Pandering and electoral competition

Gabriele Gratton

School of Economics, Australian School of Business, UNSW, Australia

A B S T R A C T

We study an election with two perfectly informed candidates. Voters share common values over the policy outcome of the election, but possess arbitrarily little information about which policy is best for them. Voters elect one of the candidates, effectively choosing between the two policies proposed by the candidates. We explore under which conditions candidates always propose the voters' optimal policy. The model is extended to include strategic voting, policy-motivated candidates, imperfectly informed candidates, and heterogeneous preferences.

© 2014 Elsevier Inc. All rights reserved.

The secret of the demagogue is to appear as dumb as his audience so that these people can believe themselves as smart as he.
[Kraus (1990, p. 113)]

A truth that's told with bad intent
Beats all the lies you can invent.
[William Blake, 'Auguries of Innocence']

1. Introduction

Proponents of representative democracy argue that voters are poorly informed about which policy is best for them, whereas candidates are better informed. Candidates propose platforms that reflect voters' preferences and lead the voters to the correct choice. Skeptics counter that office-seeking candidates pander to voters' beliefs, proposing whatever voters believe to be best. We show that even though incentives to pander exist, under mild conditions candidates propose the best policy for the voters.

For concreteness, suppose there are only two policies, 0 and 1, each equally likely to be optimal for the voters. Two candidates observe which policy is best for the voters. Voters privately observe one of two signals, 0 or 1. They observe signal 1 with probability .9 if the optimal policy is 1 and .6 if the optimal policy is 0.

Each candidate makes a proposal to the voters. Voters choose between the candidates by majority vote and the winner's proposal is implemented. Candidates are *office-motivated*: they only want to win the election. Voters want to choose the best policy.

Is there an equilibrium where the optimal policy for the voters is always implemented? At a bare minimum, at least one candidate in each state must propose the optimal policy. Yet, candidates might be tempted to pander to the majority of the voters, who always observe signal 1 and believe that policy 1 is optimal. That is, policy 0 might never be proposed by any candidate.

E-mail address: g.gratton@unsw.edu.au.

We now show that there exist equilibria where both candidates propose the optimal policy and, if one deviates, she loses.[1] For example, when the two proposals are equal, voters vote for each candidate with probability $1/2$. If the proposals are different, a voter who observes signal 1 votes for the candidate proposing policy 1 with probability $2/3$; a voter who observes signal 0 votes for the candidate proposing policy 0. To see why this is an equilibrium, note that if the candidates propose two different policies, the expected share of votes for the candidate proposing policy 1 is $.9 \times (2/3) = .6$ if policy 1 is optimal and $.6 \times (2/3) = .4$ if policy 0 is optimal. That is, whenever the candidates make differing proposals, the one optimal for the voters wins. Thus, whatever the strategy of her opponent, a candidate prefers to propose the policy optimal for the voters.

This equilibrium relies on voters' beliefs off the equilibrium path, when the two proposals are different. The chosen beliefs might seem arbitrary. Yet, if with positive probability candidates are of a *truthful* type that always proposes the voters' optimal policy, then all candidates propose the optimal policy in all equilibria. The basic intuition is as follows. Suppose that voters expect office-motivated candidates to pander and always propose policy 1. Whenever a candidate proposes another policy, the most likely scenario is that she is of the truthful type. Voters must then conclude that her proposal is optimal. Thus, in all sequential equilibria, candidates propose the optimal policy for the voters.

This paper generalizes this intuition to a generic environment with finitely many states and policies. Our results are robust to several extensions. Section 5.1 considers a finite number of strategic voters (voters who take into account the probability that their vote is pivotal between two candidates). This layer of strategic interaction selects among the fully revealing equilibria by imposing restrictions on the equilibrium voting strategies. Section 5.2 shows that the results hold if the candidates observe a common imperfect signal. In this case, candidates propose what the voters would choose if they too could observe the candidates' signal. Section 5.3 relaxes the assumption that candidates are solely office-motivated and shows that the results are robust to the introduction of a limited amount of policy-motivation. Finally, Section 5.4 allows voters to have heterogeneous preferences.

To appreciate how various features of the model contribute to the results, let us first compare our model to the closely related ones in Heidhues and Lagerlöf (2003) and Leslier and Van der Straten (2004). Both papers study a model with binary states, signals, and policies, and imperfectly informed candidates. Consider first the implications of their models for the case of perfectly informed candidates. In the example above, Heidhues and Lagerlöf (2003) show that, if voters have no private information, there exist only equilibria where the candidates propose the same policy across states. This is because the expected share of votes for the candidate proposing policy 1 is fixed across states. It is a majority when 1 is optimal if and only if it is a majority also when 0 is optimal. It follows that, in contrast with our results, there is at least one state where the optimal policy for the voters is not proposed by any candidate.[2]

Leslier and Van der Straten (2004) show that both candidates propose the optimal policy, but only when voters possess sufficiently precise information. They assume that a majority of voters always receive the correct signal.[3] In equilibrium, if the two proposals are different, a voter who observes signal 1 votes for the candidate proposing 1; a voter who observes signal 0 votes for the candidate proposing policy 0. Candidates are then induced to propose the optimal policy in each state. It is worth noticing that this argument does not hold in our numerical example: if voters play this strategy, a candidate who proposes policy 1 expects a share of votes equal to $.9$ in state 1 and $.6$ in state 0.

We build upon this intuition and show that even when voters posses arbitrarily imprecise information, they can coordinate their vote and induce the candidates to propose the optimal policy in each state. We do this at the expense of assuming that each candidate is perfectly informed about what her opponent knows. This does not mean that independent trembles of the candidates would destroy a fully revealing equilibrium. On the contrary, vanishingly small independent trembles are exactly what imposes restrictions on voters' beliefs in the fully revealing equilibrium.[4]

The key feature of our model is that voters have information that is arbitrarily imprecise, but sufficient to collectively choose the best among two policies. This closely relates to the Condorcet Jury Theorem literature.[5] In the jury environment, voters choose between *two* fixed policies and are uncertain about which one is best. Feddersen and Pesendorfer (1997) show that strategic voters coordinate their votes and choose the best of the two policies. We show that the introduction of strategic competition among candidates allows for simple, sincere voting strategies that guarantee that both candidates propose the optimal policy among *any number* of alternatives. With this comparison in mind, our message can be thought of as follows. Since voters have sufficient information to choose the best among two policies, office-motivated candidates have an incentive to choose the best proposals among any number of policies: when the two proposals are different, voters choose the best of the two.

---

[1] We focus on this kind of revealing equilibria. Equilibria where candidates propose the optimal policy because all policies win with probability $1/2$ are not robust to any small amount of candidates' policy-motivation.

[2] To be precise, these are the only equilibria where, if a candidate deviates, she loses. There also exists an equilibrium where candidates propose the optimal policy because whenever the two proposals are different, voters vote for each candidate with probability exactly $1/2$.

[3] More precisely, after observing their signals, the majority of voters always prefers the correct policy. "Of course, it does not mean that our conclusion remains valid if, for instance, one state is very unlikely or has very important consequences in terms of utility compared to the other." (p. 433)

[4] Our solution concept is Sequential Equilibrium. As shown by Kohlberg and Reny (1997), in consistent assessments, events are independent in relative probability. Our equilibria are also perfect, meaning that the best responses of the voters (and not only their beliefs) are robust to independent trembles of the candidates (see Section 2, Online Appendix).

[5] Originally formulated by Marquis de Condorcet (1785), this has been extended to strategic voting by Austen-Smith and Banks (1996), Duggan and Martinelli (2001), Feddersen and Pesendorfer (1997), McLennan (1998), and Meirowitz (2002).

A different approach to our problem is to assume a continuous one-dimensional state-policy space and imperfectly informed candidates. In a recent work, Kartik et al. (2013) show that, under some conditions on the information available to the candidates, there exists no symmetric, fully revealing equilibrium. Rather, with sufficiently poor information in the hands of the voters, office-motivated candidates have an incentive to exaggerate their private information. That is, candidates make proposals more distant from the voters' prior than suggested by their private signal.

Bond and Eraslan (2010) also consider the problem of using proposals to signal private information. In their model, a single proposer and many voters have privately known preferences over the policy space. The proposer chooses a policy voters can approve or reject, in which case they remain with the status quo. The key result is that unanimity rule makes voters (and sometimes the proposer) better off, because it induces the proposer to make more palatable proposals to the voters. We focus on office-motivated candidates and show that—in line with the jury literature mentioned above—full information aggregation is achieved under any majority rule but unanimity (see Section 5.4).[6]

A different type of pandering occurs when a politician in office implements policies that voters believe to be optimal. She does so because voters interpret it as a signal that she has preferences aligned to their own (Maskin and Tirole, 2004; Morris, 2001) or that she is very competent (Canes-Wrone et al., 2001). Hence, even if the politician has the same preferences as the voters and is very competent, she might choose sub-optimal policies in order to be re-elected.[7]

We assume that candidates fully commit to the policy they propose. Otherwise, if candidates can change policy after the election (or in future ones) voters could use their vote to signal their preferences to the candidates (Castanheira, 2003; Meirowitz and Shotts, 2009; Piketty, 2000; Razin, 2003; Shotts, 2006).[8] Similarly, we do not allow voters to communicate among themselves before voting (Austen-Smith and Feddersen, 2006; Coughlan, 2000; Doraszelski et al., 2003; Gerardi and Yariv, 2007) or to abstain from voting (Krishna and Morgan, 2011; Krishna and Morgan, 2012). Last, we assume that voters have private information about the policies. A related question is whether voters would acquire such information if costly (Martinelli, 2006; Szentes and Koriyama, 2009) or biased (Oliveros and Várdy, 2012).

2. The model

There are two candidates, A and B, and a continuum[9] of voters indexed by i. At the beginning, a state θ is drawn from a finite set Θ with probability $\Pr(\theta) > 0$ for all $\theta \in \Theta$. Candidates privately observe the state θ. Each voter i observes a private signal s^i, conditionally independent and identically distributed over a finite set $\mathcal{S}$, with $|\mathcal{S}| > 1$.

Each candidate simultaneously proposes a policy from a finite set $\mathcal{E}$. We refer to candidate c's proposal as x^c. Each voter observes the two proposals and casts a single vote for one of the candidates. The candidate who receives the largest share of votes is elected with probability 1. In case of a tie, each candidate is elected with probability $1/2$. The winner's proposal is implemented.

Voters share common values and their preferences depend on which policy is implemented, conditional on the state. Voter i's utility is a function $u : \mathcal{E} \times \Theta \to \mathbb{R}$. The voters' optimal policy in state θ is $e^*(\theta)$.[10] For any policy e, the (possibly empty) set of states where e is optimal is $\Theta_e \subsetneq \Theta$.

Each candidate $c \in \{A, B\}$ can be of two types. With probability π, she is *truthful* and always proposes $e^*(\theta)$; otherwise she is a *strategic*, office-motivated agent, and receives a rent $R > 0$ if elected. A candidate's type is her private information. With some abuse of notation, we refer to the pure strategy of candidate c as $x^c(\theta)$.

We assume that voters are *sincere*: voter i votes for candidate c if $\mathbb{E}[u(x^c, \theta) \mid x, s^i] > \mathbb{E}[u(x^{-c}, \theta) \mid x, s^i]$, where x^{-c} is the proposal of candidate c's opponent and x is the candidates' profile of proposals. A voter can mix between the two candidates if the two proposals give the same expected payoff. If the proposals are identical ($x^A = x^B$), each voter votes for each candidate with probability $1/2$.[11]

The timing of the electoral game is as follows: (1) nature chooses a state $\theta \in \Theta$ and candidates' types; (2) each candidate observes the state and her type; each voter observes his signal; (3) candidates A and B propose proposals x^A and x^B; (4) voters observe the proposals and cast votes in favor of either candidate A or B; (5) the candidate with the largest share of votes is elected and her proposal is implemented.

We impose very little structure on the conditional distribution of signals. First, we assume that the distribution has full support over $\mathcal{S}$: $\Pr(s \mid \theta) > 0$ for all $s \in \mathcal{S}$ and $\theta \in \Theta$. Second, if it is known that either policy e or e' are optimal, then signals are not confusing. That is, we rule out the possibility of signals s and s' such that s suggests more than s' that (i) the state is $\theta \in \Theta_e$ rather than $\theta' \in \Theta_{e'}$, and also (ii) that the state is $\theta'' \in \Theta_{e'}$ rather than $\theta''' \in \Theta_e$. Formally,

---

[6] Other examples of works which combine strategic voting with candidates strategic behavior are Austen-Smith and Banks (1988) and Ghosh and Tripathi (2012).

[7] Binswanger and Prufer (2009), Frisell (2004), and Harrington (1993) are examples of other works considering the incentives of an incumbent politician to target voters' prior beliefs.

[8] A related question is whether electoral competition induces candidates to lie about their intent once elected (e.g., Callander and Wilkie, 2007).

[9] Given the assumption (below) on voting behavior, assuming a continuum of voters is equivalent to there being a single voter and approximates there being sufficiently many (sincere) voters. Section 5.1 extends the results to a large, finite number of fully strategic voters.

[10] Uniqueness of $e^*(\theta)$ is not necessary for our results (see footnote 14 in Section 3). Yet, it greatly simplifies the exposition.

[11] The set of equilibrium policy outcomes is not affected by this assumption. Yet, it eliminates equilibria where the winning candidate always proposes the voters' optimal policy, while the loser makes any proposal because he loses even if he makes the correct one.

Assumption 1. Let e, e' ($e \neq e'$) be two policies and s, s' ($s \neq s'$) be two signals. One of the following holds:

1. $\dfrac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} > \dfrac{\Pr(s' \mid \theta)}{\Pr(s' \mid \theta')}$, for all $\theta \in \Theta_e$ and $\theta' \in \Theta_{e'}$.

2. $\dfrac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} < \dfrac{\Pr(s' \mid \theta)}{\Pr(s' \mid \theta')}$, for all $\theta \in \Theta_e$ and $\theta' \in \Theta_{e'}$.

In the remainder of the paper, we characterize the set of *electoral equilibria*, where this is the set of sequential equilibria (Kreps and Wilson, 1982) where voters play symmetric voting strategies (i.e., the same strategy across voters). While we impose no further refinement on the equilibrium concept, the equilibria described in this paper also satisfy trembling hand perfection, intuitive criterion, and properness.[12]

A natural question is whether there are equilibria in which both candidates propose the voters' optimal policy because this proposal wins against any other proposal. We call such an equilibrium *fully revealing*.

Definition 1. An electoral equilibrium is *fully revealing* if in each state θ (i) both candidates propose the voters' optimal policy $e^*(\theta)$, but (ii) if a candidate deviates and proposes a different policy, then she loses for sure.

One might argue that it is not hard to construct an equilibrium with property (i) but in which a candidate who deviates does not necessarily lose the election. We would like to stress that such an equilibrium is not robust to the introduction of any policy-motivation for the candidate.

3. Fully revealing equilibria

In this section, we show existence of fully revealing equilibria.

Proposition 1. *For all $\pi \geqslant 0$, there exists a fully revealing equilibrium.*

Proof. All proofs are in Appendix A, except when noted. $\square$

We provide the key elements to construct the equilibrium for a case of binary signals and one-to-one $e^*(\theta)$. In each state θ, candidates propose the voters' optimal policy $e^*(\theta)$. If both candidates make the same proposal, each voter votes for each candidate with probability $1/2$. If candidates make different proposals, e and e', with $\Theta_e = \{\theta\}$ and $\Theta_{e'} = \{\theta'\}$, voters randomize between the two candidates under one signal and vote deterministically under the other.

Due to Assumption 1, we can relabel elements in $\{e, e'\}$ and $\mathcal{S} = \{s, s'\}$ such that signal s is more indicative of θ, $\Pr(s \mid \theta) > \Pr(s \mid \theta')$, and s is more common under state θ, $\Pr(s \mid \theta) > 1/2$. With this normalization, voters with signal s' vote for e' with probability 1; voters with signal s vote for e with probability

$$a \in \left(\frac{1}{2 \Pr(s \mid \theta)}, \frac{1}{2 \Pr(s \mid \theta')} \right) \cap (0, 1) \neq \emptyset.$$

Voters' beliefs are as follows. If both candidates propose the same policy e, then they believe the state to be θ. If the candidates make different proposals, e and e', voters believe the state to be either θ or θ' with probabilities that make them indifferent between the two policies under signal s.

To see that this is an equilibrium, consider first the choice of the candidates. In state θ, if a candidate deviates to e', she loses the election:

$$\underbrace{1 - a \Pr(s \mid \theta)}_{\text{votes for } e'} < \underbrace{a \Pr(s \mid \theta)}_{\text{votes for } e}.$$

Likewise, in state θ', if a candidate deviates to e, she loses the election:

$$\underbrace{1 - a \Pr\left(s \mid \theta'\right)}_{\text{votes for } e'} > \underbrace{a \Pr\left(s \mid \theta'\right)}_{\text{votes for } e}.$$

On the equilibrium path, voters' beliefs are calculated using Bayes' rule. Out of equilibrium, when the candidates make proposals e and $e' \neq e$, voters give probability 0 to those states where neither of the proposals is optimal. Intuitively, they

---

[12] Perfection would not add further restrictions on voters' beliefs because (i) sequential equilibria already have inbuilt vanishingly small trembles of the candidates, and (ii) in any equilibrium mentioned in this paper, voters' best responses are robust to at least one sequence of such trembles (see Section 2, Online Appendix). Intuitive criterion and properness have no bite because candidates have no policy preferences.

expect candidates' trembles to be independent. When neither of the two proposals is optimal, this profile is possible only if both candidates tremble. Thus, as these trembles become vanishingly small, the profile (e, e') becomes infinitely more likely when at least one of the proposals is optimal than when neither is. The relative probabilities of θ and θ' are such that voters with signal s are indifferent between the two policies. Since s is the signal more indicative of θ, voters with signal s' strictly prefer policy e'.

We can extend this argument beyond this case, to a generic environment where a policy is optimal in many states and there are many signals. Out of equilibrium, when candidates make proposals e and $e' \neq e$, $\Theta_e \neq \emptyset$, voters give probability 0 to those states where neither of the proposals is optimal. Again, this is because the profile (e, e') in state $\theta \notin \Theta_e \cup \Theta_{e'}$ is possible only if both candidates tremble. Thus, voters' beliefs are restricted to states in Θ_e and $\Theta_{e'}$. By Assumption 1, signals can be ordered from the one suggesting states in Θ_e the most to the one suggesting states in $\Theta_{e'}$ the most. Voters with signals suggesting Θ_e the most will vote for e; voters with signals suggesting $\Theta_{e'}$ the most will vote for e'.

The share of votes for e is larger in states in Θ_e than in states in $\Theta_{e'}$. This is because the signals suggesting Θ_e the most are those observed more often in states in Θ_e than in states in $\Theta_{e'}$.[13],[14] Then, for some beliefs, there exists a voting strategy such that this share is greater than 1/2 if the state is in Θ_e and less than 1/2 if the state is in $\Theta_{e'}$.[15]

The voters' strategies described above induce the candidates to propose the voters' optimal policy. Indeed, let the voters play such a strategy. This induces a simultaneous move, constant-sum game between the candidates with a unique and *strict* Nash equilibrium where both candidates propose the voters' optimal policy. In this sense, whenever the candidates expect the voters to follow this strategy on average, they always propose the voters' optimal policy.[16]

Proposition 2. *For all $\pi \geqslant 0$, there exists a (robust) voting strategy inducing full revelation in all electoral equilibria where it is played.*

Proposition 1 says that there exists an equilibrium where both candidates propose the optimal policy. In fact, there exists a continuum of such equilibria differing for the exact voting strategy. Yet, there also exists a plethora of other equilibria. For example, candidates propose policy e in all states and voters believe that a candidate trembles much more likely when e is the optimal policy. Nonetheless, since fully revealing equilibria exist, inherently truthful candidates are not to be ruled out.

4. The importance of being earnest ($\pi > 0$)

We examine which equilibria survive a small but non-zero probability π that each candidate is truthful. If there are only two states and two policies, all electoral equilibria are fully revealing.

Proposition 3. *If there are 2 states, 2 policies, and $\pi > 0$, all electoral equilibria are fully revealing.*

The intuition is as follows. First, in equilibrium there exists at least one state in which both candidates play the voters' optimal policy with probability 1. Suppose otherwise. Then in any state θ at least one candidate plays $e^*(\theta') \neq e^*(\theta)$ with positive probability. Thus, in state θ she expects $e^*(\theta)$ to do no better than $e^*(\theta')$. By Assumption 1, for any consistent belief of the voters, policy $e^*(\theta')$ must do strictly better in state θ' than in state θ. Thus, the candidate plays $e^*(\theta')$ with probability 1 in state θ'.

Second, suppose the candidates propose the optimal policy with probability 1 only in state θ. If a voter observes proposals $e^*(\theta)$ and $e^*(\theta')$, then he believes that $e^*(\theta')$ is optimal, because candidates propose $e^*(\theta')$ with positive probability only in state θ'. But then candidates prefer to deviate to $e^*(\theta')$, since whenever a candidate makes this proposal, her expected payoff is strictly greater than if she proposes $e^*(\theta)$.[17]

This argument extends to the general model of Section 2 if we restrict the set of equilibria to candidates' symmetric pure strategies. The intuition is similar and for details we refer to the proof in Appendix A.

Proposition 4. *If $\pi > 0$, all symmetric, pure strategy electoral equilibria are fully revealing.*

---

[13] To be precise, they are the signals with $\Pr(s \mid \theta) / \Pr(s \mid \theta')$ larger if $\theta \in \Theta_e$ and $\theta' \in \Theta_{e'}$.

[14] Suppose uniqueness of $e^*(\theta)$ is not satisfied. Then there exists e and e' such that $\Theta_e \cap \Theta_{e'} \neq \emptyset$. When possible, we order the signals from those more in favor of the states when only e is optimal to those where only e' is optimal. If instead one policy is optimal whenever the other is, one can simply let the voters always vote for the policy that is optimal more often.

[15] For details on how to construct such beliefs, see Part 2, Proof of Proposition 1 in Appendix A.

[16] Lipman and Seppi (1995) call such a voting strategy a robust inference rule.

[17] In state θ, she wins with probability 1 instead of 1/2. In state θ', she wins with probability $\pi/2 + (1-\pi)[\lambda/2 + (1-\lambda)]$ instead of $(1-\pi)(1-\lambda)/2$, where λ is the probability that her strategic opponent plays $e^*(\theta')$ in state θ'.

5. Extensions

5.1. Fully strategic voting

We have so far assumed that voters vote for the candidate whose proposal maximizes their expected payoff. In this sense, although voters are not naive, they vote sincerely. The literature on voting equilibria (e.g., Myerson and Weber, 1993) has highlighted the importance for voters to consider how likely their vote is to change the result of the election.

We now extend the results of the previous sections to an environment with a finite number of strategic voters. We conduct the analysis under the assumption that the number of voters ν follows a Poisson distribution $\mathcal{P} : \mathbb{N} \to [0, 1]$ with mean $\bar{\nu} > 0$. The remainder of the model is identical to Section 2. We characterize the limit of the set of sequential equilibria as $\bar{\nu}$ becomes large.

There exists a fully revealing equilibrium where voters play sincere voting strategies.

Proposition 5. *For all $\pi \geqslant 0$ and $\bar{\nu}$ sufficiently large, if voters are fully strategic, there exists a fully revealing electoral equilibrium in which each voter votes for the candidate whose proposal maximizes his expected payoff.*

To fix ideas, focus on a binary case. There are two policies, e and e', respectively optimal in θ and θ'. Voters observe one of two signals, s and s', with $\Pr(s \mid \theta) > \Pr(s \mid \theta')$ and $\Pr(s \mid \theta) > 1/2$.

In the fully revealing equilibrium, candidates propose policy e in state θ and e' in state θ'. If both candidates propose the same policy, each voter votes for each candidate with probability $1/2$. If the two proposals are different, voters randomize between the candidates under one signal and play deterministically under the other.

Call $a(s)$ (respectively, $a(s')$) the probability that a voter with signal s (s') votes for the candidate proposing e. If $\Pr(s \mid \theta) + \Pr(s \mid \theta') \geqslant 1$, then $a(s') = 0$ and

$$a(s) = \frac{1}{\Pr(s \mid \theta) + \Pr(s \mid \theta')}; \tag{1}$$

if $\Pr(s \mid \theta) + \Pr(s \mid \theta') < 1$, then

$$a(s') = \frac{1 - [\Pr(s \mid \theta) + \Pr(s \mid \theta')]}{2 - [\Pr(s \mid \theta) + \Pr(s \mid \theta')]} \tag{2}$$

and $a(s) = 1$.

To see why this is an equilibrium, note that in each state, when candidates make different proposals, the one who proposes the optimal policy wins a strict majority of the votes.

As in the case with sincere voters, whenever the two proposals are different, voters' beliefs are such that voters are indifferent between the two policies under one of the two signals. If $\Pr(s \mid \theta) + \Pr(s \mid \theta') \geqslant 1$, then voters are indifferent under signal s and vote for e' under signal s'; if $\Pr(s \mid \theta) + \Pr(s \mid \theta') < 1$, then voters are indifferent under signal s' and vote for e under signal s. Because voters condition their choice on being pivotal, these strategies are rational only if the event that a vote is pivotal between the two policies is roughly as likely in one state as in the other. To see this, suppose that a vote is arbitrarily more likely to be pivotal in state θ than in state θ'. Then a voter knows that if his vote is ever going to make a difference, it will be in state θ, where policy e is optimal. Then the voter would rationally choose to vote for the candidate proposing e, no matter how likely he thinks state θ to be.

By the Magnitude Theorem (Myerson, 2000, Theorem 1),[18] a sufficient condition for the pivotal probability in the two states to be comparable is that the expected share of votes for e in state θ equals the expected share of votes for e' in state θ'[19]:

$$\underbrace{a(s) \Pr(s \mid \theta) + a(s')[1 - \Pr(s \mid \theta)]}_{\text{votes for } e \text{ in } \theta} = \underbrace{1 - a(s) \Pr(s \mid \theta') - a(s')[1 - \Pr(s \mid \theta')]}_{\text{votes for } e' \text{ in } \theta'}.$$

That is, the share of votes for the optimal policy is exactly $1/2$ roughly as likely in one state as in the other.

Restricting to sincere strategies ($a(s') > 0$ only if $a(s) = 1$) and imposing that a majority of the voters chooses the correct policy, we get the strategies in (1) and (2).

---

[18]   The Magnitude Theorem states that beliefs concentrate on states with maximum magnitude of the event that a vote is pivotal between e and e', $mag(piv_{e,e'} \mid \theta)$.

[19]   From the formula in Section 5 of Myerson (2000, p. 25),

$$mag(piv_{e,e'} \mid \theta) = -\left(\sqrt{a(s) \Pr(s \mid \theta) + a(s')[1 - \Pr(s \mid \theta)]} - \sqrt{1 - a(s) \Pr(s \mid \theta) + a(s')[1 - \Pr(s \mid \theta)]} \right)^2$$

$$= -\left(\sqrt{1 - a(s) \Pr(s \mid \theta') + a(s')[1 - \Pr(s \mid \theta')]} - \sqrt{a(s) \Pr(s \mid \theta') + a(s')[1 - \Pr(s \mid \theta')]} \right)^2$$

$$= mag(piv_{e,e'} \mid \theta').$$

We turn now to the case of $\pi > 0$. When voters are sincere, arguments about voters' beliefs (and not strategies) are sufficient to prove that all electoral equilibria are fully revealing. It is straightforward to extend these arguments to the case of strategic voters. Intuitively, suppose that there is a pooling equilibrium and voters observe two different proposals. Whenever this happens, all voters believe that the candidate who is proposing the unexpected policy is truthful. Therefore, voters strictly prefer to vote for her, no matter the likelihood of being pivotal. This implies that all candidates prefer to deviate.

Proposition 6. *When voters are fully strategic, if $\pi > 0$ and $\bar{v}$ is sufficiently large, all symmetric, pure-strategy electoral equilibria are fully revealing. If there are 2 states, 2 policies, and $\pi > 0$, all electoral equilibria are fully revealing.*

Proof. The proof follows the ones of Propositions 3 and 4 after noticing that if $\Pr(\Theta_e \mid x) = 1$ for some policy e, then all voters vote for a candidate proposing policy e if there is one. $\quad\square$

5.2. Imperfectly-informed candidates

We relax the assumption that candidates are perfectly informed about the state. To be precise, we allow the candidates to observe a common imperfect signal. In practice this means the two candidates do not know the exact distribution of voters' signals, but they have access to the same opinion polls and identical reports on the state. This assumption is also made in related works by Martinelli (2001) and Schultz (1996).[20] To fix ideas and avoid confusion between a candidate's and a voter's signals, we call the former a *report*.

We assume a binary scenario with two states, θ and θ', two policies, e and e', and two signals, s and s'. Candidates do not observe the state θ, but a report in $\{r, r'\}$. A (pure) strategy for candidate c is therefore $x^c : \{r, r'\} \to \{e, e'\}$.

Call $e^*(r)$ ($e^*(r')$) the policy that voters would choose, via majoritarian vote, if they could, in addition to their signals, all observe the report r (r') of the candidates. The definition of a truthful candidate we have used so far should be substituted by a type that always proposes the policy voters would choose via majoritarian vote if they could, in addition to their signals, all observe the report. Call π' the probability of each candidate being of this new truthful type.

Proposition 7. *For all $\pi' \geqslant 0$, if there are 2 states, 2 policies, and 2 signals, there exists an electoral equilibrium where candidates always propose the policy voters would choose via majoritarian vote if, in addition to their signals, they all observed the report.*

The basic intuition is that if a candidate sees report r, then she expects a majority of the voters to prefer $e^*(r)$ if the two proposals are different. Similarly, if she sees r', she expects the majority to prefer $e^*(r')$. Hence, the candidate is induced to propose the policy voters would choose if they could observe the report.

One might wonder whether such an equilibrium approaches full information equivalence as the report becomes more and more precise. The answer is yes: as $\Pr(r \mid \theta)$ and $\Pr(r' \mid \theta')$ approach 1, the probability that the correct policy is implemented approaches 1.

Proposition 8. *If $\pi' > 0$ and there are 2 states, 2 policies, and 2 signals, in all symmetric, pure strategy electoral equilibria with imperfectly informed candidates, a strategic candidate acts as if she were truthful.*

5.3. Policy-motivated candidates

In reality, candidates also care about which policy is implemented. Moreover, candidates' preferences might be misaligned with voters' preferences and biased towards one policy. To allow for policy-motivated candidates, we assume a binary scenario with two states, θ and θ', two policies, e and e', and two signals, s and s'. Policy e is optimal in state θ; e' is optimal in θ'. The novelty of this section is that a strategic candidate wants both to win the election and that policy e' is implemented. That is, if and only if she wins the election, she gets a rent $R > 0$. In addition, whenever policy e' is implemented, she also gets an extra payoff $\beta > 0$. Hence, β is a measure of the bias of the candidate.

The following proposition says that if the bias is limited, then all equilibria are fully revealing as long as $\pi > 0$.

Proposition 9. *If $\beta \leqslant R/2$ and $\pi > 0$, all electoral equilibria with policy-motivated candidates are fully revealing.*

Existence of fully revealing equilibria is at this point straightforward. Candidates always propose the optimal policy. Voters coordinate their vote so that when the candidates make different proposals, the one proposing the optimal policy wins with probability 1. For each candidate, deviating from equilibrium costs $R/2$ in any state. Indeed, the deviating candidate loses any chance of winning the election without affecting the winning policy.

---

[20] Bernhardt et al. (2007) show how independent signals induce divergent platforms.

To prove uniqueness, one should take care of only one detail which differs from the case of office-motivated candidates. Suppose that candidate B proposes e' with positive probability in state θ. Then candidate A faces a tradeoff between office and policy motivations. If she plays e, on one hand she increases her chances of winning, on the other she makes sure that her least favorite policy is implemented. Let $\phi < 1$ be the total probability that B plays e' in state θ. In state θ, A's expected payoff of e' is $\phi(\beta + R/2)$; her expected payoff of e is $(R/2)(1 + \phi)$. It is easy to see that as long as $\beta \leqslant R/2$, then A prefers to propose e.

5.4. Different majority rules and heterogeneous preferences

We extend the model to different majority rules and heterogeneous preferences. We assume a binary scenario with two states, θ and θ', two policies, e and e', and two signals, s and s'. Without loss of generality, let (i) e be optimal in θ and e' be optimal in θ', and (ii) $\Pr(s \mid \theta) > \Pr(s \mid \theta')$.

5.4.1. Different majority rules and unanimity

We allow for different majority rules: whenever two candidates make different proposals, the one proposing policy e' wins if and only if her share of votes is greater than $\eta \in [\frac{1}{2}, 1)$.[21]

Proposition 10. *For all $\pi \geqslant 0$ and all $\eta \in [\frac{1}{2}, 1)$, there exists a fully revealing electoral equilibrium. If $\pi > 0$, all electoral equilibria are fully revealing.*

Proof. In equilibrium, candidates propose the voters' optimal policy in each state. As usual, we need that whenever candidates make different proposals, the one proposing the optimal policy for the voters wins. The novelty of this section is that in state θ', this candidate must receive a share of votes greater than η instead of greater than $1/2$. It is useful to divide the analysis in two cases. First, let $\Pr(s' \mid \theta') < \eta$. Voters who observe signal s are indifferent between the two policies whenever they observe differing proposals. (Note that this implies that voters who observe signal s' strictly prefer policy e'.) They vote for the candidate proposing e with probability a such that

$$a \in \big((1 - \eta)/\Pr(s \mid \theta), (1 - \eta)/\Pr(s \mid \theta')\big) \cap [0, 1] \neq \emptyset$$

and the candidate proposing the optimal policy always wins. Second, let $\Pr(s' \mid \theta') > \eta$. Voters observing signal s' are indifferent between the two policies whenever they observe differing proposals. (Note that this implies that voters who observe signal s strictly prefer policy e.) They vote for the candidate proposing e' with probability a' such that

$$a' \in \big(\eta/\Pr(s' \mid \theta'), \eta/\Pr(s' \mid \theta)\big) \neq \emptyset$$

and the candidate proposing the optimal policy always wins. Lemma 1 in Appendix A with $1/2$ replaced by η and Part 2 of the proof of Proposition 1 establish that voters' strategies are best responses to consistent beliefs. The proof of uniqueness then is a straightforward extension of the proof of Proposition 3. □

One might wonder whether fully revealing equilibria exist if unanimity is required to elect a candidate proposing e', i.e., $\eta = 1$. The answer is negative. Indeed, if a candidate ever proposes e', then this means that at least in state θ', all voters vote for e' whenever they observe two different proposals. That is, all voters must vote e' with probability 1, no matter what signal they have observed. This means that they also vote unanimously for e' in state θ. It follows that candidates would never propose e.[22]

5.4.2. Heterogeneous preferences

We relax the common values assumption and allow voters to have heterogeneous preferences. Let $\mathcal{T}$ be a set of voters' types. Each type $t \in \mathcal{T}$ has preferences given by the utility function $u^t : \mathcal{E} \times \Theta \to \mathbb{R}$.

For each type t, $\Delta(\hat{\theta} \mid t) \equiv u^t(e, \hat{\theta}) - u^t(e', \hat{\theta})$ is the difference between the payoffs of policy e and e' in state $\hat{\theta}$. We maintain the assumption that voters have monotonic preferences in the sense of Bhattacharya (2008)[23]: the difference between the payoffs of policy e and e' is greater in state θ than in state θ'.

Assumption 2. *For any type t, $\Delta(\theta \mid t) > \Delta(\theta' \mid t)$.*

Let F be a (possibly degenerate) distribution over $\mathcal{T}$. We allow for voters whose preferred policy is independent of the state. Let $\underline{F} \geqslant 0$ be the probability that a voter is of a type t such that $\Delta(\hat{\theta} \mid t) > 0$ for all states $\hat{\theta}$. Similarly, $\bar{F} \geqslant 0$ is the probability that a voter is of a type t' such that $\Delta(\hat{\theta} \mid t') < 0$ for all states $\hat{\theta}$. The following proposition says that whenever the median voter's preferred policy is different in different states, then there exists a fully revealing equilibrium.

---

[21] Nonetheless, if both candidates propose identical policies, both win with probability $\frac{1}{2}$ and the proposed policy is implemented.

[22] Not surprisingly, the fully revealing equilibrium exists if and only if $\Pr(s \mid \theta) = \Pr(s' \mid \theta') = 1$. That is, when voters are perfectly informed.

[23] Bhattacharya (2008) shows how information aggregation might fail if preferences are not monotonic and voters choose between two given policies.

Proposition 11. *For all $\pi \geqslant 0$ and any distribution of types F such that $\underline{F} < 1/2$ and $\bar{F} < 1/2$, there exists a fully revealing electoral equilibrium. If $\pi > 0$, all electoral equilibria are fully revealing.*

Proof. Let F be such that $\underline{F} < 1/2$ and $\bar{F} < 1/2$. Whenever the candidates make different proposals, these share of voters vote respectively for e and e'. The remaining voters coordinate in such a way that a share of them greater than

$$\bar{\eta} \equiv \frac{\frac{1}{2} - \bar{F}}{1 - [\underline{F} + \bar{F}]}$$

votes for e' if and only if the state is θ'. Thus, if a candidate deviates, she loses. From Proposition 10, this is always possible. Part 2 of the proposition then follows from Proposition 3. □

6. Conclusions

An appeal of representative democracy is that informed candidates lead uninformed voters to take optimal decisions. Yet, there is a counterargument: instead of telling unpalatable truths to the voters, candidates pander to them and propose whatever the voters think is best. Of course there might be a young, idealistic politician who always tells the truth. But she would lose.

In this paper, we have argued that there exist voting strategies which ensures that candidates always propose the optimal policy. Furthermore, whenever there is a positive probability of candidates being committed to tell the truth, this is the unique equilibrium outcome. The optimal strategy for an office-motivated candidate is to propose the optimal policy for the voters, even though this implies that her chances of winning the election are not larger than those of a truthful candidate. Although these results raise some hope, we do not interpret them as proof that pandering and rhetoric are not important in democratic elections. To the contrary, we believe pandering to be common. Nonetheless, our results show that the causes of this phenomenon are not as obvious as we might think, and that simple signaling models hardly help identifying them.

Acknowledgments

Appendix A. Proofs

We refer to a mixed strategy for candidate c as σ^c, where $\sigma^c(e \mid \theta)$ is the probability that candidate c proposes policy e in state θ.

We begin by establishing Lemma 1. Suppose that the two candidates make proposals e and $e' \neq e$, $\Theta_e \neq \emptyset$. Lemma 1 constructs beliefs such that, in any state where one of the proposals is optimal, the majority of votes goes to the candidate making the correct proposal. Concretely, for any policy e, define $\mu_e : \Theta \to [0, 1]$:

$$\mu_e(\theta) = \begin{cases} \frac{\Pr(\theta)}{\Pr(\Theta_e)} & \text{if } \theta \in \Theta_e; \\ 0 & \text{otherwise.} \end{cases}$$

Lemma 1. *Let the candidates propose policies e and $e' \neq e$ such that $\Theta_e \neq \emptyset$. Let $\mu^* = b\mu_e + (1-b)\mu_{e'}$ be the voters' beliefs derived by updating the prior based on the proposals but without using the signals. For some $b \in [0, 1]$ there exists a sequentially rational voting strategy such that a (strict) majority of votes goes to the candidate proposing the optimal policy in any state $\theta \in \Theta_e \cup \Theta_{e'}$.*

Proof. Let x be a profile of proposals with two distinct proposals, e and e'. We divide the proof in two cases:

Case 1. $\Theta_{e'} = \emptyset$. Then, $b = 1$, i.e. $\mu^* = \mu_e$. Since $\Pr(s \mid \theta) > 0$ for all $\theta \in \Theta$ and all $s \in \mathcal{S}$, updating beliefs μ^* using any signal s delivers $\Pr(\Theta_e \mid s, x) = 1$. Thus, all voters vote for the candidate proposing e in any state $\theta \in \Theta_e \cup \Theta_{e'}$.

Case 2. $\Theta_{e'} \neq \emptyset$.

Step 1. We wish to express the expected shares of votes for the candidate proposing e as a function of b.
  Let s be a signal and $\mu : \Theta \to [0, 1]$, $\sum_\Theta \mu(\theta) = 1$, a belief over the set of states. Define

$$\Delta(s, \mu) \equiv \sum_{\theta \in \Theta} \mu(\theta) \Pr(s \mid \theta) \big(u(e, \theta) - u(e', \theta) \big).$$

Note that $\Delta(s, \mu)$ represents the extra expected payoffs of policy e rather than e' when a voter updates beliefs μ using signal s. Then, for any $b \in [0, 1]$, we can compute the extra expected payoffs of policy e rather than e' when the voter updates beliefs μ^*:

$$\mathbb{E}\big[u(e, \theta) \mid x, s \big] - \mathbb{E}\big[u(e', \theta) \mid x, s \big] = \frac{\sum_{\theta \in \Theta} \mu^*(\theta) \Pr(s \mid \theta)(u(e, \theta) - u(e', \theta))}{\sum_{\hat{\theta} \in \Theta} \mu^*(\hat{\theta}) \Pr(s \mid \hat{\theta})}$$

$$= \frac{b \Delta(s, \mu_e) + (1 - b) \Delta(s, \mu_{e'})}{\sum_{\hat{\theta} \in \Theta} \mu^*(\hat{\theta}) \Pr(s \mid \hat{\theta})} \tag{A.1}$$

where for the last equality we use $\mu^* = b \mu_e + (1 - b) \mu_{e'}$ and the definition of $\Delta(s, \mu)$. Such a voter is indifferent between the two policies if and only if

$$b^*(s) \equiv \frac{1}{1 - \frac{\Delta(s, \mu_e)}{\Delta(s, \mu_{e'})}} = b; \tag{A.2}$$

and he (strictly) prefers e to e' if and only if $b^*(s) < b$. (Notice that since $\Delta(s, \mu_{e'}) > 0 > \Delta(s, \mu_e)$, then $b^*(s) \in (0, 1)$ for all $s \in \mathcal{S}$.) Thus, all sequentially rational strategies give a share of votes for the candidate proposing e equal to

$$\mathcal{M}(a, b \mid \theta) \equiv \sum_{\{s \in \mathcal{S} : b^*(s) < b\}} \Pr(s \mid \theta) + a \sum_{\{s \in \mathcal{S} : b^*(s) = b\}} \Pr(s \mid \theta)$$

where a is the probability that an indifferent voter votes for the candidate proposing e. Note that the lemma is proven if there exists $(a^*, b^*) \in [0, 1]^2$ such that

$$\min_{\theta \in \Theta_e} \mathcal{M}\big(a^*, b^* \mid \theta\big) > \frac{1}{2} > \max_{\theta \in \Theta_{e'}} \mathcal{M}\big(a^*, b^* \mid \theta\big).$$

Step 2. We prove a property of $\mathcal{M} : [0, 1]^2 \times \Theta \to [0, 1]$.

  Intermediate value *For any $\theta \in \Theta_e \cup \Theta_{e'}$ and any $m \in [0, 1]$, there exists $(a, b) \in [0, 1]^2$ such that $\mathcal{M}(a, b \mid \theta) = m$.*

  First note that
   (i) $\mathcal{M}(a, b \mid \theta)$ is continuous in a for all $b \in (0, 1)$;
   (ii) $\mathcal{M}(1, b \mid \theta) = \mathcal{M}(0, b \mid \theta)$ and both are continuous in b for all $b \in [0, 1]$: $b \neq b^*(s)$ for all $s \in \mathcal{S}$;
   (iii) for all $s \in \mathcal{S}$,

$$\lim_{b \uparrow b^*(s)} \mathcal{M}(1, b \mid \theta) = \mathcal{M}\big(0, b^*(s) \mid \theta\big) < \mathcal{M}\big(1, b^*(s) \mid \theta\big) = \lim_{b \downarrow b^*(s)} \mathcal{M}(0, b \mid \theta);$$

   (iv) $\mathcal{M}(1, 1 \mid \theta) = 1$ and $\mathcal{M}(0, 0 \mid \theta) = 0$.
  Because of (ii), (iii),[24] and (iv), then $\{b : \mathcal{M}(1, b \mid \theta) \geqslant m\} = [b', 1]$ and $\{b : \mathcal{M}(0, b \mid \theta) \leqslant m\} = [0, b']$ for some unique $b' \in [0, 1]$.
  We now proceed by contradiction. Suppose there exists $m \in (0, 1)$ such that $\mathcal{M}(a, b \mid \theta) \neq m$ for all $(a, b) \in [0, 1]^2$. Then $\mathcal{M}(0, b' \mid \theta) < m < \mathcal{M}(1, b' \mid \theta)$. By continuity of $\mathcal{M}(a, b' \mid \theta)$ in a, there exists $\mathcal{M}(a, b' \mid \theta) = m$, a contradiction.
Step 3. We show that

$$\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} > \frac{\Pr(s' \mid \theta)}{\Pr(s' \mid \theta')} \quad \text{for all } \theta \in \Theta_e, \ \theta' \in \theta_{e'} \quad \Longleftrightarrow \quad b^*(s) < b^*\big(s'\big).$$

To see this, recall that

$$b^*(s) = \frac{1}{1 - \frac{\Delta(s, \mu_e)}{\Delta(s, \mu_{e'})}}$$

is decreasing in

---

[24] Notice that (ii) and (iii) amount as saying that $\mathcal{M}(1, b \mid \theta)$ and $\mathcal{M}(0, b \mid \theta)$ are the same function of b but for a finite set of points at which $\mathcal{M}(1, b \mid \theta)$ is upper semi-continuous and $\mathcal{M}(0, b \mid \theta)$ is lower semi-continuous.

$$-\frac{\Delta(s, \mu_e)}{\Delta(s, \mu_{e'})} = \sum_{\theta \in \Theta_e} \frac{\mu_e(\theta) \Pr(s \mid \theta)(u(e, \theta) - u(e', \theta))}{\sum_{\theta' \in \Theta_{e'}} \mu_{e'}(\theta') \Pr(s \mid \theta')(u(e', \theta) - u(e, \theta))}$$

$$= \sum_{\theta \in \Theta_e} \frac{\mu_e(\theta)(u(e, \theta) - u(e', \theta))}{\sum_{\theta' \in \Theta_{e'}} \frac{\Pr(s \mid \theta')}{\Pr(s \mid \theta)} \mu_{e'}(\theta')(u(e', \theta) - u(e, \theta))}.$$

Thus,

$$\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} > \frac{\Pr(s' \mid \theta)}{\Pr(s' \mid \theta')} \quad \text{for all } \theta \in \Theta_e, \ \theta' \in \theta_{e'}$$

$$\Longleftrightarrow \quad -\frac{\Delta(s, \mu_e)}{\Delta(s, \mu_{e'})} > -\frac{\Delta(s', \mu_e)}{\Delta(s', \mu_{e'})}$$

$$\Longleftrightarrow \quad b^*(s) < b^*(s').$$

Step 4. We show that

$$\min_{\theta \in \Theta_e} \mathcal{M}(a, b \mid \theta) \geqslant \max_{\theta \in \Theta_{e'}} \mathcal{M}(a, b \mid \theta) \quad \text{for all } (a, b) \in [0, 1]^2. \tag{A.3}$$

We prove the cases $a = 1$ and $a = 0$ separately. Then Step 4 follows due to continuity of $\mathcal{M}(a, b \mid \theta)$ in a for all $b \in [0, 1]$.

$(a = 1)$ We want to show that

$$\sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta) \geqslant \sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta'). \tag{A.4}$$

If $\{s \in \mathcal{S}: \ b^*(s) \leqslant b\} = \emptyset$, then (A.4) is trivially satisfied. Otherwise, by contradiction, let

$$\sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta) < \sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta').$$

Then (rearranging and dividing in each element of the sum by $\Pr(s \mid \theta')$)

$$\sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \left(\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} - 1 \right) < 0.$$

Thus, $1 > \Pr(s \mid \theta)/\Pr(s \mid \theta')$ for some $s \in \mathcal{S}: \ b^*(s) \leqslant b$. From Step 3, $\Pr(s \mid \theta)/\Pr(s \mid \theta')$ is decreasing in $b^*(s)$ and therefore

$$1 > \frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} \quad \text{for all } s \in \mathcal{S}: \ b^*(s) > b$$

which implies that if $\{s \in \mathcal{S}: b^*(s) > b\}$ is not empty

$$\sum_{\{s \in \mathcal{S}: b^*(s) > b\}} \left(\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} - 1 \right) < 0$$

$$\Longleftrightarrow \quad \sum_{\{s \in \mathcal{S}: \ b^*(s) > b\}} \Pr(s \mid \theta) < \sum_{\{s \in \mathcal{S}: \ b^*(s) > b\}} \Pr(s \mid \theta')$$

$$\Longleftrightarrow \quad \sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta) > \sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta')$$

a contradiction. Otherwise, if $\{s \in \mathcal{S}: \ b^*(s) > b\}$ is empty, then

$$\sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta) = \sum_{\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}} \Pr(s \mid \theta') = 1$$

a contradiction.

$(a = 0)$ The proof for this case follows very closely the case for $a = 1$ after substituting $\{s \in \mathcal{S}: \ b^*(s) \leqslant b\}$ with $\{s \in \mathcal{S}: \ b^*(s) < b\}$ and $\{s \in \mathcal{S}: \ b^*(s) > b\}$ with $\{s \in \mathcal{S}: \ b^*(s) \geqslant b\}$.

Step 5. Note that Assumption 1 has a strict inequality. Thus, (A.3) holds with equality only if (i) b is large enough such that $\mathcal{M}(a, b \mid \theta) = 1$ for all $\theta \in \Theta_e \cup \Theta_{e'}$ and all $a \in [0, 1]$, or (ii) b is small enough such that $\mathcal{M}(a, b \mid \theta) = 0$ for all $\theta \in \Theta_e \cup \Theta_{e'}$ and all $a \in [0, 1]$. By the Intermediate Value property of $\mathcal{M}$, these two sets do not cover the entire interval $[0, 1]$. That is, the inequality holds with strict sign for b in a non-empty subset of $[0, 1]$. We conclude that for any $m' \in (0, 1)$, there exist $(a^*, b^*) \in [0, 1]^2$ such that

$$\min_{\theta \in \Theta_e} \mathcal{M}\big(a^*, b^* \mid \theta\big) > m' > \max_{\theta \in \Theta_{e'}} \mathcal{M}\big(a^*, b^* \mid \theta\big).$$

Let $m' = 1/2$ to conclude the proof. □

A.1. Proof of Proposition 1

We first prove the result for $\pi = 0$ in two parts. Part 1 establishes a sufficient condition for the candidates to always propose the optimal policy for the voters. This condition says that, in any state θ, if a candidate proposes $e^*(\theta)$ and the other proposes $e \neq e^*(\theta)$, then a majority of the voters vote for the first candidate. By Lemma 1, this condition is satisfied if, for any pair of proposals $x^c = e$ and $x^{-c} = e' \neq e$, $\Theta_e \neq \emptyset$, voters have beliefs $\mu^* = b\mu_e + (1 - b)\mu_e$, for some $b \in [0, 1]$ (potentially) different for each pair of proposals. Part 2 shows that such beliefs are consistent with candidates' equilibrium strategies.

To conclude the proof, it is sufficient to recognize that if $\pi > 0$ (i) the beliefs of the voters along the equilibrium path are unchanged since in equilibrium a truthful candidate proposes the same policy of a strategic candidate; (ii) off-equilibrium beliefs are determined exclusively by the relative probability of a tremble from the equilibrium path in different states, something that cannot be modified in expectations by a truthful candidate.

Part 1. We establish a sufficient condition for the candidates to always propose the optimal policy for the voters: in any state θ, whenever a candidate proposes $e^*(\theta)$ and the other proposes $e \neq e^*(\theta)$, a (strict) majority of the voters is expected to vote for the candidate proposing $e^*(\theta)$. To see that this condition is sufficient, let $R(\sigma^c, \sigma^{-c} \mid \theta)$ be the expected rent for candidate c when she plays σ^c, her opponent plays σ^{-c}, and the state is θ. First, assume that $\sigma^{-c}(e^*(\theta) \mid \theta) < 1$. If $\sigma^c(e^*(\theta) \mid \theta) = 1$, then $R(\sigma^c, \sigma^{-c} \mid \theta) > R/2$. To see this, note that with probability $\sigma^{-c}(e^*(\theta) \mid \theta)$, both candidates propose $e^*(\theta)$ and collect a rent equal to $R/2$. With probability $1 - \sigma^{-c}(e^*(\theta) \mid \theta) > 0$, only c plays $e^*(\theta)$. Since the majority of the voters is expected to vote for c (the only candidate proposing $e^*(\theta)$) the expected rent of c is greater than $R/2$. To complete this part of the proof, it is sufficient to note that the two candidates are playing a symmetric constant-sum game where the payoffs are bounded above by R.

Part 2. We now show that beliefs μ^* are consistent with the equilibrium strategies of the candidates. The equilibrium strategy of each candidate c is σ^* such that, for any $\theta \in \Theta$, $\sigma^*(e^*(\theta) \mid \theta) = 1$ and $\sigma^*(e \mid \theta) = 0$ for all $e \neq e^*(\theta)$. Let e and e' be two policies such that $\Theta_e \neq \emptyset$. We want to show that, for any $b \in [0, 1]$, there exists a sequence of completely mixed strategies $\{\sigma_n\}_{n=1}^{\infty}$ converging to σ^* such that, if voters observe one candidate proposing e and another proposing e',

$$\mu(\theta) = \lim_{n \to \infty} \frac{\sigma_n(e \mid \theta)\sigma_n(e' \mid \theta)\Pr(\theta)}{\sum_{\hat{\theta} \in \Theta} \sigma_n(e \mid \hat{\theta})\sigma_n(e' \mid \hat{\theta})\Pr(\theta)} = \mu^*(\theta) = \begin{cases} b\mu_e(\theta) + (1 - b)\mu_{e'}(\theta) & \text{if } \Theta_{e'} \neq \emptyset; \\ \mu_e(\theta) & \text{otherwise.} \end{cases}$$

Let $\sigma_n(e \mid \theta) = \kappa_{e^*(\theta),e} \epsilon^n$ for all $e \neq e^*(\theta)$, with $\kappa_{e^*(\theta),e} \in (0, 1)$ and

$$\sum_{e \neq e^*(\theta)} \kappa_{e^*(\theta),e} = 1.$$

Note that this implies $\sigma_n(e^*(\theta) \mid \theta) = 1 - \epsilon^n \sum_{e \neq e^*(\theta)} \kappa_{e^*(\theta),e}$ which converges to 1. In Section 1 of Online Appendix we derive

$$\mu(\theta) = \frac{\Pr(\theta)}{\Pr(\Theta_e) + \frac{\kappa_{e',e}}{\kappa_{e,e'}} \Pr(\Theta_{e'})} \quad \text{for all } \theta \in \Theta_e,$$

$$\mu\big(\theta'\big) = \frac{\Pr(\theta')}{\Pr(\Theta_{e'}) + \frac{\kappa_{e,e'}}{\kappa_{e',e}} \Pr(\Theta_e)} \quad \text{for all } \theta' \in \Theta_{e'},$$

$$\mu\big(\theta''\big) = 0 \quad \text{for all } \theta'' \notin \Theta_e \cup \Theta_{e'}. \tag{A.5}$$

That is,

$$b = \frac{\Pr(\Theta_e)}{\Pr(\Theta_e) + \frac{\kappa_{e,e'}}{\kappa_{e',e}} \Pr(\Theta_{e'})} \in [0, 1] \quad \Rightarrow \quad \mu(\theta) = \mu^*(\theta).$$

Last, note that we can simultaneously derive any different $b \in [0, 1]$ for any distinct pair of policies e and e', $\Theta_e, \Theta_{e'} \neq \emptyset$, by choosing appropriate weights $\kappa_{e,e'}$ and $\kappa_{e',e}$. □

A.2. Proof of Proposition 2

Assume voters follow the strategy in Part 2 of the proof of Proposition 1. From Part 1, (i) this induces a constant-sum simultaneous move game between the candidates; (ii) this game has unique equilibrium (always propose the optimal policy for the voters); (iii) the equilibrium is strict. □

A.3. Proof of Proposition 3

There are two policies, e and e', each optimal in state θ and θ' respectively. Let $\bar{\sigma}^c(\theta) \equiv (1-\pi)\sigma^c(e' \mid \theta)$ and $\bar{\sigma}^c(\theta') \equiv (1-\pi)\sigma^c(e \mid \theta')$ be the total probability that candidate c does *not* play the optimal policy for the voters in state, respectively, θ and θ'. Without loss of generality, we want to prove the following: there is no equilibrium with $\bar{\sigma}^A(\theta) > 0$.

We proceed as follows. In Step 1 we show necessary conditions for $\bar{\sigma}^A(\theta) > 0$ to be a rational strategy. In Step 2 we show that in any equilibrium $\bar{\sigma}^A(\theta) > 0 \Rightarrow \bar{\sigma}^A(\theta') = 0$, that is, each candidate c plays the optimal policy for the voters with probability 1 in at least one state. Step 3 concludes our argument

Step 1. With some abuse of notation, call $A(x^A, x^B \mid \hat{\theta})$ the probability that candidate A wins if proposals are x^A and x^B and the state is $\hat{\theta} \in \{\theta, \theta'\}$. Notice that for any belief of the voters and any profile of proposals $(x^A, x^B) \in \{e, e'\}^2$ either (i) the majority of the voters vote for A and thus she wins with probability 1, (ii) the majority of the voters vote for B and thus A wins with probability 0, or (iii) exactly one half of the voters vote for A and thus she wins with probability 1/2. Hence, $A : \{e, e'\}^2 \times \{\theta, \theta'\} \to \{0, 1/2, 1\}$.

By Assumption 1 (see the proof of Lemma 1 for details),

$$A(e', e \mid \theta) \leqslant A(e', e \mid \theta'),$$
$$A(e, e' \mid \theta) \geqslant A(e, e' \mid \theta') \tag{A.6}$$

and the inequalities hold with strict sign if one of the sides equals 1/2.

Candidate A finds optimal to play e' with positive probability in state θ only if

$$\frac{\bar{\sigma}^B(\theta)}{2} + \left(1 - \bar{\sigma}^B(\theta)\right)A(e', e \mid \theta) \geqslant \bar{\sigma}^B(\theta)A(e, e' \mid \theta) + \frac{(1 - \bar{\sigma}^B(\theta))}{2}. \tag{A.7}$$

Similarly, A finds optimal to play e with positive probability in state θ' only if

$$\frac{\bar{\sigma}^B(\theta')}{2} + \left(1 - \bar{\sigma}^B(\theta')\right)A(e, e' \mid \theta') \geqslant \bar{\sigma}^B(\theta')A(e', e \mid \theta') + \frac{(1 - \bar{\sigma}^B(\theta'))}{2}. \tag{A.8}$$

Notice that since $\bar{\sigma}^B(\theta) \leqslant 1 - \pi < 1$, a necessary condition for (A.7) is (i) $A(e', e \mid \theta) \geqslant A(e, e' \mid \theta)$ or (ii) $\bar{\sigma}^B(\theta) = 0$ and $A(e', e \mid \theta) = 1/2 < A(e, e' \mid \theta)$. Similarly, since and $\bar{\sigma}^B(\theta') \leqslant 1 - \pi < 1$, a necessary condition for (A.8) is (i.a) $A(e, e' \mid \theta') \geqslant A(e', e \mid \theta')$ or (ii.a) $\bar{\sigma}^B(\theta) = 0$ and $A(e, e' \mid \theta') = 1/2 < A(e', e \mid \theta')$.

Step 2. We want to show that if $\bar{\sigma}^A(\theta) > 0$, then in equilibrium $\bar{\sigma}^A(\theta') = 0$. Using the results in step 1, we divide the analysis in three cases. First, let $A(e', e \mid \theta) > A(e, e' \mid \theta)$ or $A(e', e, \theta) = A(e, e' \mid \theta) = 1/2$. By (A.6), $A(e', e \mid \theta') > A(e, e' \mid \theta')$. From (i.a) and (ii.a) above, either $\bar{\sigma}^A(\theta') = 0$ or $\bar{\sigma}^B(\theta') = 0$ and $A(e, e' \mid \theta') = 1/2$. In this last case, by (A.6), $A(e, e' \mid \theta) = 1$, contradicting the hypothesis that $A(e', e \mid \theta) > A(e, e' \mid \theta)$.

Second, let $\bar{\sigma}^B(\theta) = 0$ and $A(e', e \mid \theta) = 1/2 < A(e, e' \mid \theta)$. Since candidate B never plays e' in state θ, whenever A plays e and B plays e', either $\bar{\sigma}^A(\theta') = 0$ or the voters must believe that state θ' has occurred with probability 1: $A(e, e' \mid \theta) = 0$, a contradiction.

Third, let $A(e', e \mid \theta) = A(e, e' \mid \theta) \neq 1/2$. In state θ one of the candidates always loses whenever the proposals are different. Then candidates play $\bar{\sigma}^A(\theta) = \bar{\sigma}^B(\theta) = 1/2$.[25] In state θ' we have one of two cases[26]: (i) $A(e', e \mid \theta') > A(e, e' \mid \theta')$, in which case either $\bar{\sigma}^A(\theta') = 0$ or we reach a contradiction (see previous paragraph); (ii) $A(e', e \mid \theta') = A(e, e' \mid \theta') \neq 1/2$, implying $\bar{\sigma}^A(\theta') = \bar{\sigma}^B(\theta') = 1/2$. But then voters' equilibrium beliefs must be identical to their prior (when the platforms are different), contradicting the hypothesis that a candidate loses whenever the proposals are different.

Step 3. We divide this step in two cases. First, assume $\bar{\sigma}^A(\theta') = \bar{\sigma}^B(\theta') = 0$ and $\bar{\sigma}^A(\theta) > 0$. Then, whenever candidate A proposes e' and candidate B proposes e, voters believe state θ has occurred with probability 1: $A(e', e \mid \theta) = 0$. Thus, from (A.7), candidate A prefers to play policy e' in state θ only if $A(e, e' \mid \theta) = 0$ and $\bar{\sigma}^B(\theta) \geqslant 1/2$. But if

---

[25] Indeed in state θ the candidates play Matching Pennies with net payoffs equal to 1/2.

[26] Note that because of (A.6) (the inequalities hold with strict sign if one of the sides equals 1/2)

$$A(e', e \mid \theta) = A(e, e' \mid \theta) \quad \Rightarrow \quad A(e', e \mid \theta') > A(e, e' \mid \theta') \quad \text{or} \quad A(e', e \mid \theta) = A(e, e' \mid \theta') \neq \frac{1}{2}.$$

$\bar{\sigma}^B(\theta) > 0$, whenever candidate B proposes e' and candidate A proposes e, voters believe state θ has occurred with probability 1: $A(e, e' \mid \theta) = 1$, a contradiction.

Next, assume $\bar{\sigma}^A(\theta') = \bar{\sigma}^B(\theta) = 0$ and $\bar{\sigma}^A(\theta') > 0$. If $\bar{\sigma}^B(\theta') = 0$, whenever candidate A proposes e' and candidate B proposes e, voters believe state θ has occurred with probability 1: $A(e', e \mid \theta) = 0$. Thus, from (A.7), candidate A prefers to play policy e' in state θ only if $A(e, e' \mid \theta) = 0$ and $\bar{\sigma}^B(\theta) \geqslant 1/2$, a contradiction. Suppose instead that candidate B finds optimal to propose e in state θ' so that $\bar{\sigma}^B(\theta') > 0$. Then we must have

$$\frac{\bar{\sigma}^A(\theta')}{2} + \left(1 - \bar{\sigma}^A(\theta')\right)\left(1 - A\left(e', e \mid \theta'\right)\right) \geqslant \bar{\sigma}^A(\theta')\left(1 - A\left(e, e' \mid \theta'\right)\right) + \frac{(1 - \bar{\sigma}^A(\theta'))}{2}$$

and thus $A(e', e \mid \theta') \leqslant 1/2$. But since A plays e' with positive probability in state θ, by (A.7) we also have $A(e', e \mid \theta) \geqslant 1/2$. Recalling that (A.6) has strict sign when any side equals 1/2, we have a contradiction. □

A.4. Proof of Proposition 4

Let σ^* be a pure strategy such that there exists $\theta \in \Theta$ for which $\sigma^*(e \mid \theta) = 1$, $e \neq e^*(\theta)$. We want to show that if $\pi > 0$, there is no equilibrium where every candidate plays σ^*.

First, suppose the voters observe $x = (e, e^*(\theta))$.[27] They must believe one of two things: (i) e is optimal, but strategic candidates propose $e^*(\theta)$ in this state or (ii) $e^*(\theta)$ is optimal, but strategic candidates propose e in this state. This is because these two cases require only the presence of a truthful candidate. Any other combination giving proposals x requires at least one candidate to tremble. To see this, let $\{\sigma_n\}_{n=1}^{\infty}$ be any sequence of completely mixed strategies converging to σ^*. Then, when voters observe $x = (e, e^*(\theta))$, they have beliefs μ such that, for any $\hat{\theta} \in \Theta$,

$$\mu(\hat{\theta}) = \lim_{n \to \infty} \frac{[(1 - \pi)\pi \sigma_n(e \mid \hat{\theta})\mathbb{1}(\hat{\theta} \in \Theta_{e^*(\theta)}) + \pi(1 - \pi)\mathbb{1}(\hat{\theta} \in \Theta_e)\sigma_n(e^*(\theta) \mid \hat{\theta})]\Pr(\hat{\theta})}{\sum_{\tilde{\theta} \in \Theta}[\pi(1 - \pi)\sigma_n(e \mid \tilde{\theta})\mathbb{1}(\tilde{\theta} \in \Theta_{e^*(\theta)}) + \pi(1 - \pi)\sigma_n(e^*(\theta) \mid \tilde{\theta})\mathbb{1}(\tilde{\theta} \in \Theta_e)]\Pr(\tilde{\theta})},$$

where $\mathbb{1}$ is an indicator function. Recall that σ^* is a pure strategy; hence, if $\lim_{n \to \infty} \sigma_n(e \mid \hat{\theta}) \neq 0$, then $\lim_{n \to \infty} \sigma_n(e^*(\theta) \mid \hat{\theta}) = 0$ (and vice versa). It follows that $\mu(\hat{\theta}) > 0$ if and only if $\hat{\theta} \in \bar{\Theta}_e \cup \bar{\Theta}_{e^*(\theta)}$, where

$$\bar{\Theta}_e \equiv \left\{\theta' \in \Theta_e : \sigma^*\left(e^*(\theta) \mid \theta'\right) = 1\right\},$$
$$\bar{\Theta}_{e^*(\theta)} \equiv \left\{\theta' \in \Theta_{e^*(\theta)} : \sigma^*\left(e \mid \theta'\right) = 1\right\}.$$

If there is no state of type (i), then the proof is concluded, since the voters must conclude that $e^*(\theta)$ is optimal and vote for the candidate proposing $e^*(\theta)$, making $\sigma(e^*(\theta) \mid \theta) = 1$ the unique best response to any strategy played by the other candidate. Otherwise, we need to calculate $\mu(\hat{\theta})$ for all the states $\hat{\theta}$ where it is positive. This is

$$\mu(\hat{\theta}) = \frac{\Pr(\hat{\theta})}{\Pr(\bar{\Theta}_e) + \Pr(\bar{\Theta}_{e^*(\theta)})}.$$

From part 2 of proof of Proposition 1 and Lemma 1, we know that in this case the expected share of votes for the candidate proposing $e^*(\theta)$ is greater in state θ than in any state in Θ_e. (Compare with (A.5) and note $\bar{\Theta}_e \subseteq \Theta_e$, $\bar{\Theta}_{e^*(\theta)} \subseteq \Theta_{e^*(\theta)}$.) Then if $e^*(\theta)$ loses against e in state θ, it must also lose in any state Θ_e. Hence, $\bar{\Theta}_e$ is empty (if not, then a candidate could deviate to e and win for sure). It follows that $\mu(\hat{\theta}) > 0$ if and only if $\hat{\theta} \in \bar{\Theta}_{e^*(\theta)}$. But then all voters vote for the candidate proposing $e^*(\theta)$, contradicting $\sigma^*(e \mid \theta) = 1$. □

A.5. Proof of Proposition 5

From the proof of Proposition 1, we know that if voters are restricted to sincere voting strategies, then there exists a fully revealing equilibrium in which voters' beliefs derived by updating the prior after observing the proposals but without using the signals are $\mu^* = b\mu_e + (1 - b)\mu_{e'}$ whenever the candidates propose two distinct policies e and e' with $\Theta_e, \Theta_{e'} \neq \emptyset$. (The case of only one policy being optimal is extended easily to strategic voters since beliefs are such that only that policy can be optimal).

Furthermore, from Lemma 1, for some $(a, b) \in [0, 1]^2$, we have

$$\min_{\theta \in \Theta_e} \mathcal{M}(a, b \mid \theta) > \frac{1}{2} > \max_{\theta' \in \Theta_{e'}} \mathcal{M}(a, b \mid \theta') \tag{A.9}$$

---

[27] Or $x = (e^*(\theta), e)$. Since we are looking for symmetric equilibria, this is without loss of generality.

where $\mathcal{M}(a, b \mid \theta)$ is the expected share of votes for e in state θ. By the Magnitude Theorem (Myerson, 2000, Theorem 1) strategic voters will concentrate their beliefs on those states in $\Theta_e \cup \Theta_{e'}$ that minimize $|\mathcal{M}(a, b \mid \theta) - 1/2|$.[28]

Voters vote sincerely only if their beliefs are concentrated on both a state θ in Θ_e and a state θ' in $\Theta_{e'}$. Otherwise, either e or e' would be preferred by all voters once they consider pivot probabilities. That is, we need

$$\min_{\theta \in \Theta_e} \mathcal{M}(a, b \mid \theta) - \frac{1}{2} = \frac{1}{2} - \max_{\theta' \in \Theta_{e'}} \mathcal{M}(a, b \mid \theta'). \tag{A.10}$$

Choose $b \in [0, 1]$ such that (A.9) holds and there exists a signal s^* such that $b^*(s^*) = b$.[29] That is, there is a signal such that, if a voter observes this signal and updates beliefs μ^*, then he is indifferent between e and e'. By Assumption 1, there can be at most one such signal for any $b \in [0, 1]$. In this case the measure of voters with signal s^* must be decisive in the election.[30]

Recall that[31]

$$\mathcal{M}(a, b \mid \theta) \equiv \sum_{s:\, b^*(s) < b} \Pr(s \mid \theta) + a \sum_{s:\, b^*(s) = b} \Pr(s \mid \theta) = \sum_{s:\, b^*(s) < b} \Pr(s \mid \theta) + a \Pr(s^* \mid \theta).$$

Hence, for $\hat{\theta} \equiv \arg\min_{\theta \in \Theta_e} \mathcal{M}(a, b \mid \theta)$ and $\hat{\theta}' \equiv \arg\max_{\theta' \in \Theta_{e'}} \mathcal{M}(a, b \mid \theta')$, (A.10) is satisfied by

$$a = \frac{1 - [\sum_{s:\, b^*(s) < b} \Pr(s \mid \hat{\theta}) + \sum_{s:\, b^*(s) < b} \Pr(s \mid \hat{\theta}')]}{\Pr(s^* \mid \hat{\theta}) + \Pr(s^* \mid \hat{\theta}')}$$

and (A.9) holds by construction. Notice that a is a probability and therefore lies in the interval $[0, 1]$ (see footnote 29). That is, strategic voters play a specific sincere voting strategy and hold specific beliefs $\mu^*(\theta) = b\mu_e + (1 - b)\mu_{e'}$. To conclude the proof, note that a and b are determined independently for each pair of policies e and e'. $\quad\square$

A.6. Proof of *Proposition 7*

We can relabel the elements such that $\Pr(s \mid \theta) > \Pr(s \mid \theta')$ and $\Pr(r \mid \theta) > \Pr(r \mid \theta')$. It follows that

1. From Bayes' rule, $\Pr(\theta \mid r) > \Pr(\theta \mid r')$, $\Pr(\theta' \mid r) < \Pr(\theta' \mid r')$;
2. $\Pr(s \mid r) > \Pr(s \mid r')$ because

$$\Pr(s \mid r) - \Pr(s \mid r') = \Pr(s \mid \theta) \Pr(\theta \mid r) + \Pr(s \mid \theta')[1 - \Pr(\theta \mid r)] - \Pr(s \mid \theta) \Pr(\theta \mid r') - \Pr(s \mid \theta')[1 - \Pr(\theta \mid r')]$$
$$= [\Pr(\theta \mid r) - \Pr(\theta \mid r')][\Pr(s \mid \theta) - \Pr(s \mid \theta')] > 0;$$

3. Since there are only two signals, voters who observe signal s are always more in favor of policy e than voters who observe signal s' and the share of voters who prefer e to e' is always at least as large in state θ than in state θ';
4. Either $\Pr(s \mid r) > 1/2$ or $\Pr(s' \mid r') > 1/2$.

We first establish a few preliminary results. Suppose that voters could also observe the report r. Then if they had to choose between e and e', they would choose as follows: a voter with signal s would chooses e if the expected payoff of e is greater than the expected payoff of e'. That is, if[32]

$$\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} > \frac{(u(e', \theta') - u(e, \theta')) \Pr(\theta')}{(u(e, \theta) - u(e,' \theta)) \Pr(\theta)} \frac{\Pr(r \mid \theta')}{\Pr(r \mid \theta)}.$$

---

[28] The Magnitude Theorem states that beliefs must be concentrated on those states in which the magnitude of the event that a vote is pivotal between e and e', $mag(piv_{e,e'} \mid \theta)$, is largest. From the formula in Section 5 of Myerson (2000, p. 25),

$$mag(piv_{e,e'} \mid \theta) = -(\sqrt{\mathcal{M}(a, b \mid \theta)} - \sqrt{1 - \mathcal{M}(a, b \mid \theta)})^2$$

which is monotonically decreasing in $|\mathcal{M}(a, b \mid \theta) - 1/2|$.

[29] The existence of such b is a direct consequence of the existence of (a, b) for which (A.9) holds. That is, we can always have the voters with one signal s^* be indifferent and choose any strategy a such that a sufficiently large share of them vote for e.

[30] Otherwise, suppose that e wins in all states $\theta \in \Theta_e$ even if no voter with signal s^* votes for them, then there is another signal s, more "in favor of e" that can be indifferent and still (A.9) holds.

[31] The derivation of the formula is in the proof of Lemma 1.

[32] This comes directly from

$$\frac{\sum_{\hat{\theta} \in \{\theta, \theta'\}} (u(e, \hat{\theta}) - u(e', \hat{\theta})) \Pr(s \mid \hat{\theta}) \Pr(r \mid \hat{\theta}) \Pr(\hat{\theta})}{\Pr(s \mid \theta) \Pr(r \mid \theta) \Pr(\theta) + \Pr(s \mid \theta') \Pr(r \mid \theta') \Pr(\theta')} > 0.$$

Again, the share of voters who prefer e to e' is at least as large in state θ as in state θ'. Since $\Pr(\theta \mid r) > \Pr(\theta \mid r')$, then the conditional expected share of voters who prefer e to e' is always as large if the report is r than if it is r'. This means that if $e^*(r) \neq e^*(r')$, then $e^*(r) = e$ and $e^*(r') = e'$.

We divide the rest of the proof in two cases:

Case 1. First, when $e^*(r) = e^*(r') = \hat{e}$. This means that for any r, the majority of the voters prefer policy $\hat{e}$ to any other policy. Choose any belief about the report that voters might have after observing the candidates making different proposals. Then the majority of the voters will vote for the candidate proposing $\hat{e}$. It follows that candidates are induced to propose policy $\hat{e}$ for any report.

Case 2. Second, let $e^*(r) \neq e^*(r')$. From the properties above, it must be $e^*(r) = e$ and $e^*(r') = e'$. Also, $\Pr(s \mid r) > 1/2$ (of course, the choice of s to be the signal for which the inequality in point 4 above holds is without loss of generality). In equilibrium, candidates' expected payoff is $R/2$. Voters vote for each candidate with probability $1/2$ if the two proposals coincide and play the following strategy otherwise. If a voter observes s, he votes for the candidate proposing $e^*(r)$ with probability a. If he observes s', he always votes for the candidate proposing $e^*(r')$. Let a be such that

$$a \in \left(\frac{1}{2\Pr(s \mid r)}, \frac{1}{2\Pr(s \mid r')} \right) \neq \emptyset,$$

where the last passage follows from point 2 above. This is coherent with voters observing signal s being indifferent between e and e' when the candidates make two different proposals.

To see why this is an equilibrium, note that, conditional on the report, the expected share of votes for the candidate proposing the correct policy is greater than $1/2$ (when the opponent makes a different proposal), since $a \Pr(s \mid r) > 1/2$ and $a \Pr(s \mid r') < 1/2$.

It remains to be shown that voters who observe signal s are indifferent between the two policies if the candidates make two different proposals. Let us redefine the candidates strategies as a function of the report r. Let $\{\sigma_n\}_{n=1}^\infty$ be a sequence of completely mixed strategies for the candidates, where $\sigma_n(e^*(r') \mid r) = \epsilon^n$ and $\sigma_n(e^*(r) \mid r') = \kappa \epsilon^n$, ϵ small. We need to show that there exists $\kappa > 0$ such that a voter observing signal s is indifferent between the two proposals when they differ from each other. That is,

$$\lim_{n \to \infty} \sum_{\hat{\theta} \in \Theta} \left(u(e, \hat{\theta}) - u(e', \hat{\theta}) \right) \frac{[(1 - \epsilon^n)\epsilon^n \Pr(r \mid \hat{\theta}) + (1 - \kappa\epsilon^n)\kappa\epsilon^n \Pr(r' \mid \hat{\theta})] \Pr(s \mid \hat{\theta}) \Pr(\hat{\theta})}{\sum_{\tilde{\theta} \in \Theta} [(1 - \epsilon^n)\epsilon^n \Pr(r \mid \tilde{\theta}) + (1 - \kappa\epsilon^n)\kappa\epsilon^n \Pr(r' \mid \tilde{\theta})] \Pr(s \mid \tilde{\theta}) \Pr(\tilde{\theta})} = 0.$$

Dividing both numerator and denominator by $(1 - \epsilon^n)\epsilon^n$, taking the limit as $n \to \infty$, and rearranging:

$$\frac{\Pr(s \mid \theta)}{\Pr(s \mid \theta')} = \frac{(u(e', \theta') - u(e, \theta'))(\Pr(r \mid \theta') + \kappa \Pr(r' \mid \theta')) \Pr(\theta')}{(u(e, \theta) - u(e', \theta))(\Pr(r \mid \theta) + \kappa \Pr(r' \mid \theta)) \Pr(\theta)}$$

which is a first order polynomial in κ with a positive root. □

A.7. Proof of Proposition 8

Proceed by contradiction. Assume that in equilibrium $x^A(r) = x^B(r)$ and $x^A(r') = x^B(r') \neq e^*(r')$. (Again, the choice of order of policies and reports is with no loss of generality.) If voters observe two different proposals, then the candidate proposing $e^*(r')$ must be truthful. To see why, notice that

Thus $x^A(r) \neq x^B(r)$ occurs with positive probability (i) whenever the candidates observe r' and (ii) when the candidates observe r if and only if $e^*(r) \neq e^*(r')$ and $x^A(r) = x^B(r) = e^*(r')$. Thus, if $e^*(r) = e^*(r')$, voters who observe two different proposals conclude that the candidate proposing $e^*(r')$ must be truthful. By definition of $e^*(r')$, when they have observe report r', candidates expect the majority of the voters to vote for the candidate proposing e'. It follows that a candidate prefers to deviate and play $x^c(r') = e^*(r')$.

Suppose that $e^*(r) \neq e^*(r')$ and $x^A(r) = x^B(r) = e^*(r')$. It is easy to see that if candidates play $e^*(r')$ when they observe r, it must be that deviating to $e^*(r)$ is not increasing their chances of winning the election. By definition, if a candidate proposing $e^*(r)$ does not expect to win against a candidate proposing $e^*(r')$ when r' occurs, then a candidate proposing $e^*(r)$ must expect to lose against a candidate proposing $e^*(r')$ when r' occurs. We can then rule out that $x^A(r') = x^B(r') \neq e^*(r')$ occurs in equilibrium. □

A.8. Proof of Proposition 9

The proof is identical to the proof of Proposition 3 after noticing that there is no point in proposing your favorite policy if there is no chance of winning and therefore implement it. The only difficult case has already been discussed in the text after Proposition 9. □

Appendix B. Supplementary material

Supplementary material related to this article can be found online at http://dx.doi.org/10.1016/j.geb.2014.01.006.

References

Austen-Smith, D., Banks, J., 1988. Elections, coalitions, and legislative outcomes. Amer. Polit. Sci. Rev. 82, 405–422.
Austen-Smith, D., Banks, J.S., 1996. Information aggregation, rationality, and the Condorcet jury theorem. Amer. Polit. Sci. Rev. 90, 34–45.
Austen-Smith, D., Feddersen, T.J., 2006. Deliberation, preference uncertainty, and voting rules. Amer. Polit. Sci. Rev. 100, 209–217.
Bernhardt, D., Duggan, J., Squintani, F., 2007. Electoral competition with privately-informed candidates. Games Econ. Behav. 58, 1–29.
Bhattacharya, S., 2008. Preference monotonicity and information aggregation in elections. Department of Economics working paper 325. University of Pittsburgh.
Binswanger, J. Prufer, J., 2009. Democracy, populism, and (un)bounded rationality. TILEC discussion paper 2008-040.
Bond, P., Eraslan, H., 2010. Strategic voting over strategic proposals. Rev. Econ. Stud. 77, 459–490.
Callander, S., Wilkie, S., 2007. Lies, damned lies, and political campaigns. Games Econ. Behav. 60, 262–286.
Canes-Wrone, B., Herron, M.C., Shotts, K.W., 2001. Leadership and pandering: A theory of executive policymaking. Amer. J. Polit. Sci. 45, 532–550.
Castanheira, M., 2003. Why vote for losers? J. Eur. Econ. Assoc. 1, 1207–1238.
Coughlan, P.J., 2000. In defence of unanimous jury verdicts: Mistrials, communication, and strategic voting. Amer. Polit. Sci. Rev. 94, 375–393.
Doraszelski, U., Gerardi, D., Squintani, F., 2003. Communication and voting with double-sided information. Contrib. Theor. Econ. 3. Article 6.
Duggan, J., Martinelli, C., 2001. A Bayesian model of voting in juries. Games Econ. Behav. 37, 259–294.
Feddersen, T., Pesendorfer, W., 1997. Voting behavior and information aggregation in elections with private information. Econometrica 65, 1029–1058.
Frisell, L., 2004. Populism. Sveriges Riksbank Working Paper Series No. 166.
Gerardi, D., Yariv, L., 2007. Deliberative voting. J. Econ. Theory 134, 317–338.
Ghosh, S., Tripathi, V., 2012. Idealogues beat idealists. Amer. Econ. J.: Microecon. 4, 7–49.
Harrington, J.E.J., 1993. Economic policy, economic performance, and elections. Amer. Econ. Rev. 83, 27–42.
Heidhues, P., Lagerlöf, J., 2003. Hiding information in electoral competition. Games Econ. Behav. 42, 48–74.
Kartik, N., Squintani, F., Tinn, K., 2013. Information revelation and pandering in elections. Mimeo.
Kohlberg, E., Reny, P.J., 1997. Independence on relative probability spaces and consistent assessments in game trees. J. Econ. Theory 75, 280–313.
Kraus, K., 1990. Half-Truths and One-and-a-Half Truths: Selected Aphorisms. University of Chicago Press.
Kreps, D.M., Wilson, R., 1982. Sequential equilibria. Econometrica 50, 863–894.
Krishna, V., Morgan, J., 2011. Overcoming ideological bias in elections. J. Polit. Economy 119, 183–211.
Krishna, V., Morgan, J., 2012. Voluntary voting: Costs and benefits. J. Econ. Theory 147, 2083–2123.
Leslier, J.-F., Van der Straten, K., 2004. Electoral competition under imperfect information. Econ. Theory 24, 419–446.
Lipman, B.L., Seppi, D.J., 1995. Robust inference in communication games with partial provability. J. Econ. Theory 66, 370–405.
Marquis de Condorcet, M., 1785. Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix. Paris.
Martinelli, C., 2001. Elections with privately informed parties and voters. Public Choice 108, 147–167.
Martinelli, C., 2006. Would rational voters acquire costly information. J. Econ. Theory 129, 225–251.
Maskin, E., Tirole, J., 2004. The politician and the judge: Accountability in government. Amer. Econ. Rev. 94, 1034–1054.
McLennan, A., 1998. Consequences of the Condorcet jury theorem for beneficial information aggregation by rational agents. Amer. Polit. Sci. Rev. 92, 413–418.
Meirowitz, A., 2002. Informative voting and Condorcet jury theorem with a continuum of types. Soc. Choice Welfare 19, 219–236.
Meirowitz, A., Shotts, K., 2009. Pivots versus signals in elections. J. Econ. Theory 144, 744–771.
Morris, S., 2001. Political correctness. J. Polit. Economy 109, 231–265.
Myerson, R., 2000. Large Poisson games. J. Econ. Theory 94, 7–45.
Myerson, R.B., Weber, R.J., 1993. A theory of voting equilibria. Amer. Polit. Sci. Rev. 87, 102–114.
Oliveros, S., Várdy, F., 2012. Demand for slant: How abstention shapes voters' choice of news media. Mimeo. Haas School of Business.
Piketty, T., 2000. Voting as communicating. Rev. Econ. Stud. 67, 169–191.
Razin, R., 2003. Signaling and election motivations in a voting model with common values and responsive candidates. Econometrica 71, 1083–1119.
Schultz, C., 1996. Polarization and inefficient policies. Rev. Econ. Stud. 63, 331–343.
Shotts, K., 2006. A signaling model of repeated elections. Soc. Choice Welfare 27, 251–261.
Szentes, B., Koriyama, Y., 2009. A resurrection of the Condorcet jury theorem. Theoretical Econ. 4, 227–252.