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Promising politicians, rational voters, and election outcomes

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Abstract. Overwhelming anecdotal evidence suggests that politicians often promise more during an election campaign than they are willing or able to deliver once elected. In this paper, we present two signaling models to explain this phenomenon. In the first model, two candidates maximize their share of the vote. In the second model both try to convince the median voter. In each model, candidates rationally distort their true policy position. Voters, however, are not fooled. Upon observing election promises, they can rationally infer the true position of each candidate. Hence, the election outcome is not affected.

JEL Classification: D72, D82

Key words: Political competition, signalling models, election promises

1 Introduction

Overwhelming anecdotal evidence suggests that politicians often promise more during an election campaign than they are willing or able to deliver once elected. One of the most notorious examples is George Bush, who, in the campaign for the 1988 US Presidential elections, made a "read my lips, no new taxes"-pledge, yet, while in office, introduced new taxes anyway. In France, Jacques Chirac promised to decrease taxes and unemployment. When in office, both increased. Other pieces of evidence, for all kinds of elections, are easy to find.

This phenomenon poses problems for the model of rational, utility-maximizing, economic agents. It is hard to imagine that rational voters are systemically fooled

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by untruthful promises of politicians. Indeed, evidence suggests that this is not the case. In the 1996 US Presidential elections, for example, 71% of all respondents in a survey indicated they did not believe Bob Dole's promise to lower taxes by 15% and balance the budget at the same time. In France, Lionel Jospin broke several of his major election promises during the first 100 days of his government. Yet, his approval rate stood at 55%[1]. But if voters are rational and do not believe these promises, we face a different problem. Why do politicians make promises which voters do not believe?

In this paper I propose a way to solve this paradox. I present two models. In the first model, candidates maximize their share of the vote. In the second, they try to attract the median voter. In each model, candidates rationally distort their true policy position. Voters, observing the promise each candidate makes, can rationally infer the true position of each candidate, and act likewise. Therefore, voters are not fooled by election promises. Nevertheless, politicians still have an incentive to promise more than they will deliver, since, in equilibrium, voters expect them to do so.

I assume that voters' preferences on policies can be represented in a single dimension, and are distributed on a line. There are two candidates. Both have a preferred policy, which they want to implement. Each candidate knows her[2] own preferred policy, but voters and the competing candidate do not. What everyone knows, however, is that the true policy position of one candidate is to the left of the median voter, while the position of the other candidate is to the right. In order to convince voters, each candidate announces a policy that she promises to implement when elected. This election promise thus serves as a signal of her true preference. It provides voters with some information about what to expect from her, even though her exact preferences are unclear. There will always be some discrepancy between what a candidate wants and what voters want. Therefore, both contestants have an incentive to make promises which are different from their true position, in an attempt to convince voters to vote for them. This misrepresentation of one's preferred policy, however, comes at a cost. There are several reasons for this. First, chances of future re-election may be lower. Second, the winning candidate will face some difficulty in implementing her preferred policy while in office. Pressure groups favoring the promised policy will put the elected candidate under strong pressure to implement her election promise. Third, she may obtain disutility from going into history as, for example, the president that promised to lower taxes, but raised them while in office. Fourth, even conscience might play a role. I therefore assume that the cost of announcing a policy that is different from the one a candidate really wants to implement, is increasing in the distance between the true and announced policy position.

In the two models considered, the equilibrium involves both candidates misrepresenting their true policy position during the election campaign. Yet, upon observing these promises, and by taking into account the candidates' incentives to misrepresent their true views, voters can infer the true policy position each candi-

[1] For details, see The Economist, 1997.

[2] As a convention, I will refer to candidates as being female and to voters as being male.

date enjoys. The models explain why it is rational for politicians to lie in an election campaign, and, at the same time, why voters do not believe these lies.

This paper fits into the tradition of modeling elections as spatial competition, which started with Hotelling (1929) and Downs (1957). See the survey by Osborne (1995). In the standard model, two candidates compete in an election. They are both free to choose their policy position. Each candidate chooses her position in a way that maximizes her chance of being elected. Voters, observing these positions, then vote for one candidate. The models presented here differ in two fundamental aspects from this standard approach. First, in the standard model it is implicitly assumed that candidates will always implement the policy they have promised during the election. In the models presented here, this is not the case. Second, contrary to the standard model, I assume that candidates cannot choose their policy position at will. They have their own preference or ideology, which they want to see implemented. Whereas in the Hotelling-Downs model candidates choose their position in order to get elected, I assume that candidates want to get elected in order to implement their preferred policy. That assumption is also made in the citizen-candidate literature (Osborne and Slivinski 1996; Besley and Coate 1997).

This paper is not the first one to make a distinction between announced and implemented policies. In Alesina and Rosenthal (2000), building on Alesina and Rosenthal (1996), there is both a president and a legislature. Parties can make credible commitments. One party is left-wing, the other right-wing. The policy that will be implemented is a weighted average of the president's policy and the legislature's policy, where the latter is in turn a weighted average of the positions of the parties making up the legislature. The authors show that, in the equilibrium of their model, the parties announce a position that is different from their preferred position. Two mechanisms are at work: on the one hand, parties want to choose a position that is closer to the preference of the median voter, for the usual reasons. On the other hand, they want to choose a position that is more extreme than their own position, since this pulls the policy that will ultimately be implemented, in the direction of their own preference. In equilibrium, the net effect may go either way. The latter effect is also present in Gerber and Ortuno-Ortin (1997). They consider a model with proportional representation. In equilibrium, parties make a policy announcement that is more extreme than their own position, knowing that the implemented policies will be a weighted average of both parties' announced positions. Note however in both papers, different from my model, parties can credibly commit to a policy.

Campaign promises have also been studied before. In Schultz (1995), parties know the true costs of providing a public good, but voters do not. A left-wing party may be inclined to overstate the true costs, while a right-wing party may be inclined to understate them. Separating equilibria only exist if one of the parties has a preference close to that of the median voter. Hence, this model predicts that in polarized societies voters rationally disregard politicians' attemps to persuade them. Harrington (1993) shows that the pressure to get re-elected may induce politicians to tell the truth in an election campaign. In his model, there is uncertainty with respect to the effectiveness of policies that can be implemented. This uncertainty will be resolved after the first election. An incumbent's reelection chances are maximized when he and voters agree as to which policy is best and the incumbent implements that policy. Harrington shows that the most desirable situation for an incumbent is to be in office when voters have beliefs similar to her own. To make that more likely, a candidate should support her preferred policy during the campaign as it raises the probability of winning the election in the event the median voter happens to favor that policy. Note that both papers consider uncertainty about the effectiveness of different policies rather than uncertainty about the preferences of the parties, as I do here.

The possibility of the announced policy position serving as a signal for the true policy position was introduced by Banks (1990). His model differs with those presented here in two ways. First, in his model, voters do not have any information on the true policy position of each candidate. They do not know whether candidates are on the left or the right of the political spectrum. In the models presented here, they do know. Second, in Banks' model, there are always some candidates that use a pooling equilibrium, provided the costs of misrepresenting are not prohibitively high. Voters therefore cannot directly infer the true policy position upon observing the announced one. In the models presented here, they can.

The remainder of this paper is structured as follows. In the next section, I discuss the rationale behind the candidates' objective function in the two different models. Section 3 sketches the basic framework and analyzes the share-of-the-vote model. In Sect. 4 the median-voter model is discussed. Section 5 concludes the paper.

2 The candidates' objective function

A common assumption in spatial models of political competition, is that each candidate only tries to capture the median voter (for example in Downs 1957, but also in Banks 1990). In an election with two candidates, the argument goes, the candidate that captures the median voter necessarily gets the majority of the vote, and, by definition, wins the election.

This assumption, however, is not appropriate for every election. With proportional representation, for example, it makes more sense to assume that candidates maximize their share of the vote. Also, rather than being concerned with only winning or losing the election, candidates will often also be interested in the exact margin with which they do so. A candidate winning the election will find it easier to implement her preferred policy, the higher her share of the vote in the election. Also, for a candidate losing the election, the loss in reputation may be lower in case of a small defeat than in case of a big one. Finally, elections are often held with more than two candidates. In that case, convincing the median voter is not enough to win the election. In parliamentary elections, candidates will be much more interested in their share of the vote rather than in appealing to the median voter.

Summarizing, for some elections the median voter will indeed be the decisive one. Other elections, however, may be modelled more appropriately by assuming that candidates maximize their share of the vote. In this paper, I therefore consider both possibilities. The equilibria in the two models are qualitatively the same. They both involve candidates distorting their true policy positions, in an attempt to win the election. In Sect. 3, I model the case in which candidates maximize their share of the vote. Section 5 considers the median voter model.

3 A maximal support model

In this section I present the basic framework of the model, and use that framework to solve for the case in which candidates try to maximize their share of the vote. There is a continuum of voters. Voters' preferences are uniformly distributed on the interval $[0, 1]$. The median voter thus prefers policy $\frac{1}{2}$. In an election, there are two candidates, L and R. Candidate L has some true policy position P_L, which is private information, and thus unknown to voters and to the other candidate. It is common knowledge, however, that L's position is to the left of the median voter and, more specifically, that $P_L \sim F_L(p)$, with F_L some well-behaved probability distribution defined on the interval $[0, \frac{1}{2}]$. The true policy position of L is referred to as the type of L. Candidate R has a position P_R, known to be to the right of the median voter: $P_R \sim F_R(p)$, defined on $[\frac{1}{2}, 1]$. In the election campaign, each candidate promises to (try to) implement a certain policy. That promise is a function of her true policy position: $\alpha_i = A_i(P_i)$, $i = L, R$, with α for announcement. Note that, for example, the position candidate L announces is not restricted to the interval which defines her possible types. Each candidate is free to announce a policy position which is impossible to be her true one. Upon observing election promises, each voter decides which candidate to vote for. This choice depends on his preference[3] $v_k \in [0, 1]$, and the observed election promises of the two candidates. If we denote the choice made as V_k, we have $V_k = V(v_k, \alpha_L, \alpha_R)$, with $V_k \in \{L, R\}$. Note that I do not allow voters to abstain, a phenomenon studied by e.g. Feddersen and Pesendorfer (1996).

Voters care about the true policies a candidate wants to implement, rather than those promised during an election campaign. They have Euclidean preferences. True policy positions, however, cannot be observed. For the sake of argument, suppose they can. Knowing P_L and P_R, any voter would choose the candidate with the policy closest to his own preference. We then have

$$V(v_k, P_L, P_R) = \begin{cases} L \text{ if } v_k \leq \frac{P_L + P_R}{2} \\ R \text{ otherwise} \end{cases} . \tag{1}$$

Next, consider both candidates. In this section, I consider the case in which candidates care about their share of the vote λ_i. In a parliamentary system, for example, it is likely that the more support a candidate manages to gather, the higher the probability that she will be able to implement her preferred policy. Also, a candidate may simply obtain direct utility from having larger support. In the model I have in mind here, both candidates are likely to obtain some support, and enter parliament actively trying to pursue their preferred policy. That implies that after the election, voters will find out what the preferred policy of each candidate is. Hence, both candidates will suffer a loss from misrepresenting their true beliefs. For simplicity, I assume that this loss is independent of the candidate's vote share.

Utility of candidate i thus depends on both voter behavior and the loss she incurs due to misrepresenting her true type. Utility of candidate i can then be written

$$U_i^*(\alpha_i | P_i) = \lambda_i(\alpha_i, \alpha_j) - g_i(|\alpha_i - P_i|), \tag{2}$$

[3] Subscripts i and j are reserved for candidates, k for voters.

noting that the fraction of voters λ_i voting for candidate i only depends on the observables α_i and α_j. I assume that the loss function g_i is linear, strictly increasing and equal to zero if the announced position coincides with the true one. We thus have $g_i(|\alpha_i - P_i|) = \delta|\alpha_i - P_i|$.[4] Voters know the candidates' utility functions. The only thing they do not know is the actual position P_i of a candidate, which we assumed to be private information. In this specification, misrepresenting one's position comes at a loss. This loss is increasing in the absolute difference between the announced and the true policy position.

As solution concept, I use a sequential equilibrium (Kreps and Wilson 1982). This requires that each player maximizes utility given beliefs and strategies of all other players. Moreover, equilibrium beliefs are consistent with Bayesian updating. We now have the following;

Theorem 1. *When both candidates maximize their share of the vote, and with* $\delta < 1/2$, *equilibrium announcements are given by*

$$A_L(P_L) = \frac{1}{2\delta} P_L. \tag{3}$$

$$A_R(P_R) = 1 - \left(1 + \frac{1}{2\delta}\right)(1 - P_R) \tag{4}$$

Proof. First, consider the left-wing candidate L. Since the model is fully symmetric, a similar analysis also holds for R. In the case of perfect information, the fraction λ_L of voters that chooses candidate L, is given by

$$\lambda_L = \frac{P_L + P_R}{2}, \tag{5}$$

using the fact that v_k is uniformly distributed on $[0, 1]$. Obviously, $\lambda_R = 1 - \lambda_L$. Denote the belief voters have about the type of j by $\tilde{P}_j$. This belief depends on the position the particular candidate announces: $\tilde{P}_j = \tilde{P}_j(\alpha_j)$. For the strategy of L

[4] Note that with this specification, I make the implicit assumption that the politician does reveal her true type after the election, and behaves as such. Yet she could also choose not to do so, and save on the costs of lying. More specifically, suppose that ρ_i is the policy this candidate chooses after the election. In other words, ρ_i is the policy that she will try to get implemented after the election, again noting that the policy that will ultimately be implemented will also depend on this candidate's share of the vote, and on the vote share and policy position of the other candidate. Suppose that utility of candidate i can be written

$$U_i^*(\alpha_i, P_i, \rho_i) = \lambda_i(\alpha_i, \alpha_j) - \delta\left(|\alpha_i - \rho_i|\right) - \gamma\left(|\rho_i - P_i|\right).$$

The cost of lying now only equals $\delta\left(|\alpha_i - \rho_i|\right)$, since ρ_i is the policy this politician will try to achieve after the election. Yet, there is an additional cost $\gamma\left(|\rho_i - P_i|\right)$, which is the cost to this politician from ex-post choosing a policy different from her preferred one. When $\gamma > \delta$, it is easy to see that this politician will always choose her preferred policy, so $\rho_i = P_i$. Effectively, this is the assumption made in the main text. Intuitively, we thus assume that the costs of lying are always outweighed by the cost of choosing a policy different from one's preferred policy.

we need

$$\alpha_L = \arg\max_{\alpha_L} U_L^* \left(P_L, \alpha_L \mid \tilde{P}_L, \tilde{P}_R\right)$$
$$= \arg\max_{\alpha_L} \frac{\tilde{P}_L + \tilde{P}_R}{2} - g_L(|\alpha_L - P_L|),\ \forall\, P_L \in \left[0, \frac{1}{2}\right]. \quad (6)$$

First note that, with $\delta > \frac{1}{2}$, truth-telling is a (local) optimum. This can be seen as follows. Suppose that both candidates do tell the truth. Then $\tilde{P}_L = \alpha_L$, and $U_L^* = \frac{1}{2}\alpha_L + \frac{1}{2}\tilde{P}_R - \delta\,|\alpha_L - P_L|$, hence taking the first derivative with respect to α_L yields $\frac{\partial U_L^*}{\partial A_L}(P_L, P_L) = \frac{1}{2} - \delta < 0$. Thus, with $\delta > \frac{1}{2}$, the candidates have no incentive to defect from a truth-telling strategy.

One complication in solving (6) is that an argument of that function is the absolute value of $\alpha_L - P_L$. Hence, in principle, the problem always yields two solutions, one with $\alpha_L < P_L$, the other with $\alpha_L > P_L$. We use the following strategy to solve this maximization problem. First, I solve the unconstrained problem, without taking the absolute value into account. This yields a solution which I denote $\bar{\alpha}_L$. For any given P_L, the original problem then has two possible solutions: $\alpha_{L^-} = P_L - |\bar{\alpha}_L - P_L|$ and $\alpha_{L^+} = P_L + |\bar{\alpha}_L - P_L|$. Then I will show that, given the set-up at hand, the only feasible solution is α_{L^+}. Thus, I first solve

$$\bar{\alpha}_L = \arg\max_{\alpha_L} U_L^* \left(P_L, \alpha_L \mid \tilde{P}_L, \tilde{P}_R\right)$$
$$= \arg\max_{\alpha_L} \frac{\tilde{P}_L + \tilde{P}_R}{2} - g_L(\alpha_L - P_L),\ \forall\, P_L \in \left[0, \frac{1}{2}\right]. \quad (7)$$

Maximizing (6) yields the first-order condition

$$\frac{dU_L^*}{d\bar{\alpha}_L} = \frac{\partial U_L^*}{\partial \bar{\alpha}_L} + \frac{\partial U_L^*}{\partial \tilde{P}_L}\frac{d\tilde{P}_L}{d\bar{\alpha}_L} = 0. \quad (8)$$

Next, assume that the equilibrium announcement function A_L is one-to-one. Later I show that in the equilibrium derived, this is indeed the case. The assumption implies that in equilibrium, voters are able to infer directly the type of candidates they are facing, since equilibrium requires $\tilde{P}_L(\alpha_L) = A_L^{-1}(\alpha_L) = P_L$. Rearranging (8) and differentiating (7), we have for the unconstrained problem

$$\frac{d\bar{A}_L}{dP_L} = \frac{-\partial U_L^*/\partial \tilde{P}_L}{\partial U_L^*/\partial \bar{\alpha}_L} = \frac{1}{2g_L'} = \frac{1}{2\delta}, \quad (9)$$

where I denote with $\bar{A}_L$ the announcement function of the unconstrained problem. The differential equation (9) gives an implicit expression for the announcement function $\bar{A}_L(P_L)$. To solve the unconstrained problem, solve the differential equation (9) to find

$$\bar{A}_L(P_L) = \frac{1}{2\delta}P_L + C, \quad (10)$$

with C the integration constant. Note that the most unfavorable belief voters can have about the true type of the candidate is $\tilde{P}_L = 0$. For an equilibrium, we need

$A_L(0) = 0$. Suppose that, by contradiction, we have $A_L(0) \neq 0$. For the candidate with type $P_L = 0$, defecting from this equilibrium can never lead to less favorable beliefs of voters. But claiming $\alpha_L = 0$ does decrease the loss of misrepresentation, so $A_L(0) \neq 0$ cannot be part of an equilibrium. Plugging $A_L(0) = 0$ in (10) yields $C = 0$, thus

$$\bar{A}_L(P_L) = \frac{1}{2\delta} P_L. \tag{11}$$

We now have two possible solutions for the constrained problem: either $\alpha_{L^-} = P_L - |\bar{\alpha}_L - P_L| = 2P_L - \frac{1}{2\delta}P_L$ or $\alpha_{L^+} = P_L + |\bar{\alpha}_L - P_L| = \frac{1}{2\delta}P_L$. Only the latter can be a sequential equilibrium. This can be seen as follows. Note that for a sequential equilibrium we need, first, that all strategies are best responses to the other players' strategies, and, second, all beliefs are consistent with Bayesian updating. Suppose that in equilibrium we have $\alpha_L < P_L$ for all possible types of L. For some P'_L we therefore have an equilibrium announcement $\alpha'_L < P'_L$, while every voter observing α'_L, believes that he faces a candidate with true position P'_L. Now consider a candidate with a position P''_L which is slightly lower than P'_L, such that $\alpha'_L < P''_L < P'_L$. This type then has an incentive to mimic a type P'_L candidate, and defect from her equilibrium strategy by setting α'_L rather than the $\alpha''_L < \alpha'_L$ her equilibrium strategy prescribes. Given that voters believe that the true position of candidates announcing α'_L is P'_L, defecting in this way yields utility $\frac{1}{2}P'_L + \frac{1}{2}P_R - \delta(|\alpha'_L - P''_L|)$, rather than equilibrium utility $\frac{1}{2}P''_L + \frac{1}{2}P_R - \delta(|\alpha''_L - P''_L|)$. Since[5] $|\alpha''_L - P''_L| > |\alpha'_L - P''_L|$, we have $\delta(|\alpha''_L - P''_L|) > \delta(|\alpha'_L - P''_L|)$. Using $P''_L < P'_L$, a candidate with position P''_L is strictly better off making election promise α'_L, and the equilibrium breaks down. Therefore, the only possible equilibria involve $\alpha_L \geq P_L$ $\forall P_L$. The equilibrium thus has $A_L(P_L) = \frac{1}{2\delta}P_L$. Straightforward application of the above analysis implies for the other candidate $A_R(P_R) = 1 - \frac{1}{2\delta}(1 - P_R)$: the strategy for a candidate R is the mirror image of that of a candidate L. □

The proof of Theorem 1 also provides an intuition for the result that candidates tend to misrepresent their position. Suppose that all candidates would reveal their true position: $A_i(P_i) = P_i$. This cannot be an equilibrium. If it were, beliefs would be $\tilde{P}_i(\alpha_i) = \alpha_i$. But then, any left-wing candidate has an incentive to claim a position to the right of her true one. Any right-wing candidate has an incentive to claim a position that is more to the left. With $\delta < 1/2$, the costs of doing so, which is the disutility of lying, are more than outweighed by the benefits, consisting of a higher share of the vote in the election. Truth-telling therefore cannot be an equilibrium. The only possible equilibrium has the marginal costs of lying equal to the marginal benefit of getting a larger share of the vote, given the equilibrium beliefs of the voters, which is exactly (8). Although this equilibrium implies that every candidate is lying, voters are not fooled. Upon observing election promises, they can exactly infer each candidate's true position.

We thus have the following

[5] With $A''_L < P''_L$ and $A'_L < P''_L$, we have $|A''_L - P''_L| = P''_L - A''_L$ resp. $|A'_L - P''_L| = P''_L - A'_L$. Since $A''_L < A'_L$, this implies the inequality given in the text.

Corollary 1. *When both candidates maximize their share of the vote, and with $\delta < 1/2$, the unique separating equilibrium has the following*

(a) Candidates only tell the truth if they have the most extreme position possible: $A_L(0) = 0$, $A_R(1) = 1$.
(b) For all other positions, the left-wing candidate announces a policy to the right of her true position, whereas the right-wing candidate announces a policy to the left of her true position: $A_L(P_L) > P_L$, for $P_L \neq 0$, $A_R(P_R) < P_R$ for $P_R \neq 1$.
(c) Voters infer the true position of each candidate from observing their announcements: $P_i = A_i^{-1}(\alpha_i)$, $i = L, R$.
(d) Left-wing candidates may make right-wing claims, whereas right-wing candidates may make left-wing claims: $\exists P_L^*, P_R^*$ such that $A_L(P_L) > \frac{1}{2}$ for $P_L > P_L^*$ and $A_R(P_R) < \frac{1}{2}$ for $P_R < P_R^*$.

Note that the equilibrium derived above allows not only for the case that, say, a left-wing candidate announces a policy that she cannot possibly have, but even for the case that such a candidate promises to implement a policy that is not feasible, and has $A_L > 1$. If we want to avoid such claims, we need to impose $\delta > 1/4$. The condition on δ then is $1/4 < \delta < 1/2$: if δ is too high, telling the truth is always a dominant strategy. If it is too low, the incentive to lie is so strong that candidates make promises beyond what any citizen wants.

4 A median voter model

In this section I use essentially the same framework as in the previous section, but I now assume that candidates are only interested in winning the election, and not in their share of the vote. That implies that they are only interested in convincing the median voter. For example, if the median voter prefers candidate L, every voter with a preference to the left of the median voter will also prefer that candidate, which implies that candidate L wins the election. In this model, there is a clear winner of the election, and a clear loser. The loser will not be able to hold any office whatsoever, different from the case in which candidates try to maximize their share of the vote. But that also implies that, in this median-voter model, the losing candidate does not need to reveal its true position after the election. One may argue that in this median-voter model, if one loses the election, there are no costs attached to the initial misrepresentation of one's beliefs: no one can observe that there was such a misrepresentation. Of course, there still is the possibility that there is a loss due to shame, or that a probability still exists that the misrepresentation will be found out later. To capture these possibilities, I therefore choose a flexible representation, in which the loss of misrepresentation for the losing candidate is some fraction β of the loss of the winning candidate. Using the same notation as in Sect. 3, we thus have that utility of a candidate with type i equals

$$U_i(\alpha_i|P_i) = \begin{cases} U - \delta|\alpha_i - P_i| & \text{if } V(\frac{1}{2}, \alpha_L, \alpha_R) = i, \\ -\beta\delta|\alpha_i - P_i| & \text{if } V(\frac{1}{2}, \alpha_L, \alpha_R) = j. \end{cases} \quad (12)$$

Here U is some fixed, positive utility of winning the election, which is equal for both candidates,[6] and β is the fraction of the loss that the candidate obtains when it loses the election. Both U and β are common knowledge, but P_i is private information. We require $\beta \in [0, 1]$. With $\beta = 0$, the losing candidate does not obtain any loss from misrepresenting her preferences during the election campaign. When $\beta = 1$, both winner and loser face the same loss function from the misrepresentation of their preferred position. The voting behavior of the median voter (for whom $v_k = \frac{1}{2}$) is denoted $V\left(\frac{1}{2}, \alpha_L, \alpha_R\right)$, given the election promises α_L and α_R. We now have the following;

Theorem 2. *When both candidates try to attract the median voter, and when $\delta < 2U$, we have a unique symmetric equilibrium in which equilibrium announcements are given by*

$$A_L\left(P_L\right) = \frac{P_L}{\delta} \frac{\delta P_L\left(1-\beta\right) + 2U}{2P_L\left(1-\beta\right) + \beta}, \tag{13}$$

$$A_R(P_R) = 1 - \frac{(1-P_R)}{\delta} \frac{\delta(1-P_R)\left(1-\beta\right) + 2U}{2(1-P_R)\left(1-\beta\right) + \beta}. \tag{14}$$

The median voter votes for L if and only if $\alpha_L \geq 1 - \alpha_R$.

Proof. For ease of argument, rescale the policy space for candidate R such that it is equivalent with that of candidate L (i.e. in the new space $P_R = 1 - P_R^O$, with P_R^O candidate R's position in the original policy space). The most extreme right-wing position thus implies $P_R = 0$, rather than the $P_R^O = 1$ in the original notation. This rescaling allows us to formulate both candidates' strategy in a similar way. With the exact same argument as in the previous section, in equilibrium, we must thus have $\alpha_i(P_i) \geq P_i$.

We first derive the value of the parameters for which truth-telling is always an equilibrium. By telling the truth, the expected utility of a party is $\Pr(P_L > P_R)U = 2P_L U$. Now suppose the party lies and makes some announcement $\alpha_L > P_L$. This yields

$$U_L(\alpha_L|P_L) = (2\alpha_L)\left(U - (1-\beta)\,\delta(\alpha_L - P_L)\right) - \beta\delta(\alpha_L - P_L).$$

This can be seen as follows. When lying, the party has to pay costs $\beta\delta(\alpha_L - P_L)$ anyway, regardless of whether or not it wins the election. When it does win the election, it receives utility U, but has to pay an additional amount of lying costs equal to $(1-\beta)\delta(\alpha_L - P_L)$. It wins the election if it makes a claim that is higher than that of party R. Given that, in this candidate equilibrium, party R tells the truth, this happens with probability $\Pr(\alpha_L > P_R) = 2\alpha_L$. Now

$$\frac{\partial U_L(\alpha_L|P_L)}{\partial \alpha_L} = 2U - \delta\left(2P_L\left(1-\beta\right) + \beta\right). \tag{15}$$

[6] Alternatively, U may equal the difference in utility from a candidate's own preferred policy position being implemented, and the (expected) utility of the policy of the other candidate being implemented. The analysis is not affected when U is different between the two candidates, as long as it is high enough for both.

This expression is decreasing in P_L. In $P_L = \frac{1}{2}$, we have $\partial U_L(\alpha_L|P_L)/\partial\alpha_L = 2U - \delta$. Hence, all types have an incentive to lie if $\delta < 2U$. We assume this to be the case.

Again, I first solve for the unconstrained problem. Then I show that this solution satisfies the requirement that $A_i(P_i) > P_i$ for all P_i. For candidate i, expected utility of making a claim α_i equals

$$U_i(\alpha_i) = (U - (1-\beta)\,\delta(\alpha_i - P_i))\Pr(\alpha_j < \alpha_i) - \beta\delta(\alpha_i - P_i), \tag{16}$$

where $\Pr(\alpha_j < \alpha_i)$ is the probability that the other candidate makes a lower claim. Suppose the announcement strategy of the other candidate, j, is given by $\alpha_j = A(P_j)$. Define $\sigma(\alpha_j) \equiv A^{-1}(\alpha_j)$. Given that we have a uniform distribution function, (16) can be written

$$U_i(\alpha_i) = (U - (1-\beta)\,\delta(\alpha_i - P_i))\,(2\sigma(\alpha_i)) - \beta\delta(\alpha_i - P_i). \tag{17}$$

Taking the first order condition

$$\frac{dU_i}{d\alpha_i} = [U - (1-\beta)\,\delta(\alpha_i - P_i)]\,2\cdot\sigma' - 2\delta\,(1-\beta)\,\sigma(\alpha_i) - \beta\delta = 0, \tag{18}$$

which implies

$$\sigma' = \frac{2\,(1-\beta)\,\delta\sigma(\alpha_i) + \beta\delta}{2\,[U - (1-\beta)\,\delta(\alpha_i - P_i)]}. \tag{19}$$

We look for a symmetric equilibrium, in which both candidates use the same strategy. Therefore we can use (19) to derive a differential equation that implicitly defines A_i:

$$\frac{dA_i}{dP_i} = \frac{2U - 2\,(1-\beta)\,\delta(A_i - P_i)}{2\,(1-\beta)\,\delta P_i + \beta\delta} \tag{20}$$

The exact solution, using $A(0) = 0$, is

$$A_i\,(P_i) = \frac{P_i}{\delta}\frac{\delta P_i\,(1-\beta) + 2U}{2P_i\,(1-\beta) + \beta} \tag{21}$$

Note that $A_i > P_i$ whenever

$$\frac{P_i}{\delta}\frac{\delta P_i\,(1-\beta) + 2U}{2P_i\,(1-\beta) + \beta} - P_i = \frac{P_i}{\delta}\frac{2U - P_i\delta\,(1-\beta) - \beta\delta}{2P_i\,(1-\beta) + \beta} > 0 \tag{22}$$

The derivative of this expression wrt β is strictly negative:

$$\frac{d}{d\beta}\left(\frac{P_i}{\delta}\frac{2U - \delta P_i\,(1-\beta) - \beta\delta}{2P_i\,(1-\beta) + \beta}\right) = \frac{P_i}{\delta}\frac{2U\,(2P_i - 1) - \delta P_i}{(2P_i\,(1-\beta) + \beta)^2} < 0 \tag{23}$$

Thus, when it is satisfied for $\beta = 1$, it is satisfied for any β. Plugging in $\beta = 1$ yields $A_i(P_i) - P_i = \frac{P_i}{\delta}\,(2U - \delta)$, which is strictly positive iff $\delta < 2U$, which is what I assumed. Hence $A_i(P_i) > P_i\ \forall\beta$.

The announcement function A_i is monotone increasing and one-to-one. Therefore, a median voter that observes both claims can immediately infer the true policy position of each candidate. Hence, in equilibrium, the median voter indeed votes as described in the theorem. □

Again, we have

Corollary 2. *When both candidates try to attract the median voter, and with* $\delta < 2U$*, the unique symmetric separating equilibrium has the following*

(a) Candidates only tell the truth if they have the most extreme position possible: $A_L(0) = 0$, $A_R(1) = 1$.
(b) For all other positions, the left-wing candidate announces a policy to the right of her true position, whereas the right-wing candidate announces a policy to the left of her true position: $A_L(P_L) > P_L$*, for* $P_L \neq 0$, $A_R(P_R) < P_R$ *for* $P_R \neq 1$.
(c) Voters infer the true position of each candidate from observing their announcements: $P_i = A_i^{-1}(A_i)$, $i = L, R$.
(d) Left-wing candidates may make right-wing claims, whereas right-wing candidates may make left-wing claims: $\exists P_L^*, P_R^*$ *such that* $A_L(P_L) > \frac{1}{2}$ *for* $P_L > P_L^*$ *and* $A_R(P_R) < \frac{1}{2}$ *for* $P_R < P_R^*$.

The intuition is the same as that for the model in the previous section: the optimal strategy balances a trade-off between trying to convince the median voter on the one hand, and the costs of doing so on the other. Again, in equilibrium, voters are aware of these incentives, and discount them when making their voting decisions. In this model, if we also want that candidates can only make feasible claims, so $A_i(1/2) < 1$, we need

$$A_i(1/2) = \frac{1}{4}\frac{1-\beta+4U\delta}{\delta^2} < 1, \tag{24}$$

which is satisfied if

$$\beta > 1 - 4\delta\left(\delta - U\right) \tag{25}$$

Note that the game described in this section can be interpreted as an auction. In an auction (see for example McAfee and McMillan 1987 or Wolfstetter 1996) a number of bidders make a bid b_i that depends on their valuation v_i of a good being auctioned, and the probability distribution of the valuations of all other bidders. The bidder with the highest bid wins the auction and obtains a surplus $v_i - b_i$. The optimal bid can be derived by maximizing expected utility, taking into account that posting a lower bid increases utility if the auction is won, but decreases the probability of winning the auction. In the game described here, two candidates make a "bid" α_i that depends on P_i and the probability distribution of P_j. The candidate with the highest "bid" wins the election and obtains a surplus $U - \delta(\alpha_i - P_i)$. The optimal "bid" can be derived by maximizing expected utility, taking into account that making a higher promise decreases utility if the election is won, but increases the probability of winning the election.

Finally, consider the effect of a change in β. From (13), we have

$$\frac{\partial A_L(P_L)}{\partial \beta} = -P_L\frac{\delta P_L + 2U\left(1-2P_L\right)}{\delta\left(2P_L\left(1-\beta\right)+\beta\right)^2}. \tag{26}$$

With $P_L < 1/2$, we thus have $\partial A_L(P_L)/\partial\beta < 0$. From the proof of the theorem, we already know that $A_L(P_L) > P_L$. Hence, as β increases, the election promise of a candidate L is closer to her true position. This is intuitive: with higher β, the expected costs the candidate incurs due to misrepresentation of her position, are higher as well. This gives her an incentive to lie less blatantly.

5 Conclusion

In this paper I showed that two candidates participating in an election may have an incentive to make untruthful promises during the election campaign. More precisely, it was shown that, if the costs of lying are not too high, each candidate will make an announcement about her policy position that does not coincide with her true position. Any left-wing candidate will make a promise that is to the right of her real position, while every right-wing candidate will make a promise that is to the left of her real position. Voters, however, are not fooled by these promises, since, upon observing election promises, they can rationally infer the true position of each candidate. This phenomenon seems robust with respect to the type of model chosen. Both in a model in which candidates try to maximize their share of the vote, and in a model in which they try to attract the median voter, the same effect occurs.

The intuition behind this result is that candidates can only convince voters of their true position if they send a costly signal, which is such that it is just not worthwhile for a different candidate to use that same signal. In the models considered here the costs consist of a disutility of misrepresenting one's true position. For example, any candidate can claim that she has the same position as the median voter has. But voters will only be convinced of this, if the particular candidate is willing to incur a cost which is only worthwhile to incur for a candidate which really has the same position the median voter has. This particular candidate will therefore make an extreme election promise, that is actually beyond that of the median voter. The voters know that only a candidate that really has the same position as the median voter can afford to make this extreme claim. Thus, upon observing this announcement, they will infer that they are really facing such a candidate. A similar logic holds for candidates who have a position that is more remote from that of the median voter. Upon observing any promise, voters can infer the type of candidate they are facing, since for every promise there is a unique type for whom it is worthwhile to make exactly that promise.

Note that the results found in this paper do not hinge on the fact that candidates have the same loss function of lying. If one candidate is known to be more trustworthy than the other, voters will simply take this into account when evaluating the election promises of the candidates. As long as voters know exactly how trustworthy each candidate is, i.e. if voters know the exact shape of a candidate's loss function, then they can always infer the true position of each candidate upon observing her election promise. A more trustworthy candidate will lie less excessively, but since voters know this and take it into account, such a candidate does not have an inherent advantage over a less trustworthy candidate.

One may argue that the results in this paper are counterfactual in that, in the real world, candidates often make claims that are more extreme than their true position, rather than being more moderate. Indeed, the examples I gave in the introduction also suggested this to be the case. First, note that mine is not the only model predicting that politicians run on platforms that are more moderate than their true position. Indeed, in e.g., Alesina and Rosenthal (2000), politians often also choose a platform that is more moderate than their true position. In their model, like mine, this is due to the fact that parties try to attract the median voter. Second, note that, in many non-OECD countries, the predictions of this model are often observed. In such countries, politicians with extreme preferences often do run for election on a moderate, democratic platform, yet, after being elected, implement their own preferences and do whatever it takes to stay in power. Third, this paper only decribes a general mechanism, in which politicians lie during election campaigns, but voters are not fooled by such lies. By slightly changing the setup of the models, we may also have that politicians make more extreme rather than more moderate claims. In the vote-share model, this may be the case when voters are polarized, in the sense that the probability distribution of their preferred positions has relatively little mass in the middle. As another possibility, suppose voters abstain when they feel that there is no candidate which is close enough to their own preferences. In that case, candidates also have an incentive to make a claim which is more extreme that their true position, in order to also capture the extreme voters. In that case, therefore, we can have that a left-wing candidate makes claims to the left of her true position, while a right-wing candidate makes a claim to the right of her true position.

I showed that, in equilibrium, every candidate incurs some costs to credibly signal her true position. Yet, in equilibrium, voters can always infer the true position of each candidate. Therefore, in welfare terms, the equilibrium derived here is worse than that in the case in which voters are able to observe the true policy position of a candidate. In the latter case, there is no necessity for candidates to incur the cost of lying about their policy position. Yet the outcome of the election is the same since, ex post, voters do have the same information under both information regimes. Therefore, any device that decreases the cost for all possible types of candidates to signal their true policy position, would enhance welfare.

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