The climate policy puzzle, or why parties disagree on scientifically uncontroversial issues

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Abstract

Political parties sometimes disagree even about issues that are scientifically uncontroversial, climate change being a prime example. While the disagreement may partially be driven by differences in parties' constituencies or ideologies, we offer a novel explanation that is related to the nature of electoral competition. In our model, two parties compete by announcing their climate policies in the light of a potential catastrophe, after receiving independent private signals about the true state of the world. Parties are both office- and policy-motivated. Our model can explain radically different policy positions, even when parties receive identical signals and have unbiased preferences. This holds in an asymmetric equilibrium in which both parties reveal their private information to the voters and the implemented policy is (almost) first-best for all possible realizations of parties' signals. In this equilibrium, one party adopts extreme and the other one moderate policy positions.

Keywords: electoral competition, signaling, climate catastrophe, voting

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1 Introduction

Given the large scientific consensus about anthropogenic climate change, the widespread disagreement about the issue in public debates seems like a puzzle. Several high-profile politicians have publicly declared their skepticism towards the reports and recommendations of the Intergovernmental Panel on Climate Change (IPCC).[1] A well-documented fact is that at least some political parties seem to take an active role in conveying their (non) belief in climate science, and there is evidence that voters extract information about the state of the world from parties' publicly stated opinions or policy platforms (see for instance Hornsey et al., 2016; Guber, 2013).

Using the example of climate change, we present a model explaining why political parties or candidates may sometimes (radically) disagree on issues after observing identical signals about the state of the world, even when parties have unbiased policy preferences. We show that situations can arise endogenously in which two parties systematically respond differently to identical signals: while one party always responds moderately to the (private) signal it receives, the other party over-reacts to its private signal and adopts extreme policy positions. The co-existence of such a "moderate" and an "extreme" party, can be socially desirable and lead to (almost) first-best results, for any realization of the two parties' signals.

In our setup, two parties (or candidates) compete for office in an upcoming election. Each of the two parties hires experts to evaluate the benefits of a public investment, which we interpret as an investment in climate stability. We assume that each party commits to a policy platform after observing its private signal (expert's opinion), and the winner implements its announced policy after the election. While parties have access to experts' opinions, that can sometimes be conflicting, an individual voter does not have the necessary resources or incentives to become informed about this specific policy issue.[2] However, voters may infer the experts' signals that parties have received, by observing their policy platforms.

We assume that parties are both office- and policy-motivated. However, their evaluation of an efficient policy is not systematically biased: if parties have access to identical information, they agree on what the socially optimal policy should look like. Hence, we abstract from systematic biases in parties' preferences, reflecting among other things

[1]For instance, in its 2016 official platform (p.20), the US Republican Party states that "The United Nations' Intergovernmental Panel on Climate Change is a political mechanism, not an unbiased scientific institution. Its unreliability is reflected in its intolerance toward scientists and others who dissent from its orthodoxy. We will evaluate its recommendations accordingly." Similarly, in his bid for the 2017 presidential election in France, former head of state Nicolas Sarkozy declared that "Sahara has become a desert, it isn't because of industry. You need to be as arrogant as men are to believe we changed the climate."(http://www.politico.eu/article/nicolas-sarkozy-says-climate-change-not-caused-by-man-cop-21/)

[2]See for instance Lupia (2013) on the difficulties to communicate science in a politicized environment.

differences in their constituencies, in their exposure to lobbyist groups, or in their ideology (see also Callander, 2008). While such factors may also play an important role in many real-world politics, our model can help to explain policy divergence – even under identical signals – in their absence. In this sense, we present a parsimonious approach to help resolve "policy-divergence puzzles" such as the climate policy one.

We find that, if at least one party has sufficiently high policy motivation, an asymmetric equilibrium exists that successfully aggregates all available information, and where policies close to the first-best are implemented for any realization of the two parties' signals. In this equilibrium, one "moderate" party adopts a "pandering" strategy, offering a platform that is close to the optimal policy given the prior of the voters, but still transmits its signal. This party is elected under conflicting signals, and therefore implements an almost optimal policy when elected. The other party is "extreme" and offers an "anti-pandering" platform in which it truthfully transmits its signal, but that is only optimal if *two* independent and identical signals are transmitted. This party is elected when both signals are identical, and therefore implements the optimal policy when elected. If only one party is sufficiently policy motivated, this party is the moderate one. This implies that the party that cares the least about the policy outcome makes the most audacious proposals, while the party that cares the most about it offers almost identical platforms regardless of the information it receives.

If, for both parties, office motivation is at an intermediate level, there also exists a symmetric revealing "anti-pandering" equilibrium in which the implemented policies are too extreme, given the limited amount of information received by each party. It is the unique symmetric revealing equilibrium of our game. In a related model, Kartik, Squintani, and Tinn (2015) show that such an anti-pandering equilibrium is the unique symmetric revealing pure-strategy equilibrium of a game with continuous state, signal, and policy spaces when both parties have pure office motivation. If office motivation is very high for both parties, a symmetric "pandering" equilibrium exists in our model where both parties announce a moderate platform and no information is revealed. Heidhues and Lagerlöf (2003) show that pandering is the unique equilibrium in a setting with binary signal and policy spaces, and pure office motivation.

Overall, it seems that neither pandering nor anti-pandering alone can explain the conflicting observations on climate policy: while in some countries there are parties that hold on extreme positions that often seem to be in sharp conflict with the scientific evidence on the issue, other parties adopt moderate climate policies. Such observations are consistent with the asymmetric revealing equilibrium identified in this paper. It predicts that some parties hold on extreme policy positions, while others always adopt moderate ones.

Two key assumptions of our model are that information is naturally coarser than actions, and that the issue is more pragmatic than ideological. In the case of climate change, comprehensive predictions are regularly made by the Intergovernmental Panel on Climate Change (IPCC). As the IPCC is in the position of "natural monopoly" (Tol, 2011), the political question is, thus, primarily whether or not to trust the current state of the scientific literature as summarized by the panel (a binary question). The action space is however not binary, as the abatement of emissions is clearly a continuous choice in the form of emission targets. Regarding ideology, Ansolabehere and Konisky (2014) show that Americans are more pragmatic than ideological in their opinions about energy alternatives and pollution. Moreover, while the approach may vary, ambitious pollution abatements do not have to be ideologically left-leaning, a prominent example being the first large tradable emission permit market implemented in 1990 under the Bush administration (Joskow, Schmalensee, and Bailey 1998).

While we use climate policy as our leading example, our results may apply also in other contexts. For example, in German politics, the (binary) question of whether atomic power should continue to be part of electricity supply, has been highly controversial for many years. While the Christian Democratic Party (CDU) favored a continuation of the usage of atomic power, the Social Democrats (SPD), in alliance with the Green Party, pushed towards a nuclear phase-out within a limited time frame. In 2002, under chancellor Schröder and a coalition-government of SPD and the Green Party, moderate phase-out became Germany's official policy, based on a consensus reached with the leading electricity companies requiring a complete phase-out until the year 2022. After chancellor Merkel took over, and the CDU was the leading party, the phase-out policy was abandoned, granting substantially longer usage of existing nuclear power plants to the electricity providers. Yet, after the Fukushima Daiichi nuclear disaster, the CDU under Merkel changed its position radically. In 2011, Merkel indeed committed to a much faster nuclear phase-out, without cooperation with the electricity companies, with eight reactors shut down immediately.[3]

Universal Basic Income (UBI) is another example where the insights of our analysis may apply. The (binary) question is to know whether providing an unconditional amount of money is in principle more efficient than existing welfare systems. Implementation could however vary a lot, from a small amount replacing a limited number of transfers to completely substituting all of them. As for our previous examples, issues of feasibility and efficiency seem to matter more than political bias, as UBI has been be supported by parties with heterogeneous ideologies. For example, in the 2010 General Election in the UK, right-wing populists of the UKIP supported the policy.[4] In 2015, it was supported by the Green party.[5] In France, it was one of the main points in the socialist party's platform

[3]Source: http://www.world-nuclear.org/, visited March 5, 2018.

[4]UKIP 2010 manifesto, "Empowering the people" p.9.

[5]Basic Income: a detailed proposal, Green Party of England and Wales, 2015.

in the 2017 presidential election.[6] In Finland, a partial UBI has been implemented by a center-right government.[7]

Related Literature:

In a closely related paper, Ambrus, Baranovskyi, and Kolb (2017) consider a situation in which an uninformed principal (corresponding to the voters in our model) chooses between one out of two experts (the candidates in our model) to do a job. As in our setup, each of the experts also receives a private signal about the state of the world. The main difference is that these authors assume that the experts are biased, while we assume that candidates have unbiased preferences, matching those of the (median) voter. Their model allows for purely policy-motivated experts, or experts that have mixed motives (as in our model). While we assume a coarse information structure, with experts' signals and the true state of the world being binary, Ambrus et al. (2017) allow the state of the world and signals to be drawn from a continuum. While the continuous setup has the advantage that no out-of-equilibrium beliefs need to be specified as long as any action by an expert is consistent with an equilibrium strategy of this player for some signal realization, our simpler setup facilitates the analysis of equilibria where parties behave asymmetrically, which is the main focus of our paper. Ultimately, the appropriateness of a discrete or continuous state and signal space also depends on the type of application under consideration.

Focusing on pure office motivation in a model similar to Ambrus et al. (2017), Kartik et al. (2015) show that the welfare of the voters under political competition cannot be higher (in expectation) than in a situation in which only one party's information is available. In contrast, we show that in the presence of at least one party with sufficient policy motivation, electoral competition can deliver (almost) first-best results (given both signals). Another explanation for symmetric policy divergence in a Downsian model is provided by Bernhardt, Duggan, and Squintani (2009). These authors show that if parties only imperfectly know the preferences of the median voter, they may offer diverging platforms partly following their own bias. Leslier and Van der Straten (2004) analyze a model related to Heidhues and Lagerlöf (2003), but assume that also voters (as well as each of the parties) receive a private signal. The authors show that in equilibrium, parties truthfully reveal their signals, if voters possess sufficiently precise information. Felgenhauer (2012) shows that in the presence of a third ("uninformed") party, a more efficient outcome can be achieved, even when this party does not receive a signal about the true state of the world. Our model also relates to Loertscher (2012). We share with

[6] "French socialist presidential candidates back universal basic income of £655 a month for all citizens." The Independent, 17 January 2017.

[7] "Money for nothing: is Finland's universal basic income trial too good to be true?" The Guardian, 12 January 2018.

this paper the assumption of binary signals and continuous policy space, together with similar concepts of equilibrium refinement. The author finds equilibria in mixed strategies in which some information is transmitted. However, he focuses on pure office motivation, so that the asymmetric equilibrium we identify is not a feature of his model.

A model in which parties are primarily policy-motivated is introduced by Schultz (1996). In contrast to our approach, Schultz (1996) does not assume that parties are uncertain about the true state of the world (only voters are). The author allows for the case where parties' preferences are polarized (distorted away from the median voter's preferences) and shows that in this case, only non-revealing equilibria fulfill a criterion similar to the Intuitive Criterion. We focus on the case where parties' preferences over policies are aligned with voters' preferences. However, the winning party also obtains a fixed utility premium for getting into office. Martinelli (2001) analyzes a model in which parties with polarized preferences care about the implemented policy. Voters and parties receive noisy signals about the true state of the world. In contrast to our model (as well as Heidhues and Lagerlöf (2003) and other authors), the author assumes that both parties receive the same signal. In contrast to Schultz (1996) the author finds that voters can infer the parties' signal even if parties' preferences are very polarized.

The conjunction of policy and office motives for parties has been introduced by Wittman (1983) and Calvert (1985) who show that policies do not generally converge in a two-party electoral equilibrium. Building on this framework, Cukierman and Tommasi (1998) show that biased parties can offer policies at the extreme opposite of their own preferences as it is it is more credible to convey one's private signal about the state of the world if it goes against her apparent interest.

Feddersen and Pesendorfer (1997) assume that voters are uncertain about the true state of the world and each voter obtains a private signal. However, the alternatives from which voters can choose are exogenously fixed and not determined via electoral competition. Gratton (2014) demonstrates in a similar framework that when policies are determined endogenously via electoral competition, voters can coordinate their votes and induce candidates to adopt the optimal policy in each state, even when voters possess arbitrarily imprecise information.

An application of a political economy approach to climate change is presented by Shapiro (2016). In this model, a journalist reports the opinion of an expert to a voter who can choose a policy. Two competing parties can make investments that influence the journalist's opinion. The author argues that the model may help to explain persistent public ignorance on climate change. By contrast, we focus on the relevance of electoral competition in the context of climate policy.

2 Model

We consider the political economy of climate policy in the context of a (potential) environmental catastrophe, corresponding to the presence of a threshold or 'tipping point' in the climate system (see for instance Barnosky et al, 2012). If the catastrophe occurs, a damage of $D > 0$ is incurred by society. Otherwise, the environmental damages caused by the emission of greenhouse gases are (for simplicity) assumed to be zero.

Suppose there are two states of the world: G ('good') and B ('bad'). The true state of the world is denoted by $W \in \{G, B\}$. In the good state there is no approaching catastrophe, so costly effort to prevent the catastrophe is not warranted. In the bad state, there is an approaching catastrophe; but the probability that it occurs can be reduced by exerting costly effort (x) to lower the emissions.

We assume that society can implement any effort x in the interval $\mathbb{X} = [0, 1]$. Given that $W = B$, the probability that the catastrophe occurs is then $1 - x$, while it is zero when $W = G$ (irrespective of the chosen effort x). The effort x is determined by the government. We implicitly assume there is only one country, hence, we abstract from environmental externalities and free-rider effects. What we are interested in is how effective a *representative democracy* is in providing an optimal level of effort, given the uncertainties surrounding the problem. We assume that there are two parties, indexed $i \in \{1, 2\}$, that announce policy platforms $x_i \in \mathbb{X}$. Then, an election takes place, and the winning party implements its announced platform. Hence, parties are committed to their announcement (e.g., Heidhues and Lagerlöf, 2003).

2.1 Information structure and payoffs

Before parties announce their policy platforms x_i ($i \in \{1, 2\}$), each of them receives a private signal s_i about the true state of the world, W. We assume that these signals are binary: $s_i \in \{g, b\}$, where a "good" signal ($s_i = g$) indicates a lower probability that a catastrophe is approaching than a "bad" signal ($s_i = b$). The two parties' signals s_1 and s_2 are drawn independently from the same distribution. More specifically, we assume that each party receives a correct signal, conditional on the true state, with probability $p \in (1/2, 1)$, hence, $Pr[s_i = g|W = G] = Pr[s_i = b|W = B] = p$. We focus on pure strategies.[8] Hence, party i's strategy $x_i(s_i)$ ($i \in \{1, 2\}$) is a mapping from s_i into $\mathbb{X}$. By contrast, voters do not observe any signal about the probability of an approaching climate catastrophe. We assume that their prior belief (probability) that $W = G$ is 1/2. This is also the probability with which nature selects $W = G$ for the true state at the beginning of the game.[9] However, after observing the policy platforms which are simultaneously

[8] Heidhues and Lagerlöf (2003) and Loertscher (2012) analyze also mixed strategies.

[9] The case where nature selects the state $W = G$ with a probability different from 1/2 is considered in an extension (Section 4). This serves us as a robustness check.

announced by the two parties, voters update their belief according to Bayes' rule. We denote the voters' belief that $W = G$ after observing the platforms by $\mu(x_1, x_2)$. We assume that all voters have identical preferences.[10]

The cost of implementing an effort of x to prevent climate damages is given by $x^2/2$. Conditional on the true state of the world, voters' payoff is given by

$$v(W, x) = \begin{cases} -\frac{x^2}{2} & \text{if } W = G, \\ -\frac{x^2}{2} - (1-x)D & \text{if } W = B. \end{cases} \tag{1}$$

Voters' preferences are thus characterized by the following (expected) utility function:

$$\begin{aligned} u(\mu, x) &= \mu v(G, x) + (1-\mu)v(B, x) \\ &= -x^2/2 - (1-\mu)(1-x)D. \end{aligned} \tag{2}$$

Given our restriction to pure strategies, party i's strategy is either fully revealing, which means that it chooses a policy platform $x_i(g)$ after observing a good signal that differs from its platform choice $x_i(b)$ after observing a bad signal, or it is non-revealing, so that $x_i(g) = x_i(b)$. Let $\hat{s}_i(x_i)$ denote party i's signal as *inferred* by the voters after observing policy platform x_i, if its signal can be inferred from x_i, given party i's (assumed) strategy. If party i plays a non-revealing strategy, or if x_i is some out-of-equilibrium platform choice that does not reveal the signal that party i observed (see Section 2.5), voters cannot infer s_i. We denote this case by $\hat{s}_i = n$. Hence, $\hat{s}_i \in \{g, b, n\}$, which corresponds to the three possible cases: 1. voters infer that party i received a good signal, 2. that it received a bad signal, or 3. party i's signal cannot be inferred. We show formally in Appendix A (Proposition 5) that this convenient way of formalizing voters' beliefs about the signals that parties received is without loss of generality. This is intuitive, given the binary signal structure in our model.

Let $\beta(s_1, s_2)$ (for *belief*) be the function that aggregates parties' signals when one or two signals are observed, or inferred by voters from observing policy platforms. Given our earlier assumptions about signals, we obtain the following conditional probabilities that the true state of the world is G:

$$\beta_{gg} \equiv \beta(g, g) = Pr[W = G | s_1 = s_2 = g] = \frac{p^2}{p^2 + (1-p)^2}, \tag{3}$$

$$\beta_{bb} \equiv \beta(b, b) = Pr[W = G | s_1 = s_2 = b] = \frac{(1-p)^2}{p^2 + (1-p)^2}, \tag{4}$$

$$\beta_{gb} \equiv \beta(g, b) = \beta(b, g) = Pr[W = G | s_i = g, s_{-i} = b] = 1/2, \tag{5}$$

[10] Hence, voters can be replaced by a 'representative voter'. Alternatively, one could assume that both parties have preferences over policies which are identical to that of the median voter.

where β_{gg}, β_{bb}, and β_{gb} are introduced as short-hand notation. Note that (by (5)) two conflicting signals "cancel each other out", so that $\beta_{gb} = 1/2$ corresponds to voters' prior belief that the true state of the world is G, when no signal is available. Furthermore, if only one signal g (resp. b) is observed or inferred, we find for the conditional probability that the true state of the world is G:

$$\beta_g \equiv \beta(g,n) = \beta(n,g) = Pr[W = G|s_i = g] = p, \tag{6}$$

$$\beta_b \equiv \beta(b,n) = \beta(n,b) = Pr[W = G|s_i = b] = 1 - p, \tag{7}$$

where the latter implies that $Pr[W = B|s_i = b] = p$.

Voters' belief that the true state of the world is G, given parties' policy platforms (x_1, x_2), is, then given by:

$$\mu(x_1, x_2) = \beta(\hat{s}_1(x_1), \hat{s}_2(x_2)). \tag{8}$$

Note that we have $\mu(x_1, x_2) = \beta(s_1, s_2)$ when voters correctly infer s_1 and s_2 upon observing x_1 and x_2. If voters can infer only the signal of one party (say, party 1), while ignoring the one of the other party in their formation of beliefs about the true state of the world, then $\mu(x_1, x_2) = \beta(s_1, n)$. Since signals are imperfect, the true state is never fully revealed. In any equilibrium and for any realization of parties' signals, it holds that $\mu(x_1, x_2) \in [\beta_{bb}, \beta_{gg}]$.

Let us finally specify parties' preferences. We assume that these are aligned with those of the voters (parties care about the efficiency of the implemented policy), but they also have an office-holding motive. The latter amounts to a fixed utility premium $f_i \geq 0$ for a party $i \in \{1, 2\}$ that wins the election. For instance, consider some hypothetical situation where party i is elected with probability one when offering platform x_i. Its expected utility is then given by

$$u(\beta(s_i, n), x_i) + f_i,$$

where x_i is the implemented policy, and $\beta(s_i, n)$ is the party's belief that $W = G$ after observing its private signal, but not the signal of the other party. A complete description of parties' expected utility is provided in Section 2.4.

As signals convey information about the true state of the world, one's signal also conditions the expectation of the signal observed by the other party. For instance, party 1's expectation about the likely realization of party 2's signal, after observing its own private signal s_1, is captured by the following conditional probability:

$$\pi \equiv Pr[s_2 = g|s_1 = g] = Pr[s_2 = b|s_1 = b] = p^2 + (1-p)^2, \tag{9}$$

where π is again a short-hand notation.

2.2 Voting behavior

Conditional on their belief $\mu = \mu(x_1, x_2)$ that the true state of the world is G, voters' *most preferred policy* (in $\mathbb{X}$) is:

$$\tilde{x} = (1 - \mu)D. \tag{10}$$

This follows simply from maximizing (2) over x. We restrict the size of the damages D so that $\tilde{x} \leq 1$ is always satisfied. This requires that $\tilde{x} \leq 1$ holds for the most pessimistic beliefs that can occur, i.e., $\mu = \beta_{bb}$, which leads to the parameter restriction $D \leq \pi/p^2$. If parties announce different platforms, voters prefer policy x_1 over x_2 (given μ) if

$$u(\mu, x_1) > u(\mu, x_2),$$

which is equivalent to (using (2) and (10))

$$|\tilde{x} - x_1| < |x_2 - \tilde{x}|.$$

Hence, party 1 is elected with probability 1 if and only if its announced policy is closer to their most preferred policy, $\tilde{x}$. This property allows us to directly compare our results to the ones in Ambrus et al. (2017) and Kartik et al. (2015), in which voters have a quadratic loss function of being away from their most preferred policy. We further assume that ties are broken randomly so that each party is elected with probability 1/2 when no off-path[11] policy platform is chosen by any party and voters are indifferent between the platforms x_1 and x_2 (given their belief $\mu(x_1, x_2)$).[12]

We express the voting behavior by a function $\sigma(x_1, x_2)$, which is the probability of electing party 1 when parties announce platforms (x_1, x_2). Given our above assumptions, in any pure-strategy equilibrium, σ can only take on the values 0, 1/2, and 1.

2.3 Social optimum

In order to understand parties' platform choices, we first need to characterize the social optimum, given the informational constraints. This social optimum would be obtained if both parties' signals were made public, and voters could directly choose their most preferred policy in $\mathbb{X} = [0, 1]$, given their updated belief about the probability that

[11] Throughout this paper, we refer to "off-path" actions as actions that should never be chosen by a player if this player sticks with her equilibrium strategy (for any realization of her signal), whereas "out-of-equilibrium" actions are deviations in general, including a deviation to a policy that should be played after receiving the opposite signal.

[12] The case where voters are indifferent between an on-path policy platform of one party and an off-path platform of the other party is discussed in Section 3.1.

$W = G$. When $s_1 = s_2 = g$, then $\mu = \beta_{gg}$ (see (3)), so that (by (10)) the optimal policy is

$$x^*_{gg} \equiv (1 - \beta_{gg})D = (1 - p)^2 D/\pi. \tag{11}$$

Similarly, when $s_1 = s_2 = b$ then the most preferred policy is $x^*_{bb} \equiv (1 - \beta_{bb})D$. When signals differ, the optimal policy is $x^*_{gb} \equiv (1 - \beta_{gb})D = D/2$. We refer to $D/2$ also as the "neutral policy": the optimal policy when no signal is revealed.

Let us also characterize the optimal policy when only one signal is revealed. Then we obtain

$$x^*_g \equiv (1 - \beta_g)D = (1 - p)D \tag{12}$$

if the signal is g, and $x^*_b \equiv (1 - \beta_b)D = pD$ if the signal is b.

We illustrate the optimal platform choices in Figure 1 (for the parameter values $D = 1$ and $p = 0.7$). Observe that x^*_g and x^*_b, resp. x^*_{gg} and x^*_{bb}, are located symmetrically around the neutral policy $D/2 = x^*_{gb}$.

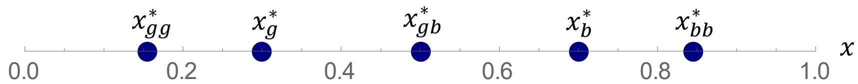


Figure 1: Optimal policies, for $p = 0.7$ and $D = 1$

Later, we analyze "symmetric revealing equilibria". These are equilibria in which each party chooses a policy platform x_g if it observes a good signal, and platform x_b if it observes b. The qualifier "symmetric" refers to the restriction that these two values are the same for both parties; and "revealing" means that the two platforms x_g and x_b differ, so that voters can infer the signal of each party that is playing this strategy. Furthermore, whenever we use the term "revealing", we implicitly also assume that parties' strategies are truthful, in the sense that $x_b > x_g$, so that a bad signal translates into more investments into climate stability than a good signal. As a benchmark for such equilibria, let us here analyze how such policies x_g and x_b that satisfy these constraints would be chosen *optimally* in order to maximize the expected utility of the voters. Because policies that are located symmetrically around the neutral policy will turn out to play a central role later on, we impose yet another restriction: $x_b = D - x_g$.

Lemma 1. *If only two different policies can be implemented (x_g and x_b), with the additional constraint that $x_b = D - x_g$, then the values $x_g = x^*_g = (1-p)D$ and $x_b = x^*_b = pD$ deliver the highest expected utility to the voters when both signals are revealed.*

The restriction $x_b = D - x_g$ implies that both policies are located symmetrically around the "neutral policy" $x^*_{gb} = D/2$, which is voters' most preferred policy given their prior, or under conflicting signals ($\mu = 1/2$). It is easy to verify that voters are indifferent between such policies x_g and x_b when $\mu = 1/2$. Observe, that the policies $x_g^* = (1-p)D$ and $x_b^* = pD$ are also voters' preferred policies when only *one* signal is revealed.[13]

The intuition behind Lemma 1 is straightforward. Given the restriction that at most two different policies can be implemented, the (unconstrained) social welfare optimum cannot be implemented since there are three different realizations of voters' most preferred policy, given the underlying information structure: $x_{gg}^* = (1-\beta_{gg})D$ (where $\beta_{gg} > p$) when $s_1 = s_2 = g$, $x_{bb}^* = (1-\beta_{bb})D$ when $s_1 = s_2 = b$, and $x_{gb}^* = D/2$ when signals differ. The policy $x_b^* = pD$ can be seen as a compromise between the neutral policy $D/2$ which is optimal when voters do not learn anything about the true state of nature, and the pro-active strategy x_{bb}^* which is optimal when both signals are 'bad' (similarly for x_g^*).

When the restriction $x_b = D - x_g$ is relaxed, a (slightly) higher welfare can be achieved when only two policies can be implemented. In this case, voters would select policy x_g (resp. policy x_b) with probability 1 when they are offered conflicting platforms. The optimal values for x_g and x_b are then skewed (relative to the reference point $D/2$).[14]

2.4 Parties' optimization behavior

In a PBE (Perfect Bayesian Nash Equilibrium), party i chooses its policy platform x_i so as to maximize its expected utility, given the strategy of the other party: $x_{-i}(s_{-i})$. Assuming that party 2 adopts strategy $x_2(s_2)$, and that voters respond to platform choices (x_1, x_2) with beliefs $\mu(x_1, x_2)$ that lead to an optimal voting probability for party 1 of $\sigma(x_1, x_2)$, the expected utility of party 1, $E_{s_2|s_1} U_1(s_1, s_2, x_1, x_2(s_2), \sigma(x_1, x_2(s_2)))$, given that it received signal s_1 and chooses policy platform x_1, is given by

$$\mathrm{E}_{s_2|s_1}\big[\sigma(x_1, x_2(s_2))\,(u(\beta(s_1, s_2), x_1) + f_1) + (1 - \sigma(x_1, x_2(s_2)))\,u(\beta(s_1, s_2), x_2(s_2))\big]. \quad (13)$$

Consider again the case of symmetric revealing strategies. Assuming that party 2 sticks with the equilibrium strategy (i.e., $x_2(g) = x_g$ and $x_2(b) = x_b$), the above expectation becomes for an arbitrary choice of x_1:

$$\begin{aligned} &Pr[s_2 = g|s_1]\big[\sigma(x_1, x_g)\,(u(\beta(s_1, g), x_1) + f_1) + (1 - \sigma(x_1, x_g))\,u(\beta(s_1, g), x_g)\big] \\ &+ Pr[s_2 = b|s_1]\big[\sigma(x_1, x_b)\,(u(\beta(s_1, b), x_1) + f_1) + (1 - \sigma(x_1, x_b))\,u(\beta(s_1, b), x_b)\big]. \end{aligned} \quad (14)$$

[13]Lemma 1 is reminiscent of Theorem 2 in Kartik et al. (2015) showing that any equilibrium where both parties are elected with positive probability yields the voter strictly lower ex-ante expected utility than in a situation where one party is always elected, offering the optimal policy conditional on its signal.

[14]E.g., for $p = 3/4$ and $D = 1$, the expected welfare is maximized when $x_g = 0.1$ and $x_b \approx 0.681$, if the pro-active policy (x_b) is implemented with probability 1 when signals differ. The same expected welfare is obtained when $x_g \approx 0.318$ and $x_b = 0.9$, if the less active policy (x_g) is implemented with probability 1 when signals differ. However, the additional welfare (relative to the symmetric case where $x_g = x_g^*$ and $x_b = x_b^*$) is in the order of magnitude of only 1 percent, and for most parameter constellations that we have checked far below that.

Note that given our earlier assumptions it holds that $\sigma(x_g, x_g) = \sigma(x_b, x_b) = 1/2$. Furthermore, in the special case where the equilibrium platform choices x_g and x_b are located symmetrically around the neutral policy, we have

$$\sigma(x_g, x_b) = \sigma(x_b, x_g) = 1/2,$$

since voters do not learn anything from observing contrasting platforms in a symmetric revealing equilibrium, and each of the policies x_g, x_b then yields an identical expected welfare.

2.5 Equilibrium concept

Given our earlier assumptions, we can summarize our model as follows (see Figure 2). There are three strategic players: party 1, party 2, and the voters acting as one player. In the first move, nature picks the state of the world, $W \in \{G, B\}$ (each with a probability of 1/2), and signals $s_i \in \{g, b\}$ for party $i \in \{1, 2\}$ with $Pr[s_i = g|W = G] = Pr[s_i = b|W = B] = p$. In the second move, party 1 chooses action (platform) $x_1 \in \mathbb{X}$, after observing only s_1 (and not s_2 or W). In the third move, party 2 chooses action $x_2 \in \mathbb{X}$, after observing only s_2 (and not s_1, x_1, or W). Finally, voters choose action $\sigma \in [0, 1]$ (the probability with which they elect party 1), after observing only x_1 and x_2 (and not s_1, s_2, or W). Assuming that the other party adopts strategy $x_{-i}(s_{-i})$, and that voters elect party 1 with a probability of $\sigma(x_1, x_2)$, party i's expected utility ($i = 1, 2$) is $E_{s_{-i}|s_i} U_i(s_i, s_{-i}, x_i, x_{-i}(\cdot), \sigma(\cdot, \cdot))$, as defined in (13) for party 1 (similarly for party 2). Figure 2 gives an overview of the game.

In the context of this model, a Perfect Bayesian Equilibrium (PBE) is a profile of strategies $(x_1^*(\cdot), x_2^*(\cdot), \sigma^*(\cdot, \cdot))$, combined with voters' beliefs (inferred signals) $\hat{s}_1(\cdot)$ and $\hat{s}_2(\cdot)$ that assign a probability of $\mu(x_1, x_2) = \beta(\hat{s}_1(x_1), \hat{s}_2(x_2))$ to the state $W = G$, conditional on observing actions $x_1, x_2 \in \mathbb{X}$, such that

(i) party i's strategy is optimal given the strategy of party $-i$ and voters' strategy $\sigma^*(\cdot, \cdot)$, for $i = 1, 2$,

(ii) voters' beliefs $\hat{s}_1(x_1)$ and $\hat{s}_2(x_2)$ are consistent with parties' strategies $x_1^*(s_1)$ and $x_2^*(s_2)$, and

(iii) the voters' strategy is optimal for each $(x_i, x_{-i}^*(s_{-i})) \in \mathbb{X}^2$, $i = 1, 2$, given voters' beliefs $\hat{s}_1(x_1)$ and $\hat{s}_2(x_2)$ for all $s_{-i} \in \{g, b\}$.

We further assume that if one party plays an action that is consistent with the equilibrium strategy of that player (i.e., should be played for some realization of this player's signal), whereas the other party chooses an "off-path" action that should never be played

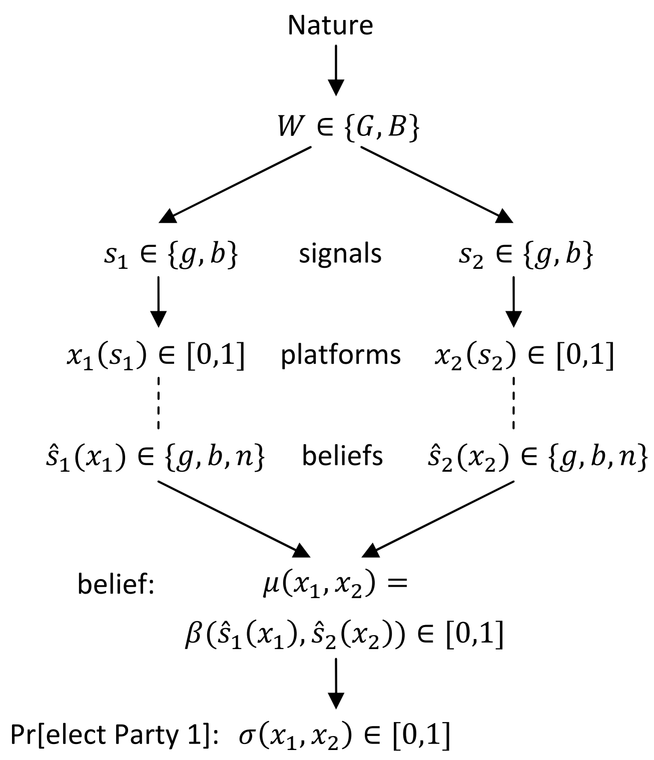


Figure 2: Overview of the game

according to the equilibrium strategy of that player (for any realization of his signal), voters rationalize the observed actions with the fewest deviations and therefore identify the deviator (Bagwell and Ramey, 1991).

It is well-known that models such as this one may display a large number of PBE, some of them relying on out-of equilibrium beliefs that are not plausible. For this reason it is useful to introduce a refinement criterion. Following the idea of Cho and Kreps (1987) in a one-sender, one-receiver game, our goal is to identify unilateral deviations from a proposed equilibrium strategy to an action x_i', that would never be profitable for party i after observing one of the two possible realizations (g/b) of signal s_i, irrespective of what voters might infer about the signal that this party received. In that case, our refinement requires that voters put zero probability on that realization of the signal s_i when they observe the off-path policy platform x_i'. Furthermore, according to our definition of "plausible beliefs", if x_i' is a deviation that could be profitable for party i after observing either one of the two possible signal realizations or after neither one of them, voters ignore the signal conveyed by x_i'. While other refinements would not uniquely pin down the beliefs for all out-of-equilibrium policy platforms in this model, our refinement does. This helps to sharpen some of our predictions because it narrows the set of parameter values where certain types of equilibria exist, thereby reducing the multiplicity of equilibria.

A formal definition of our equilibrium refinement, based on our concept of "plausible beliefs", along with further intuitive explanations, is provided for interested readers in Appendix A. Furthermore, we show in Appendix A that, when checking if an equilibrium is based on plausible beliefs, it is enough to consider voters' beliefs about the signal that a deviating party i may have received such that $\hat{s}_i(x_i') \in \{g, b, n\}$.

3 Results

Let us now proceed to the results of the model. While most authors so far have focused on symmetric equilibria, we show the existence of *asymmetric* equilibria (almost) efficiently aggregating the information received by the two parties. When there are only two parties or candidates, with any *symmetric* equilibrium, at most two different policies can be implemented, while four different policies can be implemented in an asymmetric equilibrium. An asymmetric equilibrium is therefore a natural candidate to reach the social welfare optimum, because in the latter there are only three different policies that need to be implemented (x^*_{gg}, x^*_{bb}, and x^*_{gb}), depending on the realization of the two signals.[15]

Subsequently, we also analyze symmetric revealing equilibria, and non-revealing (pandering) equilibria. Such equilibria have also been analyzed by other authors, in related frameworks. Using our refinement criterion based on "plausible beliefs", we characterize the set of parameter values for which each of the different types of equilibria exists.

3.1 Asymmetric revealing equilibria

Consider the following (candidate) equilibrium. Suppose, party 1 offers policy platforms near the extremes of the policy space, that is, $x_1 = x^*_{gg}$ if $s_1 = g$ and $x_1 = x^*_{bb}$ if $s_1 = b$. By contrast, party 2 offers platforms in the center of the policy space. For a social optimum, it is necessary that both parties are able to convey their private information truthfully and credibly to the voters. Hence, the case where party 2 always offers the platform $x^*_{gb} = D/2$, irrespective of its signal, cannot lead to the social optimum. However, that platform choice is optimal whenever the two signals are conflicting. One way to resolve this problem would be to add a "cheap talk" stage to the game where party 2 can announce whether it received a good or a bad signal, independently of its actual platform choice. In order to avoid such a change in the structure of the game itself, we may assume instead that party 2 announces a platform choice of $D/2 - \alpha$ when it receives a good, and $D/2 + \alpha$ when it receives a bad signal, where α is a (small) positive number. This

[15]This conclusion is valid only under the coarse information structure that is assumed in our model. When there are more than two possible signal realizations, or even a continuum of them, also in an asymmetric equilibrium, the information obtained by two parties can in general not be aggregated efficiently via their policy platforms.

way, party 2's platform choice is still 'revealing', yet, in the limit case where $\alpha \to 0$, the implemented policy effectively leads to the same welfare as the policy $x = D/2$ whenever this party is elected.

Definition 1. *A strategy $x_i(s)$ is* extreme *if $x_i(s) = x^*_{ss}$ for any $s \in \{g, b\}$. Instead, it is* moderate *if there exists $\alpha > 0$ such that $x_i(b) = D/2 + \alpha < x^*_b$ and $x_i(g) = D/2 - \alpha > x^*_g$.*

While it is possible to construct a variety of out-of-equilibrium beliefs such that an asymmetric equilibrium with an extreme and a moderate party exists, we focus our attention on what we denote by "plausible" beliefs (see Appendix A): if x'_i is an off-path platform choice that could be profitable for party i after observing either one of the two possible signal realizations or after neither one of them, voters ignore the signal conveyed by x'_i. Else, voters correctly infer the only signal realization for which a deviation to x'_i is profitable, for *some* beliefs of the voters.

Proposition 1. *There exists $f^\alpha > 0$ such that, if $f_2 < f^\alpha$, then there exists an asymmetric equilibrium with plausible beliefs in which party 1 plays an extreme strategy and party 2 plays a moderate strategy. Furthermore, let*

$$f^\epsilon \equiv \frac{D^2}{8(1 - 2p + 2p^2)^2}.$$

If $f_2 < f^\epsilon$, for any $\epsilon > 0$ (sufficiently small), there exists an equilibrium with plausible beliefs in which party 1 plays an extreme strategy and party 2 plays a moderate strategy with $x_2(b) = D/2 + \epsilon$ and $x_2(g) = D/2 - \epsilon$.

In such an asymmetric equilibrium, we have two clearly identifiable parties playing different strategies. One party is "moderate" in the sense that it conveys its message while offering a "safe" platform in case the message of the other party is conflicting. The second party is "extreme" in the sense that it offers the anti-pandering policy x^*_{gg} (resp. x^*_{bb}), depending on its signal. Only one party (the moderate one) has to be sufficiently policy-motivated for the equilibrium to exist. The extreme party can have any kind of motivation, as it benefits both from being elected whenever the other party obtains an identical signal (with a probability greater than 1/2) and from seeing the almost socially optimal policy being implemented for any realization of s_1 and s_2. As parties are clearly identifiable, the equilibrium can be sustained even for parameter values for which the moderate party might mimic the anti-pandering strategy of the extreme one. The equilibrium then exists under the assumption that, when indifferent, voters elect the non-deviating party. Such a pattern of voters "preferring the original" is often described as characterizing extreme-right votes surges when a moderate right-wing party tries to move too far to the right (see Arzheimer, 2009).

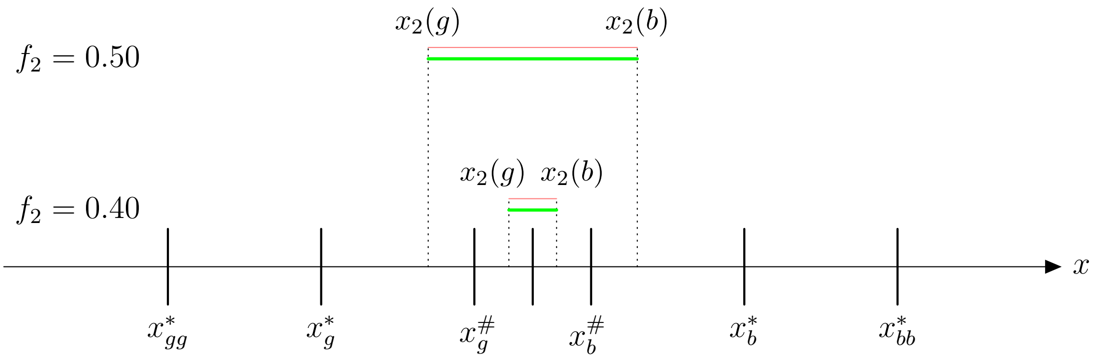


Figure 3: Profitable deviations from the asymmetric equilibrium strategies for the moderate party 2 for *some* beliefs; thick green line: after observing $s_1 = g$; thin red line: $s_1 = b$, for $D = 1$, $p = 0.7$, with $x_2^g = D/2 - \alpha$ and $x_2^b = D/2 + \alpha$.

While there is some freedom in the "design" of an asymmetric equilibrium regarding the exact choice of the moderate party's policy platforms, the equilibrium policy platforms of the extreme party are always x^*_{gg} (resp. x^*_{bb}). Those extreme platforms correspond to the social optimum for the case where two conforming signals are revealed. The moderate party's platforms are located symmetrically around the neutral policy, but there remains a range of distances to $D/2$ such that an asymmetric equilibrium exists. As both parties and voters have the same objective function regarding the implemented policy, it seems reasonable to focus on the case where voters and parties coordinate on an equilibrium with the smallest possible distance to the neutral policy, such that party 2 can still credibly convey its signal to the voters via its platform choice. If f_2 is sufficiently small ($f_2 < f^\epsilon$), then the distance to $D/2$ can be arbitrarily small. Indeed, party 2 then only deviates from the neutral policy in order to convey its signal. By contrast, if f_2 is larger but not too large ($f^\epsilon < f_2 \leq f^\alpha$), then the distance to the neutral policy must be larger, in order to render a deviation to $D/2 + \alpha$ after observing $s_2 = g$ (and vice versa) unprofitable.

We illustrate this idea in Figure 3. The critical values $x^\#_g$ and $x^\#_b$ in the figure are defined generally (also for later reference) as follows. Let $x^\#_g$ be the threshold policy that is as efficient from voters' perspective as the policy x^*_{gg} after observing *only one* good signal.[16] Similarly, $x^\#_b$ is the policy that is as acceptable to the voters as x^*_{bb} after observing only one bad signal. The bottom part of Figure 3 corresponds to a parameter value of $f_2 = 0.4$. For this parameter value, the asymmetric equilibrium exists, with α strictly positive as $f^\epsilon < f_2 < f^\alpha$. The green (red) line at the center illustrates the platform choices x_2 to which party 2 could profitably deviate under *some* beliefs of voters about the realization of s_2, after observing $s_2 = g$ (resp. $s_2 = b$). The lines are fully overlapping because a deviation to a policy in this range is profitable whenever voters infer that party 2's signal was either good or bad (depending on s_1), but never profitable

[16] It is possible to show that $x^\#_g = 2(1-p)D - x^*_{gg}$, see the proof of Proposition 1 in the Appendix.

when the signal is ignored. If its signal is ignored, party 2 would not be elected under the deviation because with only one available signal (from party 1), voters prefer to elect party 1 (for $s_1 = g$ and for $s_1 = b$) as $x_2(g) > x_g^{\#}$ (and $x_2(b) < x_b^{\#}$). This implies that voters prefer the extreme platform of party 1 to the moderate one of party 2 when observing only one signal. Because the green and the red lines are overlapping, under this type of deviation voters ignore party 2's signal (given plausible beliefs), which renders the deviation unprofitable.

The situation changes when office motivation f_2 becomes too large ($f_2 > f^\alpha$). In that case, it no longer holds that $x_2(g) > x_g^{\#}$.[17] The overlapping lines then stretch beyond the interval $[x_g^{\#}, x_b^{\#}]$. Such a case is shown in the top part of Figure 3. The equilibrium fails to exist because upon observing $s_2 = g$, party 2 would find it profitable to deviate to some $x_2' \in (D/2 - \alpha, x_g^{\#})$. Given plausible beliefs, voters would discard party 2's signal under this deviation, and yet, elect party 2 as this party's policy platform is preferred to x_{gg}^* when only one signal (g) is available. The deviation is clearly profitable, because party 2 is, then, elected when signals are conforming, as under a deviation to $D/2 + \alpha$ with $\hat{s}_2(D/2 + \alpha) = b$, but the deviation policy is less distorted than $x_2' = D/2 + \alpha$.[18]

Our assumption that voters ignore the signal conveyed by a deviation that is profitable for a party after either signal realization for *some* beliefs (part (iii) of Definition 2 in Appendix A), determines the extent to which such deviations can be profitable and, hence, the range of parameter values for which the equilibrium exists. For $f_2 < f^\epsilon$, the equilibrium exists for any specification of these beliefs, as there is no such deviation (the central overlapping lines in Figure 3 vanish for $f_2 < f^\epsilon$). For higher values of f_2, it is possible to construct other out-of-equilibrium beliefs such that the equilibrium exists for a broader set of parameter values than under our definition of plausible beliefs.

An important characteristic of the asymmetric equilibria we characterize here is that each of the two parties is identified as being either "moderate" or "extreme", for each realization of its signal. The reason is that parties alternating being moderate or extreme depending on the signal they receive would not permit to reach the (almost) efficient outcome of Proposition 1. Consider an asymmetric equilibrium where, say, party 1 plays $x_1(g) = x_{gg}^*$ and $x_1(b) = D/2$, while party 2 plays $x_2(g) = D/2$ and $x_2(b) = x_{bb}^*$. Such an equilibrium cannot lead to the first-best, because for $s_1 = g$ and $s_2 = b$, an extreme policy is always implemented.

[17] The critical value f^α is defined by the equality $x_2(g) = D/2 - \alpha = x_g^{\#}$ that is satisfied when $f_2 = f^\alpha$.

[18] By construction, party 2 is indifferent between its equilibrium platform and the deviation platform $D/2 + \alpha$ when the equilibrium exists; see the proof of Proposition 1 for further details.

3.2 Symmetric revealing equilibria

As indicated in Section 2.3, a (truthful) "symmetric revealing equilibrium" consists of two choices, x_g and x_b, such that party i chooses $x_i = x_g$ if $s_i = g$ and $x_i = x_b$ if $s_i = b$. In general, x_g and x_b can take on arbitrary values in $\mathbb{X}$, as long as $x_b > x_g$ holds (if $x_b < x_g$, the equilibrium would not be 'truthful', and if $x_b = x_g$ it would not be revealing).[19]

As a benchmark case, we first show that if voters *ignore* off-path platform choices in their formation of beliefs ($\hat{s}_i(x_i') = n$ if $x_i' \notin \{x_i(g), x_i(b)\}$, $i = 1, 2$), the policies described in Lemma 1 constitute a PBE:

Lemma 2. *If voters ignore off-path platform choices in their formation of beliefs, there exists a symmetric revealing equilibrium in which parties adopt the 'strategies'* $x_g^* = (1-p)D$ *and* $x_b^* = pD$.

This equilibrium exists for any degree of parties' office-motivation (captured by the parameters f_1 and f_2). Even when parties' office-holding motives are strong, they can truthfully convey their realized signals to the voters via their policy platform choices. However, the result comes with the caveat that voters ignore the information transmitted by a party playing some off-path platform x_i', even if the only possible signal for which such a deviation is profitable under *some* beliefs is g (resp. b).

For example, if party 1 receives signal $s_1 = g$, then a deviation to $x_1' = x_{gg}^*$ is profitable when voters infer $\hat{s}_1(x_1') = g$. Then if $s_2 = g$, party 1 is elected for sure (rather than with a probability of 1/2 – as in equilibrium), and in addition, it implements a policy that is (in expectation) superior to the policy that would be implemented in equilibrium. Overall, it is straight-forward to show that the deviation leads to an increase in party 1's expected payoff (see the proof of Lemma 2). Conversely, if $s_1 = b$ then party 1 has no incentive to deviate to $x_1' = x_{gg}^*$, irrespective of voters' beliefs.

Figure 4 illustrates the ranges of x_1-values to which party 1 would be willing to deviate from a strategy $\{x_g^*, x_b^*\}$ under *some* beliefs of the voters when it received a 'good' signal (thick green line), and when it received a 'bad' signal (thin red line), for an intermediate value of office motivation $f_1 = 0.4$, and for pure office motivation $f_1 \to \infty$. A deviation to values of x_1 in the interval $(D/2, x_b^*)$ is profitable to party 1 if f_1 is sufficiently large for it to prefer to be elected at the cost of implementing a policy on the "wrong side" of the neutral policy (given party 1's signal $s_1 = g$), and voters believe that this party received a *bad* signal when they observe the deviation. If $s_2 = g$, voters would infer that $s_1 \neq s_2$ and prefer party 1's platform to that of party 2 because it is closer to the "neutral policy" $D/2$. Also a deviation to values of x_1 in the interval $(x_g^*, D/2)$ is profitable to party 1 if f_1 is sufficiently large, and voters believe that this party received a *bad* signal

[19] In the analysis of symmetric revealing equilibria, we sometimes refer to x_g and x_b as 'strategies', when $x_i(g) = x_g$ and $x_i(b) = x_b$ holds for both parties.

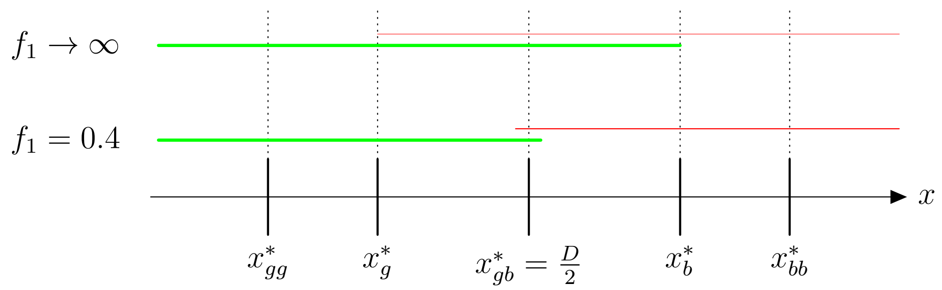


Figure 4: Profitable deviations from the equilibrium strategies $\{x^*_g, x^*_b\}$ for *some* beliefs; green line: after observing $s_1 = g$; red: $s_1 = b$, for $D = 1$, $p = 0.7$.

when they observe the deviation. Again, such a deviation induces wrong beliefs about party 1's true signal, and since voters infer that $s_1 \neq s_2$ when $s_2 = g$ they prefer party 1's platform to that of party 2 because it is closer to the "neutral policy" $D/2$.[20]

Building on these insights, we arrive at the following result:

Lemma 3. *Any pair of symmetric revealing strategies* $(x_g, x_b) \neq (x^*_{gg}, x^*_{bb})$ *does* not *constitute an equilibrium under plausible beliefs.*

The profitable deviations under plausible beliefs that are underlying this (negative) result are generally towards the anti-pandering strategy x^*_{gg} (if $x_g \neq x^*_{gg}$), resp. to x^*_{bb} (if $x_b \neq x^*_{bb}$). In particular, as we show in the proof of Lemma 3, if $x_g \neq x^*_{gg}$ *and* $x_b \neq x^*_{bb}$, there is always a profitable deviation to x^*_{gg} (resp. x^*_{bb}) for some player i after observing $s_i = g$ (resp. $s_i = b$). Only in the special case where one of the two strategies (x_g, x_b) is already the corresponding anti-pandering strategy (x^*_{gg}, resp. x^*_{bb}), while the other one is not, the profitable deviations underlying Lemma 3 may be different, but it is still possible to show that there exist profitable deviations under plausible beliefs.[21]

The above result suggests that there exists only one candidate PBE with *symmetric* revealing strategies and plausible beliefs, corresponding to the anti-pandering strategies x^*_{gg} and x^*_{bb}.[22] This is confirmed by our next result.

Proposition 2. *If f_i is in an intermediate range $\forall i \in \{1, 2\}$, there exists a unique symmetric revealing equilibrium with plausible beliefs (see Definition 2), in which parties adopt the anti-pandering 'strategies' x^*_{gg} and x^*_{bb}. Else, there exists no symmetric revealing equilibrium with plausible beliefs.*

[20] The lowest value of x_1 to which party 1 would be willing to deviate when $s_1 = g$ (see Figure 4) is given by the condition that voters are indifferent between this policy platform and the platform $x_2 = x^*_g$ that party 2 chooses when $s_2 = g$.

[21] The proof of this specific aspect is a bit involved and provided in an online appendix.

[22] Given any other pair of symmetric strategies, there are profitable deviations either to x^*_{gg} after observing $s_1 = g$, or to x^*_{bb} after observing $s_1 = b$. Therefore, any other conceivable equilibrium refinement based on the Intuitive Criterion adapted to our two-sender context would yield similar results as our refinement based on "plausible beliefs". Indeed, those deviations are profitable for some beliefs after observing one signal only, and voters infer this correctly. In this sense, our more narrow definition of "plausible beliefs" (see Definition 2 in Appendix A) is without loss of generality.

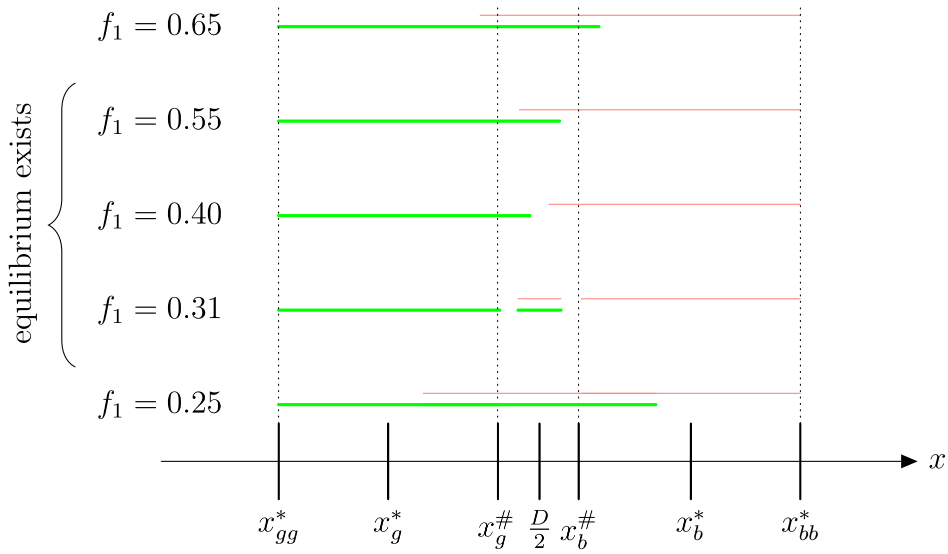


Figure 5: Profitable deviations from the equilibrium strategies $\{x^*_{gg}, x^*_{bb}\}$ for *some* beliefs; thick green line: after observing $s_1 = g$; thin red line: $s_1 = b$, for $D = 1$, $p = 0.7$

We illustrate in Figure 5 the logic of this equilibrium, by studying whether there exist profitable unilateral deviations for party 1 under plausible beliefs when party 2 plays the equilibrium strategy. Office motivation f_1 must not be too high for the equilibrium to exist. If party 1 has sufficiently high office motivation, it could deviate after observing $s_1 = g$ by announcing the platform $x^\#_g$ closer to the neutral one, but sufficiently close to x^*_g to be elected when signals are identical if voters observe only one signal $s_2 = g$. Under plausible beliefs, voters would ignore the signal of party 1 playing $x^\#_g$ if its office motivation is sufficiently high for the deviation to be profitable under both $s_1 = g$ and $s_1 = b$ for some beliefs of the voters. This case is illustrated on the top of Figure 5, plotted for $f_1 = 0.65$, for which the equilibrium fails to exist (note the overlapping thick green and thin red lines above the threshold policies $x^\#_g$ and $x^\#_b$, implying $\hat{s}_1 = n$ for a deviation in this range, given our definition of plausible beliefs). The deviation is profitable because it increases party 1's winning probability: when signals are conforming (the more likely case), under this type of deviation it is elected with probability 1 (instead of 1/2, as in the assumed equilibrium).

With lower office motivation (second case from the top in Figure 5, with $f_1 = 0.55$), the lines do not overlap up to the points $x^\#_g$ and $x^\#_b$, so that the equilibrium exists. The plausible beliefs sustaining the equilibrium are as follows. For extreme values of x_1 (to the left of x^*_{gg} or to the right of x^*_{bb}), voters ignore the signal of party 1 as a deviation to a policy in these ranges is never profitable. For the non-overlapping part of the green (red) line, voters infer $s_1 = g$ (resp. $s_1 = b$) when observing a deviation by party 1 to an off-path platform in the respective range. For the overlapping part of the lines, voters ignore the signal of party 1, but a deviation to some x'_1 in this range is not profitable because party 1 would never be elected. The third case from the top in Figure 5 presents a similar case (plotted for $f_1 = 0.4$), but as it assumes even lower office motivation there is no overlapping part. Parties are not benefiting enough from being elected to be willing to implement a policy on the "wrong" side of the neutral policy $x^*_{gb} = D/2$.

With even lower office motivation (fourth case from the top in Figure 5, for $f_1 = 0.31$), party 1 is willing to reduce its chances of being elected in order to improve the quality of the implemented policy under conflicting signals. This is the reason why we observe again profitable deviations around the central policy $D/2$, for some beliefs. The deviations are symmetric around $D/2$ because they are only profitable if the deviating party would be elected under *conflicting* signals, in which case it is indifferent between policies equidistant from $D/2$ as $\mu = 1/2$. For this reason, the red and green lines are overlapping, and voters always ignore the signal of a party deviating in this range under plausible beliefs. Therefore, party 1 is not elected when deviating to a policy in this range, which renders the deviation unprofitable.

When winning office is even less attractive for party 1 (see the case with $f_1 = 0.25$ at the bottom of Figure 5), the central overlapping lines stretch further away from $D/2$, beyond the thresholds $x^{\#}_g$ and $x^{\#}_b$ where a deviating party can be elected when voters infer only one signal (from the non-deviating party). Then party 1 could deviate upon observing $s_1 = g$ to the policy platform $x^{\#}_b$ closer to the neutral policy (but on the "wrong" side of the neutral policy, given party 1's signal). This way, it would get elected when the two signals are conflicting (i.e., when $s_2 = b$), in which case the implemented policy is better than the one that would be implemented if both parties play their (assumed) equilibrium strategies. With party 1's policy-motivation being sufficiently strong, this deviation is profitable, so that the symmetric anti-pandering equilibrium characterized in Proposition 2 then fails to exist.

As it was the case in the asymmetric equilibria, except for the intermediate case where no lines overlap ($f_1 = 0.4$ in Figure 5), whether deviations are profitable or not crucially depends on our assumption that voters ignore party 1's signal for deviations that are profitable under both signal realizations for *some* beliefs (see part (iii) of our Definition 2). It is possible to construct other out-of-equilibrium beliefs such that the symmetric anti-pandering equilibrium exists for a broader set of parameter values (in particular for larger values of parties' office motivation) by removing this part of the definition. What remains robust however (see Lemma 3) is that no other symmetric revealing equilibrium exists.

3.3 Non-informative equilibrium

Both types of revealing equilibria described above rely on at least one of the parties being sufficiently policy-motivated. When both parties have high office motivation however, a non-informative "pandering" equilibrium arises, similar in spirit to the one described by Heidhues and Lagerlöf (2003).

Proposition 3. *There exists a symmetric "pandering" equilibrium with plausible beliefs where both parties offer the platform $x = D/2$ regardless of the signal they receive if for both parties, office motivation is sufficiently high ($f_i > f^p$).*

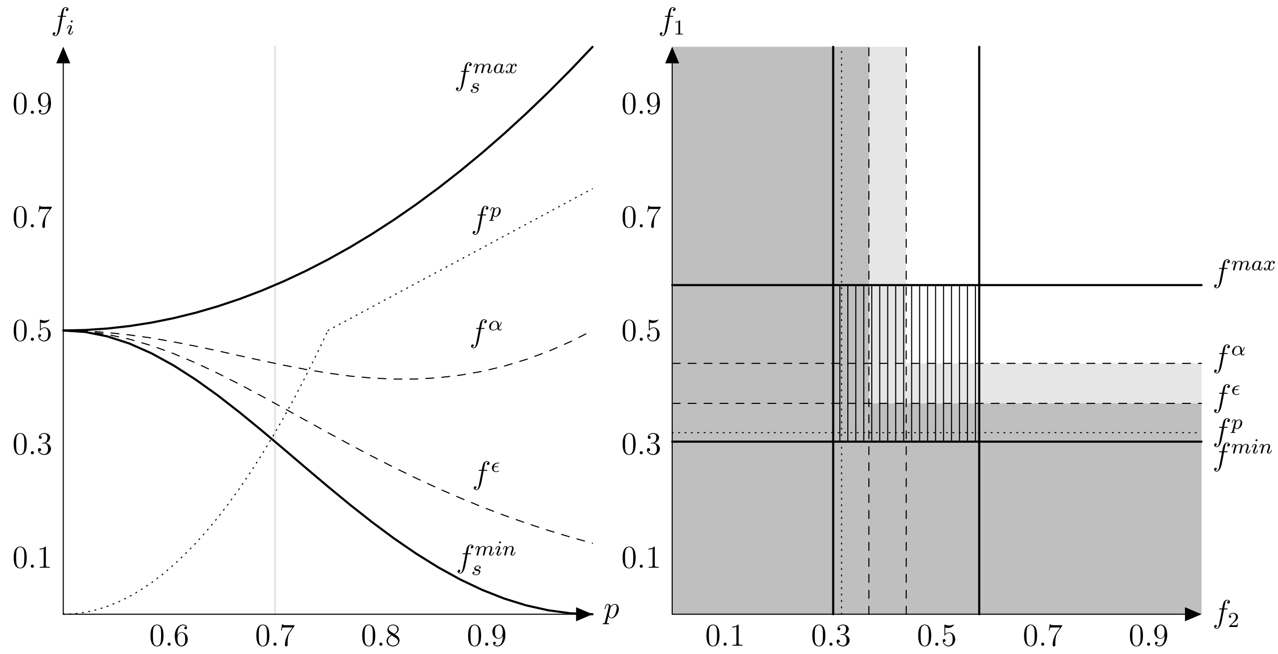
The idea behind the pandering equilibrium is that if both parties have very strong office motivation, voters cannot infer anything from a party deviating from the equilibrium strategy as any deviation that manages to attract voters would be profitable regardless of the signal received. Hence, there is no profitable deviation from the "pandering strategy" $x_i(g) = x_i(b) = D/2$ $(i = 1, 2)$ under plausible beliefs. This result mirrors the results of Heidhues and Lagerlöf (2003) and Loertscher (2012) who restrict their attention to purely office-motivated parties.

3.4 Comparison

We conclude this section with a brief discussion about the three types of equilibria we have identified above, and how restrictive the conditions for their existence are.

We plot on the left side of Figure 6 the conditions on f_i (for $D = 1$) for the equilibria described in Propositions 1 - 3 to exist. The asymmetric equilibrium exists for $f_i < f^\alpha$, and is almost efficient if $f_i < f^\epsilon$. The symmetric "anti-pandering" equilibrium exists if $f_i \in (f^{min}, f^{max})$. Finally, f^p represents the minimum level of office motivation for the pandering equilibrium to exist. Note that these conditions are for one party only. If we consider both parties with (possibly) heterogeneous levels of office-motivation, the parameter restrictions for the existence of the asymmetric equilibrium become (relatively) less restrictive than for the symmetric one. This becomes clear when considering the right side of Figure 6, that displays the equilibrium constellation for $p = 0.7$ (corresponding to the vertical grey line in the left part of the figure). In all the grey areas, the asymmetric equilibrium exists (dark gray represents the "almost efficient" equilibrium with $\alpha = \epsilon$, assumed infinitesimally small). The symmetric anti-pandering equilibrium of Proposition 2 exists only in the striped area. As there is a condition on both parties to have an intermediate office-motivation f_i for the equilibrium to exist, the area is rather limited. The pandering equilibrium exists for sufficiently high values of office motivation, see the top right part of the graph (above the dotted curve f^p). While it is always true, regardless of D and p, that $f^{max} \geq f^\alpha \geq f^\epsilon \geq f^{min}$, how tight the parameter restrictions for the pandering equilibrium to exist are, as compared to the two other equilibrium types, depends on the damage level (D) and on the precision of the signal (p).

Perhaps surprisingly, there are cases where voters may benefit if the degree of office-motivation of one party (say, party 1) increases, holding f_2 constant. This holds when



Threshold values of f_i, with $D = 1$. Threshold values of f_1, f_2, with $p = 0.7$, $D = 1$.

Figure 6: Equilibrium constellation

f_1 and f_2 are such that the asymmetric and the symmetric anti-pandering equilibria co-exist (where the grey area in Figure 6 overlaps with the striped area), so that players may coordinate on the less efficient of the two equilibria. Raising f_1 further (when $f_1 > f_2$ holds to begin with), the anti-pandering equilibrium ceases to exist, while the (almost) efficient asymmetric equilibrium continues to exist.[23]

4 Extension: skewed prior

In our analysis so far, we assumed that voters' prior belief that the true state of the world is good is 1/2. This is a plausible benchmark case in a world where voters are a priori poorly informed about the true state of the climate system. Nevertheless, it is a special case, and in this section we extend the model and allow for a skewed prior. We do not seek to replicate the entire analysis from the previous section. We merely want to investigate whether an *asymmetric revealing equilibrium* as characterized in Proposition 1 exists also under such circumstances. Loertscher (2012) shows that *symmetric* revealing equilibria fail to exist under a skewed prior when parties only care about getting into office and signals are "strong", which means that the conditional probability after receiving a

[23] Also in Abmrus et al. (2017), voters can benefit from a small amount of office-motivation, while higher levels adversely affect welfare. The underlying mechanisms that lead to this result are, however, different than in our model.

specific signal, that the other signal is the same, is larger than 1/2.[24] We demonstrate below that the asymmetric revealing equilibrium highlighted in our paper continues to exist (within a certain range of parameter values) when parties care both about getting into office and about the efficiency of the implemented policy. Hence, it is not an artifact of our previous assumption that voters' prior belief is unskewed.

Let $q \equiv \Pr[W = G] \in (0, 1)$ be the ex ante probability that the true state of the world is good. The previous sections, therefore, correspond to the special case $q = 1/2$. This generalization also leads us to a modified way of modeling the signal structure. If we would maintain our assumption from Section 2 that party i receives a correct signal with probability $p \in (1/2, 1)$, irrespective of q, this would lead to some implausible predictions. Suppose q is very small, so that ex ante, is is known almost with certainty that the true state of the world is bad. Then under a fixed p, say, close to 1/2, each party would still receive a signal indicating that the true state of the world is good with a probability close to 1/2. This seems implausible because it is common knowledge that the true state of the world is most likely bad.

To avoid this problem, we assume instead that with a probability of $1 - \eta$, the signal s_i is drawn randomly from the same distribution as the state of the world itself, while with a probability of η, the signal is always correct. The interpretation is that there are two types of experts: η is the fraction of "informed experts" who know the true state of the world with certainty, while the remaining experts are unbiased but uninformed. The latter do not know more about the true state of the world than the voters and draw their signal accordingly from the prior distribution. We further assume that party i does not know the type of its expert. Then we obtain

$$p_g \equiv \Pr[s_i = g | W = G] = \eta + (1 - \eta)q,$$

$$p_b \equiv \Pr[s_i = b | W = B] = 1 - (1 - \eta)q.$$

For $q = 1/2$, this reduces to the same information structure as before, $p_g = p_b = \frac{1}{2}(1+\eta) \equiv p$. We also obtain modified expressions for the conditional probabilities (see (3) – (5)):[25]

$$\beta_g \equiv \Pr[W = G | s_i = g] = \frac{qp_g}{qp_g + (1 - q)(1 - p_b)} = p_g,$$

$$\beta_{gg} \equiv \Pr[W = G | s_1 = s_2 = g] = \frac{qp_g^2}{qp_g^2 + (1 - q)(1 - p_b)^2}.$$

[24] In the case with an unskewed prior, this is assured by our assumption that $p > 1/2$, which implies $\pi > 1/2$.

[25] The corresponding expressions for $(W = B | s_i = b)$ etc. are obtained by substituting $1 - q$ for q and swapping p_g and p_b.

For conflicting signals we obtain:[26]

$$\beta_{gb} \equiv \Pr[W = G | s_i = g \wedge s_{-i} = b] = \frac{q p_g (1 - p_g)}{q p_g (1 - p_g) + (1 - q) p_b (1 - p_b)} = p_g / (1 + \eta).$$

Note that two conflicting signals do not "neutralize" each other, so that the conditional probability $\Pr[W = G | s_i = g \wedge s_{-i} = b]$ differs from the prior q unless $q = 1/2$.[27]

Finally, for the conditional expectation of the *other* party's signal, we obtain the expression:[28]

$$\pi_g \equiv \Pr[s_2 = g | s_1 = g] = \frac{q p_g^2 + (1 - q)(1 - p_b)^2}{q p_g + (1 - q)(1 - p_b)} = q + (1 - q)\eta^2.$$

A "strong" signal therefore corresponds to parameter values for which both π_g and π_b are greater than 1/2. With these modified expressions, we can again compute the optimal policies x_g^*, x_b^*, x_{gg}^*, x_{bb}^*, and x_{gb}^* when one resp. two signals are revealed (using the respective value of μ in (10)). When no signal is revealed at all, the optimal policy (given the prior) is the *neutral policy*: $x_0^* \equiv (1 - q)D$. This differs from x_{gb}^* unless $q = 1/2$ since conflicting signals do not cancel each other out. Unlike in the previous section, the optimal policies are not located symmetrically around the neutral policy (unless $q = 1/2$), as illustrated in Figure 7.

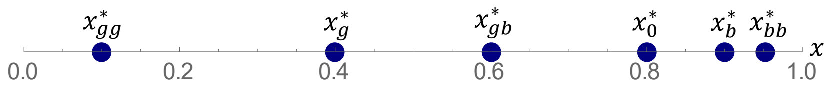


Figure 7: Optimal policies under skewed prior, for $q = 1/5$, $\eta = 1/2$, and $D = 1$

We are now ready to state the main result of this section. It confirms that an asymmetric equilibrium, similar to the one characterized in Proposition 1 for the case $q = 1/2$ (i.e., no skewed prior), exists also under a skewed prior if the office-motivation of at least one party is not overly high.

Proposition 4. *When signals are "strong" ($\pi_g, \pi_b > 1/2$), there exists an asymmetric revealing equilibrium with plausible beliefs where party 1 plays the strategy $x_1(g) = x_{gg}^*$ and $x_1(b) = x_{bb}^*$, while party 2 plays $x_2(g) = x_{gb}^* - \alpha_g$ and $x_2(b) = x_{gb}^* + \alpha_b$, if f_2 is not too large. If f_2 is sufficiently small, α_g and α_b are arbitrarily close to zero, so that the equilibrium is arbitrarily close to the socially optimal policy. For intermediate values of f_2, α_g or α_b (or both) is / are strictly positive.*

[26] Recall that this expression equals 1/2 in the case $q = 1/2$.

[27] E.g., for $q = 1/5$ and $\eta = 1/2$, we obtain $p_g = 3/5$, $p_b = 9/10$, so $\Pr[W = G | s_i = g \wedge s_{-i} = b] = 0.4$.

[28] The corresponding expression for $\pi_b \equiv \Pr[s_2 = b | s_1 = b]$ is again obtained by substituting $1 - q$ for q and swapping p_g and p_b.

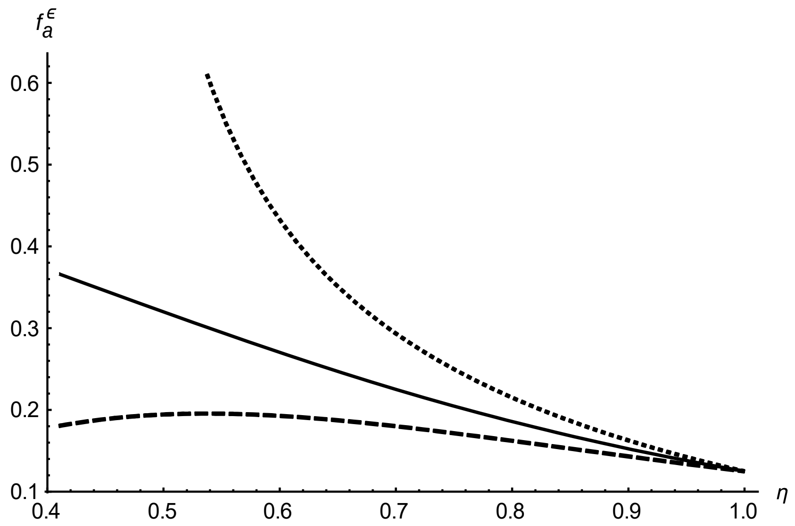


Figure 8: Critical values for f_2 under skewed prior, for $D = 1$; plain curve: f^ϵ for $q = 1/2$ (reference), dotted (dashed) curve: $f^{\epsilon,g}$ ($f^{\epsilon,b}$) for $q = 0.4$

Figure 8 shows the critical values of the office-motivation f_2 of the "moderate party" for the asymmetric equilibrium with $\alpha_g = \alpha_b = \epsilon$ to exist (see the proof of Proposition 4 for further details). The smallest value of η plotted on the figure corresponds to the minimum value such that $\pi_g > 1/2$ for $q = 0.4$, so that both signals are strong. A value of f_2 below the dashed curve $f^{\epsilon,b}$ rules out a deviation by party 2 to $x_2' = x_2(g)$ after observing $s_2 = b$, while a value below the dotted curve $f^{\epsilon,g}$ rules out a deviation to $x_2' = x_2(b)$ after observing $s_2 = g$. The equilibrium exists if f_2 does not exceed the *lowest* of the critical values, which is $f^{\epsilon,b}$ (dashed curve) in our example with $q < 1/2$. We see that for the lowest value of η such that the signal is strong ($\eta \approx 0.4$), the dotted curve converges to infinity, as for $\pi_g = 1/2$ the corresponding deviation decreases the quality of the policy without increasing the probability of winning the election. The plain curve shows f^ϵ in the reference case $q = 1/2$. It corresponds to the respective curve for f^ϵ in Figure 6, but is plotted over η.[29] We observe from Figure 8 that the asymmetric equilibrium that implements the first-best continues to exist for a fairly large set of parameter values when the prior is skewed.

As in the case with $q = 1/2$, for somewhat larger values of f_2, a deviation from x_{gb}^* by an infinitesimally small amount is insufficient for party 2 to credibly reveal its signal. Party 2's equilibrium policies are then distorted away from x_{gb}^* by values of respectively $\alpha_g > 0$ and $\alpha_b > 0$ to render a deviation unprofitable where this party mimics its own behavior following the opposite signal. This case is relevant in particular if signals are informative (η is sufficiently large). For example, if $q = 1/3$, $D = 1$, and $\eta = 0.8$, then we obtain $f^{\epsilon,b} \approx 0.14$ ($< f^{\epsilon,g}$), whereas $f^\alpha \approx 0.31$. For comparison, if $q = 1/2$, $D = 1$,

[29]For $q = 1/2$, the relation between η and p is simply $\eta = 2p - 1$.

and $\eta = 0.8$ (which corresponds to $p = 0.9$), then an asymmetric equilibrium exists for $f_2 < f^\alpha \approx 0.43$.

5 Conclusion

In a complex world, even interested voters cannot be well-informed about every conceivable policy dimension. Hence, they have to rely on representatives and their experts who collect information for them. Parties can then try to signal their private information to the voters via their platform choices, and voters elect the party that offers a more attractive platform, given their updated beliefs.

The observation that political parties often disagree even about fundamental issues such as climate change suggests that pandering is not the main issue here. If parties would pander to the public opinion, their announcements and platform choices should converge towards the dominant position. In the context of anthropogenic climate change, the observed disagreement is particularly puzzling, given the large amount of consensus among experts on this issue. This paper offers a novel explanation for such observations, that does not rely on differences in parties' ideologies or other factors such as the influence of lobbyist groups.

Using a parsimonious setup, we demonstrate that when at least one party cares not only about about holding office but also about the efficiency of the implemented policy, representative democracy may well be able to convey the private information of both parties to the voters. While in a symmetric equilibrium, the outcome then exhibits anti-pandering, that is, platform choices are more extreme than would be socially desirable, relaxing the symmetry assumption leads to a richer set of outcomes that can be implemented. In particular, there exists an asymmetric equilibrium in which parties truthfully reveal their private information, and the implemented outcomes are (almost) first-best for any realization of the two parties' signals. In this equilibrium, one party adopts more extreme policy positions: it follows its true signal but behaves as if it had received two signals with identical contents. The other party adopts a moderate position: close to the "neutral policy", voters' preferred policy when signals are conflicting, just distorted enough to still convey its signal credibly to the voters.

An interesting extension of our model would be to analyze whether asymmetric equilibria, similar to the one characterized in this paper, may exist also under a continuous state and signal space, in a setting similar to the one of Ambrus et al. (2017). Furthermore, it is not obvious how the equilibrium outcome would change if parties have biased preferences. We leave these challenges as starting points for future research.

Appendix A: Equilibrium refinement

Here we provide a formal definition of our equilibrium refinement (informally discussed in the main text), based on our concept of "plausible beliefs".

Consider a PBE $(x_1^*(\cdot), x_2^*(\cdot), \sigma^*(\cdot,\cdot), \hat{s}_1(\cdot), \hat{s}_2(\cdot))$. The resulting payoff of party 1 when observing signal s_1 is $U_1^*(s_1) \equiv E_{s_2|s_1} U_1(s_1, s_2, x_1^*(s_1), x_2^*(s_2), \sigma^*(x_1^*(s_1), x_2^*(s_2)))$.[30] We say that action (policy platform choice) x_1 is *equilibrium dominated* for signal s_1 if there is no voters' belief about party 1's signal $\hat{s}_1(x_1) \in \{g, b, n\}$ such that party 1 would increase its payoff by playing x_1. Formally,

$$U_1^*(s_1) > E_{s_2|s_1} \max_{\sigma \in R^*(x_1, x_2^*(s_2))} U_1(s_1, s_2, x_1, x_2^*(s_2), \sigma), \tag{15}$$

where $R^*(x_1, x_2) \in [0,1]$ is the set of possible equilibrium responses σ of the voters that can arise after actions x_1 and $x_2 = x_2^*(\cdot)$ are observed, for *some* belief $\hat{s}_1(x_1) \in \{g, b, n\}$. Afterwards, we show that our restriction to voters' beliefs about parties' signals to lie on the "grid" $\hat{s}_i(x_i) \in \{g, b, n\}$ is without loss of generality.

Let $\mathbb{X}_1^- = \{x_1 \in \mathbb{X} \text{ but } x_1 \notin \{x_1^*(g), x_1^*(b)\}\}$ be the set of off-path choices of x_1. Now define for each $x_1' \in \mathbb{X}_1^-$ the set $S_1^*(x_1') = \{s_1 : \text{condition (15) does not hold}\}$. Note that $S_1^*(x_1') \in \{\{g, b\}, \{g\}, \{b\}, \varnothing\}$. Intuitively, if $S_1^*(x_1') = \{g, b\}$ then party 1 would deviate to action x_1' for each possible realization of its signal for *some* belief $\hat{s}_1(x_1') \in \{g, b, n\}$. If $S_1^*(x_1') = \{g\}$ then party 1 would never deviate to action x_1' when $s_1 = b$, for *any* $\hat{s}_1(x_1') \in \{g, b, n\}$. If $S_1^*(x_1') = \varnothing$ then party 1 would never deviate to x_1', no matter what voters infer about s_1, and what signal party 1 actually obtained. Note that in all these cases, we are assuming that voters always respond optimally to their beliefs when choosing σ, taking party 2's policy platform into consideration when forming their belief $\mu(x_1', x_2) = \beta(\hat{s}_1(x_1'), \hat{s}_2(x_2))$, so that $\hat{s}_2(x_2(s_2)) = s_2$ if party 2 plays a revealing strategy, and $\hat{s}_2(x_2) = n$ otherwise.

Definition 2. *A PBE has "plausible beliefs" if for all actions $x_1' \in \mathbb{X}_1^-$, it holds that*

(i) *if $S_1^*(x_1') = \{g\}$ then $\hat{s}_1(x_1') = g$,*

(ii) *if $S_1^*(x_1') = \{b\}$ then $\hat{s}_1(x_1') = b$,*

(iii) *if $S_1^*(x_1') \in \{\{g, b\}, \varnothing\}$ then $\hat{s}_1(x_1') = n$.*

Next, we show that our restriction to voters' beliefs about the signals that parties observed to lie on the "grid" $\hat{s}_i \in \{g, b, n\}$ is without loss of generality. Suppose party 2 chooses an equilibrium platform $x_2 \in \{x_2^*(g), x_2^*(b)\}$, and consider a unilateral deviation

[30] We show definitions here only for party 1; for party 2, corresponding definitions apply but are not shown here for the sake of brevity.

by party 1 to some off-path platform $x_1' \in \mathbb{X}_1^-$. Let us define (for the remainder of Appendix A only)

$$\mu_1(x_1', \hat{s}_2) \equiv Pr[s_1 = g | x_1', \hat{s}_2], \tag{16}$$

where $\hat{s}_2 \in \{g, b, n\}$ is the signal of party 2, as (correctly) inferred by the voters if it can be inferred. Definition 2 on "plausible beliefs" can be generalized accordingly by replacing $\hat{s}_1(x_1')$ by $\mu_1(x_1', \hat{s}_2)$, and adapting the restriction "for *some* belief $\hat{s}_1(x_1) \in \{g, b, n\}$", so that $\mu_1(x_1', \hat{s}_2)$ is allowed to take on any value in $[0, 1]$ when checking for profitable out-of-equilibrium platform choices.

With this generalization of our definition of plausible beliefs, the following result holds:

Proposition 5. *The set of equilibria under plausible beliefs (Definition 2) remains unchanged if the restriction $\hat{s}_1(x_1) \in \{g, b, n\}$ is relaxed, so that voters can infer any probability $\mu_1(x_1', \hat{s}_2)$ that $s_1 = g$ upon observing off-path policy platform x_1' and inferring signal s_2 from x_2 (if it can be inferred).*

The intuition behind this result is that, for any equilibrium policy x_2 and voters' belief $\hat{s}_2(x_2)$, the *probability* of being elected when offering policy x_1' is monotonic in $\mu_1(x_1', \hat{s}_2)$, while the *preference* for being elected when offering policy x_1' is independent of μ_1.

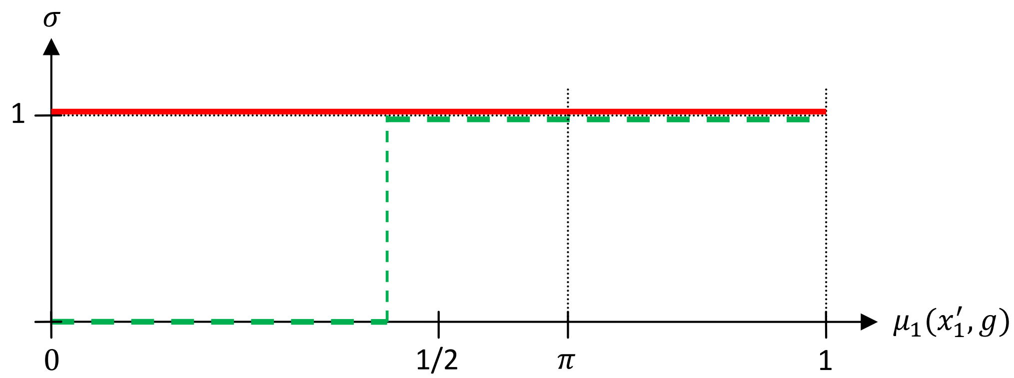


Figure 9: An illustrative example for Proposition 5

Consider the illustrative example in Figure 9. Party 1 does not care for which belief of voters it is elected. Its payoff only depends on the actual policy that is implemented, and its own belief about the true state of the world, following the realization of its own signal s_1, and party 2's inferred signal $\hat{s}_2$. Hence, the red line showing the values of voters' belief $\mu_1(x_1', \hat{s}_2 = g)$ for which party 1 *wants* to be elected when offering policy platform x_1', when party 2 receives a good signal is horizontal. In this example, we assume party 1 wants to be elected (given x_1' and $s_2 = g$), so that the red line is at $\sigma = 1$.

The green (dashed) lines show voters' probability of electing party 1 as function of their belief $\mu_1(x_1', \hat{s}_2 = g)$ that party 1 obtained a good signal. Assume voters switch from electing party 2 with probability 1 for lower values of μ_1 towards electing party 1 for larger values of μ_1. Because the policies x_1' and x_2 are fixed at this stage, there can be *at most* one discontinuity in the green line. Hence, if a deviation to x_1' by party 1 is profitable for *some* belief μ_1 when μ_1 can take on any value in $[0, 1]$, then it is always also profitable for some belief μ_1 in the set $\{0, \pi, 1\}$. Our restriction of out-of-equilibrium beliefs in Definition 2 is thus without loss of generality.

Furthermore, as can be seen from Figure 9, when checking for profitable deviations for *some* beliefs, it is actually sufficient to look only at the *extremes* of the grid, corresponding to $\mu_1 = 0$ and $\mu_1 = 1$ (i.e., $\hat{s}_1 = g$ resp. $\hat{s}_1 = b$). If a deviation to x_1' is found to be unprofitable for these extreme values, then by the monotonicity of voters' best response function σ, it is unprofitable also for *any* intermediate value of $\mu_1 \in (0, 1)$. This facilitates our equilibrium analysis.

Appendix B: Proofs

Proof of Lemma 1. Given the parties' strategies $x_i(g) = x_g$ and $x_i(b) = x_b$ with $x_b = D - x_g$ and $x_g < D/2$, voters' expected utility is

$$-\frac{x_g^2}{4} - \frac{x_b^2}{4} - \frac{D}{2}\big[(1-p)^2(1-x_g) + p^2(1-x_b) + p(1-p)((1-x_g)+(1-x_b))\big],$$

where we have used the assumption that voters choose x_g resp. x_b with a probability of $1/2$ when platforms differ, and the probabilities: $Pr[W = B] = 1/2$, $Pr[s_1 = s_2 = g|W = B] = (1-p)^2$, $Pr[s_1 = s_2 = b|W = B] = p^2$, as well as $Pr[s_i = g, s_{-i} = b|W = B] = 2p(1-p)$. The maximization over x_g and x_b then yields $x_g = x_g^*$ and $x_b = x_b^*$. □

Proof of Proposition 1. As indicated in the main text (see Section 3.1), we denote by $x_b^\# < x_b^*$ the value of x such that voters observing only one signal $s_2 = b$ prefer a policy $x_1 \in (x_b^\#, x_{bb}^*)$ to x_{bb}^*, with $x_b^\#$ solving

$$u(1-p, x_b^\#) = u(1-p, x_{bb}^*),$$

so that $x_b^\# = 2pD - x_{bb}^* = Dp(2 - \frac{p}{1-2p+2p^2})$. Similarly, we identify $x_g^\# = 2(1-p)D - x_{gg}^* = D\frac{1-4p+7p^2-4p^3}{1-2p+2p^2}$ satisfying $u(p, x_g^\#) = u(p, x_{gg}^*)$.

Given parties' equilibrium strategies, when $s_1 = s_2 = g$ or when $s_1 = s_2 = b$ then party 1 wins the election with probability 1, whereas when signals are conflicting party 2 wins with probability 1. If party 1 receives a good signal, its expected payoff in equilibrium is

$$\pi\big[u(\beta_{gg}, x_{gg}^*) + f_1\big] + (1-\pi)u(1/2, D/2 - \alpha).$$

If party 2 receives a good signal, its expected payoff in equilibrium is

$$\pi u(\beta_{gg}, x_{gg}^*) + (1-\pi)\big[u(1/2, D/2-\alpha) + f_2\big].$$

Now consider possible deviations.

Party 1: Suppose $s_1 = g$. (The argument for the case where $s_1 = b$ follows analogously.) A deviation by party 1 can only be profitable if (i) it strictly raises its probability of being elected (σ), and/or (ii) the quality of the implemented policy is (in expectation) raised due to the deviation.

(i) It is straightforward to verify that there exists no deviation policy for party 1 that guarantees this party to be elected both when $s_2 = g$ and $s_2 = b$: irrespective of what voters infer about the contents of party 1's signal when observing the deviation, it always holds that party 2's equilibrium policy is (weakly) closer to voters' most preferred policy (given their belief) either under $s_2 = g$ or under $s_2 = b$ than party 1's deviation platform. In the knife-edge case where voters infer $\hat{s}_1(x_1') = g$ ($\hat{s}_1(x_1'') = b$) when party 1 deviates to $x_1' = D/2 - \alpha$ ($x_1'' = D/2 + \alpha$), voters are indifferent between parties' platforms under both realizations of s_2. In this case, we can simply assume that voters elect the party that did not deviate (see Sections 2.2 and 3.1). Since, in equilibrium, party 1 is already elected with certainty under party 2's most likely signal realization (given $s_1 = g$), a deviation can only (weakly) reduce σ.

(ii) This is impossible to achieve because party 1's equilibrium policy is already optimal when signals are conforming; if party 1 were purely policy-motivated, its best (candidate) deviation would be to offer $x_1' = D/2 - \epsilon$, where ϵ is an arbitrarily small positive number (just large enough so that voters can still distinguish this policy from $D/2$) when $s_1 = g$, resp. $x_1'' = D/2 + \epsilon$ when $s_1 = b$. This way, party 1 could still convey its signal to the voters, and (assuming voters believe in this) party 1 would get elected whenever signals are conflicting, in which case the welfare-optimal (neutral) policy would be offered (distorted only by ϵ, that is assumed infinitesimally small). However, then party 2 would get elected whenever signals are conforming (the more likely case), and the policy it offers ($D/2 - \alpha$) is by construction close to the neutral policy. The welfare loss that results from the deviation when signals are conforming is $u(\beta_{gg}, x_{gg}^*) - u(\beta_{gg}, D/2 - \alpha)$. This is always larger than the welfare gain achieved under the deviation when signals are conflicting: $u(1/2, D/2) - u(1/2, D/2 - \alpha)$. To see this, note that the loss is decreasing in α, while the gain is increasing in α. But even for $D/2 - \alpha = x_g^{\#}$, that corresponds to the largest value that α can attain (shown below), the loss is still larger than the gain (when verifying analytically, one obtains the inequality $1 - 8p - 8p^2 < 0$, that is satisfied for all $p \in (0.5, 1)$).

Since we have shown that a deviation by party 1 to any out-of-equilibrium policy platform is not profitable even under the most amenable beliefs (for the deviation) of voters about the realization of party 1's signal, there is no deviation that is profitable under any beliefs. Hence, our restriction to plausible beliefs implies that voters ignore the realization of party 1's signal if they observe a deviation by this party to any off-path policy platform (i.e., $\hat{s}_1(x_1') = n$).

Party 2: Suppose $s_2 = g$.

Claim (i) A deviation to $x_2' = D/2 + \alpha$ is not profitable. If this deviation induces voters to draw an incorrect inference about party 2's signal ($\hat{s}_2(x_2') = b$), party 2's winning probability is raised. The implemented policy is, however, less efficient than under party 2's equilibrium strategy. Comparing party 2's expected welfare under the equilibrium strategy (see above) with its welfare under the deviation:

$$\pi\big[u(\beta_{gg}, D/2 + \alpha) + f_2\big] + (1 - \pi)u(1/2, x_{bb}^*),$$

we obtain a lower bound for the value α,[31] with $\frac{d\alpha}{df_2} > 0$. Define $f^\epsilon = \frac{D^2}{8(1-2p+2p^2)^2}$ as the threshold value of f_2 such that party 2 is indifferent between deviating or not when $\alpha = 0$. When $f_2 < f^\epsilon$, the constraint is not binding so that the lower bound for α is negative. If $f_2 \leq f^\epsilon$, we can set α arbitrarily small, but positive so that party 2 can still convey its signal to the voters, while implementing an (almost) efficient policy (in case this party is elected).

(ii) A deviation to $x_2' \in (x_{gg}^*, D/2 - \alpha)$ is not profitable. The deviation policy is too distorted to be a profitable deviation after observing $s_2 = b$ (see (i)). Hence, under plausible beliefs, it holds that $\hat{s}_2(x_2') \in \{n, g\}$. If $\hat{s}_2(x_2') = g$, the deviation is not profitable as party 2 would get elected with the same probability as under the equilibrium policy (i.e., only when signals are conflicting), but the implemented policy is then inferior. Therefore, $\hat{s}_2(x_2') = n$, as a deviation to a policy in this range is not profitable under any signal realization.

(iii) A deviation to $x_2'' \in (D/2 + \alpha, x_{bb}^*)$ is not profitable, because it leads to a lower payoff than a deviation to $x_2' = D/2 + \alpha$ (ruled out in (i)).

(iv) A deviation to $x_2' \in (D/2 - \alpha, D/2 + \alpha)$ is not profitable if $f_2 < f^\alpha$. For a deviation to a policy in this range, there always exists a belief of voters about s_2 such that the deviation is profitable, under both signal realizations ($s_2 = g$ and $s_2 = b$), as follows from our discussion above (see case (i)). Therefore, given our restriction to plausible beliefs, $\hat{s}_2(x_2') = n$, so that $\mu(x_1, x_2') = \mu(\hat{s}_1(x_1), n)$. If $u(p, x_{gg}^*) > u(p, D/2 - \alpha)$, party 2's probability of being elected, thus, drops to zero (as voters elect party 1 with

[31] $\alpha = \frac{2\sqrt{\left(D^2(p-1)^2p^2+2f_2(-4p^3+6p^2-4p+1)^2\right)}-D\left(2p^2-2p+1\right)}{2(2p-1)(2p^2-2p+1)}$.

probability 1 if $s_1 = g$ and if $s_1 = b$), and the implemented policy is inferior to the equilibrium outcome when signals are conflicting.

Using the value of α described above (see case (i)), the condition $u(p, x^*_{gg}) > u(p, D/2-\alpha)$, that is equivalent to $D/2 - \alpha > x^{\#}_g$, yields:

$$f_2 < D^2 \left(\frac{1}{2 - 4p(1-p)} - 2p(1-p) \right) \equiv f^\alpha.$$

If f_2 is above this critical value (i.e., if $D/2 - \alpha < x^{\#}_g$), it is always profitable for party 2 to deviate to some $x'_2 \in (D/2 - \alpha, x^{\#}_g)$ after observing $s_2 = g$. Voters prefer to elect this party when $\hat{s}_2(x'_2) = n$ and $s_1 = g$. Hence, the deviation raises party 2's probability of being elected in the same way as a deviation to $x'_2 = D/2 + \alpha$ (discussed in case (i)), while the implemented policy under the deviation is more efficient than under $x'_2 = D/2 + \alpha$ (when party 2 is elected). Conversely, if $f_2 < f^\alpha$, the above deviation is never profitable because party 2 is, then, never elected (neither for $s_1 = g$, nor for $s_1 = b$). Note that $f_2 < f^\alpha$ (so $D/2 - \alpha > x^{\#}_g$) also implies that $D/2 - \alpha > x^*_g$, as x^*_g is voters' preferred policy when observing one signal g only, while $x^{\#}_g$ is the policy that is as acceptable to the voters as x^*_{gg} when only one signal g is revealed. Note that as $u(p, x^*_{gg}) > u(p, D/2)$, $\alpha = 0$ for $f_2 = f^\epsilon$, and $\frac{d\alpha}{df_2} > 0$, it always holds that $f^\alpha > f^\epsilon$.

(v) A deviation to $x'_2 = x^*_{gg}$ or to $x'_2 = x^*_{bb}$ is not profitable. To rule out this type of deviation, we assume (see Section 2.2) that voters elect party 1 when this party chooses one of its equilibrium policy platforms, while party 2 chooses this type of deviation (as parties are clearly identifiable). This type of deviation is, thus, never profitable (irrespective of voters' belief about s_2), so they ignore the deviating party's signal under plausible beliefs.

(vi) A deviation to $x'_2 < x^*_{gg}$ or $x'_2 > x^*_{bb}$ is not profitable. This claim is always true as voters would never elect such a party after observing at most two signals when the other party plays its equilibrium strategy (see Section 2.2). □

Proof of Lemma 2. We want to show that the pair of strategies $\{x^*_g, x^*_b\}$ is a PBE if voters ignore off-path platform choices when forming their beliefs, hence: $\hat{s}_i(x^*_g) = g$, $\hat{s}_i(x^*_b) = b$, while $\hat{s}_i(x) = n$ for all $x \neq \{x^*_g, x^*_b\}$. In order to do so, we show that there is no profitable unilateral deviation under the assumed beliefs.

We study a unilateral deviation of party 1 after observing $s_1 = g$. The proof for $s_1 = b$ follows symmetrically. Under the equilibrium strategy, the expected utility of party 1 is

$$U^*_1(g) = E_{s_2|s_1=g} U_1(\cdot) = \frac{f_1}{2} + \pi u(\beta_{gg}, x^*_g) + (1-\pi) u(\beta_{gb}, x^*_b),$$

where the last element follows from $u(\beta_{gb}, x^*_b) = u(\beta_{gb}, x^*_g)$, as $x^*_g = D - x^*_b$.

Claim (i): a deviation to $x' \neq x_b^*$ is not (strictly) profitable for $f_1 \geq 0$. By our assumed beliefs, $\hat{s}_1(x') = n$, so that $\mu(x', x_2) = \beta(n, \hat{s}_2(x_2))$. As $\arg\max_{\hat{x}} u(\beta(n, b), \hat{x}) = x_b^*$ and $\arg\max_{\hat{x}} u(\beta(n, g), \hat{x}) = x_g^*$, $\sigma(x', x_g^*) = \sigma(x', x_b^*) = 0$ (party 2 is elected with probability 1), and

$$U_1(x' \mid s_1 = g) = \pi u(\beta_{gg}, x_g^*) + (1 - \pi) u(\beta_{gb}, x_b^*) \leq U_1^*(g),$$

where we used $U_1(x_1 \mid s_1 = g) \equiv E_{s_2|s_1=g} U_1(s_1, s_2, x_1, x_2^*(s_2), \sigma(x_1, x_2^*(s_2))$ as a short-hand notation. Similar (self-explanatory) notation will be used throughout the Appendix.

(ii): A deviation to x_b^* is not profitable. By our assumed beliefs, $\hat{s}_1(x_b^*) = b$, so that $\mu(x_b^*, x_2) = \beta(b, \hat{s}_2(x_2))$ and $\sigma(x_b^*, x_g^*) = \sigma(x_b^*, x_b^*) = \frac{1}{2}$ (both parties are always elected with equal probability), hence

$$U_1(x_b^* \mid s_1 = g) = \frac{f_1}{2} + \frac{\pi}{2} u(\beta_{gg}, x_g^*) + \frac{\pi}{2} u(\beta_{gg}, x_b^*) + (1 - \pi) u(\beta_{gb}, x_b^*) < U_1^*(g).$$

This completes the proof. □

Proof of Lemma 3. We first show that there exists a profitable deviation if at least one platform is "extreme" $x \notin [x_{gg}^*, x_{bb}^*]$. Suppose $x_g < x_{gg}^*$. (The case where $x_b > x_{bb}^*$ follows analogously.) When $s_1 = g$, then for all $\hat{s}_1(x_{gg}^*) \in \{g, b, n\}$, a deviation by party 1 to x_{gg}^* increases both the probability of being elected and the quality of the expected policy. With probability π, $s_2 = g$, and it always holds that $\sigma(x_{gg}^*, x_g) = 1$ and $u(\beta_{gg}, x_g) < u(\beta_{gg}, x_{gg}^*)$. With probability $1 - \pi$, $s_2 = b$, and it always holds that $\sigma(x_{gg}^*, x_b) \geq \sigma(x_g, x_b)$. It is also easy to verify that if $\sigma(x_{gg}^*, x_b) > 0$, then $u(\beta_{gb}, x_b) < u(\beta_{gb}, x_{gg}^*)$. The same reasoning holds for $x_b > x_{bb}^*$.

Second, consider symmetric strategies with $x_g > D - x_b$, and $x_b \neq x_{bb}^*$, so that $u(\beta_{gb}, x_g) > u(\beta_{gb}, x_b)$, and $\sigma(x_g, x_b) = 1$. Under the proposed equilibrium strategy, the expected utility of party 1 after receiving a good resp. bad signal is

$$U_1^*(g) = \pi(u(\beta_{gg}, x_g) + \frac{f_1}{2}) + (1 - \pi)(u(\beta_{gb}, x_g) + f_1),$$
$$U_1^*(b) = \pi(u(\beta_{bb}, x_b) + \frac{f_1}{2}) + (1 - \pi)(u(\beta_{gb}, x_g)).$$

We want to show that x_{bb}^* is a profitable deviation after observing $s_1 = b$ under the plausible belief $\hat{s}_1(x_{bb}^*) = b$. For this, we need to show that (i) x_{bb}^* is not a profitable deviation for any belief after observing $s_1 = g$, and (ii) x_{bb}^* is a profitable deviation for $\hat{s}_1(x_{bb}^*) = b$ after observing $s_1 = b$.

For claim (i), it is enough to study $\hat{s}_1(x_{bb}^*) = b$ to characterize all profitable deviations to x_{bb}^* when $s_1 = g$. Indeed, player 1 is never elected if $s_2 = g$ ($\sigma(x_{bb}^*, x_g) = 0$ and all $\hat{s}_1(x_{bb}^*)$), and always elected and implementing the optimal strategy if $s_2 = b$ for $\hat{s}_1(x_{bb}^*) = b$.

The expected utility under the suggested deviation is

$$U_1(x_{bb}^* \mid s_1 = g, \hat{s}_1 = b) = \pi u(\beta_{gg}, x_g) + (1-\pi)(u(\beta_{gb}, x_{bb}^*) + f_1) < U_1^*(g),$$

as $u(\beta_{gb}, x_{bb}^*) < u(\beta_{gb}, x_g)$.

For claim (ii), the expected utility under the suggested deviation is

$$U_1(x_{bb}^* \mid s_1 = b, \hat{s}_1 = b) = \pi(u(\beta_{bb}, x_{bb}^*) + f_1) + (1-\pi)u(\beta_{gb}, x_g) > U_1^*(b).$$

Third, consider symmetric strategies with $x_g > D - x_b$, and $x_b = x_{bb}^*$, so that $u(\beta_{gb}, x_g) > u(\beta_{gb}, x_b)$, and $\sigma(x_g, x_b) = 1$. Under the proposed equilibrium strategy, the expected utility of party 1 is as in the second part of the proof, replacing $x_b = x_{bb}^*$. In this case, x_{bb}^* is not a deviation anymore. It is however possible to show that such an equilibrium never exists under plausible beliefs (see online appendix).

Finally, consider symmetric strategies with $x_g = D - x_b$, so that both $x_g \neq x_{gg}^*$ and $x_b \neq x_{bb}^*$.

Under the equilibrium strategy, the expected utility of party 1 after receiving a good resp. bad signal is

$$U_1^*(g) = \pi u(\beta_{gg}, x_g) + (1-\pi)u(\beta_{gb}, x_g) + \frac{f_1}{2},$$
$$U_1^*(b) = \pi u(\beta_{bb}, x_b) + (1-\pi)u(\beta_{gb}, x_g) + \frac{f_1}{2}.$$

We want to show that x_{gg}^* is a profitable deviation after observing $s_1 = g$ under the plausible belief $\hat{s}_1(x_{gg}^*) = g$. For this, we need to show that (i) x_{gg}^* is not a profitable deviation for any belief after observing $s_1 = b$, and (ii) x_{gg}^* is a profitable deviation for $\hat{s}_1(x_{gg}^*) = g$ after observing $s_1 = g$. For (i), for reasons similar as in the second part of the proof, it is enough to consider $\hat{s}_1(x_{gg}^*) = g$. Under the assumed beliefs, $\sigma(x_{gg}^*, x_b) = 0$ and $\sigma(x_{gg}^*, x_g) = 1$. This yields expected payoff

$$U_1(x_{gg}^* \mid s_1 = b, \hat{s}_1 = g) = \pi(u(\beta_{bb}, x_b)) + (1-\pi)(u(\beta_{gb}, x_{gg}^*) + f_1) < U_1^*(b).$$

For (ii), the expected payoff under the proposed deviation is

$$U_1(x_{gg}^* \mid s_1 = g, \hat{s}_1 = g) = \pi(u(\beta_{gg}, x_{gg}^*) + f_1) + (1-\pi)u(\beta_{gb}, x_b) > U_1^*(g).$$

This completes the proof. □

Proof of Proposition 2. We study deviations by party 1 after observing $s_1 = g$, assuming equilibrium behavior for party 2. The other case (deviations after observing $s_1 = b$), and deviations by party 2, follow analogously by symmetry. We first state a direct consequence of our definition of plausible beliefs.

Claim (i) There is no profitable deviation to a policy x' under plausible beliefs $\hat{s}_1(x') = b$ after observing $s_1 = g$. By definition of our plausible beliefs, if a deviation to $x' \neq x^*_{gg}$ is profitable after observing $s_1 = g$ under some beliefs, $\hat{s}_1(x') \in \{n, g\}$.

Next, we study all possible deviations relying on plausible beliefs.[32]

(ii) A deviation to some "extreme" value $x_1 < x^*_{gg}$ or $x_1 > x^*_{bb}$ is never profitable. This claim is always true as voters would never elect such a party after observing at most two signals when the other party plays its equilibrium strategy (see Section 2.2).

(iii) There is no profitable deviation to some $x' \neq x^*_{gg}$ under plausible beliefs $\hat{s}_1(x') = g$ after observing $s_1 = g$. Upon observing $s_1 = g$, if party 2 plays its equilibrium strategy, the policy x that maximises the probability for party 1 to be elected by voters who believe $\hat{s}_1(x) = g$ is x^*_{gg}. A "truthful" deviation to $x_1 \neq x^*_{gg}$ thus never increases the probability of being elected. If the observed signals are identical (with probability $\pi > \frac{1}{2}$), $x_2 = x^*_{gg}$ is voters' preferred platform and party 1 is never elected under the deviation. Hence, the probability of being elected could be at most $1 - \pi < 1/2$. The only potentially profitable deviation must therefore induce better expected policies, which is only possible under conflicting signals (as the policy is already optimal for identical signals). Such a deviation is profitable under the assumed beliefs, if there exists an $\alpha > 0$ satisfying

$$\pi u(\beta_{gg}, x^*_{gg}) + (1-\pi)\big[u(1/2, D/2 - \alpha) + f_1\big] = \pi u(\beta_{gg}, x^*_{gg}) + (1-\pi)u(1/2, x^*_{gg}) + f_1/2.$$

However, if the deviation is profitable for $x_1 \in (D/2 - \alpha, D/2)$, it is also profitable for $x_1 \in (D/2, D/2 + \alpha)$ under the assumed beliefs as policies equidistant from $D/2$ are equally good when $\mu = 1/2$. This implies that for any of these potential deviations the beliefs that party 1 observed $s_1 = g$ are not plausible, as any policy in this interval would also be a profitable deviation after observing $s_1 = b$ under some beliefs. Thus, for any deviation to $x \in (D/2 - \alpha, D/2 + \alpha)$ that would be profitable if $\hat{s}_1(x) = g$, such belief is not plausible. Note also that α is decreasing in f_1,[33] as the deviation concerns a party trading off chances of being elected for better expected policy.

(iv) If and only if f_1 is sufficiently small ($f_1 \leq f^{min}$), then there exists a profitable deviation to $x^\#_b \in (D/2, x^*_b)$ under plausible beliefs $\hat{s}_1(x^\#_b) = n$ (as a deviation to $x^\#_b$ is profitable upon observing $s_1 = g$ or $s_1 = b$ under some beliefs about party 1's signal) and party 1 is elected when signals are conflicting. We know from (iii) that if there exists an $\alpha > 0$ as specified above, for any policy x_1 in the interval $(D/2 - \alpha, D/2 + \alpha)$, voters

[32] By Proposition 5, we can restrict our attention to unilateral deviations inducing $\hat{s}_1 \in \{g, b, n\}$.

[33] The complete expression is $\alpha = \frac{(2p-1)\sqrt{D^2(1-p)p - 2f_1(1-2(1-p)p)}}{2(1-2(1-p)p)\sqrt{(1-p)p}}$, decreasing in f_1 as $1 - 2(1-p)p > 0$.

ignore the signal transmitted by party 1. If party 1 wants to increase the quality of the policy it needs to be elected when signals are conflicting so that $x_2 = x^*_{bb}$. Note that (a) $x^\#_b$ is the best policy in $[x^\#_b, x^*_{bb})$ for $\mu = 1/2$ and (b) if for some $x' \in [x^\#_b, x^*_{bb})$ it holds that $x' \in (D/2 - \alpha, D/2 + \alpha)$, then $x^\#_b \in (D/2 - \alpha, D/2 + \alpha)$. A profitable deviation under plausible beliefs therefore exists if $x^\#_b < D/2 + \alpha$. Indeed, any deviation policy $x'_1 \in (x^\#_b, x^*_{bb})$ ensures winning the election when signals are conflicting and $\hat{s}_1(x'_1) = n$, and any $x'_1 < D/2 + \alpha$ ensures that this deviation is strictly profitable. The condition $D/2+\alpha = x^\#_b$ is solved by $f^{min} = \frac{4D^2(1-p)^2p^2}{1+2(1-p)p}$ so that for any $f_1 \leq f^{min}$ there is a profitable "policy-motivated" deviation under plausible beliefs. The condition is identical for a profitable deviation under plausible beliefs to $x^\#_g$ after observing $s_1 = b$. For $f_1 > f^{min}$, there is no profitable deviation of this type.

(v) If and only if f_1 is sufficiently high ($f_1 \geq f^{max}$), then there exists a profitable deviation to $x^\#_g \in (x^*_g, D/2)$ under plausible beliefs $\hat{s}_1(x^\#_g) = n$ (as a deviation to $x^\#_g$ is profitable upon observing $s_1 = g$ or $s_1 = b$ under some beliefs about party 1's signal) and party 1 is elected when signals are identical.

(v.a) Plausible beliefs. For voters to ignore party 1's signal, the deviating strategy $x^\#_g$ must be in the range of profitable deviations after observing $s_1 = b$ under some beliefs. If voters (wrongly) believe party 1 observed $s_1 = g$, there is a profitable deviation to all $x'_1 \in [x^{db}_1, x^*_{bb})$, with x^{db}_1 solving

$$\pi\big[u(\beta_{bb}, x^{db}_1) + f_1\big] + (1-\pi)u(1/2, x^*_{gg}) = \pi u(\beta_{bb}, x^*_{bb}) + (1-\pi)u(1/2, x^*_{gg}) + f_1/2,$$

if $x^{db}_1 > x^*_{gg}$. Else, every $x_1 \in (x^*_{gg}, x^*_{bb})$ is a profitable deviation for these beliefs.

(v.b) Profitable deviation. If party 1 is actually elected when signals are identical after observing $s_1 = g$, a deviation to any $x'_1 \in (x^*_{gg}, x^{dg}_1]$ with x^{dg}_1 solving

$$\pi\big[u(\beta_{gg}, x^{dg}_1) + f_1\big] + (1-\pi)u(1/2, x^*_{gg}) = \pi u(\beta_{gg}, x^*_{gg}) + (1-\pi)u(1/2, x^*_{gg}) + f_1/2$$

is profitable.

(v.c) Plausible and profitable. A profitable deviation under plausible beliefs exists if there is a policy platform $x'_1 \leq x^{dg}_1$ such that voters ignore the signal of party 1 ($x'_1 \geq x^{db}_1$), and voters elect party 1 ($x'_1 \leq x^\#_g$). It is possible to show that $x^{dg}_1 = D - x^{db}_1$, so that the above conditions are always fulfilled if $x^{db}_1 \leq x^\#_g$, which simplifies to $f_1 \geq D^2(1 - 2(1-p)p) = f^{max} \geq f^{min}$. As we have exhausted all possible deviations, we find that the assumed equilibrium exists if for both parties $f_i \in (f^{min}, f^{max})$, with $i \in \{1, 2\}$.

The existence of no other symmetric equilibrium under plausible beliefs directly derives from Lemma 3. □

Proof of Proposition 3. In equilibrium, both parties are elected with equal probability and the implemented policy is $D/2$. We study deviations by party 1. For a deviation to $x_1' \in [0, \frac{D}{2})$ to be profitable, voters beliefs must be such that $\hat{s}_1(x_1') = g$. Indeed, for $\hat{s}_1(x_1') \in \{b, n\}$, party 1 is never elected.

Hence, for a deviation to $x_1' \in [0, \frac{D}{2})$ to be profitable under plausible beliefs after observing $s_1 = g$, it must be that (i) the deviation is profitable after observing $s_1 = g$, (ii) the belief $\hat{s}_1(x_1') = g$ is plausible, i.e., x_1' is never a profitable deviation after observing $s_1 = b$. We want to identify a value of $f_1 = f_g^p$ such that for all $f_1 > f_g^p$ there is no deviation satisfying (i) and (ii).

(i) We identify $\tilde{x}_g$ such that there is a profitable deviation to $x_1' \in (\tilde{x}_g, D/2)$ but no profitable deviation to $x_1' < \tilde{x}_g$ after observing $s_1 = g$. For a deviation to be profitable for party 1 under some beliefs, x_1' must be in the range of values of x strictly preferred by voters to $D/2$ if $\hat{s}_1(x_1') = g$, so that their beliefs that the state of the world is G are $\mu(x_1, D/2) = \beta(g, n) = p$. The minimum value of x satisfying this condition is defined by:

$$u(p, D/2) = u(p, x),$$

$x = \frac{D}{2}(3 - 4p)$. As we assume the policy space is comprised between 0 and 1, we find $\tilde{x}_g = \max\{\frac{D}{2}(3 - 4p), 0\}$, so that $\tilde{x}_g = 0$ for all $p > 3/4$. If the deviation is preferred by voters, it is also preferred by party 1 as it gets elected with probability $\sigma = 1$ and implements a better policy.

(ii) For party 1 to benefit from a deviation to $x_1' \in (\tilde{x}_g, D/2)$ after observing $s_1 = b$, it must be that $\hat{s}_1(x_1') = g$. Else, the party is never elected. The worst policy outcome in this range after observing $s_1 = b$ is $\tilde{x}_g$. Hence, if a deviation to $\tilde{x}_g$ is profitable, all deviations to $x_1' \in (\tilde{x}_g, D/2)$ are profitable.

A deviation to $\tilde{x}_g$ is profitable under some beliefs after observing $s_1 = b$ whenever

$$f_1 + u(1 - p, \tilde{x}_g) > \frac{f_1}{2} + u(1 - p, D/2),$$

which yields

$$f_g^p = \begin{cases} 2D^2(2p - 1)^2 & \text{if } p < 3/4 \\ \frac{D^2}{4}(4p - 1) & \text{if } p \geq 3/4. \end{cases} \tag{17}$$

Hence, for all values of $f_1 > f_g^p$, any deviation that is profitable after observing $s_1 = g$ is also profitable after observing $s_1 = b$, so that the deviation is not profitable under plausible beliefs.

We can similarly identify a maximum value of x such that voters are indifferent between policy $\tilde{x}_b$ and policy $D/2$ if they believe party 1 observed $s_1 = b$, $\tilde{x}_b = \min\{\frac{D}{2}(4p - 1), 1\}$. It is possible to show that a deviation to $\tilde{x}_b$ after observing $s_1 = b$ is profitable under plausible beliefs if $f_1 < f_b^p$,

$$f_b^p = \begin{cases} 2D^2(2p-1)^2 & \text{if } p < \frac{2+D}{4D} \\ \frac{(2-D)(2+(4p-3)D)}{4} & \text{if } p \geq \frac{2+D}{4D}. \end{cases} \tag{18}$$

We define $f^p = \min\{f_g^p, f_b^p\}$. From the above we have proven that, if for both parties $f_i > f^p$, there is no profitable deviation from the pandering equilibrium under plausible beliefs. All deviations that are profitable under *some* beliefs after observing $s_1 = g$ (resp. b) are also profitable under some beliefs if $s_1 = b$ (resp. g). In the figures in Section 3.4, we assume $D = 1$, so that $f_g^p = f_b^p = f^p$. □

Proof of Proposition 4. The proof follows along the same line as the proof of Proposition 1 for the case $q = 1/2$. Therefore, we do not repeat all steps of the proof here, and focus only on those aspects of the proof that differ. We first start with the simpler case where $\alpha_g = \alpha_b = \epsilon$ (arbitrarily small), for which we provide sufficient conditions. Afterwards, we consider the case where some of these conditions are violated, and analyze when the asymmetric equilibrium nevertheless exists by setting α_g or α_b (or both) strictly larger than zero.

(i) Case $\alpha_g = \alpha_b = \epsilon$:
We can directly rule out any deviation motivated by policy improvements, as the equilibrium is welfare-optimal (for $\epsilon \to 0$). Hence, any potentially profitable deviation must lead to a strictly higher election probability for the deviating party. Similar as in the proof of Proposition 1, it is straightforward to verify that if signals are strong $\pi_g, \pi_b > 1/2$, such deviation cannot exist for party 1, as there is no deviation policy x_1' that would assure this party to get elected for both realizations of s_2. This holds because voters always prefer party 2's equilibrium policy over x_1' for either $s_2 = g$ or $s_2 = b$, at least weakly. A (potentially) profitable deviation by party 1 to, e.g., $x_1' = x_2^*(g)$ is ruled out by our tie-braking rule according to which voters elect the non-deviating party when a deviation by one party is clearly identifiable and voters are indifferent between the two platforms given their belief.

Now consider a deviation by party 2 to some out-of-equilibrium platform x_2'. For later reference, let us (similarly as in the proof of Proposition 1) compute the value $x_g^{\#}$ (resp. $x_b^{\#}$) that leaves voters indifferent between this policy and x_{gg}^* (resp. x_{bb}^*) when they can infer only one good (resp. bad) signal. Using the condition $u(\beta_g, x_{gg}^*) = u(\beta_g, x_g^{\#})$, we obtain $x_g^{\#} = 2(1-p_g)D - x_{gg}^*$, the same expression as before (see the proof of Proposition 1) when p is replaced by p_g. Similarly, we find $x_b^{\#} = 2p_bD - x_{bb}^*$. For $q < 1/2$, $\pi_g > 1/2$, it is possible to show that $x_g^{\#} < x_{gb}^*$ always holds, with $x_g^{\#} = x_{gb}^*$ for $\pi_g = 1/2$.

To complete the proof for the case $\alpha_g = \alpha_b = \epsilon$, we want to rule out a profitable deviation under the assumed equilibrium beliefs $\hat{s}_2(x_{gb}^* + \epsilon) = b$ to $x_2' = x_{gb}^* + \epsilon$ upon observing $s_2 = g$, resp. under beliefs $\hat{s}_2(x^*_{gb} - \epsilon) = g$ to $x'_2 = x^*_{gb} - \epsilon$ upon observing $s_2 = b$. This amounts to two critical values $f^{\epsilon,g}$ resp. $f^{\epsilon,b}$. The equilibrium then exists if f_2 does not exceed the lowest of these critical values. Equalizing the expected equilibrium payoff of party 2 when $s_2 = g$ with the expected payoff under the deviation to $x'_2 = x^*_{gb}+\epsilon$, we obtain the condition

$$\pi_g u(\beta_{gg}, x^*_{gg}) + (1 - \pi_g)[u(\beta_{gb}, x^*_{gb}) + f_2] = \pi_g[u(\beta_{gg}, x^*_{gb}) + f_2] + (1 - \pi_g)u(\beta_{gb}, x^*_{bb}),$$

which yields the critical value $f^{\epsilon,g}$. The expression (not shown here) is rather lengthy and involves higher-order polynomials. Similarly, using the condition

$$\pi_b u(\beta_{bb}, x^*_{bb}) + (1 - \pi_b)[u(\beta_{gb}, x^*_{gb}) + f_2] = \pi_b[u(\beta_{bb}, x^*_{gb}) + f_2] + (1 - \pi_b)u(\beta_{gb}, x^*_{gg}),$$

we obtain the critical value $f^{\epsilon,b}$ (not shown). A graphical illustration of these values (as a function of η) is shown in the main text.

(ii) Case $\alpha_g > 0$, or $\alpha_b > 0$ (or both):
To construct an asymmetric equilibrium with $\alpha_g > 0$, or $\alpha_b > 0$ (or both), we compute values α_g and α_b that satisfy the following inequalities:

$$\pi_g u(\beta_{gg}, x^*_{gg}) + (1-\pi_g)\left[u(\beta_{gb}, x^*_{gb} - \alpha_g) + f_2\right] \geq \pi_g\left[u(\beta_{gg}, x^*_{gb} + \alpha_b) + f_2\right] + (1-\pi_g)u(\beta_{gb}, x^*_{bb})$$

$$\pi_b u(\beta_{bb}, x^*_{bb}) + (1-\pi_b)\left[u(\beta_{gb}, x^*_{gb} + \alpha_b) + f_2\right] \geq \pi_b\left[u(\beta_{bb}, x^*_{gb} - \alpha_g) + f_2\right] + (1-\pi_b)u(\beta_{gb}, x^*_{gg}),$$

which assure that party 2 does not find it profitable to deviate to $x'_2 = x^*_{gb} + \alpha_b$ after observing $s_2 = g$, resp. to $x''_2 = x^*_{gb} - \alpha_g$ after observing $s_2 = b$, with $\hat{s}_2(x'_2) = b$, $\hat{s}_2(x''_2) = g$, thereby "fooling" the voters about its signal. The equilibrium values of α_g and α_b are obtained when both conditions hold with equality and this leads to positive values α_g and α_b. If one of the values obtained in this way is negative, the respective condition is not binding so this value is set equal to ϵ, and the other value is obtained from its respective condition above (with equality).

The maximum value (f^α) that party 2's office-motivation parameter f_2 can attain for the asymmetric equilibrium to exist is then obtained when one of the conditions $x^\#_g \leq x^*_{gb} - \alpha_g$ and $x^\#_b \geq x^*_{gb} + \alpha_b$ (see above) just holds with equality. The system of equations that determines α_g and α_b (see above) is fairly complicated (both conditions are linear-quadratic in α_g and α_b), so we cannot state a closed-form solution for these values, and hence, for f^α. These values can, however, be computed numerically in a straightforward way for a given set of parameter values. □

Proof of Proposition 5. Suppose, party 2 plays a revealing strategy. If $s_2 = g$, then under the restriction on beliefs, $\mu_1(x'_1, \hat{s}_2) \in \{0, \pi, 1\}$; if $s_2 = b$, then $\mu_1(x'_1, \hat{s}_2) \in \{0, 1-\pi, 1\}$. If party 2 plays a non-revealing strategy, then under the restriction on beliefs, $\mu_1(x_1', \hat{s}_2) \in \{0, 1/2, 1\}$. When checking if a candidate equilibrium fulfills our criterion of "plausible beliefs" (Definition 2), one needs to check if a deviation to some off-path policy platform x_1' is profitable for some value of μ_1 on this "grid" (similarly for party 2). We show that, without this restriction, a deviation to x_1' is profitable for *some* belief $\mu_1 \in [0, 1]$, if and only if it is profitable for some belief μ_1 "on the grid".

First, a deviation to some $x_1' \in \mathbb{X}_1^-$ can only be profitable for *some* belief μ_1 (on or off the grid), if for at least one realization of $\hat{s}_2 \in \{g, b, n\}$, party 1 prefers to be elected and *is* elected, or prefers not to be elected and is not elected. The deviation is, then, profitable if in expectation over s_2, these "matches" of party 1's interests, and voters' actual behavior (given some belief μ_1) outweigh the unfavorable outcomes (i.e., where party 1 is not elected for any μ_1 when it would prefer to be elected, and vice versa).

The characterization of the deviation to x_1' is the same as without this restriction, if it holds that (i) party 1 either (weakly) prefers to be elected for any given realization $\hat{s}_2 \in \{g, b, n\}$ for all $\mu_1 \in [0, 1]$, or weakly prefers not to be elected for all $\mu_1 \in [0, 1]$, and (ii) voters' best response σ (given x_1' and $x_2(s_2)$), as function of μ_1, is monotonic in μ_1 for any given realization $\hat{s}_2 \in \{g, b, n\}$. If both of these statements hold, then clearly the set of equilibria under plausible beliefs is identical with and without the restriction that μ_1 can only lie on a "grid". In the remainder of this proof, we thus demonstrate that each of these two claims holds.

Claim (i): This follows immediately by noting that party 1 does not care for which beliefs of the voters it is elected, since voters' belief does not enter directly its payoff function (only indirectly via σ).

(ii): This follows from the ordering of x_1' and $x_2(s_2)$, which (for a given realization of s_2) either fulfills: $x_1' > x_2$, $x_1' < x_2$, or $x_1' = x_2$. This ordering is clearly not affected by μ_1. Therefore, σ as function of μ_1 (for a given realization of s_2), may either take on one of the values $\{0, 1/2, 1\}$ everywhere (i.e., for all $\mu_1 \in [0, 1]$), or can have at most one discontinuity where it switches from one of these values to another. Hence, σ is monotonic in μ_1. This completes the proof. □

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For online publication only, details of the third statement of the proof of Lemma 3

Consider symmetric strategies with $x_g > D - x_b$, and $x_b = x^*_{bb}$, so that $u(\beta_{gb}, x_g) > u(\beta_{gb}, x_b)$, and $\sigma(x_g, x_b) = 1$. We want to show that there always exists a profitable deviation under plausible beliefs from the proposed equilibrium. Under the proposed equilibrium strategy, the expected utility of party 1 (given its signal) is

$$U^*_1(g) = \pi(u(\beta_{gg}, x_g) + \frac{f_1}{2}) + (1 - \pi)(u(\beta_{gb}, x_g) + f_1)$$
$$U^*_1(b) = \pi(u(\beta_{bb}, x^*_{bb}) + \frac{f_1}{2}) + (1 - \pi)u(\beta_{gb}, x_g). \tag{19}$$

1. *Claim: if $f_1 > 0$ a necessary condition for the proposed equilibrium to exist is $\pi > 2/3$.* We want to show that there always exists profitable "policy motivated" deviation under plausible beliefs for $\pi \leq 2/3$. A deviation to some $x' \in (x_g, D-x_g)$ after observing $s_1 = g$ can increase party 1's payoff if $\hat{s}_1(x') = g$, if the policy improvement dominates the lower probability of winning office. Such a deviation yields payoff

$$U_1(x' \mid s_1 = g, \hat{s}_1 = g) = \pi(u(\beta_{gg}, x_g)) + (1 - \pi)(f_1 + u(\beta_{gb}, x')). \tag{20}$$

   A deviation to some $x' \in (x_g, D - x_g)$ after observing $s_1 = g$ never increases party 1's payoff if $\hat{s}_1(x') = b$ for $\pi \leq 2/3$ (as it would imply being elected less often and implementing a worse policy). Similarly, a deviation to some $x' \in (x_g, D-x_g)$ after observing $s_1 = b$ can increase party 1's payoff if $\hat{s}_1(x') = b$. Such a deviation yields payoff

$$U_1(x' \mid s_1 = b, \hat{s}_1 = b) = \pi u(\beta_{bb}, x^*_{bb}) + (1 - \pi)(f_1 + u(\beta_{gb}, x')). \tag{21}$$

   We immediately see that for all $f_1 > 0$, if $U_1(x' \mid s_1 = g, \hat{s}_1 = g) > U^*_1(g)$, then $U_1(x' \mid s_1 = b, \hat{s}_1 = b) > U^*(b)$. This implies that if there exists a deviation close to $D/2$ that is profitable under some beliefs after observing $s_1 = g$, the deviation is also profitable under some beliefs after observing $s_1 = b$. Moreover, a deviation arbitrarily close to x_g or $D - x_g$ is never profitable after observing $s_1 = g$ since it implies winning discretely less often and only marginally improving the policy.

   Hence, for $\pi \leq 2/3$, if there exists a profitable deviation to some x' after observing $s_1 = b$ if $\hat{s}_1(x') = b$, some deviation in the range $(x_g, D - x_g)$ is profitable after observing $s_1 = b$ but never after after observing $s_1 = g$ under any belief. A necessary condition for the proposed equilibrium to exist is thus $U_1(D/2 \mid s_1 =$

$b, \hat{s}_1 = b) < U_1^*(b)$, that yields:

$$(1-\pi)(u(\beta_{bg}, D/2) - u(\beta_{bg}, x_g)) < f_1 \frac{3\pi - 2}{2}. \tag{22}$$

In particular, it is easy to see that this condition implies $\pi > 2/3$ as the left-hand side is positive. Else, a deviation to some $x' \in (x_g, D - x_g)$ after observing $s_1 = b$ is profitable under plausible beliefs for any parameter values, as it both increases the probability of winning the election and the quality of the expected policy.

2. *Claim: If $\pi > 2/3$, a deviation to x_{gg}^* after observing $s_1 = b$ is never profitable.* After observing $s_1 = b$, a deviation to x_{gg}^* is only profitable if $\hat{s}_1(x_{gg}^*) = g$, else party 1 is never elected (remember that if indifferent voters never elect a deviating party). If $\hat{s}_1(x_{gg}^*) = g$, such a deviation yields payoff

$$U_1(x_{gg}^* \mid s_1 = b, \hat{s}_1 = g) = \pi u(\beta_{bb}, x_{bb}^*) + (1-\pi)(f_1 + u(\beta_{gb}, x_{gg}^*)). \tag{23}$$

It is easy to show that if $\pi > 2/3$, $U_1(x_{gg}^* \mid s_1 = b, \hat{s}_1 = g) < U_1^*(b)$, as it implies winning less often the election and implementing a worse expected policy.

3. *Claim: If $\pi > 2/3$, there always exists a profitable deviation under plausible beliefs to x_{gg}^* after observing $s_1 = g$ if $y > 1/3$, with y implicitly defined via $x_g = x_{gg}^* + y(x_{bb}^* - x_{gg}^*)$.* As we have already shown that x_{gg}^* is not a profitable deviation after observing $s_1 = b$, if beliefs $\hat{s}_1(x_{gg}^*) = g$ sustain a profitable deviation after observing $s_1 = g$, these beliefs are plausible. Such a deviation yields payoff

$$U_1(x_{gg}^* \mid s_1 = g, \hat{s}_1 = g) = \pi(u(\beta_{gg}, x_{gg}^*) + f_1) + (1-\pi)(u(\beta_{gb}, x_{bb}^*)). \tag{24}$$

Again, as x_{gg}^* is not an equilibrium strategy, voters vote for party 2 when indifferent. Rewriting $U_1(x_{gg}^* \mid s_1 = g, \hat{s}_1 = g) > U_1^*(g)$ yields

$$\frac{3\pi - 2}{2} f_1 > \pi(u(\beta_{gg}, x_g) - u(\beta_{gg}, x_{gg}^*)) + (1-\pi)(u(\beta_{bg}, x_g) - u(\beta_{bg}, x_{bb}^*)). \tag{25}$$

As the left-hand side is strictly positive for $f_1 > 0$ and $\pi > 2/3$, it is enough to show that the right-hand side is negative to show that the deviation is profitable. Rewriting with $y \in (0, 1)$, we can show that this is the case if and only if

$$\frac{(2Dp - D)^2(2(1-p)p - y)}{2(1 - 2(1-p)p)^2} < 0, \tag{26}$$

which is always true if $y > 1/3$ for $\pi > 2/3$, where the latter is equivalent to $p > \frac{1}{6}(3 - \sqrt{3})$.

4. *Claim. For $\pi > 2/3$ and $y < 1/3$, if there is no profitable deviation to x^*_{gg} under plausible beliefs after observing $s_1 = g$, there is a profitable deviation under plausible beliefs to some $x' \in (x_g, D - x_g)$ after observing $s_1 = b$.* If condition (25) is not fulfilled and $\pi > 2/3$, there is no profitable deviation to x^*_{gg} after observing $s_1 = g$. We combine the restriction that (25) is not fulfilled and the restriction that (22) is fulfilled (no profitable deviation to some $x' \in (x_g, D - x_g)$ after observing $s_1 = b$). For some f_1 to fulfill the two constraints, it must hold that

$$\pi(u(\beta_{gg}, x_g) - u(\beta_{gg}, x^*_{gg})) + (1-\pi)(u(\beta_{bg}, x_g) - u(\beta_{bg}, x^*_{bb})) > (1-\pi)(u(\beta_{bg}, D/2) - u(\beta_{bg}, x_g)). \quad (27)$$

The above condition simplifies to

$$\frac{(D - 2Dp)^2 \left(2(2(p-1)p-1)y^2 - 8(p-1)py + (p-1)p\right)}{4(1-2(1-p)p)^2} > 0. \quad (28)$$

It is possible to show that the expression $(2(2(p-1)p-1)y^2 - 8(p-1)py + (p-1)p)$ is strictly negative for $\pi > 2/3$ and $y < 1/3$, so that the condition is violated and the claim holds.

5. Finally, consider $f_1 = 0$. For $x_g > x^*_g$, a deviation to x^*_g allows being elected with probability 1 after observing $s_1 = g$ and implementing the policy that is by definition optimal conditional on observing one signal only. The underlying beliefs are plausible as the proposed deviation does not increase the expected quality of the policy under any beliefs after observing $s_1 = b$.

   For $x_g \leq x^*_g$, there exists a profitable deviation to $x^\#_b$ solving

$$u(1-p, x^\#_b) = u(1-p, x^*_{bb}),$$

   so that $x^\#_b = 2pD - x^*_{bb} = Dp(2 - \frac{p}{1-2p+2p^2}) < 1 - x^*_g$, implements a better policy and allows getting elected under conflicting signals for $\hat{s}_1(x^\#_b) \in \{n, g\}$.