is no overlap in which form the equilibrium takes, the equilibrium is unique.[4]

Proposition 1 ***Equilibrium characterization.***
For any $\pi \in (\frac{1}{2}, 1)$, *there exist* $\delta_s(\pi,\sigma), \delta_p(\pi,\sigma)$ *with* $0 < \delta_s(\pi,\sigma) < \delta_p(\pi,\sigma)$, *such that*

1. *there exists a sincere equilibrium if and only if* $\delta \in (0, \delta_s(\pi,\sigma)]$.

2. *there exists a pandering equilibrium if and only if* $\delta \in [\delta_p(\pi,\sigma), \infty)$.

3. *there exists a partial-pooling if and only if* $\delta \in (\delta_s(\pi,\sigma), \delta_p(\pi,\sigma))$. *This equilibrium is unique.*

As δ is determined by the level of patience (β) as well as the ratio between the utility from holding office (R) and from implementing the preferred policy (G), this means that, when politicians are patient and place a high value on being in office, we get pandering in equilibrium, and when candidates are impatient and policy motivated, politicians behave sincerely. We now consider how the cut-offs for different types of equilibrium to exist vary with the parameters.

in which all politicians choose b in the first period. However, in our analysis we do not consider this equilibrium but rather focus on equilibria of the form in Definition 1.

[4]Assumption 1 is necessary for the equilibrium to be unique. While all politicians of the same informed type, x_0, face the same tradeoff between different actions, if the voters believe that the probability of politicians with the same informed type taking each action differs by their policy preference, $x \in \{a, b\}$, it is possible to support other equilibria. For example, if the voters believe that only politicians of type $x = b$ ever choose $\omega_0 = b$, it is possible to support a pandering equilibrium with lower δ than the bound given.

Proposition 2 ***Comparative Statics***

1. *$\delta_s(\pi,\sigma)$ and $\delta_p(\pi,\sigma)$ are strictly increasing in π on $(\pi^*,1)$, where $\pi^* \equiv \frac{1}{1+\sqrt{\sigma/(1-\sigma)}} \in (1/2,1)$.*

2. *$\delta_p(\pi,\sigma)$ is strictly decreasing in π on $(1/2,\pi^*)$.*

3. *$\delta_s(\pi,\sigma)$ and $\delta_p(\pi,\sigma)$ are strictly increasing in σ.*

4. *as π approaches 1,*
$$\lim_{\pi\to 1}\delta_s(\pi,\sigma) = \lim_{\pi\to 1}\delta_p(\pi,\sigma) = \infty,$$
but $\lim_{\pi\to\frac{1}{2}}\delta_s(\pi,\sigma)$ and $\lim_{\pi\to\frac{1}{2}}\delta_p(\pi,\sigma)$ are finite.

Part (1) of the above proposition says that, when the size of the minority is not too large (that is, when π is large), increasing the size of the minority will make it more difficult to support a sincere equilibrium, and more likely that the equilibrium will involve pandering. Hence, the likelihood of a pandering equilibrium is increasing in the size of the minority – at least as long as the minority is not too large. Intuitively, when π goes down there are two effects: the fear of incongruence of the incumbent goes up (direct effect) and the probability of a congruent replacement goes down, and while the first direct effect increases the incentive to pander, the latter would reduce it. This part of the proposition shows that for high enough π the direct effect of a reduction in π dominates.

On the other hand, when the size of the minority is large, $\pi \in (\frac{1}{2},\pi^*)$, increasing the size of the minority makes it more difficult rather than easier to support a pandering equilibrium. The reason for this is that, when there is a large minority (π small) and the likelihood that the majority's preferred policy does not match their prior is low (σ small), the voters will infer that those choosing policy b are most likely the minority type. When π increases, the fear of the incongruence of the incumbent goes down a little, but the probability of a congruent replacement goes up more. The second effect dominates in this region, leading to the non monotonicity result for $\delta_p(\pi,\sigma)$. Note, however, that though revealing herself to be informed type $x_0 = b$ is less harmful when π decreases, revealing herself to be informed type $x_0 = a$ is more beneficial. Hence the comparative statics of $\delta_s(\pi,\sigma)$ on $(\frac{1}{2},\pi^*)$ will depend on the distribution of the valence.

The incentive to behave sincerely is also affected by the informational advantage that politicians have. When σ is large, so voters have considerable uncertainty as to their preferred policy, a politician of informed type $x_0 = b$ is likely to have observed signal $\theta_0 = b$, and so is still a type $x = a$ politician with high probability. As such, since revealing that her informed type is $x_0 = b$ is less damaging when σ is higher, the equilibrium is more likely to be sincere and less likely to be pandering.

The prediction that politicians are more likely to pander on "doorstop issues" (Zaller and Feldman 1992), on which voters are more informed and more sure of their preferences, is consistent with the empirical findings of Canes-Wrone and Shotts (2004): Canes-Wrone and Shotts find that politicians' chosen actions are more "congruent" with the voters – that is, the politicians' actions are more likely to match the voters' stated preferences – on issues that "citizens are likely to consider on a routine basis than for other policy domains." (p. 691) For example, there is greater policy congruence on social security, health care, and crime than on foreign aid, the environment, and space exploration (see Table 1). In our setting, politicians taking the action which corresponds to the majority of the voters' ex-ante preferred policy, even if it goes against their own preferences or private information, corresponds to a pandering equilibrium.[5]

Finally, while the relationship between pandering and the size of the minority is not monotonic, the last point in the proposition establishes that it is easier to support a sincere equilibrium when there is a broad consensus on the issue (π close to 1) than when an issue is evenly divided (π close to 1/2). When there is little disagreement, voters update little on the politician's action, and so the politician will always choose her preferred policy even if she values being in office highly. On a divisive issue, conversely, when the incentive to hold office is strong enough, there will be a pandering equilibrium, and no politician will act on her preferences or information.

Because they influence the incentives for politicians to pander, changes in the divisiveness of an issue (π), or the amount of information voters possess (σ), can have unexpected effects on the first period behavior of politicians, and on the welfare of the voters. Interestingly, increasing the fraction of minority voters – that is, the number of voters biased towards b – can increase the likelihood that action a is taken! By decreasing the likelihood of pandering, decreasing the size of the minority can cause action a to be chosen less often. We focus on the case in which δ is sufficiently large to make pandering possible with an appropriate distribution of preferences; as, by Proposition 2, for any $\sigma \in (0, 1/2)$, a pandering equilibrium is most easily supported when $\pi = \pi^*(\sigma)$, we have the following result.

[5]While we have considered a setting in which pandering is due to the desire of politicians to signal that their preferences are congruent with the majority of voters, there are also models with common policy-preferences in which pandering is driven by a desire to appear competent (e.g. Canes-Wrone et al. 2001). It is possible to show that our result that pandering is more likely when voters are more certain which action is in their interest also holds in the Canes-Wrone et al. (2001) model. Hence, this result holds whether pandering is rooted in a desire to signal preferences or competence to voters.

Proposition 3 ***Probability of Action*** a ***Being Taken***
Suppose $\delta > \delta_p(\pi^*(\sigma), \sigma)$. *Then there exist* π_1, π_2, π_3 *with* $1/2 \leq \pi_1 < \pi_2 < \pi_3 < 1$ *such that*

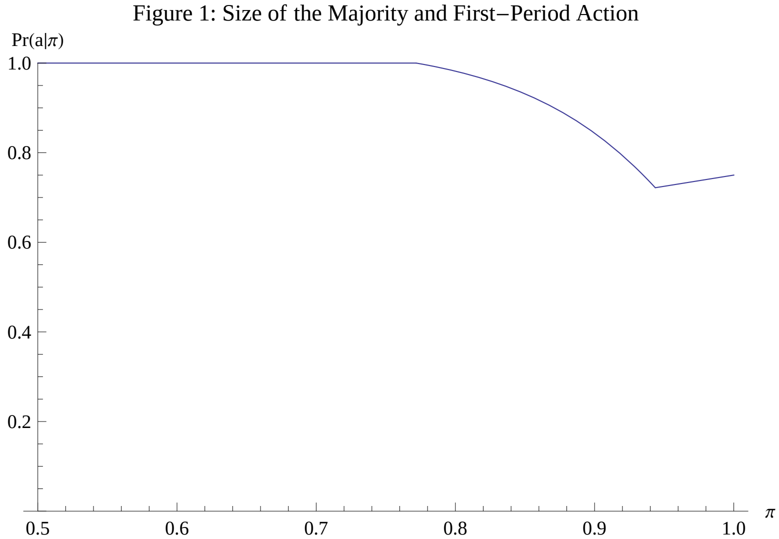
1. $Pr(\omega_0 = a|\pi) = 1$ *for all* $\pi \in (\pi_1, \pi_2]$.

2. $Pr(\omega_0 = a|\pi) < 1$ *for all* $\pi \in (\pi_2, 1)$.

3. $Pr(\omega_0 = a|\pi)$ *is increasing for* $\pi \in (\pi_3, 1)$ *with* $\lim_{\pi \to 1} Pr(\omega_0 = a|\pi) = 1 - \sigma$.

As the above proposition shows, the probability that a is taken is non-monotonic in the size of the majority. As a pandering equilibrium involves action a being taken for all politician types and all states of the world, action a is most likely to be taken in a pandering equilibrium. When the size of the majority gets large, however, the pandering equilibrium breaks down. Hence, for $\pi \in (\pi_2, 1)$, politicians will take action $\omega_0 = b$ with positive probability, meaning that the probability of $\omega_0 = a$ being taken in the first period is decreasing in π for a range. When $\pi > \pi_3$, the equilibrium is sincere with politicians taking the action which they myopically prefer in the first period, so the likelihood of action a being taken is increasing in π for this range. Figure 1 below shows the probability of action a being taken as a function of π for a specific level of uncertainty ($\sigma = 1/4$), value from holding office ($\delta = 3$), and distribution on valence (F is $\mathcal{N}(0, 0.25)$).

Figure 1: Size of the Majority and First−Period Action



As both types receive a higher payoff from action $\omega_0 = b$ in state $\theta_0 = b$, a pandering equilibrium involves action a being taken more often than even the majority type desires. As politicians forgo utility when taking a misguided action, only when the size of the minority is large enough ($\pi \leq \pi_2$) is the inference that voters draw from observing action

b taken sufficiently damaging to support a pandering equilibrium. So we would expect politicians to stake out more "extreme" and inflexible positions – such as McCarthyism or backlashes against immigrants or the rights of same-sex couples – when there is a clear majority opinion, but also a significant number of people in the minority.

The relationship between the voters' information and the behavior of politicians also reveals some interesting results. While increasing σ can only make politicians less likely to take action a – increasing σ increases the likelihood of sincere behavior by politicians as well as the fraction of politicians who sincerely prefer action b in the first period – the effect of σ on voter welfare is more nuanced. As all politicians seek to convince the voters that they share the preferences of the majority of voters, we might expect that if the majority voters had better information about which action is in their interest politicians would be more likely to take actions in the interest of the majority voters. However, this is not always true. While decreasing σ makes the voters more certain as to the action they prefer, as shown in Proposition 2, it also increases the likelihood of pandering. When increasing the uncertainty of voters also decreases the pandering by politicians, it can increase the welfare received from the first period action, even for voters in the majority. The relationship between voter information and first period welfare is described in the following proposition.

Proposition 4 ***First-Period Welfare***
For all $\pi \in (1/2, 1)$, there exists $\bar{\delta}(\pi)$ such that, for all $\delta > \bar{\delta}(\pi)$ there exist $\sigma_p(\pi, \delta)$, $\sigma_s(\pi, \delta)$ with $0 < \sigma_p(\pi, \delta) < \sigma_s(\pi, \delta) < 1/2$ such that,

1. *the expected first period utility of both the majority type, $E[u_0^a(\omega_0, \theta_0)]$, and the minority type, $E[u_0^b(\omega_0, \theta_0)]$, are decreasing in $\sigma \in (0, \sigma_p(\pi, \delta))$.*

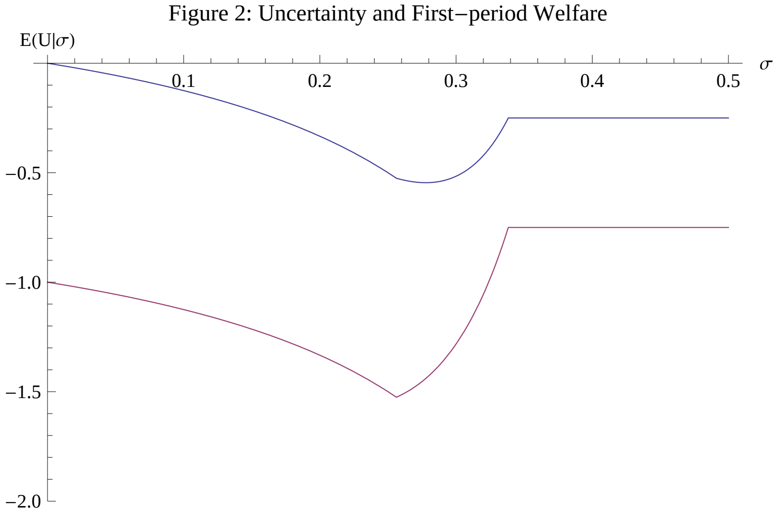
2. *the expected first period utility of both the majority type, $E[u_0^a(\omega_0, \theta_0)]$, and the minority type, $E[u_0^b(\omega_0, \theta_0)]$, are increasing in $\sigma \in (\sigma_p(\pi, \delta), \sigma_s(\pi, \delta))$.*

3. *the expected first period utility of both the majority type, $E[u_0^a(\omega_0, \theta_0)]$, and the minority type, $E[u_0^b(\omega_0, \theta_0)]$, are constant in $\sigma \in (\sigma_s(\pi, \delta), 1/2)$*

When δ is large – so politicians are patient and office motivated – politicians are only willing to behave sincerely if the electoral cost from doing so is small. As the electoral cost from going against the majority voters' prior is lower when there is more uncertainty about the state of the world, when δ is large, the cutoff which determines whether the politician engages in sincere or pandering behavior involves a high σ. Since the politician's expertise is most valuable when σ is large, this guarantees that when δ is high enough the equilibrium will transition from pandering to sincere at a point where sincere behavior generates a higher first period payoff to the majority voters than pandering. The welfare of both the majority and the minority voters will be increasing on the interval (σ_p, σ_s), the range for which a partial-pooling equilibrium exists. The point $\sigma_p \in (0, 1/2)$ – the greatest amount of uncertainty for which the pandering equilibrium is obtained – is then the point which minimizes the first period utility of all voters.[6]

When σ is low enough that the equilibrium is pandering, the politician will always take the action the majority of voters prefer ex-ante. Consequently, the more the voters know about which action is in their interest, the better the outcome will be for the majority voters. So, if a majority voter is well informed about the action in her interest, she can only benefit from more information. However, when the electorate is not too informed, by increasing the incentive for politicians to engage in socially harmful pandering, a little more information can be dangerous for voter welfare. Figure 2 below shows the first period welfare of both the majority (blue line) and minority (red) type voters as a function of σ for a specific size of the majority ($\pi = 1/4$), value from holding office ($\delta = 3$), and distribution on valence (F is $\mathcal{N}(0, 0.25)$).

Figure 2: Uncertainty and First−period Welfare



Note also that, while Proposition 4 only concerns first period welfare, when the equilibrium moves from pandering to sincere this not only increases first period welfare but also the ability to select majority candidates for the second period. Though minority-type voters are harmed by this selection, this is dominated by improved incentives in the the first

[6]While the sign of the derivative of first period welfare is always the same for the majority and minority voters, as the minority voter receives greater benefit from an $x_0 = b$ politician taking action b than a majority voter does, the slope is not. Note also that this welfare calculation says nothing about the politician behavior which maximizes the welfare of the two types of voters: a minority voter will always receive a higher first period payoff from sincere instead of pandering behavior, whereas the majority voter often receives a higher first period utility if the politician panders. In addition, it is possible, when $\delta < \bar{\delta}(\pi)$, for minority voters to benefit from increased uncertainty even if the majority is harmed by it.

period. As such, the discounted two-period welfare of all voters is increasing on (σ_p, σ_s) for both types of voters. Further, in a sincere equilibrium, as voters can form a more precise inference from the politician's first period action when they have more information, the lower σ the better equilibrium selection, which benefits majority voters. We conclude this section with the following corollary.[7]

Corollary 1 ***Two-Period Welfare***
For all $\pi \in (1/2, 1)$ there exists $\bar{\delta}^*(\pi)$ such that, for all $\delta > \bar{\delta}^*(\pi)$,

1. *the expected utility of both the majority type, $E[u^a]$, and the minority type, $E[u^b]$, are decreasing in $\sigma \in (0, \sigma_p(\pi, \delta))$.*

2. *the expected utility of both the majority type, $E[u^a]$, and the minority type, $E[u^b]$, are increasing in $\sigma \in (\sigma_p(\pi, \delta), \sigma_s(\pi, \delta))$.*

3. *the expected utility of the majority type, $E[u^a]$, is decreasing in $\sigma \in (\sigma_s(\pi, \delta), 1/2)$.*

4 Discussion

While we have not considered the possibility of the different decision-making mechanisms introduced in Maskin and Tirole (2004) – direct democracy or unelected judges – but instead focused on the behavior of politicians in representative democracy, it is worth recalling how the efficacy of different institutions relate to the incentive for politicians to pander in representative democracy. One of the main findings from Maskin and Tirole (2004) is that a pandering equilibrium can never out-perform both direct democracy and rule by unelected judges, but rather that a pandering equilibrium results in the direct democracy outcome in the first period, and, since no learning about the politicians' preferences can take place, rule by an unelected judge in the second period. Our results show that this pandering outcome is most likely to occur on issues on which opinions are divided and politicians' informational advantage is small.

Our results provide some novel nuances on the appropriateness of representative democracy for issues of varying degrees of availability (or relevance) of information. Issues like abortion, divorce laws, same sex marriage, are typical examples of issues where politicians have very little informational advantage and where the electorate as well as politicians are divided, the two features determining the maximum incentives to pander in our model. While in some countries abortion and divorce laws, and more recently same-sex marriage

[7] The proof of this result is available upon request, but is omitted from the text due to its algebraic intensity.

laws, have been left to direct democracy or judicial ruling, in many others they are still subject to ruling by elected politicians. When and where should such issues be resolved outside the realm of representative democracy? If voters are sure of which action is in their interest, pandering, which means taking the action the majority of voters think they prefer, is not necessarily bad: to a majority type voter, the greater concern is of a non-congruent politician. Pandering is more worrisome on issues with an intermediate level of informational advantage, not enough to discourage pandering but enough to make the politician's private information very valuable. Issues like stem cell research or genetic research in general could be good examples of issues where there is both a high level of preference heterogeneity but also an intermediate informational advantage. On such issues, we have shown that, despite pandering behavior being very costly, there are strong incentives for politicians to pander in representative democracy.

When politicians have a lot of private information about which policy is in the voters' interest, like perhaps in foreign policy and economic policies, there is much potential harm if they fail to act on this information. In such an environment, our results are more encouraging for representative democracy. When voters are unsure of the policy that is in their interest, there is less risk of a pandering equilibrium. Hence, politicians are most likely to behave sincerely when there is the greatest benefit to voters from sincere behavior. Further, when politicians do not pander, there is improved selection through representative democracy over having an unaccountable expert. This finding adds a novel nuance to the argument that democracy is ill-suited for sanctioning and selecting officials tasked with making technical decisions (e.g. Alesina and Tabellini 2007): though pandering can be very harmful when voters are uninformed, a pandering equilibrium can only be supported in such an environment when re-election concerns are dominant.

In our analysis the policy preferences of politicians is relevant because politicians cannot make binding commitments before taking office. We have assumed that the incumbent, as well as her potential replacement, are drawn from the population of candidates, which is identical to the population at large. One avenue for future research is to allow for an endogenous candidacy stage, in which case the pool of candidates may not exactly mirror the broader electorate. Intuitively, whenever pandering is expected in equilibrium, majority type politicians derive strictly higher utility from running for office than minority type candidates, because the latter have to forgo G in the first period. This implies that if running for office is costly, majority type politicians may be more likely to run for office. Hence, with endogenous candidates we could observe less pandering than in the model with exogenously chosen candidates, because the endogenous percentage of majority types among candidates is higher than in the overall population. The dynamic consequences of this intuitive reasoning could also be interesting: If high polarization (π close to 1/2) goes along with lower chances for the minority to find a politician to represent them, then this could dishearten the minority from participation in election (unmodeled here), until again the minority politicians will find it worthwhile to run for office because of a sufficiently lower necessity to pander once in office.

5 Conclusion

We have considered how the distribution of preferences and information affect the incentive for politicians to pander. We have shown that, if the size of the minority is not too large, increasing the size of the minority will make it more likely that the equilibrium will consist of pandering, and so less likely that the minority's preferred action is taken. In addition, we have shown that, if there is sufficient homogeneity of preferences on an issue, politicians will never pander, but always take the action they sincerely support. Conversely, on issues on which there are divided preferences ex-ante, if the benefits from office are high-enough, politicians will always pander. This means that politicians are likely to take the most inflexible positions on issues with significant preference heterogeneity.

In addition, we have considered the effect of voter uncertainty on the incentives for pandering behavior. We have shown that the less informational advantage politicians have about the state of the world the greater the incentive for politicians to pander. Interestingly this means that, because it increases the incentives to pander, politicians may take actions less aligned with the preferences of the majority when voters are more informed about which action is in their interest.

Finally, another important substantive point of the paper is that the issues for which the pandering incentives have the most negative welfare consequences are issues with intermediate polarization of opinions and intermediate levels of informational advantage – when politicians have little informational advantage pandering behavior is not costly, and when the informational advantage is extreme there is little incentive to pander. It is on the issues on which voters are divided but not very well informed that the strongest argument can be made for delegating decisions to electorally unaccountable policymakers.

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Appendix

Proof of Proposition 1 We begin by considering the set of beliefs a majority voter could have for which it would be in their interest to vote to re-elect the incumbent. Note that, if the incumbent is a majority type, then a majority voter will receive payoff of v in period $t = 1$ as the politician will choose her (and the majority voters') most preferred policy. If the incumbent is the minority type, then she will choose the majority voter's most preferred policy only in state $\theta_1 = b$ and in state $\theta_1 = a$, and hence, the expected utility from a minority type politician of valence v is $-1 + v$. Now note that a random replacement is the majority type with probability π, and has expected valence of 0. Hence the expected value of a random replacement is $-(1 - \pi)$.

Hence the majority will vote to re-elect the politician if and only if

$$Pr(x = a|\omega_0)v + (1 - Pr(x = a|\omega_0))[-1 + v] = v - (1 - Pr(x = a|\omega_0)) \geq -(1 - \pi),$$

which is equivalent to

$$v \geq \pi - Pr(x = a|\omega_0).$$

We now consider when a sincere equilibrium exists. In a sincere equilibrium, the type a politician will choose $\omega_0 = a$ if and only if the state is $\theta_0 \in \{a, n\}$ and the b type politician will choose $\omega_0 = a$ if and only if $\theta_0 = a$. As the first occurs with probability $1 - \sigma$, and the second occurs with probability σ, by Bayes's rule

$$Pr(x = a|\omega_0 = a) = \frac{\pi(1 - \sigma)}{\pi(1 - \sigma) + \sigma(1 - \pi)}.$$

Hence, after $\omega_0 = a$ the politician will be re-elected if and only if

$$v \geq \pi - \frac{\pi(1 - \sigma)}{\pi(1 - \sigma) + \sigma(1 - \pi)} = -\frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi(1 - \sigma) + \sigma(1 - \pi)},$$

which happens, by symmetry, with probability $F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)})$.

Similarly, by Bayes's rule, we can calculate the probability of being the majority type conditional on choosing policy $\omega_0 = b$. As the b type will choose $\omega_0 = b$ with probability $1 - \sigma$ and the a type will choose $\omega_0 = b$ with probability σ the beliefs are

$$Pr(x = a|\omega_0 = b) = \frac{\pi\sigma}{\pi\sigma + (1 - \pi)(1 - \sigma)}$$

So we can determine that the incumbent is re-elected after choosing $\omega_0 = b$ if and only if

$$v \geq \pi - \frac{\pi\sigma}{\pi\sigma + (1 - \pi)(1 - \sigma)} = \frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi\sigma + (1 - \pi)(1 - \sigma)},$$

which holds with probability $F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})$. Hence, by deviating from choosing $\omega_0 = b$ to $\omega_0 = a$, the gain in terms of future utility to the politician is

$$\beta(G + R)[F(\frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi(1 - \sigma) + \sigma(1 - \pi)}) - F(-\frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi\sigma + (1 - \pi)(1 - \sigma)})] > 0.$$

Further, as the cost of deviating is G, we have an equilibrium if and only if

$$G \geq \beta(G + R)[F(\frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi(1 - \sigma) + \sigma(1 - \pi)}) - F(-\frac{\pi(1 - \pi)(1 - 2\sigma)}{\pi\sigma + (1 - \pi)(1 - \sigma)})],$$

or equivalently

$$1 \geq \delta[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})].$$

Hence, for all $\pi \in (1/2, 1)$ we can define

$$\delta_s(\pi,\sigma) = \frac{1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]},$$

and we have a sincere equilibrium if and only if $\delta \in (0, \delta_s(\pi,\sigma)]$.

We now consider the parameters for which there exists a pandering equilibrium. In a pandering equilibrium, all politicians choose a in the initial period. Hence the belief after observing a is that the politician is the majority type with probability π, and so she is re-elected with probability 1/2. Next note that, by Assumption 1, even at off-path information sets, the voters must believe the probability of taking an action for any given x_0 is the same. Therefore, at information set b, by Bayes rule, the beliefs most conducive to supporting an equilibrium are

$$Pr(x=a|\omega_0=b) = Pr(x=a|x_0=b) = \frac{\pi\sigma}{\pi\sigma+(1-\pi)(1-\sigma)}.$$

Given these beliefs, the politician would be re-elected if and only if

$$v \geq \pi - \frac{\pi\sigma}{\pi\sigma+(1-\pi)(1-\sigma)} = \frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)},$$

which holds with probability $F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})$. Hence, by deviating from choosing $\omega_0 = a$ to $\omega_0 = b$, the loss in terms of future utility to the politician is

$$\beta(G+R)[\frac{1}{2} - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})],$$

and the utility benefit from deviating in the first period is G. So we have an equilibrium if and only if

$$G \leq \beta(G+R)[\frac{1}{2} - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})],$$

or equivalently

$$1 \leq \delta[\frac{1}{2} - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})].$$

Hence, for all $\pi \in (1/2, 1)$ we can define

$$\delta_p(\pi,\sigma) = \frac{1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} > \frac{1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} = \delta_s(\pi,\sigma),$$

and we have a pandering equilibrium if and only if $\delta \in [\delta_p(\pi,\sigma),\infty)$.

When $\delta \in (\delta_s(\pi,\sigma),\delta_p(\pi,\sigma))$ then, neither a sincere or pandering equilibrium can exist. As such we consider the possibility of partial-pooling equilibria. In a partial-pooling equilibrium, politicians set $\omega_0 = a$ if $x_0 = a$ and randomize if $x_0 = b$. Let

$$\gamma = Pr(\omega_0 = b|x_0 = b),$$

and note that we have a sincere equilibrium when $\gamma = 1$ and a pandering equilibrium when $\gamma = 0$. Note that, by Bayes's rule, for each γ the voters form belief

$$Pr(x = a|\omega_0 = b) = \frac{\pi\sigma\gamma}{\pi\sigma\gamma + (1-\pi)(1-\sigma)\gamma} = \frac{\pi\sigma}{\pi\sigma + (1-\pi)(1-\sigma)},$$

after observing $\omega_0 = b$. Given these beliefs, a politician who takes action $\omega_0 = b$ is re-elected if and only if $v \geq \frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)}$ which occurs with probability $F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})$.

Conversely after observing action $\omega_0 = a$, the voters beliefs are

$$\begin{aligned} Pr(x = a|\omega_0 = a) &= \frac{\pi(1-\sigma) + \pi\sigma(1-\gamma)}{\pi(1-\sigma) + (1-\pi)\sigma + [\pi\sigma + (1-\pi)(1-\sigma)](1-\gamma)} \\ &= \frac{\pi(1-\sigma\gamma)}{1-\gamma[\pi\sigma + (1-\pi)(1-\sigma)]}. \end{aligned}$$

Hence, a politician who takes action a is re-elected if and only if

$$v \geq \pi - \frac{\pi(1-\sigma\gamma)}{1-\gamma[\pi\sigma + (1-\pi)(1-\sigma)]} = \frac{-\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma + (1-\pi)(1-\sigma)]}$$

which makes the probability of re-election $F(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]})$. As such, in order to make a politician with $x_0 = b$ indifferent, and so willing to randomize, we must have

$$1 = \delta[F(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma + (1-\pi)(1-\sigma)]}) - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma + (1-\pi)(1-\sigma)})].$$

Now note that, when $\gamma = 0$ this becomes

$$1 = \delta[\frac{1}{2} - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma + (1-\pi)(1-\sigma)})],$$

which holds if and only if $\delta = \delta_p(\pi,\sigma)$, and when $\gamma = 1$ this becomes

$$1 = \delta[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma) + (1-\pi)\sigma}) - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma + (1-\pi)(1-\sigma)})],$$

which holds if and only if $\delta = \delta_s(\pi,\sigma)$. Finally note that

$$F(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma + (1-\pi)(1-\sigma)]}) - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma + (1-\pi)(1-\sigma)}),$$

is strictly increasing in γ. Hence, there exists a $\gamma \in (0,1)$ which solves

$$1 = \delta[F(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]}) - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})],$$

if and only if $\delta \in (\delta_s(\pi,\sigma), \delta_p(\pi,\sigma))$, and for all $\delta \in (\delta_s(\pi,\sigma), \delta_p(\pi,\sigma))$ this γ is unique.

As such, there exists a partial-pooling equilibrium if and only if $\delta \in (\delta_s(\pi,\sigma), \delta_p(\pi,\sigma))$, and this equilibrium is unique.■

Proof of Proposition 2 We now consider the comparative statics of $\delta_s(\pi,\sigma)$ and $\delta_p(\pi,\sigma)$. We begin with some preliminaries. First, note that

$$\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} = \frac{(1-2\sigma)[(1-2\pi)\sigma-\pi^2(1-2\sigma)]}{[\pi(1-\sigma)+\sigma(1-\pi)]^2} < 0,$$

and

$$\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} = \frac{-\pi(1-\pi)}{[\pi(1-\sigma)+\sigma(1-\pi)]^2} < 0.$$

In addition,

$$\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} = \frac{-\pi(1-\pi)}{[\pi\sigma+(1-\pi)(1-\sigma)]^2} < 0,$$

and

$$\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} = \frac{(1-2\sigma)[(1-\pi)^2(1-\sigma)-\sigma\pi^2]}{[\pi\sigma+(1-\pi)(1-\sigma)]^2}.$$

Unlike the first three derivatives, which are negative for all parameters, this is strictly negative if and only if $(\frac{1-\pi}{\pi})^2 < \frac{\sigma}{1-\sigma}$, or equivalently when

$$\pi > \frac{1}{1+\sqrt{\sigma/(1-\sigma)}} \equiv \pi^*,$$

and strictly positive when $\pi < \pi^*$.

We now use these calculations to calculate comparative statics the bounds on the existence of pooling and separating equilibria. Taking the derivative of $\delta_s(\pi,\sigma)$ with respect of π,

$$\frac{\partial\delta_s(\pi,\sigma)}{\partial\pi} = \frac{-1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]^2}$$

$$\{f(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)})\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} + f(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)}\}.$$

As f has full support and both $\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}$ and $\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)}$ are negative when $\pi > \pi^*$, we can conclude that $\frac{\partial\delta_s(\pi,\sigma)}{\partial\pi} > 0$ when $\pi > \pi^*$.

Now consider how $\delta_p(\pi,\sigma)$ varies with π. We have

$$\frac{\partial\delta_p(\pi,\sigma)}{\partial\pi} = \frac{-1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]^2} f(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)}.$$

Since when $\pi > \pi^*$, $\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} < 0$, and when $\pi < \pi^*$, $\frac{\partial}{\partial\pi}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} > 0$, we can conclude that $\frac{\partial\delta_p(\pi,\sigma)}{\partial\pi} > 0$ when $\pi > \pi^*$ and $\frac{\partial\delta_p(\pi,\sigma)}{\partial\pi} < 0$ when $\pi < \pi^*$. We have then completed the proof of parts (1) and (2).

Now we consider the comparative statics with respect to σ. As we have established that $\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} < 0$, and $\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} < 0$, we can see immediately that

$$\frac{\partial\delta_s(\pi,\sigma)}{\partial\sigma} = \frac{-1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]^2}$$

$$\{f(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)})\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} + f(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)}\},$$

and

$$\frac{\partial\delta_p(\pi,\sigma)}{\partial\sigma} = \frac{-1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]^2} f(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)},$$

are both positive. So we have completed the proof of part (3).

We now consider the limits as π approaches 1 and 1/2 respectively. Note that as

$$\lim_{\pi\to1}\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)} = \lim_{\pi\to1} -\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} = 0,$$

we can see immediately that

$$\lim_{\pi\to1}\delta_s(\pi,\sigma) = \lim_{\pi\to1}\frac{1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} = \infty,$$

and

$$\lim_{\pi\to1}\delta_p(\pi,\sigma) = \lim_{\pi\to1}\frac{1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} = \infty.$$

Conversely,

$$\lim_{\pi\to\frac{1}{2}}\delta_s(\pi,\sigma) = \lim_{\pi\to\frac{1}{2}}\frac{1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} = \frac{1}{F(\frac{1-2\sigma}{2}) - F(-\frac{1-2\sigma}{2})},$$

and

$$\lim_{\pi\to\frac{1}{2}}\delta_p(\pi,\sigma) = \lim_{\pi\to\frac{1}{2}}\frac{1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} = \frac{1}{1/2 - F(-\frac{1-2\sigma}{2})},$$

are both finite. This proves part (4) of the proposition. ■

Proof of Proposition 3 We begin by defining π_1, π_2 and π_3. First define π_1 to be the smallest π for which the equilibrium is pandering

$$\pi_1 = \inf_{\pi \in (1/2,1)} \{\delta_p(\pi,\sigma) < \delta\}.$$

Note that, as we have assumed $\delta > \delta_p(\pi^*(\sigma),\sigma)$, it is immediate that $\pi_1 < \pi^* < 1$. Further, because $\delta_p(\pi,\sigma)$ is decreasing in σ on $(1/2,\pi^*)$, the equilibrium will be pandering on (π_1,π^*). Next we define π_2 and π_3 as

$$\pi_2 = \inf_{\pi \in (\pi^*,1)} \{\delta_p(\pi,\sigma) > \delta\},$$

and

$$\pi_3 = \inf_{\pi \in (\pi^*,1)} \{\delta_s(\pi,\sigma) > \delta\}.$$

Note that, since, by Proposition 2, $\delta_p(\pi,\sigma)$ and $\delta_s(\pi,\sigma)$ are increasing in π when $\pi \in (\pi^*,1)$ a pandering equilibrium exists on (π_1,π_2) but not when $\pi > \pi_2$ and there always exists a sincere equilibrium when $\pi > \pi_3$. In addition, since $\delta > \delta_p(\pi^*(\sigma),\sigma)$ both π_2 and π_3 must be strictly greater than π^*, and hence also π_1. Further, as $\delta_s(\pi,\sigma) < \delta_p(\pi,\sigma)$ for all π, we have $\pi_2 < \pi_3$. In addition, as $\lim_{\pi\to1}\delta_p(\pi,\sigma) = \lim_{\pi\to1}\delta_p(\pi,\sigma) = \infty$, we see that $\pi_3 < 1$. We then conclude that

$$\frac{1}{2} \leq \pi_1 < \pi_2 < \pi_3 < 1.$$

We consider how the probability of action a being taken varies with π for each range. When $\pi \in (\pi_1,\pi_2]$ we have established that the equilibrium is pandering, and so $Pr(\omega_0 = a|\pi) = 1$. Conversely, when $\pi \in (\pi_2,1)$ a pandering equilibrium does not exist and so $Pr(\omega_0 = a|\pi) < 1$. Finally, when $\pi > \pi_3$ we have a sincere equilibrium, and so the politician will choose $\omega_0 = a$ if and only if her time-0 informed type is $x_0 = a$. Hence the probability of the politician taking action a is $Pr(\omega_0 = a|\pi) = \pi(1-\sigma)+(1-\pi)\sigma$, which is clearly increasing in π when $\sigma < 1/2$. Finally, note that $Pr(\omega_0 = a|\pi) \to 1-\sigma$ as $\pi \to 1$. ■

Proof of Proposition 4 Recall from Proposition 1 that we have a sincere equilibrium if and only if

$$\delta \leq \delta_s(\pi,\sigma) = \frac{1}{[F(\frac{\pi(1-\pi)(1-2\sigma)}{\pi(1-\sigma)+\sigma(1-\pi)}) - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]},$$

and we have a pooling equilibrium if and only if

$$\delta \geq \delta_p(\pi,\sigma) = \frac{1}{[1/2 - F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]} > \delta_s(\pi,\sigma),$$

Recall that $\delta_p(\pi,\sigma)$ and $\delta_s(\pi,\sigma)$ are both decreasing in σ by Proposition 2 and note that

$$\lim_{\sigma\to 1/2}\delta_s(\pi,\sigma)=\infty,$$

and

$$\lim_{\sigma\to 0}\delta_p(\pi,\sigma)=\frac{1}{[1/2-F(-\pi)]}.$$

Hence when $\delta>\frac{1}{[1/2-F(-\pi)]}$, it is immediate that there exist $\sigma_s(\delta,\pi)$ and $\sigma_p(\delta,\pi)$ such that we have a pandering equilibrium if and only if $\sigma\leq\sigma_p(\delta,\pi)$, and a sincere equilibrium if and only if $\sigma\geq\sigma_s(\delta,\pi)$. Further, since $\delta_s(\pi,\sigma)<\delta_p(\pi,\sigma)$ we must have $\sigma_p(\delta,\pi)<\sigma_s(\delta,\pi)$. When $\sigma\in(\sigma_p(\delta,\pi),\sigma_s(\delta,\pi))$ we have a partial pooling equilibrium.

We first show that on $(0,\sigma_p(\delta,\pi))$ the welfare of all voters is decreasing in σ. This is immediate since, by the construction of $\sigma_p(\delta,\pi)$ we have a pandering equilibrium when $\sigma<\sigma_p(\delta,\pi)$. In a pandering equilibrium the politician always takes action a in the first period, which is the preferred action of the majority type with probability $1-\sigma$ and the minority type with probability σ. Hence the first period utility of the majority and minority type voters are

$$E[u_0^a(\omega_0,\theta_0)]=-\frac{\sigma}{1-2\sigma},$$

and

$$E[u_0^b(\omega_0,\theta_0)]=-\frac{1-\sigma}{1-2\sigma},$$

which are both decreasing in σ.

We consider how the welfare of voters varies with $\sigma\in(\sigma_p(\pi,\delta),\sigma_s(\pi,\delta))$ when δ is large. To do so, we first define, for each σ, $Pr(\omega_0=x_0^a|\sigma)$ and $Pr(\omega_0=x_0^b|\sigma)$ to be the probability that the equilibrium first period action matches the preferred first period action for the majority and minority voters.

Next we note that when δ is large, every $\sigma\in(\sigma_p(\delta,\pi),\sigma_s(\delta,\pi))$ is close to 1/2. This follows because $\sigma_p(\delta,\pi)$ is defined as the solution to

$$\delta=\frac{1}{[1/2-F(-\frac{\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})]}.$$

This implies that taking the limit as $\delta\to\infty$,

$$\lim_{\delta\to\infty}\frac{\pi(1-\pi)(1-2\sigma_p)}{\pi\sigma_p+(1-\pi)(1-\sigma_p)}=0,$$

and so

$$\lim_{\delta\to\infty}\sigma_p(\delta,\pi)=1/2.$$

In a partial pooling equilibrium, a politician with informed type $x_0 = b$ takes action b with probability $\gamma \in (0,1)$. Recall, from the proof of Proposition 1, that this γ solves

$$1 = \delta[F(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]}) - F(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})].$$

We can then calculate the comparative statics about how the politician's action varies with σ. Noting that

$$\frac{\partial}{\partial\sigma}\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)} = \frac{\pi(1-\pi)}{[\pi\sigma+(1-\pi)(1-\sigma)]^2},$$

$$\frac{\partial}{\partial\sigma}\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]} = \frac{\pi(1-\pi)\gamma(\gamma-2)}{(1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)])^2},$$

and

$$\frac{\partial}{\partial\gamma}\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]} = \frac{\pi(1-\pi)(1-2\sigma)}{[1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]]^2},$$

Hence, implicitly differentiating the equation which defines γ with respect to σ yields

$$f(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]})\frac{[\gamma(\gamma-2)+(1-2\sigma)\frac{\partial\gamma}{\partial\sigma}]}{(1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)])^2}$$
$$= f(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})\frac{1}{[\pi\sigma+(1-\pi)(1-\sigma)]^2}.$$

Rearranging this equation to isolate the partial derivative of γ with respect to σ,

$$(1-2\sigma)\frac{\partial\gamma}{\partial\sigma} = \gamma(2-\gamma) + \frac{f(\frac{-\pi(1-\pi)(1-2\sigma)}{\pi\sigma+(1-\pi)(1-\sigma)})}{f(\frac{\pi(1-\pi)(1-2\sigma)\gamma}{1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)]})}\frac{(1-\gamma[\pi\sigma+(1-\pi)(1-\sigma)])^2}{[\pi\sigma+(1-\pi)(1-\sigma)]^2},$$

and recalling that $\sigma_p \to 1/2$ as $\delta \to \infty$, we can conclude that for all $\sigma \in (\sigma_p, \sigma_s)$,

$$\lim_{\delta\to\infty}(1-2\sigma)\frac{\partial\gamma}{\partial\sigma} = \gamma(2-\gamma) + (2-\gamma)^2 = 2(2-\gamma).$$

Now that we have derived the differential equation which governs how the politician's strategy varies with σ as δ gets large, we can derive the effect in terms of welfare. Note that the probability the politician's action matches the preferred action of the majority voter is

$$\begin{aligned} Pr(\omega_0 = x_0^a|\sigma) &= \sigma Pr(\omega_0 = a|\theta_0 = a) + \sigma Pr(\omega_0 = b|\theta_0 = b) + (1-2\sigma)Pr(\omega_0 = a|\theta_0 = n) \\ &= \sigma + \sigma\gamma + (1-2\sigma)[\pi + (1-\pi)(1-\gamma)] \\ &= 1 - \sigma + [\sigma - (1-\pi)(1-2\sigma)]\gamma, \end{aligned}$$

and the probability that the action taken matches the minority's preference is

$$\begin{aligned} Pr(\omega_0 = x_0^b|\sigma) &= \sigma Pr(\omega_0 = a|\theta_0 = a) + \sigma Pr(\omega_0 = b|\theta_0 = b) + (1-2\sigma)Pr(\omega_0 = b|\theta_0 = n) \\ &= \sigma + \sigma\gamma + (1-2\sigma)[(1-\pi)\gamma) \\ &= \sigma + [\sigma + (1-\pi)(1-2\sigma)]\gamma. \end{aligned}$$

So the first period welfare of the majority and minority voters are

$$E[u_0^a(\omega_0,\theta_0)] = \frac{Pr(\omega_0 = x_0^a|\sigma) - 1}{1-2\sigma} = \frac{-\sigma + [\sigma - (1-\pi)(1-2\sigma)]\gamma}{1-2\sigma},$$

and

$$E[u_0^b(\omega_0,\theta_0)] = \frac{Pr(\omega_0 = x_0^b|\sigma) - 1}{1-2\sigma} = \frac{-(1-\sigma) + [\sigma + (1-\pi)(1-2\sigma)]\gamma}{1-2\sigma}.$$

Differentiating $E[u_0^a(\omega_0,\theta_0)]$ then yields that $\frac{\partial E[u_0^a(\omega_0,\theta_0)]}{\partial\sigma}$ is equal to

$$\frac{(1-2\sigma)[-1+(1+2(1-\pi))\gamma + [\sigma-(1-\pi)(1-2\sigma)]\frac{\partial\gamma}{\partial\sigma}] + 2[-\sigma+[\sigma-(1-\pi)(1-2\sigma)]\gamma]}{(1-2\sigma)^2}.$$

Note that this means that the sign of $\frac{\partial E[u_0^a(\omega_0,\theta_0)]}{\partial\sigma}$ is the same as the sign of the numerator of this fraction, and the numerator equals

$$D^a(\pi,\sigma) \equiv \sigma[(1-2\sigma)\frac{\partial\gamma}{\partial\sigma} - 2(1-\gamma)] - (1-2\sigma)[1-\gamma+(1-\pi)(1-2\sigma)\frac{\partial\gamma}{\partial\sigma}].$$

Similarly, differentiating $E[u_0^b(\omega_0,\theta_0)]$ reveals that $\frac{\partial E[u_0^b(\omega_0,\theta_0)]}{\partial\sigma}$ is equal to

$$\frac{(1-2\sigma)[1+(1-2(1-\pi))\gamma + (\sigma+(1-\pi)(1-2\sigma))\frac{\partial\gamma}{\partial\sigma}] + 2[-(1-\sigma)+[\sigma+(1-\pi)(1-2\sigma)]\gamma]}{(1-2\sigma)^2},$$

and so has the same sign as

$$D^b(\pi,\sigma) \equiv \sigma[(1-2\sigma)\frac{\partial\gamma}{\partial\sigma} - 2(1-\gamma)] - (1-2\sigma)[1-\gamma-(1-\pi)(1-2\sigma)\frac{\partial\gamma}{\partial\sigma}].$$

Note that, as γ is increasing in σ, $D^b(\pi,\sigma) > D^a(\pi,\sigma)$. Now recall that we have established that $\lim_{\delta\to\infty}\sigma_p(\delta,\pi) = 1/2$ and

$$\lim_{\delta\to\infty}(1-2\sigma)\frac{\partial\gamma}{\partial\sigma} = 2(2-\gamma).$$

Therefore,

$$\lim_{\delta\to\infty} D^a(\pi,\sigma) = \frac{1}{2}[2(2-\gamma) - 2(1-\gamma)] = 1.$$

This means that we can define

$$\bar{\delta}(\pi) = \inf\{\delta' \in (\frac{1}{[1/2 - F(-\pi)]},\infty) : D^a(\pi,\sigma) > 0 \text{ for all } \delta > \delta' \text{ and } \sigma \in (\sigma_p(\delta,\pi),\sigma_s(\delta,\pi))\} < \infty.$$

Then, for all $\delta > \bar{\delta}(\pi)$, $D^a(\pi,\sigma)$ and $D^b(\pi,\sigma)$ are strictly positive, and the welfare of both the minority and majority voters are strictly increasing, on $(\sigma_p(\delta,\pi),\sigma_s(\delta,\pi))$.

Finally, consider the case in which $\sigma > \sigma_s(\delta,\pi)$ and so the equilibrium is sincere. In a sincere equilibrium, in expectation, a majority voter receives a first-period payoff of 0 from a majority type politician, and -1 from a minority politician, and a minority type receives payoff 0 from a minority type and -1 from a majority type. Hence the expected first period payoff is $-(1-\pi)$ for a majority type and $-\pi$ for a minority type, which are constant in σ.

Putting everything together, for all $\delta > \bar{\delta}(\pi)$, the expected first period welfare of the majority voter is decreasing in $\sigma \in (0, \sigma_p(\delta, \pi))$, increasing in $\sigma \in (\sigma_p(\delta, \pi), \sigma_s(\delta, \pi))$, and constant for $\sigma \in (\sigma_s(\delta, \pi), 1/2)$. ■