Wisdom of the Crowd? Information Aggregation and Electoral Incentives

Prato, Carlo and Wolton, Stephane

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Carlo Prato[†] Stephane Wolton[‡]

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Abstract

Elections have long been understood as a mean to encourage candidates to act in voters' interest as well as a way to aggregate dispersed information. This paper juxtaposes these two key features within a unified framework. As in models of electoral control, candidates compete for office by strategically proposing policy platforms. As in models of information aggregation, agents are not always informed about the policy which maximizes the electorate welfare. Candidates face a trade-off between acting in the electorate's best interest and maximizing their chance of being elected. We provide conditions under which electoral institutions encourage candidates' conformism—thereby stifling proper competition among ideas—and render information aggregation unfeasible in equilibrium. In extensions, we highlight that the new political failure we uncover cannot be fully resolved by liberalizing access to candidacy or reducing voter information.

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[†]Columbia University. E-mail: cp2928@columbia.edu

[‡]LSE. E-mail: S.Wolton@lse.ac.uk

1 Introduction

Elections serve two prominent roles in democracies. They are meant to align politicians' actions with voters' preferences and to aggregate information dispersed in the electorate. These two aspects have usually been studied in isolation. They need not be. From Barack Obama retorting "I won" to Republicans' critiques of his economic plan (Wall Street Journal, 2009) to David Cameron claiming to have a mandate to renegotiate Britain's relationship with Europe (Reuters, 2015), newly elected officials often see their victory as a vindication of their campaign promises.

This paper studies whether electoral incentives foster or rather impede information aggregation. In our setting, voters agree that there exists a welfare-maximizing policy, but are not always informed about which policy is optimal. If citizens were to be presented with exogenous policy options, the majority would select the correct option with probability approaching one as the electorate grows large: information would be aggregated. Instead, we suppose that voters cast a vote for one of two candidates who make binding policy promises. Information aggregation is thus contingent upon candidates' platform proposals.

We show that information aggregation (or the possibility thereof) can generate perverse electoral incentives. Under certain conditions, platforms are over-conformist as candidates converge to the ex-ante more likely policy option. Electoral institutions then no longer perform their role as a marketplace of ideas and render aggregation information unfeasible. In equilibrium, the probability of policy mistake is bounded away from zero. The political failure we identify cannot be fully resolved by liberalizing access to candidacy and thereby increasing ex-ante electoral competition. Far from improving the competition among ideas, removing restrictions to candidacy may reduce it by engendering serious coordination failures resulting in no candidate entering the electoral arena.

Formally, this paper introduces electoral competition within the set-up of Feddersen and Pesendorfer (1996), a canonical model of information aggregation in elections. There are two possible policy options and states of the world. All voters want the policy to match the state of the world. Voters can be informed (in which case they observe the state) or not (in which case they can only rely on their prior). Two candidates competing for office also receive either a perfectly informative signal about the state or no information at all.[1]

[1] The assumption that candidates' signal fully reveals the state guarantees that the wrong policy is not implemented as a result of candidates' 'honest mistakes.'

If voters were presented with two distinct policy options, as Feddersen and Pesendorfer establish, information aggregation would always be guaranteed. In our set-up, however, the alternatives offered to the electorate depend on the strategic choices of candidates who value both implementing the correct policy and holding office.

When candidates propose distinct policy options, informed voters have a dominant strategy to select the candidate proposing the correct policy. When candidates converge, in turn, we assume that voters are swayed by a random symmetric valence shock (i.e., toss a fair coin). Given voters' strategy, we first establish that in a large electorate, there is no equilibrium in which candidates propose divergent policies. An informed candidate who promise the wrong policy would rather offer the correct option for electoral reason (he is almost certain to lose the election otherwise) as well as policy reason (he suffers a cost when he wins). This failure to sustain divergence is not necessarily bad for voters. Indeed, convergence may arise because both candidates observe the state, and both choose the optimal policy. But candidates are not always informed. Their behavior when uninformed is critical for the feasibility of information aggregation.

In fact, information aggregation requires uninformed candidates to propose divergent policies. Is this strategy consistent with equilibrium behavior? The answer depends critically on the balance between electoral incentives and the payoff loss of implementing the wrong policy. If one policy option is more likely to be correct, the candidate proposing the ex-ante less likely option would benefit electorally from offering the more popular policy. But this deviation comes at a cost: the possibility of a policy mistake when both candidates are uninformed and Nature selects the ex-ante less likely state. If electoral incentives are strong enough, uninformed candidates converge to the ex-ante popular policy. Elections then render information aggregation unfeasible: *In any equilibrium* (in particular, whether or not voters play a symmetric voting strategy conditional on divergence), the probability that the correct policy is implemented is bounded away from one as the electorate grows large.

Our theoretical results uncover a novel form of political failure. The possibility of information aggregation can paradoxically stifle competition among ideas by encouraging excessive conformism among candidates. As some policy options are no longer offered, information aggregation becomes unfeasible in equilibrium. In two extensions of our baseline setting, we ask whether facilitating access to candidacy or reducing voter information can restore elections as a "marketplace of ideas."

Information aggregation is unfeasible because candidates do not have enough electoral incentives to offer the ex-ante less likely policy. We find that removing restrictions to candidacies does not guarantee that the correct policy is proposed. Far from it. The presence of electoral institutions (such as parties or primaries) limiting access to candidacy are beneficial to the electorate for two separate reasons. By providing benefits from office, parties can avoid the "volunteer dilemma," whereby all citizens want the correct policy to be implemented, but everyone would like someone else to run for office and bear the associated cost. Even when citizens enjoy a net benefit from holding office, parties can be helpful in coordinating entry and increasing the chances that informed candidates select the correct policy. Increasing ex-ante electoral competition by allowing for the entry by a third party as well can further impede information aggregation by reducing the cost of policy mistake and thus increasing the relative benefit of conformism. As a consequence, limiting electoral competition to two parties can be socially beneficial.

In our second extension, we consider voters who observe imperfectly the state of the world as well as candidates' platforms (consistent with evidence in e.g., Campbell et al., 1980; Delli Carpini and Keeter, 1996). Restricting attention to voter symmetric strategies, we establish that our results are robust to change in voter information whenever the electorate cannot fully infer candidates' platforms from their presecribed strategy (e.g., candidates make mistakes with positive probability). As in Feddersen and Pesendorfer (1996), voters who do not observe the state abstain in order to minimize the risk of a policy mistake and let well-informed voters decide the outcome of the election. But so do voters who observe the state but not the platforms. Rather than the wrong policy, they are afraid to pick the wrong candidate who does not offer a policy matching the state when his opponent does. As a result, only voters who observe the state and (at least) one platform cast a vote, and candidates' electoral incentives remain unchanged compared to the baseline model, thereby generating the same political failure. Given our equilibrium restriction to symmetric voting strategy, this result, however, should be seen as a lower bound suggesting that reducing voter information is, at worst, inconsequential.

Our work builds upon and is connected to a large body of literature on electoral institutions. Starting with Austen-Smith and Banks (1996), an important game-theoretic literature has examined whether information can be aggregated in large electorates. Several scholars consider private value environments in which voters have divergent policy preferences (e.g., Castanheira, 2003b,a; Gül and Pesendorfer, 2009; Meirowitz and Shotts, 2009; Myatt, 2016). There, the main question is of full information equivalence: is *the majority's* decision the same with perfect and imperfect information? Due to the conflict of interest between voters, information equivalence is not guaranteed, especially when voters' evaluation of a policy is different conditional on receiving the same information (Bhattacharya, 2013a,b; Ali et al., 2017).

Instead, we consider a common value environment: all voters agree ex-post on the correct policy. Several important contributions in varied settings have shown that the electorate selects the right policy with probability approaching one as its size increases when faced with exogenous options (e.g., Feddersen and Pesendorfer, 1997; Wit, 1998; Myerson, 1998; McMurray, 2012; Acharya and Meirowitz, 2017). In particular, a sufficient condition, satisfied in our setting, is that the signal space has same cardinality as the exogenous policy space (Barelli et al., 2017). With exogenous options, as Piketty (2000) establishes, information aggregation may nonetheless fail whenever the electorate must vote in multiple elections as voters use the first election to coordinate electoral decisions in the second election.[2]

A few papers incorporate strategic politicians in common value environments. Razin (2003) and McMurray (2017a) show that when candidates can adjust their policies after observing vote tallies, information aggregation is feasible only if politicians share voters' preferences.[3] Battaglini (2017) shows that this problem is especially acute when the decision-maker cannot commit to a decision-rule and voter information is noisy. Our set-up is immune to these issues, since candidates' policy preferences coincide with voters' and informed voters can perfectly observe the state of the world.

An important feature of our model is that candidates strategically propose their platforms ex-ante rather than adjusting their policy as a function of the electoral results. With a single strategic proposer, Bond and Eraslan (2010) show that unanimity can be more beneficial for voters than majority rule as it induces more moderation. In a setting with electoral competition, Martinelli (2001) and Laslier and Van der Straeten (2004) highlight how voter information can discipline politicians with distinct preferences than the electorate's.[4] In contrast, Kartik et al.

[2]Lohmann (1994) shows that costly political actions can serve as a coordination device, Meirowitz (2005) attributes the same role to polls.

[3]In a similar vein, Shotts (2006) highlights that when there are multiple elections, voters can induce candidates' moderation in the second election by choosing the appropriate voting strategy (including abstention) in the first election. Aytimur and Bruns (2015) show that a large electorate is able to aggregate information to encourage more effort from an incumbent in a principal-agent setting.

[4]Gül and Pesendorfer (2009) shows that voters may not be able to discipline politicians when they do not always learn their platforms. However, only one candidate is strategic in their setting.

(2015) shows that office-motivated candidates tend to posture and over-react to their information when voters can only rely on their prior. Our results instead highlight that candidates with the same policy preferences as the voters' become too conformist because of the possibility of information aggregation.

Closest to our approach are Gratton (2014) and McMurray (2017b). Both find that electoral competition benefits an imperfectly informed electorate. Gratton (2014) establishes that well-informed candidates provide higher welfare than citizens voting between alternatives as the former may pick the right policy among many. McMurray (2017b) finds that poorly informed candidates always offer meaningful alternatives among a continuum of policy options to the electorate when states of the world are symmetrically distributed. Because our interest lies in information aggregation (which is less easily defined in settings with a continuum of policy options), we restrict our analysis to a binary policy space and show that the positive effects of electoral competition these authors document are not robust to imperfectly informed candidates and asymmetrically distributed states of the world. In these situations, electoral incentives can stifle the competition among ideas and decrease voter welfare.[5]

The paper proceeds as follows. The next Section describes the model. Section 3 contains our main results on information aggregation when candidates have the same policy preferences as voters, but also care about holding office. Section 4 discusses our extensions on access to candidacy and voter information. Section 5 concludes. Proofs for Section 3 are in the Appendix. All remaining proofs and additional extensions are collected in an Online Appendix.[6]

2 Model

The game features an electorate composed of $2n + 1$ citizens and two candidates (A and B) competing for an elected office. Candidate $J \in \{A, B\}$ chooses a platform $x_J \in \{0, 1\}$, a citizen $i \in N$ makes an electoral decision $a_i \in \{\phi, A, B\}$, where ϕ denotes abstention and $J \in \{A, B\}$ a vote for J. The impact of platform x_J depends on an underlying state of the world $z \in \{0, 1\}$ chosen by Nature at the beginning of the game. We assume that policy 0 is less likely to be correct;

[5]Information aggregation is always feasible in our baseline setting only when politicians are always informed or the states are symmetrically distributed, in line with Gratton's and McMurray's results. We expect our logic to hold in their set-ups provided the notion of information aggregation can be extended to a continuum of policy options.

[6]Available here

that is, the common knowledge prior satisfies $Pr(z = 0) = \alpha < 1/2$. We henceforth refer to policy 1 as the ex-ante more popular policy.

We suppose that all citizens have similar policy preferences (i.e., we focus on a common value environment when it comes to the electorate). All want the policy choice to match the state. Hence, citizen i's preferences can be represented by the following utility function:

$$U_i(x, z) = \begin{cases} 0 & \text{if } x = z \\ -1 & \text{if } x \neq z \end{cases} \tag{1}$$

Following Feddersen and Pesendorfer (1996), we assume that citizen i is selected by Nature to vote with probability $1 - p_\phi$ (p_ϕ corresponds, e.g., to the probability of being sick on the day of the vote). Henceforth, we refer to selected citizens as voters. This assumption guarantees that a voter is always pivotal with strictly positive probability for any finite n.

Candidates share voters' policy preferences, but also value holding office. More formally, candidate J' utility function assumes the following form:

$$U_J(x, z, e) = \begin{cases} \omega + (1-\omega)U_i(z, x) & \text{if } e = J \\ (1-\omega)U_i(z, x) & \text{otherwise} \end{cases}, \tag{2}$$

where $\omega \in [0, 1]$ captures the extent of candidate's office motivation relative to their policy payoff.

While no player knows z at the beginning of the game, we assume that voters and candidates receive a signal of the state of the world. Before choosing his platform x_J, candidate $J \in \{A, B\}$ observes a message $m_J \in \{\emptyset, 0, 1\}$. Similarly, citizen i receives a message $m_i \in \{\emptyset, 0, 1\}$ before being selected by nature and eventually making her electoral decision. Message $m \in \{0, 1\}$ fully reveals the state of the world—$Pr(z = y|m = y) = 1,\ y \in \{0, 1\}$—, whereas message $m = \emptyset$ is completely uninformative—$Pr(z = 0|m = \emptyset) = \alpha$. All messages are i.i.d. conditional on the state of the world. It is common knowledge that candidate J is informed with probability $\pi \in (0, 1)$—$Pr(m_J = \emptyset) = 1 - \pi$—and citizen i is informed with probability $q \in (0, 1)$—$Pr(m_i = \emptyset) = 1 - q$.

To summarize the timing of the game is:

1. Nature draws $z \in \{0, 1\}$;
2. Candidate $J \in \{A, B\}$ privately observes his signal $m_J \in \{\emptyset, 0, 1\}$. He then chooses $x_J \in \{0, 1\}$;

3. Citizen $i \in N$ observes $m_i \in \{\emptyset, 0, 1\}$, and $(x_A, x_B) \in \{0,1\}^2$. She is then selected to vote with probability $1 - p_\phi$, and if so makes her electoral decision $a_i \in \{\phi, A, B\}$. Otherwise, she abstains;
4. The candidate who receives the most votes is elected (with ties decided by a fair coin toss) and implements his platform;
5. The game ends and payoffs are realized.

The equilibrium concept is Perfect Bayesian Nash Equilibrium (PBE). We impose two additional refinements. First, we assume that when candidates converge to the same policy, each voter randomizes uniformly between both candidates. This assumption is consistent with the presence of an unmodeled symmetrically distributed valence shock determining each voter's decision when indifferent.[7]

As a second refinement, we assume that both candidates face an arbitrarily small probability of mistake $\delta > 0$ (i.e., with probability δ, J proposes $y \in \{0,1\}$ when his strategy prescribes $x \neq y$). This refinement is close in spirit to trembling hands with an important caveat: we do not take the limit of δ to 0.[8] This restriction has two consequences. First, it implies that, whatever their prescribed strategies, candidates' platforms never fully reveal the state and leave a role for information aggregation by the electorate. Second, it guarantees that an equilibrium exists for all parameter values even after restricting voters' strategy. Importantly, the possibility of mistake plays no role in establishing the unfeasibility of information aggregation with strategic candidates.

In what follows, the term 'equilibrium' refers to PBE satisfying these two additional requirements. Notice that, unlike the rest of the literature, we dispense with voters playing symmetric voting strategies conditional on information and candidates' divergence. For some auxiliary results, we further impose the symmetry assumption and refer then to 'voter-symmetric equilibrium.'

Throughout the paper, we make use of the following notation. In a size $2n+1$ electorate, for each candidate J, a pure strategy is a mapping $x_J^n : \{\emptyset, 0, 1\} \to \{0, 1\}$. A mixed strategy is denoted by $\gamma_J^n : \{0,1\} \times \{\emptyset, 0, 1\} \to \Delta[\{0,1\}]$. For each voter $i \in N$, a pure strategy is a mapping $a_i^n : \{\emptyset, 0, 1\} \times \{x_A, x_B\} \to \{\phi, A, B\}$ and a mixed strategy is denoted by $\tau_i^n : \{\phi, A, B\} \times$

[7]Our main conclusion no longer holds when voters can play coordinated strategies (see Online Appendix B.2). As extensively discussed in Online Appendix B.3, coordinated voters' behavior requires perfect indifference, whereas all our results continue to hold if voting behavior is affected by any kind of additional non-policy considerations.

[8]Matějka and Tabellini (2016) also assume candidates make mistakes to generate rational inattention in probabilistic voting models. Alternatively, we could have assumed that voters face a small probability of misperceiving candidates' platforms. In our extension section, however, we choose another approach to introduce frictions in voter information about candidates' platforms.

$\{\emptyset, 0, 1\} \times \{x_A, x_B\} \rightarrow \Delta[\{\emptyset, A, B\}]$. A tuple of strategies takes the form $\gamma^n := (\gamma^n_A, \gamma^n_B)$ for candidates and $\tau^n = \{\tau^n_i\}_{i=1}^{2n+1}$ for voters. In what follows, we say that a candidate *follows his signal* if $x^n_J(m_J) = m_J \in \{0, 1\}$, $J \in \{A, B\}$ and a voter follows her signal if she votes for the candidate proposing the correct policy conditional on platform divergence.

We now introduce our notion of information aggregation which incorporates the possibility of mistakes. Let $Pr(x, z; \gamma^n, \tau^n, \delta)$ the probability that policy $x \in \{0, 1\}$ is implemented in state $z \in \{0, 1\}$ when candidates play strategy profile γ^n, voters play strategy profile τ^n in an electorate of size $2n+1$, and the probability of mistake is δ. The probability the correct policy is implemented is then:

$$Q(\gamma^n, \tau^n, \delta) = \alpha Pr(0, 0; \gamma^n, \tau^n, \delta) + (1 - \alpha) Pr(1, 1; \gamma^n, \tau^n, \delta).$$

Adapting Battaglini's (2017) definition to our setting, we define information aggregation as follows.

Definition 1. *Information aggregation is feasible if and only if for all* $\epsilon > 0$, *there exists* $\delta(\epsilon) > 0$ *and a sequence of equilibria* $\{\gamma^n, \tau^n\}_{n=0}^{\infty}$ *such that* $\lim_{n\to\infty} Q(\gamma^n, \tau^n, \delta(\epsilon)) > 1 - \epsilon$.

Notice that Definition 1 only requires the existence of a sequence of equilibria. We naturally extend the definition by stating that information aggregation is feasible for the sequence of equilibria $\{\tilde{\gamma}^n, \tilde{\tau}^n\}_{n=0}^{\infty}$ if and only if all $\epsilon > 0$, there exists $\delta(\epsilon) > 0$ such that $\lim_{n\to\infty} Q(\tilde{\gamma}^n, \tilde{\tau}^n, \delta(\epsilon)) > 1 - \epsilon$.

Before proceeding to the analysis, two remarks are in order. First, our approach builds on Feddersen and Pesendorfer's (1996) framework, with policy options endogenous to candidates' choices.[9] This approach has two advantages. First, we can compare our results to a clear baseline. As Feddersen and Pesendorfer (1996) establish, when voters are presented with two distinct alternatives information aggregation is feasible. This allows us to isolate the effect of electoral incentives on information aggregation. Second, conditional on receiving an informative signal, candidates learn the state of the world. This goes against our main finding on the unfeasibility of information aggregation. Indeed, if candidates receive a noisy signal of the state of the world, there is a strictly positive probability that both candidates make a honest mistake (proposing the same mistaken platform while following their signal). Not so much in our set-up: as long as at least one candidate is informed and follows his signal, information aggregation is guaranteed.

Finally, notice that we allow candidates to have access to better information than the average citizen (i.e., we can have $\pi > q$). This assumption captures a variety of political institutions (e.g.,

[9] We also assume that there are no partisan voters. Partisan voters can only impede information aggregation and so their presence could only reinforce our main result.

parties, primaries) that, in practice, are responsible for supporting and screening candidates. We discuss the role of these institutions in greater details in Section 4.

3 Electoral incentives and information aggregation

As noted above, if voters are presented with distinct alternatives, information aggregation is feasible. We therefore first ask whether candidates have electoral incentives to propose divergent platforms (i.e., $x_A(m_A) \neq x_B(m_B)$ for all $m_J \in \{\emptyset, 0, 1\}$) and fully decentralize information aggregation to the electorate. Our first result establishes that if information aggregation is feasible, equilibria with strategic candidates are qualitatively distinct from the ones arising in set-ups with exogenous policy options.

Proposition 1. *In any sequence of equilibria for which information aggregation is feasible, there exists $\overline{n}^{inf}$ such that for all $n \geq \overline{n}^{inf}$ in equilibrium candidates do not propose divergent platforms.*

To understand this result, suppose, by way of contradiction, that there exists a sequence of equilibria for which information aggregation is feasible and in which candidate A proposes $x_A = 0$ and candidate B $x_B = 1$. For such equilibrium to exist, it must be that A prefers policy 0 even after learning that the state is $z = 1$. This is never the case for large enough electorate because A suffers a double cost from proposing $x_A = 0$. First, there is an electoral cost: A wins with probability 1/2 when offering $x_A = 1$, but strictly less than 1/2 if he promises $x_A = 0$ (since information is aggregated in the limit). Second, there is a policy cost: conditional on winning, A is certain to implement the wrong policy.

Proposition 1 indicates that we cannot sustain a divergent equilibrium in the limit. However, it would be wrong to conclude from it that the absence of competition among ideas in elections necessarily harms the electorate. In fact, a divergent strategy is not incentive compatible because candidates have too much incentive to use their knowledge of the state of the world. This tends to benefit voters since it implies that with probability at least $\pi^2(1-\delta)^2$, both candidates offer the correct policy. To understand whether information aggregation is feasible, we need to consider *all candidates' strategy profiles*, some of them could be better for the electorate than divergent platforms.

Our next result establishes that even after considering all candidates' strategy profiles and voters' electoral decisions conditional on divergence, full information aggregation is not always feasible.

Proposition 2. *Information aggregation is feasible if and only if*

$$\left(\frac{1}{2}-\alpha\right)\omega < \alpha(1-\pi)(1-\omega) \tag{3}$$

To guarantee full information aggregation, uninformed candidates must offer divergent platforms with probability one.[10] For this reason, it must be individually rational for uninformed candidates to offer distinct policies for n large enough in a sequence of equilibria for which information aggregation is feasible.

Suppose without loss of generality that for n large enough, $x_A^n(\emptyset) = 0$ and $x_B^n(\emptyset) = 1$. By choosing $x_A = 0$, as n goes to infinity, A wins only if $z = 0$: with probability one when candidate B offers platform 1 (probability $\alpha(1-\pi)$) and with probability 1/2 when B learns the state and also chooses platform 0 (probability $\alpha\pi$). This results in a winning probability of $\alpha[(1-\pi)+\pi/2]$. When he deviates to $x_A = 1$, A wins with probability 1/2 only when B also chooses $x_B = 1$, which occurs when either the state is $z = 1$ (probability $1-\alpha$) or when the state is $z = 0$ but B is uninformed (probability $\alpha(1-\pi)$). This results in a higher winning probability: $(1-\alpha)/2 + \alpha(1-\pi)/2$. The electoral benefit of deviating to $x_A = 1$ is thus $\left(\frac{1}{2}-\alpha\right)\omega$. However, this deviation also carries a risk of having the wrong policy implemented, which occurs when the state is $z = 0$ and B is uninformed (with probability $\alpha(1-\pi)$). Deviation to $x_A = 1$ thus entails an expected policy loss of $\alpha(1-\pi)(1-\omega)$. Combining the two, we obtain that information aggregation is feasible if and only if the cost of policy mistake dominates the electoral benefit of proposing $x_A = 1$ as Proposition 2 establishes. Otherwise, uninformed candidates have too much incentives to be conformist and propose the ex-ante more popular policy 1.[11]

Proposition 2 directly implies that information aggregation is never feasible with office-motivated candidates (which corresponds to $\omega = 1$ in our setting). Electoral incentives work through office-motivation. When candidates only care about winning, the best way to achieve their objective is

[10] In all other cases, there is a strictly positive probability that both candidates converge to the wrong policy when uninformed and we can always find $\epsilon > 0$ such that Definition 1 is not satisfied. The proof of Proposition 2 establishes this point formally.

[11] Observe that the asymmetry between the two states is critical. When the state is distributed uniformly ($\alpha = 1/2$), full information aggregation is always feasible as in McMurray (2017b).

to be conformist and propose the ex-ante more likely alternative. As in a Downsian framework with uncertainty over voters' preferences (Bernhardt et al., 2009), in the context of information aggregation, candidates' policy motivation is critical for the well-functioning of elections.

Corollary 1. *When $\omega = 1$, information aggregation is never feasible.*

We next consider equilibria when information aggregation is unfeasible (i.e., Equation 3 does not hold). As in Feddersen and Pesendorfer (1996), we restrict attention to symmetric voting strategies. Observe that voters can never infer the state from proposed platforms, since candidates make mistakes with small but positive probability. Uninformed voters always face the risk of making an electoral mistake after conditioning on the event they are pivotal. To avoid this, they abstain and delegate electoral decision-making to the informed voters: the swing voter's curse holds in our setting (see Lemma 2 in the Appendix for a formal statement and proof). Consequently, the probability that the correct policy is chosen goes to 1 conditional on divergence.

Anticipating voters' behaviors and its consequences, uninformed candidates have too much incentive to behave with conformity when n is large. As a result, for large n the unique voter-symmetric equilibrium features uninformed candidates proposing the ex-ante more popular policy $x = 1$ (i.e., $x_A(\emptyset) = x_B(\emptyset) = 1$), whereas informed candidates follow their signal (i.e., $x_J(m) = m$ $J \in \{A, B\}$ $m \in \{0, 1\}$).[12] Our analysis thus establishes a lower bound on the quality of information aggregation. While non always guaranteed, in the limit, the correct policy is always implemented when at least one candidate is informed. As a result, the quality of equilibrium electoral decision-making is strictly increasing with π.

Corollary 2. *If $\left(\frac{1}{2} - \alpha\right)\omega > \alpha(1-\omega)(1-\pi)$, in the unique voter-symmetric sequence of equilibria, the limit probability that the correct policy is implemented is strictly increasing with π.*

Combining Proposition 2 and Corollary 2, our analysis highlights that a large probability that candidates are informed (π) is a mixed blessing for the electorate. On the one hand, a high π

[12] The assumption that candidates make mistakes with probability δ is essential for the existence of a voter-symmetric equilibrium for sufficiently large n. Absent mistake, in the strategy profile described in the text, platform $x = 0$ fully reveals the state $z = 0$. In this case, uninformed voters have a dominant strategy to vote for the candidate proposing $x = 0$, which in turns creates an incentive for uninformed candidates to deviate from their prescribed strategies and choose $x = 0$ (if $q < 1 - q$, a candidate proposing $x = 0$ against an opponent proposing $x = 1$ is certain to win the election as $n \to \infty$ regardless of the state). Equilibrium existence then is not guaranteed for all parameter values. Introducing mistakes eliminates this problem for large enough electorates. An equilibrium may not exist only for relatively small n. In that case, we can assume that the electorate is sufficiently large to begin with to reestablish the result. Since we are concerned with information aggregation or lack thereof in the limit, this is without loss of generality.

reduces the policy loss associated with deviation and thus encourages conformism by uninformed candidates (the condition for information aggregation to be feasible becomes tighter). On the other hand, the probability that the correct policy is implemented increases with π (since informed candidates propose the correct policy in equilibrium).[13]

4 Access to candidacy and voter information

The previous section establishes that electoral incentives can impede information aggregation by stifling competition among ideas in elections In the next section, we study whether this competition can be restored when (i) access to candidacy is liberalized or (ii) voters' informational shortcomings affect not only the state of the world but also candidates' announcements. A formal analysis of this section and all proofs are collected in Online Appendix A.

Access to candidacy

Our baseline framework presupposes the presence of political institutions that perform two roles: they restrict entry to two candidates, and they (possibly) provide benefits from office. In this subsection, we discuss whether the political failure we uncover in Proposition 2 is resolved when we liberalize access to candidacy.

Consider first a setting in which candidacy is fully decentralized. Building on citizen-candidate models (Osborne and Slivinski, 1996; Besley and Coate, 1997), we assume that each citizen decides whether to run at cost $c \in (0, 1)$ after observing their message $m \in \{\emptyset, 0, 1\}$. While citizens are ideologically differentiated in traditional citizen-candidate approaches, in ours, all citizens agree ex-post on the correct policy (see Equation 1). As a consequence, the entry game resembles a volunteer's dilemma: each voter wants the correct policy to be implemented, but would prefer somebody else to run. Volunteer games have well-known properties. In any sequence of symmetric equilibria, the probability at least one citizen runs is strictly decreasing with the size of the electorate (even after restricting entry to informed citizens). Far from encouraging competition, liberalizing entry may deplete the marketplace of ideas.

We further show that focusing on asymmetric equilibria—in which a few citizens are "designated" to run—cannot fully resolve the issue. Indeed, unlike a classical volunteer's dilemma where

[13] Using the proof of Corollary 2, it can further be checked that information aggregation is feasible when candidates are always informed ($\pi = 1$) in line with results in Gratton (2014).

one volunteer suffices, information aggregation is guaranteed only if two citizens enter. But the citizen assigned to propose the ex-ante less popular policy has little incentive to do so if uninformed since he always pays the cost $c > 0$, but is pivotal for information aggregation only if the state is $z = 0$; that is, only with probability $\alpha < 1/2$.

The analysis thus reveals that a benefit of holding office—at the core of the political failure we identify (Corollary 1)—is also key to encourage entry and permit information aggregation. An intrinsically valuable office, however, is not sufficient. There is no sequence of equilibria in which all informed voters run with probability one as the electorate grows large. An informed citizen always pays the cost of entry, but his probability of winning the valuable office tends to zero as n approaches infinity (in addition, the cost of not running in term of policy mistakes also tends to zero). In any symmetric equilibrium, informed voters must thus randomize between entering and staying out. A positive probability of entering in turns requires that the risk of policy mistake is non null. Hence, the existence of any symmetric equilibrium with positive probability of entry *requires* information aggregation to be unfeasible. In turn, benefits from office facilitate (in the sense of set inclusions), but do not guarantee information aggregation when a subset of citizens are designated to be candidates. These benefits, however, must not be too high or risk encouraging too many entrants and generating the same coordination problem as in symmetric equilibria.

By offering rents from office and favoring coordination, political institutions that restrict entry may benefit rather than hurt the electorate. But should entry be limited to two candidates? Or would it be beneficial to allow for third candidate entry (a best case scenario by the reasoning above)? In a third extension, we show that partially liberalized access to candidacy—a partially informed politician C choosing whether to run (at a cost c) after A and B commit to their platforms—has ambivalent effect on information aggregation. When the cost of entry is very low, C always enters and information aggregation is always feasible. When it is intermediate, C's presence can actually render information aggregation *harder* to achieve (i.e., the condition in Proposition 2 becomes more stringent), by reducing the likelihood of a policy mistake when A and B converge to the ex-ante more popular policy 1.

While directly responsible for the political failure we uncover, political institutions that provide a benefit from office and restrict entry to two candidates may nonetheless improve the performance of elections as a market place of ideas. They serve to facilitate coordination on designated candidates and to guarantee that some candidates may actually run.

Imperfectly observed platforms

In this subsection, we investigate whether additional imperfection in voter information can reduce (uninformed) candidates' incentives to play conformist strategies. We assume that voters do not necessarily observe candidates' platforms, in line with survey evidence that voters know very little about politics and what candidates stand for (e.g., Campbell et al., 1980; Delli Carpini and Keeter, 1996).

Formally, we assume that before making her electoral decision, each voter observes two messages: (i) $m \in \{\emptyset, 0, 1\}$ and (ii) $r \in \{(\emptyset, \emptyset), (\emptyset, x_B), (x_A, \emptyset), (x_B, x_A)\}$. The first message m reveals the state z if $m \neq \emptyset$ and has thus similar properties as in the baseline set-up. The second message $r = (r_A, r_B)$ fully reveals the platform of candidate $J \in \{A, B\}$ if and only if $r_J \neq \emptyset$. We assume that platform learning is i.i.d. across voters and candidates, and satisfies: $Pr(r_J = x_J) = p \in (0, 1)$, $J \in \{A, B\}$ (the baseline model has $p = 1$).

Even when a voter does not observe x_J, she updates about candidates' behavior from her knowledge of the state. As such, partially informed voters who observe $m = z$, but not (x_A, x_B) may have an incentive to vote for the candidates more likely to propose $x = z$. This, in turn, can encourage uninformed candidates to propose divergent platforms. The candidate proposing the ex-ante less popular policy would have less to gain from proposing the more likely option as he would never be able to earn the votes of partially informed voters in the likely state $z = 1$.

Alas, the strategy profile discussed above does not arise in equilibrium in a large enough electorate when voters play a symmetric voting strategy. The reason is that partially informed voters abstain (Lemma A.5 in Online Appendix A). Due to the probability of mistakes $\delta > 0$, for any candidates' strategy profile, these voters do not know which candidates promised the right policy. While their reasons are distinct, these voters—like voters who observe platforms but not the state—fear choosing the wrong candidate and prefer to delegate electoral decision-making to more informed voters (who both observe the state and at least one platform).[14]

As the election is decided by voters who observe the state and what candidates stand for, candidates face the exact same incentives as in the baseline model. As a result, uninformed candidates prefer conformity whenever the electoral benefit of proposing the ex-ante more popular policy dominates the potential policy cost.

[14] We show in the proof of Lemma A.5 that abstention is the unique voter-symmetric equilibrium strategy for n large enough. In particular, there is no equilibrium in which voters who do not observe the state vote for a candidate and voters who do not observe any platform vote for his opponent.

Proposition 3. *There exists a sequence of voter-symmetric equilibria for which information aggregation is feasible if and only if Equation 3 holds.*

Observe that in this section, we only establish our unfeasibility result for the most-studied—and arguably more natural—case of voter-symmetric strategies. We cannot exclude that (relatively complex) asymmetric voting strategies may improve the feasibility of information aggregation. In addition, it should be noted that the possibility of candidates' mistakes plays a key role. It implies that voters who only observe $m = z$ have a dominant strategy to abstain. However, it also indicates that non-abstention by these voters is fragile; it requires that voters are absolutely certain of what candidates propose, even without observing their offers, arguably a strong assumption. Nonetheless, given these two caveats, Proposition 3 should thus be interpreted as an lower bound on the unfeasibility of voter information in electoral setting with strategic candidates and low voter information.[15] Worsening voters' ability to observe candidates' platforms cannot exacerbate the political failure that this paper identifies.

5 Conclusion

Elections are meant to both aggregate dispersed information in the electorate and provide incentives to politicians. This paper shows that electoral incentives can impede the competition among ideas and render information aggregation unfeasible. When candidates' office-motivation is large relative to the policy cost of implementing the wrong policy, uninformed candidates prefer conformity and converge to the ex-ante more popular policy. Absent clear choices, even a well-informed electorate (some voters learn the state) makes mistakes.

The novel policy failure we identify cannot be resolved by lifting restrictions to entry. Quite the contrary, fully or partially liberalized access to candidacy can deplete the marketplace of ideas as no citizen may choose to enter with positive probability. Introducing additional imperfections in voter information cannot exacerbate, and may even mitigate, candidates' excessive conformism. In Online Appendix B, we further show that information aggregation is always feasible when voters can play coordinated strategies conditional on convergence (Online Appendix B.2), but that this

[15] We expect that our main conclusion continues to hold when voters receive noisy signals or need to pay a cost to acquire information, as others have shown that these assumptions are of no or only limited consequences on information aggregation whenever the electorate is presented with two distinct exogenous options (see Martinelli, 2006; Szentes and Koriyama, 2009).

result is fragile as any small shock on voters' preferences restores our unfeasibility result (albeit with different conditions described in Online Appendix B.3).

Overall, voters' electoral choices and their aggregate consequences cannot be understood separately from candidates' incentives to offer diverse policy options. While political institutions play a crucial role in modulating the trade-off between aggregating dispersed information in the citizenry and providing incentives to candidates, they generally cannot resolve it in full.

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Appendix: Proofs for Section 3

Recall that for each candidate J, a pure strategy is a mapping $x_J^n : \{\emptyset, 0, 1\} \to \{0, 1\}$ and a mixed strategy is denoted by $\gamma_J^n : \{0,1\} \times \{\emptyset, 0, 1\} \to \Delta[\{0,1\}]$. For each voter $i \in N$, a pure strategy is a mapping $a_i^n : \{\emptyset, 0, 1\} \times \{x_A, x_B\} \to \{\phi, A, B\}$ and a mixed strategy is denoted by $\tau_i^n : \{\phi, A, B\} \times \{\emptyset, 0, 1\} \times \{x_A, x_B\} \to \Delta[\{\emptyset, A, B\}]$.

Throughout, denote $\Pi_J^n(z; x_A, x_B)$ the ex-ante probability that candidate $J \in \{A, B\}$ wins in state $z \in \{0,1\}$ when candidates propose platforms $(x_A, x_B) \in \{0,1\}^2$ and the electorate is of size $2n+1$. Under the assumption, $\Pi_J^n(z; x_A, x_B) = \frac{1}{2}$ whenever $x_A = x_B$. In what follows, in line with the idea of trembling hand refinements, candidates only consider their opponent's probability of mistakes (and not their own since $\delta < 1/2$) when making their platform choice.

Lemma 1. *In any sequence of equilibria for which information aggregation is feasible, there exists $\overline{n}^{inf}$ such that for all $n \geq \overline{n}^{inf}$, the platform choice of a candidate $J \in \{A, B\}$ satisfies: $x_J(m) = m$ for $m \in \{0, 1\}$.*

Proof. Denote $\Gamma_J(x; z) := \pi\big((1-\delta)\gamma_J(x; z) + \delta\gamma_J(\neg x, z)\big) + (1-\pi)\big((1-\delta)\gamma_J(x; \emptyset) + \gamma_J(\neg x, \emptyset)\big)$ the ex-ante probability that $J \in \{A, B\}$ chooses x in state z. A's expected payoff from following his signal $m = z$ and doing the opposite are, respectively

$$\omega\left(\Pi_A^n(z; z, \neg z)\Gamma_B(\neg z; z) + \Gamma_B(z; z)\frac{1}{2}\right) - (1-\omega)\left(1 - \Pi_A^n(z; z, \neg z)\right)\Gamma_B(\neg z; z)$$

$$\omega\left(\Gamma_B(\neg z; z)\frac{1}{2} + \Pi_A^n(z; \neg z, z)\Gamma_B(z; z)\right) - (1-\omega)\Big(\Gamma_B(\neg z; z) + \Pi_A^n(z; \neg z, z)\Gamma_B(z; z)\Big)$$

Whenever information aggregation is feasible, $\lim\limits_{n\to\infty} \Pi_A^n(z; z, \neg z) = 1$ and $\lim\limits_{n\to\infty} \Pi_A^n(z; \neg z, z) = 0$. So for n large enough, $\Pi_A^n(z; z, \neg z) \geq 1/2 \geq \Pi_A^n(z; \neg z, z)$, A prefers to follow his signal. By symmetry, the claim follows for B. $\square$

Proof of Proposition 1

The proof follows directly from Lemma 1 as divergence requires $x_A(m) = 0$ or $x_A(m) = 1$ for $m \in \{0, 1, \emptyset\}$. $\square$

Proof of Proposition 2

We restrict attention to voters' strategies such that $\lim_{n\to\infty} \Pi^n_A(z;z,\neg z) = 1$ and $\lim_{n\to\infty} \Pi^n_A(z;\neg z,z) = 0$. Observe that this is without loss of generality (wlog) as information aggregation would not be feasible otherwise (because voters make mistakes conditional on divergence or candidates always converge when uninformed). From the proof of Lemma 1, an informed candidate J must then always follow his signal for n large enough.

Step 1. We first show that information aggregation is feasible if and only if there exists a sequence of equilibria in which candidates' strategies satisfy $\gamma_J(0;\emptyset) = \gamma_{-J}(1;\emptyset) = 1$ for some $J \in \{A,B\}$ for n large enough.

Necessity. Suppose that $\gamma_J(0;\emptyset) \in (0,1)$. In the limit, given the voter's strategy, the probability that the correct policy is chosen (where we simply highlight dependence on n and γ for ease of exposition) is then:

$$\begin{aligned}\lim_{n\to\infty} Q(n;\gamma) =& 1-\delta^2 \begin{pmatrix} \pi^2 + \pi(1-\pi)\big(\alpha(\gamma_A(0;\emptyset)+\gamma_B(0;\emptyset)) + (1-\alpha)(\gamma_A(1;\emptyset)+\gamma_B(1;\emptyset))\big) \\ +(1-\pi)^2\big(\alpha\gamma_A(0;\emptyset)\gamma_B(0;\emptyset) + (1-\alpha)\gamma_A(1;\emptyset)\gamma_B(1;\emptyset)\big) \end{pmatrix} \\ &- \delta(1-\delta)\begin{pmatrix} (1-\pi)^2\big(\gamma_A(1;\emptyset)\gamma_B(0;\emptyset) + \gamma_A(0;\emptyset)\gamma_B(1;\emptyset)\big) \\ +\pi(1-\pi)\big(\alpha(\gamma_A(1;\emptyset)+\gamma_B(1;\emptyset)) + (1-\alpha)(\gamma_A(0;\emptyset)+\gamma_B(0;\emptyset))\big) \end{pmatrix} \\ &- (1-\delta)^2\big(\alpha\gamma_A(1;\emptyset)\gamma_B(1;\emptyset) + (1-\alpha)\gamma_A(0;\emptyset)\gamma_B(0;\emptyset)\big)\end{aligned}$$

Unless $\alpha\gamma_A(1;\emptyset)\gamma_B(1;\emptyset)+(1-\alpha)\gamma_A(0;\emptyset)\gamma_B(0;\emptyset) = 0$, there exists $\epsilon > 0$ such that $\lim_{n\to\infty} Q(n;\gamma) < 1-\epsilon$ for all $\delta > 0$. Hence, information aggregation requires: (i) $\gamma_A(0;\emptyset)\gamma_B(0;\emptyset) = 0$ and (ii) $\gamma_A(1;\emptyset)\gamma_B(1;\emptyset) = (1-\gamma_A(0;\emptyset))(1-\gamma_B(0;\emptyset)) = 0$. The two conditions are satisfied simultaneously only if $\gamma_J(0;\emptyset) = \gamma_{-J}(1;\emptyset) = 1$ for some $J \in \{A,B\}$.

Sufficiency. Consider candidates' strategy profile $(x_A(m), x_B(m)) = (\mathbb{I}_{\{m=1\}}, \mathbb{I}_{\{m\neq 0\}})$. In this case, $\lim_{n\to\infty} Q(n;\gamma) = 1-\pi\delta^2-(1-\pi)\delta(1-\delta)$. Observe that $\pi\delta^2+(1-\pi)\delta(1-\delta)$ is strictly increasing with δ (since $\delta < 1/2$). Hence, for all $\epsilon > 0$, there exists a unique $\overline{\delta}(\epsilon) > 0$ such that for all $\delta \in (0,\overline{\delta}(\epsilon))$, $\lim_{n\to\infty} Q(n;\gamma) > 1-\epsilon$. Hence, information aggregation is feasible.

Step 2. As a second step, we establish that there exists a sequence of equilibria in which candidates' strategy $\gamma_J(0;\emptyset) = \gamma_{-J}(1;\emptyset) = 1$ for some $J \in \{A,B\}$ is individually rational for all $\delta \in (0,\delta^0)$ for some $\delta^0 > 0$ and n large enough if and only if Equation 3 holds. Wlog, assume that $x_A(\emptyset) = 0$. Recall that $\Gamma_J(x;z)$ is the ex-ante probability that $J \in \{A,B\}$ chooses x in state z.

Candidate A's (IC) when uninformed is:

$$\alpha\left\{\begin{array}{c}\Gamma_B(0;0)\Pi^n_A(0;0,0)\omega+\Gamma_B(1;0)\Pi^n_A(0;0,1)\omega\\-\Gamma_B(1;0)(1-\Pi^n_A(0;0,1))(1-\omega)\end{array}\right\}+(1-\alpha)\left\{\begin{array}{c}\Gamma_B(0;1)\left(\Pi^n_A(1;0,0)\omega-1+\omega\right)\\+\Gamma_B(1;1)\Pi^n_A(1;0,1)(2\omega-1)\end{array}\right\}$$
$$\geq\alpha\left\{\begin{array}{c}\Gamma_B(0;0)\Pi^n_A(0;1,0)(2\omega-1)\\+\Gamma_B(1;0)\left(\Pi^n_A(0;1,1)\omega-1+\omega\right)\end{array}\right\}+(1-\alpha)\left\{\begin{array}{c}\Gamma_B(0;1)\Big(\Pi^n_A(1;1,0)-1+\omega\Big)\\+\Gamma_B(1;1)\Pi^n_A(1;1,1)\omega\end{array}\right\}\tag{4}$$

Under our assumption, $\Pi^n_A(z;x,x)=1/2$. Given, $\lim_{n\to\infty}\Pi^n_A(z;z,\neg z)=1$ and $\lim_{n\to\infty}\Pi^n_A(z;\neg z,z)=0$ for $z\in\{0,1\}$ as $n\to\infty$, Equation 4 becomes:

$$\alpha\omega\left(1-\frac{\Gamma_B(0;0)}{2}\right)+(1-\alpha)(1-\Gamma_B(1;1))\left(\frac{\omega}{2}-(1-\omega)\right)$$
$$\geq\alpha(1-\Gamma_B(0;0))\left(\frac{\omega}{2}-(1-\omega)\right)+(1-\alpha)\omega\left(1-\frac{\Gamma_B(1;1)}{2}\right)$$

Given B's strategy, $\Gamma_B(1;1)=1-\delta$ and $\Gamma_B(0;0)=\pi+(1-2\pi)\delta$ so the (IC) can be rewritten as:

$$\omega\left(\frac{1}{2}-\alpha\right)\leq(1-\omega)\alpha(1-\pi)+\delta\left(\frac{\omega}{2}(1-\alpha)-(1-\omega)\big(\alpha(1-2\pi)+(1-\alpha)\big)\right)\tag{5}$$

Notice that if Equation 5 holds, it can be checked that a candidate B has no incentive to deviate after $m_B=\emptyset$ since he proposes the ex-ante more likely policy.

We now show that Equation 3 implies Equation 5 for small enough δ. We need to consider two cases. First, suppose that $\frac{\omega}{2}(1-\alpha)-(1-\omega)\big(\alpha(1-2\pi)+(1-\alpha)\big)\geq 0$. Hence, if Equation 3 holds, Equation 5 is satisfied for all $\delta>0$. Second, suppose that $\frac{\omega}{2}(1-\alpha)-(1-\omega)\big(\alpha(1-2\pi)+(1-\alpha)\big)<0$. Then Equation 3 implies that there exists $\delta^0>0$ such that for all $\delta\in(0,\delta^0]$, Equation 5 holds. $\square$

Proof of Corollary 1

Direct from observation of the necessary and sufficient condition in the text of Proposition 2 given $\alpha<1/2$. $\square$

To prove our next result, we focus on voter-symmetric voting strategy. Following Feddersen and Pesendorfer (1996), we denote $\sigma_{z,x}(\tau)$ the probability that a randomly drawn voter votes for policy $x\in\{0,1\}$ in state $z\in\{0,1\}$ as a function of the uninformed voters' strategy τ. We further denote $\sigma_J(z;x_A,x_B)$ the probability that a randomly drawn voter votes for $J\in\{A,B\}$ in state

z as a function of candidates' platforms $(x_A, x_B) \in \{0,1\}^2$. Finally, let $\Pi^n := \frac{(1-(1-p_\phi)q)^{2n+1}}{2}$. A preliminary Lemma states that the swing voter's curse holds in this setting. In a voter-symmetric equilibrium, uninformed voters abstain for n large enough.

Lemma 2. *Suppose $x_A \neq x_B$. For all $\beta(\emptyset, (x_A, x_B)) \in (0,1)$, there exists $\overline{n}^\phi(\beta)$ such that for all $n > \overline{n}^\phi(\beta)$, the unique voter-symmetric equilibrium features uninformed voters abstaining.*

Proof. The proof follows closely the proofs of Proposition 1, Lemma 1.A and Proposition 3.(iii) in Feddersen and Pesendorfer (1996, p. 421-22). Without loss of generality, suppose $x_A = 0$ and $x_B = 1$. The probabilities that a citizen makes a correct decision in states $z = 0$ and $z = 1$ are, respectively:

$$\begin{aligned}\sigma_{0,0}(\tau) =&\sigma_A(0;0,1) = (1-p_\phi)(q + (1-q)\tau_A(\emptyset;(x_A,x_B)))\\ \sigma_{1,1}(\tau) =&\sigma_B(1;0,1) = (1-p_\phi)(q + (1-q)\tau_B(\emptyset;(x_A,x_B)))\end{aligned}$$

In turn, the probabilities of an incorrect vote in states $z = 0$ and $z = 1$ are, respectively:

$$\begin{aligned}\sigma_{0,1}(\tau) =&\sigma_B(0;0,1) = (1-p_\phi)(1-q)\tau_B(\emptyset;(x_A,x_B))\\ \sigma_{1,0}(\tau) =&\sigma_A(1;0,1) = (1-p_\phi)(1-q)\tau_A(\emptyset;(x_A,x_B))\end{aligned}$$

As in Feddersen and Pesendorfer (1996), $\sigma_{x,x}(\tau) = \sigma_{\neg x,x}(\tau) + q(1-p_\phi)$. Let $Eu(x|m; x_A, x_B, \tau)$ be the expected utility associated with voting for the candidate committing to $x \in (x_A, x_B)$ or abstaining, in which case $x = \phi$, conditional on (i) message m, (ii) candidates' platforms (x_A, x_B), and (iii) uninformed citizens' strategy profile τ.

We can thus use the proof of Feddersen and Pesendorfer's Proposition 1 in Fey and Kim (2002) (simply replacing α with the posterior $\beta(\emptyset,(x_A,x_B)))$ to establish that $Eu(0|\emptyset;0,1,\tau) = Eu(1|\emptyset;0,1,\tau) \Rightarrow Eu(\phi|\emptyset;0,1,\tau) > Eu(0|\emptyset;0,1,\tau)$. Further, if there exists $\varepsilon > 0$ such that $\sigma_{\neg x,x}(\tau) - \sigma_{x,\neg x}(\tau) > \varepsilon$, then there exists $\overline{n}^\emptyset(\beta)$ such that for all $n \geq \overline{n}^\emptyset(\beta)$ $Eu(\neg x|\emptyset;0,1,\tau) > Eu(\phi|\emptyset;0,1,\tau) > Eu(x|\emptyset;0,1,\tau)$ (Feddersen and Pesendorfer's Lemma 1.A). Finally, using a similar logic as in the proof of Feddersen and Pesendorfer's Proposition 3.(iii) for $n \geq \overline{n}^\emptyset$ we obtain that abstention is a dominated strategy so $\tau_\phi = 1$. □

Proof of Corollary 2

By Proposition 1, there is no divergent equilibrium. Further, observe that due to probability δ of mistake, uninformed voters' belief satisfies $\beta(\emptyset; x_A, x_B) \in (0,1)$ for all x_A, x_B such that $x_A \neq x_B$ for all candidates' strategy. Hence, by Lemma 2, there exists a finite n large enough such that uninformed voters abstain. This implies that for n large enough, informed candidates follow their signal in any equilibrium (proof of Proposition 2). We now show that for n large enough, under the condition of the corollary, uninformed candidates converge to 1. From the proof of Proposition 2, for n large enough, for uninformed A it is individually rational to propose $x_A(\emptyset) = 1$ even if B proposes $x_B(\emptyset) = 1$ with probability one (if $\gamma_B(1;\emptyset) < 1$, the electoral benefit of proposing 1 is higher and the policy cost lower for A). By symmetry, it is individually rational for B to propose $x_B(\emptyset) = 1$ even if $\gamma_A(1;\emptyset) = 1$.

Hence, there exists a unique sequence of equilibria such that in equilibrium the probability that the policy implemented matches the state satisfies:

$$\begin{aligned}\lim_{n\to\infty} Q(n) =& \pi^2(1-\delta^2) + 2\pi(1-\pi)\big(\alpha(1-\delta(1-\delta)) + (1-\alpha)(1-\delta^2)\big)\\ &+ (1-\pi)^2\big(\alpha(1-(1-\delta)^2) + (1-\alpha)(1-\delta^2)\big)\\ =& 1-\delta^2((1-\alpha)+\pi^2\alpha) - 2\delta(1-\delta)\pi(1-\pi)\alpha - (1-\delta)^2(1-\pi)^2\alpha\end{aligned}$$

Denote $H(\pi) = (1-\pi)(1-\delta)^2 - \pi\delta^2 - (1-2\pi)\delta(1-\delta)$ and observe that $\lim\limits_{n\to\infty} \partial Q(n)/\partial\pi$ has the same sign as $H(\pi)$. Notice that $H'(\pi) < 0$ and $H(1) = \delta(1-2\delta) > 0$ (since $\delta < 1/2$). Hence $\lim\limits_{n\to\infty} \partial Q_S(n)/\partial\pi > 0$ as claimed. $\square$