The Role of Reputation in Political Competition: An Analysis of Promises and Policy Implementation

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Abstract

This paper explores the effect of reputation in electoral competition, where a voter considers the candidates' perceived honesty and the proximity of their promises to their preferences. A two-period model of political competition is developed, where candidates face a trade-off between keeping their promises to maintain a good reputation or implementing their preferred policies. The efficacy of reputation as an enforcement mechanism is contingent upon the level of uncertainty candidates face about the voter's preferences and the relationship between the salience of reputation and the weight placed on future election. The model demonstrates that when uncertainty is high, candidates prioritize winning the election and may break their promises, while for low levels of uncertainty and high reputation salience, candidates make compromises between their preferred policies and the voter's ideal policy and implement their promises.

1 Introduction

> "Lying... is so ill a quality, and the mother of so many ill ones that spawn from it, and take shelter under it. It should be always spoke of before him with the utmost detestation, [...] and is not to be endured in any one who would converse with people of condition, or have any esteem or reputation in the world".
>
> **John Locke.**

Reputation can be a factor in changing the outcome of electoral campaigns. Reputation is central for democracies because it influences voters' decisions in future election. A politician with a good reputation is more likely to be elected or re-elected, as voters perceive them as trustworthy and competent. On the other hand, a politician with a poor reputation is less likely to be voted for, as voters perceive him as dishonest or ineffective. Reputation is also important as it affects a politician's bargaining power and ability to implement their preferred policies; a politician with a good reputation can secure support for their policies and initiatives, while a politician with a poor reputation may face opposition and resistance. In short, reputation is salient for politicians as it can make or break their political careers. Politicians can build and maintain their reputation through their actions and behavior. This includes keeping promises, being transparent, and engaging in ethical and responsible behavior. On the other hand, engaging in unethical or controversial behavior, breaking promises, or being perceived as untrustworthy can harm a politician's reputation. For these reasons, understanding the role that reputation has in determining the election results is key

This paper studies the effect of reputation in the context of political competition. I develop a two-period model of electoral competition with two candidates and one voter. During the campaign, candidates make promises about the policies they want to implement and the voter choose a candidate considering these promises as policy intentions. Once elected, the winner chooses a policy. She faces a trade off between keeping her promise, and consequently, a good reputation that allows them to be competitive in future election, or applying a different policy. As each candidate has preferred policies to implement, if a candidate promises certain policy, but once elected acts selfishly and implements something different, the voter will perceive this candidate as dishonest and will be less likely to vote for her in future election. Here, the trade-off between present and future utility appears naturally as a consequence of the reputation accrued from being in office.

There is a unique voter in the model, and the candidate's reputation influences his choice. He does not use his information from previous election to infer the policy that each candidate would implement if elected. He only cares about present election and considers the candidate's perceived honesty and the proximity of their promises to the voter's preferences. A candidate perceived as more honest may be favored over one ideologically closer, even if his promises are further from the voter's preferences Galeotti and Zizzo (2015). In the first version of the model, presented in section 2, candidates have complete information and can accurately predict the voter's preferences. In the second version, presented in section 4, one candidate's valence, represented by a stochastic variable A, introduces uncertainty and makes it impossible for candidates to predict the outcome of the election. After the first election, the voter observes the candidate's policy implementation and updates their beliefs about the candidate's reputation, setting the stage for a new electoral cycle. This uncertainty makes candidates face a trade-off when choosing their platforms between promising the ideal policy of the voter and increasing their chances of winning or a promise close to their preferred point that is easier to fulfill or harms their reputation for the incoming election.

I demonstrate that the effectiveness of reputation as a mechanism to enforce candidates' promises is contingent upon the relationship between two factors. Firstly, the degree of uncertainty that candidates face concerning the voter's preferences. Secondly, the relation between the salience of the reputation and the weight candidates place on future election compared to the present period. When uncertainty is high, candidates are wary of risking their chances of being elected and therefore pledge to adhere to the voter's preferred policy. In this scenario, the winner breaks her promise and implements her ideal policy. This happens because a high level of uncertainty reduces the effect of reputation as an enforcement mechanism of the promises. Conversely, when the level of uncertainty is low relative to the combination of the salience of the reputation and the weight placed on future election, candidates opt for a compromise between their ideal policy and the ideal of the voter. The winner implements her promise, and both candidates promise the voter's preferred policy in the subsequent round. For intermediate levels of uncertainty, candidates again make compromises between their preferred policies and the voter's ideal policy but once elected, they implement their favored one.

Literature Review

- Electoral Competition and **lying/ promises**.
  - The first economic model of the political parties' behavior is presented in Downs (1957), where office-motivated candidates compete as rational agents to win election. In this paper, parties have an intrinsic value of gaining office and are not motivated by policies *per se*. On it, governments try to maximize the number of votes to stay in power as in Hotelling (1929) with consumers. This analysis misses the ideological motivation of parties. Barro (1973) presents a model of repeated election to study the behavior of elected public office-holders when they care both about reelection and policies. He states that candidates act selfishly choosing their preferred policy if there is no political control by citizens and apply the promised policies when the public control of candidates is present. In this paper, voters are backwards-looking[1] and reputation is a factor that *discards* political representatives from being reelected when they act in their own interest.

[1] See also Austen-Smith and Banks (1989).

The two previous models predict a fight for the median voter that might fail to explain some of the electoral promise location that is observed in reality.

- Wittman (1983) and Calvert (1985) introduce candidates that care both about the probability of winning and the policy that is applied. A similar result appears in this paper, where the joint role of reputation and uncertainty is enough to create polarization in the electoral promises.
- In this line, Alesina (1988) develops a model of forward-looking voters and ideologically motivated candidates without commitment. The absence of commitment creates an equilibrium of the one-shot game where each candidate promises her ideal policy due to a problem of credibility. Convergence only appears when the game is infinitely repeated. My setup allows for both types of equilibria depending on the importance of the reputation and the level of uncertainty within the model.
- Aragonés, Palfrey, and Postlewaite (2007) study how reputation is used by voters to form beliefs about the credibility of candidates' campaign promises. They show that there is an equilibrium where candidates announce policies different from their ideal point and keep their promises. The voters I present in this paper are, instead backward-looking. In my model, candidates incur reputation costs when they apply a policy that differs from their promises. This reputation cost harms the predisposition of citizens to vote for the candidates that they consider reliable as a sort of punishment. Weelden (2013) analyzes the trade-off between applying rent-seeking policies or increasing the probabilities of reelection with an infinite number of candidates. He extends the analysis of credibility of campaign promises when there is no full commitment. In the same line, Bischoff and Siemers (2013) explain how retrospective voting and biased beliefs affect the policy outcomes and the probabilities of reelection.
- The relation between the promises and the policy intentions of candidates is also studied in Schnakenberg (2016). He proves that cheap talk can also be informative even if there is no commitment. In this line, Kartik and Van Weelden (2018) prove that cheap talk during the elections can affect candidates' behavior when they are in power.
- Rivas (2015) develops a model where a politician has to take several decisions during his term office. In his model, citizens are backwards looking when evaluating the quality of the politician. Under this assumptions, he sees incentives to take selfish decisions first and act honestly later. This differs with my papers because he considers multiple decisions in one electoral period, so there is no threaten of no-reelection.

- Electoral competition with **valence**.

Differently from previous papers on re-election, I model reputation as an additive term that decreases the utility of the voter to choose certain candidate. This way of modeling is close to the literature of electoral competition and *valence*.[2]

1. Ashworth and Bueno de Mesquita (2009) develop a model where candidates can invest in costly valences and show that valences are more important the less polarized is the society. In their model, a shock in one candidate's valence leads to complete platform convergence, while in mine, reputation can keep polarization.
2. Gouret, Hollard, and Rossignol (2011) analyze in a survey prior to the French presidential election of 2007 several spatial voting models with valence. Taking into account the empirical evidence, they develop a model of intensity valence that diverges from the additive valence models.

- Electoral competition empiric literature
  - Fong, Malhotra, and Margalit (2019) study the effect of the legacy as a key factor in the motivation of candidates. They find that candidates are worried about the memories of their time in office after they leave as they influence future debates.
  - Born, van Eck, and Johannesson (2018) analyze the effect of election promises in electoral behavior in the laboratory. The see that politicians tend to keep more promises if the reelection is close, as it is well known in the literature. They also see that voters use retrospective voting to punish for broken promises, as I model in this paper.
  - Galeotti and Zizzo (2015) experimentally measure the reaction of voters when candidates face a trade-off between competence and honesty. They conclude that *voters tend to have a bias towards caring about honesty even when this results in lower payoffs*. Without considering the role of competence, my model is in line with the results they find.
- Welfare analysis
  - Weelden (2015) studies the welfare implications of polarization in a context of repeated elections, extending the model in Weelden (2013). TBC

The rest of the paper is organized as follows: Section 2 presents the complete information model, including the players and the timing. Section 3 develops the equilibrium of the complete information model. Finally, section 4 restates the model with imperfect information

[2]See Stokes (1963), Groseclose (2001), Aragones and Palfrey (2002), Hummel (2010), Aragones and Xefteris (2013). Xefteris (2013), Denter (2021), and Buisseret and Van Weelden (2022) among others.

and, in section 5 there is a discussion of the results and their implications. All the proofs are relegated to the Appendix.

2 Complete Information Model

In this section, I present the main features of the complete information model: players, their payoffs, and the dynamics of information in the game.

Two *candidates* compete in election to decide who will apply a policy. I define a policy as a point in the reals, $x \in \mathbb{R}$. The timing of the election is the following: first, each candidate simultaneously announces a promise $p_i \in \mathbb{R}$ about the policy she will implement. The voter observes these promises and votes for his preferred candidate; the candidate who wins the vote is elected and applies a policy, $\pi \in \mathbb{R}$. Then, the voter observes the policy implemented and updates the reputation of the winning candidate. Once this process finishes, it repeats itself. I analyze two periods: $t = 0$ and $t = 1$.

2.1 Players

This section presents the players of the game. There are three players: two candidates, L and R (she), and a voter (he). I use i to refer to a generic candidate and v to the voter.

The voter Assuming the existence of just one voter is a simplification without loss of generality that allows me to focus on the behaviour of candidates. It is equivalent to take any distribution of voters and consider that the winner is elected by majority voting. In this case, the analysis focuses on the actions of the median voter.

The voter will choose the candidate that he thinks is closer to him. For simplicity, I will not consider the possibility of abstention. Therefore, he must vote for one and only one candidate. He has an innate preference over the policy, $x_v = 0$, that is common knowledge to all players. The voter decides his vote myopically (without thinking in future election); he does backward-looking reasoning and chooses the candidate whose promise is closest to him, but without making inferences about future policies. He will punish those candidates who earn a bad reputation. I assume this as my main goal is to study how the changes of a candidate between campaign and government affect her chances of reelection. I want to capture the punishment effect that deviations from the promises made in the campaign provoke; this is why I don't allow the voter to make any inference about the preferred policy of candidates.

Reputation cost Reputation is the key factor in this model. I will refer to it as reputation cost, bad reputation, or just reputation. It measures the difference between a candidate's promises and what she effectively does. The voter calculates the reputation of each candidate at every period, which will affect the chances of election. By assumption, the reputation of any candidate at $t = 0$ will be zero.

Equation (1) describes the reputation of candidate i at the beginning of period 1.

$$\mathfrak{R}_i^1 = \delta|p_i^0 - \pi_i^0| \tag{1}$$

where $\delta \in (0, 1)$. Equation (1) states that the reputation cost of a candidate consists of the positive difference between the promise made during election and the policy applied after winning. The interpretation of the term $\mathfrak{R}_i^1$ is as reputation costs of lying: it increases when a candidate deviates from her promise. δ captures the salience of reputation on voter's decisions.

Given the promises and reputation of each candidate, voter v will choose the candidate that maximizes her utility given by equation (2).

$$\mathcal{U}_{v,i}^t(p_i^t, \mathfrak{R}_i^t) = -|p_i^t| - \mathfrak{R}_i^t \tag{2}$$

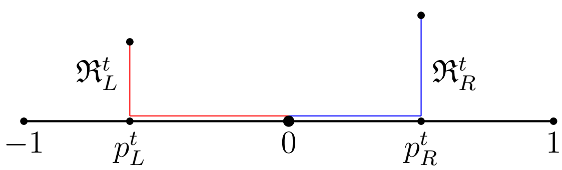

Figure 1: This graph shows the perceived distance from voter v to candidates i (red) and j (blue) given a pair of promises, $p_L^t < 0$ and $p_R^t > 0$ and reputations.

As shown in equation (2), the voter receives utility from each candidate considering two factors. The first factor is the distance from the promises of each candidate to her preferred policy, $x_v = 0$. The second is this candidate's reputation. An increase in $\mathfrak{R}_i^t$ decreases the utility of choosing candidate i for the voter. Hence, given a pair of promises, it will diminish the candidate's chances of being elected. As there are two candidates, there is always at least one maximizing the utility of voter v. In case of indifference, the voter will choose the candidate with the best reputation. If both candidates have identical reputations, the voter is indifferent and there will be a vote for each candidate with probability $\frac{1}{2}$.

Therefore, the voter will vote for candidate i with probability one if

$$|x_v - p_i^t| + \mathfrak{R}_i^t < |x_v - p_j^t| + \mathfrak{R}_j^t, \quad j \neq i$$

or if

$$|x_v - p_i^t| + \mathfrak{R}_i^t = |x_v - p_j^t| + \mathfrak{R}_j^t, \quad \text{and } \mathfrak{R}_i^t < \mathfrak{R}_j^t, \quad j \neq i$$

And with probability one-half whenever

$$|x_v - p_i^t| + \mathfrak{R}_i^t = |x_v - p_j^t| + \mathfrak{R}_j^t, \quad \text{and } \mathfrak{R}_i^t = \mathfrak{R}_j^t, \quad j \neq i$$

Candidates Each candidate has an exogenously given preferred policy,[3] x_R and $x_L \in \mathbb{R}$ for candidates R and L, respectively. These points are assumed to be symmetric around zero. Without loss of generality I assume $x_R = 1$ and $x_L = -1$. At the beginning of the period, each candidate publicly announces p_i^t, which is a promise about the policy that the candidate will implement if elected. The winner of the election decides π_i^t. For notation simplicity, I set $\pi_i^t = p_i^t$ for the losing candidate, as that keeps her reputation untouched. I say that a candidate is dishonest whenever she chooses $p_i^t \neq \pi_i^t$.

To simplify notation, I will use trough the paper $\mathfrak{R}^t$ to refer to the reputation for both candidates, $\mathbf{p^t}$ for the promises, and $\boldsymbol{\pi^t}$ for the policies at time t. I will remove the superscript t when it refers to the complete history.

Flow utility Candidates act as rational agents, maximizing their utility. The utility function of candidate i for period t is as follows:

$$u_i^t(\pi_i^t; \pi_{-i}^t, \mathbf{p^t}, \mathfrak{R}^t) = \begin{cases} -|x_i - \pi_i^t| & \text{if } i \text{ wins} \\ -|x_i - \pi_{-i}^t| & \text{if } i \text{ loses} \end{cases} \tag{3}$$

Where π_{-i}^t is the policy applied by the other candidate when she wins. The utility that candidates perceive from winning election comes from the opportunity to implement

[3] TBC Here, I could also say that it's not just a preferred policy because they are selfish but also a policy that they think is right.

a policy. For this reason, despite the candidates are not office motivated, they seek to win. With this, candidates maximize their total utility for the game.[4]

$$U_i(\imath, \boldsymbol{\pi}) = \sum_{t=0}^{1} \gamma^t u_i^t(\pi_i^t; x_i, \pi_{-i}^t) \tag{4}$$

for $0 < \gamma < 1$ a time discount factor. The utility of the game for candidates is the discounted sum of utilities for each period.

To sum up, candidates must choose every period a promise, p_i^t, and a policy to implement, π_i^t. Hence, the strategy of the candidate i at time t is a pair $\{p_i^t, \pi_i^t\}$. Consequently, the candidate's strategy for the game will consist of a sequence of promises and actions $\{p_i^t, \pi_i^t\}_{t=0}^1$.

2.2 Timing of the model

The structure of one period is as follows:

1. First, on *Campaign*, candidates publicly announce their policies, interpreted as intentions about policy implementations, p_i.
2. Second, in the *Voting stage*, the voter decides which candidate gives them a higher utility and votes.
3. Finally, in the *Office stage,* the elected candidate chooses a policy π_i. Voters observe it and update the candidate's reputation.

3 Results

In this section, I develop all the necessary steps to solve the model and present the equilibrium to the game. The equilibrium is a sub-game perfect Nash equilibrium for the candidates' strategies. It is a pair of promises and policies for each individual and each period:

$$\{p_R^0, p_R^1, \pi_R^0, \pi_R^1\}, \ \{p_L^0, p_L^1, \pi_L^0, \pi_L^1\}$$

[4]Assuming concavity for the utility function arises different equilibria, as I will discuss in Section 5.

I find the equilibria of the game by backward induction. The next set of results characterizes the equilibrium strategies in the last period, $t = 1$. Later, I will solve the first period.

3.0.1 Last period

In the last period, each candidate chooses a promise and a policy. This decision determines candidates' reputation, $\mathfrak{R}_i^1$. For this reason, the decision on p_i^1 and π_i^1 are not motivated by their effect on future reputation costs. Instead, when candidates decide on a promise and a policy to implement, they only care about the impact on that period's utility. Proposition 3.1 states the policy that candidates apply in equilibrium using this reasoning. As there is no mechanism that the voter can use to punish him, the candidate that wins election in the last period maximizes the flow utility of $t = 1$.

Proposition 3.1 (Optimal policies for the last period)**.** *In the last period, the candidate that wins the election best replies with her preferred policy in equilibrium:*

$$\pi_i^1 = x_i$$

The best reply of the previous proposition holds for every promise, p_i^1, and reputation, $\mathfrak{R}_i^1$, given that she has won the election. As candidate i is the winner, there is no possible punishment from voters. Therefore, she chooses in equilibrium the policy that maximizes his utility.

Using the previous result for the optimal policies for the last period, I can state the equilibrium payoffs for each candidate conditional on winning and losing. If candidate i wins the final period's election, she will apply her preferred policy and get a utility given by:

$$u_i(\pi_i^1; p_i^1, p_{-i}^1, \pi_{-i}^1) = -|x_i - \pi_i^1| = -|x_i - x_i| = 0 \tag{5}$$

If instead, candidate i loses in the last period, the other candidate will apply her preferred policy, and then the utility for losing is

$$u_i(\pi_i^1; p_i^1, p_{-i}^1, \pi_{-i}^1) = -|x_i - \pi_{-i}^1| = -|x_i - x_{-i}| = -2 \tag{6}$$

This result allows me to find the promises in equilibrium, as the optimal policies determine the flow utilities of both losing and winning. If candidates arrive in period one with the same reputation, they must choose the voter's preferred policy in order to win, as the voter can only differentiate between them by their promises. This is not the case if they have different reputations. If, for example, candidate L arrives at the last period with positive reputation costs, her opponent has a *relative advantage* that she can exploit to win that period's election. In this case, candidate L can not do anything to win, as candidate R will always win in equilibrium promising the voter's ideal policy. As only one candidate wins the election at each period and both begin the game with zero reputation cost, in equilibrium, there is only one case in which both candidates have the same reputation in the last period. This is if $\mathfrak{R}^1_L = \mathfrak{R}^1_R = 0$. Proposition 3.2 states the optimal policy promises for both candidates in the last period of the game depending on the reputation costs.

Proposition 3.2 (Optimal promise in the last period). *If both candidates begin the last period with the same reputation, $\mathfrak{R}^1_i = 0$, the promises p^1_i of their best reply will be the preferred policy of the voter.*

$$p^1_R = p^1_L = 0$$

If, instead, candidate R has lower reputation costs than L, she will choose in equilibrium any promise $p^1_R \in [-\mathfrak{R}^1_L, \mathfrak{R}^1_L]$. In this case, candidate L's policy choice does not matter.

The two previous propositions characterize the equilibrium of the last period. If both candidates reach the final period with equal reputation costs, they will promise the preferred policy of the voter. Hence, they will be equally likely to win that period's election. Once the voter's decision realizes, the winner applies her preferred policy and gets a flow utility of zero. The candidate that loses receives a flow utility of -2. However, if one of the candidates has a positive reputation cost, she loses in the last period with certainty. For this reason, a candidate that acts dishonestly in the first period ensures herself a utility of -2.

3.0.2 First period

Given the results of the last period of the game, I can calculate the equilibrium of the game. The structure of this section is similar to the previous one. First, I will characterize the optimal policies for any possible promise. Second, I will use this result to find the promises of both candidates in equilibrium. One particularity of the first period is that, by assumption, both candidates are symmetric for the voter's ideal point; they have a zero reputation cost, and their preferred policy is symmetric around the voter.

The candidate that wins the election must choose which policy to apply. This decision can make her keep her initial reputation or incur a reputation cost. This decision is one of the keys to the model. The policy that the candidate applies determines her reputation for the next period. Reputation costs make candidates lose in the last stage with certainty; this is a mechanism that can enforce honesty for candidates. Proposition 3.3 determines the best reply for the policies of candidate R, similarly for L, given any promise when she wins.

Proposition 3.3 (Optimal policy in the first stage)**.** *If candidate R wins in the first stage of the game with some promise $p_R^0 \in \mathbb{R}$ her best reply for the policy π_R^0 is*

$$\pi_R^0 = \begin{cases} p_R^0 & \text{if } 1+\gamma > p_R^0 > 1-\gamma \\ 1 & \text{otherwise} \end{cases}$$

Proposition 3.3 shows the range of promises that make candidate R act honestly when she is in power. If the promise that makes her win is inside a neighborhood of her preferred point, she will be honest. Otherwise, she prefers to apply her ideal policy. It is important to note that γ determines the interval's boundaries for the promises. When γ increases, the relative importance of the future payoffs increases, and the range of promises that make the candidate keep his promise also enlarges. Consequently, given γ,

$$[1-\gamma, 1+\gamma] \subseteq [1-\tilde{\gamma}, 1+\tilde{\gamma}] \text{ if } \gamma \leq \tilde{\gamma}$$

I can state a version of proposition 3.3 for candidate L. Given the symmetry between both candidates in the first period, if candidate L wins with some promise $-1-\gamma < p_L^0 < -1+\gamma$, she will apply that promise, and if she wins with a promise elsewhere, she will apply her preferred point, $\pi_L^0 = -1$. To characterize the equilibrium strategies, I still need to find what promises candidates choose in the first period. Let's assume that candidate L wins at $t = 0$ and applies her promise $\pi_L^0 = p_L^0$. The utility for candidate R is composed by two terms; the *flow utility* of p_L^0 being applied plus the expected utility of the last stage where both candidates compete with any reputation costs multiplied by the parameter γ. The expected utility of the second stage can be easily derived from equations (5) and (6).

$$U_R(p_R, p_L, \pi_L, \pi_R) = -(|1-p_L^0|) - \gamma$$

On the other hand, the total utility for candidate R if L wins and is dishonest is the utility when L applies her ideal policy. In this case, candidate R wins with certainty in the last period, and she can choose her preferred policy, receiving zero utility in that period.

$$U_R(p_R, p_L, \pi_L, \pi_R) = -(|1 - (-1)|) = -2$$

The next proposition characterizes the optimal promises in the first stage. In the first period, as both candidates are symmetric, they will promise the ideal policy of the voter to maximize their chances of winning, as there is no other factor that makes them different from the voter preferences.

Proposition 3.4 (Optimal promises in the first stage)**.** *In the first period, the two candidates best reply promising the voter's ideal policy.*

$$p_R^0 = p_L^0 = 0$$

We know from proposition 3.3 that a condition for candidate R, to be honest. If she promises her ideal point, she will always be honest. If rather, she promises something different to her ideal point, proposition 3.3 determines an interval that makes candidate R apply her promise if she wins. Given the results of proposition 3.4, it is important to study for what values of γ the lower boundary of this interval is below zero. Whenever $1 - \gamma \leq 0$, candidate R will be honest for every $p_R^0 \in [0, 1]$, in particular for $p_R^0 = 0$. Rearranging the terms of the inequality, I can state that candidate R will be honest for every $p_R^0 \in [0, 1]$ iff $\gamma > 1$. When $\gamma < 1$, candidate i applies her preferred policy if she wins with a promise equal to the voter's ideal policy. Then, her reputation will be $\mathfrak{R}_i^1 = \delta$. Proposition 3.4 ensures that any possible equilibria will include $p_i^0 = 0$. With propositions 3.3 and 3.4 I can prove Theorem 3.1, that determines the equilibrium of the game.

Theorem 3.1. There exists a unique equilibrium of the game. Both candidates promise the voter's ideal policy in the first period. They tied at the election. The winner applies her preferred policy, $\pi_i^0 = x_i$. In the last period, the loser chooses $p_{-i} \in [-\delta, \delta]$, wins, and she also apply her preferred policy.

3.1 Discussion

Theorem 3.1 states the unique equilibrium of the complete information model, where the voting is deterministic. In equilibrium, candidates promise the ideal policy of the voter in the first period, and the winner applies her preferred point. In the second period, the loser candidate chooses a promise closer to zero than δ and applies her preferred policy, while the promise of the other is indeterminate. The same reasoning applies for the promises of both candidates in the last stage; as there is a set of promises that, in equilibrium, make the favored candidate win, the payoffs are the same. If candidate R has zero reputation cost in the last stage of the game, choosing any $p_R^1 \in [-\delta, \delta]$ makes her win in equilibrium for any promise of candidate L and, consequently, she can choose her preferred policy. Given that candidate R wins at $t = 1$, her payoff only depends on the applied policy, which in this case is $\pi_R^1 = 1$, as stated in theorem 5.1. This happens because for any $\delta > 0$ the effect of any reputation cost is enough to reduce to zero the chances of a candidate to win the election. For the same reason, for any promise of candidate L he loses with certainty and receives the same payoff.

In this model, I do not assume any reputation effect on the utility after finishing the game. If I impose an infinitesimally small preference for honesty, I could state that candidate R prefers to promise $p_R^1 = \delta$ if she loses in the first stage. In this case, the effect of reputation not only makes candidates win or lose with certainty but also makes candidates choose unique promises that reveal their preferences.

This equilibrium relies on the fact that $\gamma < 1$. From propositions 3.3 and 3.4 there is only one strategy at the equilibrium of the first period that both candidates will choose. If γ is interpreted only as a time discount factor, I can not state $\gamma \geq 1$. In this model, this is not necessarily the case. As the policies applied in the first and the second periods are different and candidates are policy motivated, it can be the case in which one of the two candidates receives more utility from applying one policy rather than the other.

Here, I show two examples of why $\gamma > 1$ could be assumed. As the measures being applied in each of the periods are different, candidates might have an intrinsic preference for choosing one instead of the other. Let's suppose that, in the first period, the candidate has to apply healthcare policies and, in the second, they have to choose military expenditure. In that case, a candidate might prefer to win the second election than the first one if she is more interested in military topics. A second example is the following: the utility of the candidates depends on the policy but not on the probability that it is effective, as I do not discuss the concept of effectiveness in this paper. However, imagine that two candidates compete for the direction of a football club. They can use the club's fund for one of two activities at each period. However, they know that, after the next election, there will be a big football championship. That will increase the number of members of the club, and it will raise the income of the club. Candidates could prefer to win election in a period of high membership.

These two reasons make it worth studying the case in which $\gamma \geq 1$. With the results of propositions 3.3 and 3.4 I can state this corollary.

Corollary 3.1. *If $\gamma > 1$, there is a unique equilibrium of the game: Both candidates promise the voter's ideal policy in both periods. In the first, the winner applies her promise. In the* *last period, each wins with a probability of one-half, and the winner carries out her preferred policy.*

It is worth noting two differences between this corollary and the previous theorem. In the case of $\gamma < 1$, promises are never reliable; all the promises are what the median voter wants and the policies applied are what each candidate wants. Assuming that the future is preferred brings forth an equilibrium where candidates apply their promises in the first period. This mechanism only works because reputation is disqualifying in the race for the last period. A second difference is the strategy for the promises in the final period. In the case of $\gamma > 1$, as both candidates reach this stage with the same reputation, the only valid promise to win is the voter's ideal policy. In the case of $\gamma < 1$, the *reputation effect* allows the losing candidate to choose a policy closer to zero than δ for the second election.

In the next section, I will show that assuming probabilistic voting brings forth different equilibria. When candidates consider that the voter does not act deterministically, their decisions depend on the level of uncertainty.

4 Probabilistic voting

In this section, I present a version of the model where the reputation is computed stochastically for one candidate. All the other assumptions stay the same. In this case, candidates don't know exactly the preferred candidate for the voter given $\mathbf{p}$ and $\boldsymbol{\pi}$; I will assume that the voter has a private preference for one of the candidates that affects his willingness to vote for her but doesn't depend on $\mathbf{p}_i$ or $\boldsymbol{\pi}_i$. This preference is a pair of random variables A^0, A^1 iid that follow a uniform distribution in the interval $[-a, a]$, where $a \geq 0$ and affects the utility for the voter of choosing candidate R. The utility of the voter at the period t is given by the next equation.

$$\mathcal{U}_v^t(p_i^t, \mathfrak{R}_i^t) = \begin{cases} -|p_L^t| - \mathfrak{R}_L^t & \text{if she votes for candidate } L \\ -|p_R^t| - \mathfrak{R}_R^t - A^t & \text{if she votes for candidate } R \end{cases}$$

Given a pair of promises and the reputations for both candidates at time t, the probability of candidate R winning is equivalent to $P\left(A^t \leq -|p_R^t| + |p_L^t| + \mathfrak{R}^t\right)$. Using the fact that A^t is uniformly distributed, the probability of candidate R winning reads as,

$$P(\text{Win R}) = \begin{cases} 0 & \text{if } -a \geq -|p_R^t| + |p_L^t| + \mathfrak{R}^t \\ \frac{1}{2a}\left(-|p_R^t| + |p_L^t| + \mathfrak{R}^t + a\right) & \text{if } -a \leq -|p_R^t| + |p_L^t| + \mathfrak{R}^t \leq a \\ 1 & \text{if } a \leq -|p_R^t| + |p_L^t| + \mathfrak{R}^t \end{cases}$$

where $\mathfrak{R}^t = \mathfrak{R}_L^t - \mathfrak{R}_R^t$. Candidates are punished by the voter if they move away from his preferred policy as in the previous section. However, in this case, a candidate can win with positive probability even if she does not promise what the voter wants. As a final remark, note that the random variable that affects the reputation is realized twice (once per period). These two variables are *iid*. This allows me to focus the study on the role of uncertainty in the decision making of politicians and ignore the information updating that would arise assuming some correlation between both realizations of the random variable. As before, the equilibrium concept is sub-game perfect Nash equilibrium for the strategies of the candidates. I find the equilibrium by backward induction. The next section provides results about the equilibrium in last period of the game.

4.1 Last period

At the last period of the game, $t = 1$, the reputation for both candidates, $\mathfrak{R}_i^1$ are given by the results of the previous period. The only two decision variables of the candidates are the promise about the policy that they will apply and the policy itself in the case of winning election. Next proposition characterizes the optimal policy for the candidate that wins election in the last period. Once a candidate is elected to choose the policy, the probability of winning election does not play a role in the decisions, and therefore all the results of the deterministic model apply here.

Proposition 4.1 (Optimal policy in the last period). *If candidate i wins at $t = 1$, her best response is $\pi_i^1 = x_i$.*

This proposition is analogous to proposition 3.1. As the policy in the last stage does not depend on the promise that made the candidate win, she will apply her preferred policy. However, this is the only result independent on the variable A^t. As before, the promises made in equilibrium in the last period depend on the difference in reputation between the two candidates. If this difference is big enough, the candidate with better reputation will have a range of optimal promises that makes her win with certainty. If not, both candidates fight for the median voter. Next proposition characterizes the optimal promises in the last stage.

Proposition 4.2 (Optimal promise in the last stage). *If $\mathfrak{R}_L^1 \geq a$ there exist multiple equilibria of the form*

$$p_R^1 \in \left[a - \mathfrak{R}_L^1, \mathfrak{R}_L^1 - a\right] \text{ and } p_L^1 \in \mathbb{R}$$

If $a > \mathfrak{R}_L^1 \geq 0$, $\mathfrak{R}_R^1 = 0$, the unique equilibrium is

$$p_R^1 = p_L^1 = 0$$

Unlike in the complete information model, with a positive, but small enough, reputation cost both candidates have a positive probability of winning in equilibrium and they still promise the ideal point of the voter. This enlarges the strategies that might be optimal in the first period, as incurring in reputation costs is not disqualifier. Notice that, if the reputation cost is high enough, $\mathfrak{R}_L^1 \geq a$, this result is equivalent to proposition 3.2. Next section characterizes the results for the first period of the game and states the equilibria of the game.

4.2 First period

As before, the policies that the candidate applies in the first period depend on the promise that made her win. If this promise is close enough to the ideal point of the candidate, she will keep her promise and she will choose her ideal point otherwise. However, there is an extra condition for both candidates to keep their promise as proposition 4.3 shows; the level of uncertainty in the reputation, a, must be smaller than the future discounted salience of the reputation, $\gamma\delta$.

Proposition 4.3 (Optimal policies in the first period). *If candidate R wins at $t = 0$ with p_R^0, she chooses, in equilibrium,*

$$\pi_R^0 = \begin{cases} p_R^0 & \text{if } a < \gamma\delta \text{ and } 1 + \gamma \geq p_R^0 \geq 1 - \gamma \\ 1 & \text{Otherwise} \end{cases}$$

As in the deterministic model, the optimal policies in the first period are only the ideal point for keeping the promise. As the utility function is linear, there is no possibility of finding an optimal promise in the middle between these two options. Assuming a quadratic utility for the candidates, for the voter, or for both can make different equilibria appear where $\pi_R^0 \in (p_R^0, 1)$. This proposition split the model into two different cases, one in which the level of uncertainty is smaller than the future salience of reputation, $a < \gamma\delta$, and the opposite. Note that the first case coincides with the complete information model. The next proposition shows the optimal policies for candidate L and can be read as the symmetric version of proposition 4.3.

Proposition 4.4. *For candidate L, the optimal policy applied at $t = 0$ reads as*

$$\pi_L^0 = \begin{cases} p_L^0 & \text{if } a < \gamma\delta \text{ and } -1+\gamma \geq p_L^0 \geq -1-\gamma \\ -1 & \text{Otherwise} \end{cases}$$

Before stating the proposition that characterize the optimal promises in equilibrium for the first period, is important to note that, at the beginning of the game, the expected utility of candidates can have three different shapes. These shapes depend on the relation between the parameters of the model and the promise p_R^0. If the candidate is honest in the first period, $\pi_R^0 = p_R^0$, the expected utility of candidate R reads as

$$\mathbb{E}\left[U_R(\mathbf{p}, \boldsymbol{\pi})\right] = -\frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)\left[-|1-p_R^0| - \gamma\right] - \frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)\left[-|1+p_L^0| + \gamma\right]$$

where $\mathbf{p}$ is the set of promises and $\boldsymbol{\pi}$ the set of policies. The first term corresponds to the probability of winning in the first period multiplied by the utility of winning and applying the promise $-|1-p_R^0|$ plus the expected utility of the last period, that is -2 with probability one half. As both candidates have the same reputation in the last stage, both have the same chances of winning in equilibrium. The second term is the probability of losing times the utility of candidate L applying her policy.

If the candidate applies a different policy to her promise, the utility function for candidate R is

$$\mathbb{E}\left[U_R(\mathbf{p}, \boldsymbol{\pi})\right] = \begin{cases} -\frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)\left[\frac{\gamma}{a}\left(\delta|1-p_R^0| + a\right)\right] & \\ -\frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)\left[2 + \frac{\gamma}{a}\left(-\delta| - 1 - p_L^0| + a\right)\right] & \text{if } \delta|1-p_R^0| < a \\ -\frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)2\gamma & \\ -\frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)2 & \text{if } \delta|1-p_R^0| \geq a \end{cases}$$

Notice two things. First, the fact that the separation between both expressions depend on the relation between $\delta|1-p_R^0|$ and a is because of proposition 4.6. Second, this is only true in the case of symmetry.

As before, the first term of both expressions correspond with the probability of winning times the expected utility of winning. In both cases, the first period utility is zero, as candidate applies her ideal point. The only difference is the probability in equilibrium of winning in the second stage. If $\delta|1-p_R^0| < a$ this probability is positive. In the opposite case, this probability is zero and the candidate loses with certainty. Notice that the expected utility is a continuous function in the three cases. If $\delta|1-p_R^0| = a$, the two previous expressions are equal. The same holds for $p_R^0 = \pi_R^0$. The next two propositions characterize the optimal promises in the first period as a function of the relation between a and $\gamma\delta$.

Proposition 4.5 (Optimal promises in the first period $a < \gamma\delta$)**.** *Assume $a < \gamma\delta$.*

- *If $a \geq 2(1-\gamma)$ candidates choose in equilibrium*

$$p_R^0 = \frac{a}{2}, \quad p_L^0 = -\frac{a}{2}$$

- *If $a < 2(1-\gamma)$ candidates choose in equilibrium*

$$p_R^0 = p_L^0 = 0$$

The previous proposition implies that, when the level of uncertainty in the decision of the voter is smaller than the discounted salience of the reputation, there are two different equilibria. One arises when both a and γ are relatively large. In that case, both candidates chose a promise as a function of the level of uncertainty.

Proposition 4.6 (Optimal promises in the first period $a > \gamma\delta$)**.** *Assume $a > \gamma\delta$.*

If $a \leq \frac{2\gamma\delta}{2-\gamma\delta}$ and $2(1-\gamma) < \gamma\delta$,

$$p_R^0 = 1 + \frac{a}{2} - \frac{a}{\gamma\delta}, \; p_L^0 = -1 - \frac{a}{2} + \frac{a}{\gamma\delta}$$

Otherwise,

$$p_R^0 = p_L^0 = 0$$

Propositions 4.5 and 4.6 characterize the equilibria for the promises. In total, three different equilibria exist for the promises. The first, arises if the level of uncertainty, a is between $\gamma\delta$ and $2(1-\gamma)$. In this equilibrium candidates' promise is a function of the level of uncertainty and it goes further from the ideal policy of the voter if the uncertainty increases. Notice that, when the importance of the future enlarges, the interval $[2(1-\gamma), \gamma\delta]$ also does. The appearance of this equilibrium implies that γ is relatively high, at least higher than $\frac{2}{3}$, as if not the interval is empty for any δ.

The second equilibrium for the promises require a high level of uncertainty, as it only appears when $a > \gamma\delta > \max\left\{\frac{2a}{2+a}, 2(1-\gamma)\right\}$.Candidates' promises are weekly between the ideal policy of the voter and their preferred policy. In this case, the level of uncertainty has the inverse effect than in the previous equilibrium. Here, when the uncertainty increases, candidates converge to the ideal policy of the voter. If the future discounted salience of the reputation and the level of uncertainty are close, this equilibrium converges to the previous one.

The third, that coincides with the complete information model, appears in any other case. This equilibria were both candidates promise the voter's ideal policy might happen for two reasons. First, because the future is important (γ high) and the level of uncertainty about the preferences of the voter, a, is small. Second, because the future salience of the reputation is small relative to the rest of the parameters.

5 Discussion

The next theorem presents all three different types of equilibria that exist in this model. Notice that equilibria in the second stage depend on the relation between $\mathfrak{R}_i^1$ and a, as stated in proposition 4.2. If the reputation cost of one candidate exceeds the value of the uncertainty, the other candidate has a margin of movements on her promises around the ideal policy of the median voter that allows him to win with certainty in equilibrium. In the opposite case, both candidates will promise the voter's ideal policy.

Theorem 5.1 (Equilibria of the game)**.** This game has three different equilibria depending on the parameters.

1. *Honest equilibrium.* If $2(1-\gamma) < a < \gamma\delta$, in the first stage both candidates promise $p_R^0 = \frac{a}{2}$, and $p_L^0 = -\frac{a}{2}$. The winner applies her promise, $\pi_i^0 = p_i^0$ and keeps her reputation. In the second stage, both candidates promise the voter's ideal policy and, if they win, apply her preferred policy.
2. *High uncertainty equilibrium.* If $\frac{2\gamma\delta}{2-\gamma\delta} > a > \gamma\delta > 2(1-\gamma)$, in the first stage both candidates promise $p_R^0 = 1 + \frac{a}{2} - \frac{a}{\gamma\delta}$ and $p_L^0 = -1 - \frac{a}{2} + \frac{a}{\gamma\delta}$. The winner implements her

ideal policy. On the second stage, both candidates promise the median's voter ideal policy and the winner applies her ideal policy.

3. *Complete information equilibrium.* In any other case, in the first stage, both candidate promise voter's ideal policy, $p_R^0 = p_L^0 = 0$, and the winner implements her ideal policy. If $\delta > a$, the candidate with zero reputation cost makes a promise in the interval $[a - \delta, \delta - a]$, wins with probability one and applies her ideal policy. If, instead, $\delta \leq a$, both candidates choose the ideal policy of the median voter and the winner applies her ideal policy.

To understand this theorem, I will consider the different cases based on the values of γ and δ. Figure 2 shows the range of a where the different equilibria appear given γ and δ. When $2(1-\gamma) > \gamma\delta$, the optimal promises for both candidates in the first stage are the voter's ideal policy independently on a, the level of uncertainty. Notice that, if $\gamma < \frac{2}{3}$, this will always be the case. However, candidates implement their ideal policy when they win the election. The reputation effects appear also in the second stage. After the first election, either one candidate has zero probabilities of winning (when $\delta > a$) or both candidates still have positive probability of winning (when $\delta \leq a$).

If the candidates still have a positive probability of winning in the second stage, then their optimal strategies are to promise the voter's ideal policy. In this case, the level of uncertainty about the decision of the median voter is high to the importance of reputation. In other words, the exogenous stochastic part of the voter's utility is high relative to the endogenous one. Any deviation from the voter's ideal policy is small relative to the unknown preferences of the median voter. Therefore, both candidates still want to fight for the voter in equilibrium.

If the reputation cost of one candidate is high enough and her probability of winning for one candidate is zero in the second stage, the equilibrium is equivalent to the one developed in Section 2. I call it the *complete information equilibrium.* It also appears whenever $a = 0$ no matter the values of δ and γ as the model reduces to the one developed in Section 2. The candidate that loses in the first election can choose a range of promises around the voter's ideal policy to win the second stage election with certainty. As I did in section 2, I can assume an infinitesimally small *legacy effect* that pushes candidates towards being honest even when the game is over. This effect would make the right candidate choose the promise $p_R^1 = \delta - a$ and the left candidate $p_L^1 = a - \delta$. Then, incurring reputation costs in the first stage makes the advantaged candidate polarize in the second stage. Given his advantage, he can win with certainty, choosing a more polarized position. In this case, promises are a mechanism that reveals the policy that the candidate will apply in the second stage.

Let's analyze now the two types of equilibria that arise when $2(1-\gamma) < \gamma\delta$. If the level of uncertainty is in between those two terms, candidates are willing to polarize in their promises and move from the voter's ideal policy. As the future weight of the reputation is high concerning the uncertainty, they prefer to risk some of their probability of winning in exchange for a promise that will implement if elected. The effect of reputation also appears in the policies applied by the winner in equilibrium. Only in this equilibrium do candidates implement their promise when winning. This is due to two reasons: if the uncertainty about the utility of the median voter is low, candidates know that incurring high reputation costs makes them lose in the second stage with certainty. Therefore, under low levels of variance, candidates prefer to apply not their ideal policy, but the promise that made them win. This effect is insufficient, as shown in section 2, it is also necessary that the promises are not too far from the ideal policy of the candidate, as otherwise, candidates prefer to sacrifice future utility in exchange for the actual one. Theorem 5.1 ensures that assuming an infinitesimally low level of uncertainty can make candidates go honest when both periods are equally valuable for them, $\gamma = 1$. As they are truthful in their promises, in the last stage, both candidates compete with zero reputation costs.

If the level of uncertainty is high enough, $a > \gamma\delta > 2(1-\gamma)$, but smaller than $\frac{2\gamma\delta}{2-\gamma\delta}$ a different equilibrium appears; the so called *high uncertainty equilibrium.* Promises in the first stage are a decreasing function of the level of uncertainty. Two effects act together on the promises of this equilibrium. On the one hand, candidates do not apply their promises if they win, which creates a reputation cost for the next stage that will decrease the probability of winning. On the other hand, the high level of uncertainty makes candidates unsure about the result of the election and, consequently, about the effect of reputation on the probability of winning. These two effects make candidates move away from the voter's preferred policy; they are willing to risk the probability of winning in the first stage in exchange for incurring fewer reputation costs when they deceive and having a higher probability of winning in the second. However, when the level of uncertainty becomes higher than $\frac{2\gamma\delta}{2-\gamma\delta}$, the ignorance about the voter's behavior dominates the effect of the reputation on the second stage, which makes candidates promise the voter's preferred policy.

5.1 Descriptive statics

Figure 3 shows the evolution of the promises in the first stage as a function of the level of uncertainty. First of all, note that promises are continuous when $\gamma\delta = a$, as

$$\lim_{a\to\gamma\delta} 1 + \frac{a}{2} - \frac{a}{\gamma\delta} = \frac{a}{2}$$

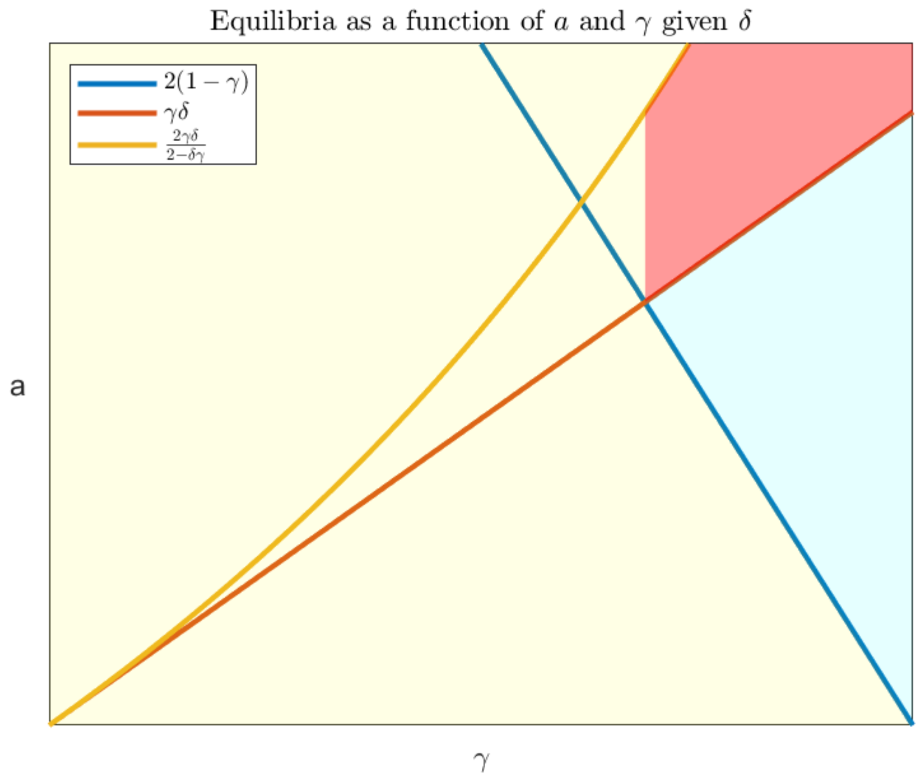

Figure 2: This figure splits the domain of a in three different sections, each corresponds with one equilibrium. In blue, the *honest equilibrium*. In red, the *high uncertainty equilibrium* and, in yellow, the *complete information equilibrium*.

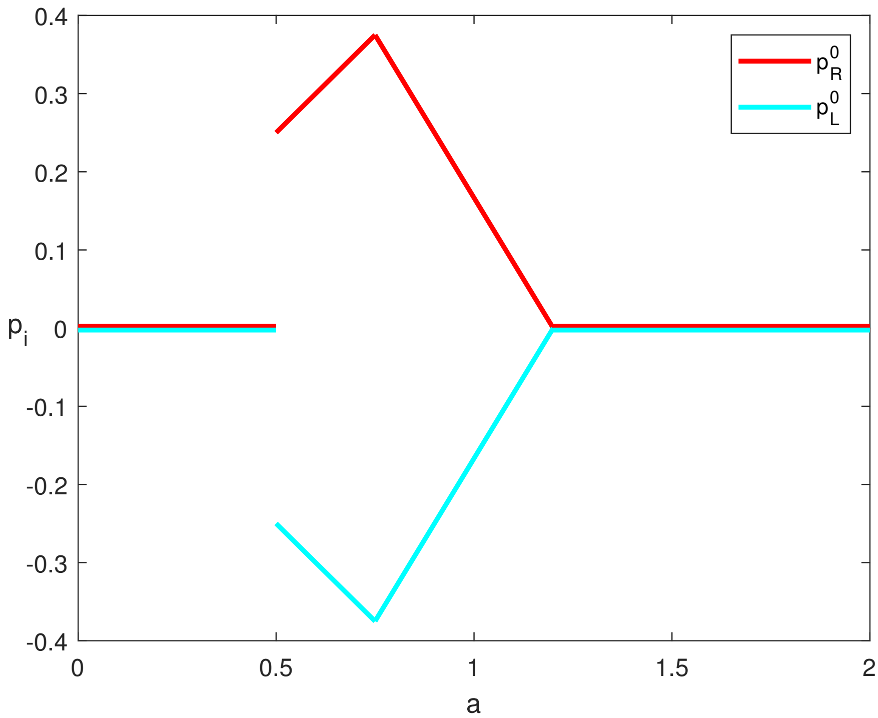

Figure 3: The promises in the first stage for candidate R as a function of a. Parameters: $\gamma = 0.75, \delta = 1$

and $\gamma\delta > \frac{2\gamma\delta}{2+\gamma\delta}$. Therefore, for small levels of uncertainty, $a < 2(1-\gamma)$ candidates choose still the ideal policy of the voter as their promise corresponding with the *complete information equilibrium*. However, when the level of uncertainty increases, they move towards more polarized positions. If the level of uncertainty about voter's preferences continues increasing $a > \gamma\delta$, the effect is the opposite, as candidates chose more moderate promises. This effect continues until the level of uncertainty is high enough that candidates do not want to risk probabilities of winning in exchange of less reputation and go back to promise the voter's ideal policy.

Hence, reputation plays a double role. In the second stage, if candidates have kept a relatively small reputation cost, they can still win with some positive probability. Knowing this, candidates do forwards looking reasoning and introduce this effect on their decision-making. Therefore, in the first stage, the reputation effect can polarize candidates in their promises and not choose only the ideal policy for the voter. From the point of view of *honesty*, how promises and policies relate, this polarization can be positive, as it produces a lower deviation between them.

5.2 Consequences

Here arises a central question in the political literature: *Is the electoral system forcing public representatives to lie?* The answer to this question is crucial to understanding the state of health of modern democracies. The problem of politicians lying to the public is not new and has been a concern for democratic societies for a long time. However, the issue has become increasingly relevant in recent years due to the rise of social media and the increasing polarization of political opinions; this has made it easier for politicians to manipulate public opinion and use lies and half-truths to gain support. The political process depends on politicians and citizens agreeing to legitimate it. The trust between politicians and their constituents is the best remedy to avoid the loss of faith in democracy, as this loss extends generally to the system itself. Losing this confidence helps extremism and populism to appear; citizens are unable to distinguish through the electoral process different ideologies. The need to win elections and gain power often leads politicians to make unrealistic promises and exaggerate their accomplishments; this is particularly true in countries with a two-party system, where politicians must appeal to a narrow set of swing voters to win elections. In such a system, politicians are forced to cater to the desires of the swing voters, which can lead to a distortion of the political process and the emergence of extremism.

The loss of *faith in the democracy*, apart from the appearance of extremism and populism, reduces the incentives of the citizenship to participate in the election: *"If every politician lies, we should give our trust on something different or not participate in the election"*. Reducing the level of participation in the election also reduces the legitimacy of the process; fewer voters make it less representative of the preferences of the society. Consequently, the elected authorities and the system represent a smaller proportion of society, which gives them less legitimacy. This process defines a loop in three steps:

1. If the candidates do not keep their promises, citizens do not believe in both politicians and the process.
2. Without confidence between politicians and citizens, there are fewer incentives to join the electoral process.
3. With fewer people joining the process, the legitimacy of the authorities diminishes. And consequently, candidates have fewer incentives to keep their promises.

Promises made during an election campaign are an essential tool for candidates to gain the trust and support of the electorate. However, the impact of these promises on people's welfare is realized through the policies implemented by the elected government. Therefore, political leaders must uphold their campaign promises and prioritize the interests of their constituents in their policies. If a politician applies policies that do not address the real needs of the people but her interests can lead to a decline in the population's welfare, especially those who are marginalized or vulnerable.

In the realm of economics, this issue is even more complex. Economic policies have far-reaching effects on the welfare of people, and any promises made during an election campaign must be realistic and sustainable. A candidate may make lofty promises of economic growth, job creation, or social welfare that may not translate into benefits for the people if they are poorly implemented.

In conclusion, lying or misleading the public during an election campaign can lead to policies that do not address the real needs of the population, especially in economics, where the impact of policies can be far-reaching and complex. Therefore, it is essential for political leaders to be honest and transparent in their campaign promises and to have a clear and sustainable plan to implement them.

6 Conclusion

This paper provides a framework for future research on the endogenize valence. I provide a prediction on the behavior of candidates: reputation can play a role in shaping campaign's promises if its salience is high enough. Candidates prefer to move away of the median voter towards their preferred policies when they are uncertain about his preferences. However, high levels of uncertainty about the voter's preferences have the opposite effect, as they dissolve the role of reputation. The results of this paper complement those in the literature of backwards looking voters[5] and electoral competition. Here I use reputation as the mechanism that relates selfish policies with the chances of reelection.

[5] See for example Fearon (1999) and the cites in there.

A Mathematical appendix

Proof of Proposition 3.1. The last period flow utility of candidate i if she wins at $t = 1$ is

$$u_i(\pi_i^1; p_i^1, p_{-i}^1, \pi_{-i}^1) = -(|x_i - \pi_i^1|)$$

Notice that this utility function only depends on π_i^1, a variable that the candidate chooses, and x_i which is exogenous. Then, this expression is maximized at $\pi_i^1 = x_i$ for every pair p_i^1, p_{-i}^1. $\square$

Proof of Proposition 3.2. As stated before, the optimal policies of both candidates determine, in equilibrium, the flow utilities of winning and losing election in the last period. These utilities are, respectively, 0 and -2. For this reason, candidates always prefer winning to losing at $t = 1$. They will choose the promise p_i^1 that maximizes their chances of winning.

First, I will assume that both candidates reach the last period with the same reputation. Notice that, as only one candidate wins the election at each period, this assumption implies that $\mathfrak{R}_L^1 = \mathfrak{R}_R^1 = 0$. Candidate i would like to choose any p_i^1 such that

$$(|p_i^1|) < (|p_{-i}^1|)$$

if $0 < |p_{-i}^1|$, as it makes her win with probability one. If, instead, $|p_{-i}^1| = 0$, candidate i chooses $p_i^1 = 0$ to win with probability one half, as otherwise, she loses. The best reply correspondence for candidate i is

$$p_i^1(p_{-i}^1) = \begin{cases} \left(-|p_{-i}^1|, |p_{-i}^1|\right) & \text{if } |p_{-i}| > 0 \\ 0 & \text{if } |p_{-i}| = 0 \end{cases}$$

Therefore, the only mutual best response is $p_i^1 = p_{-i}^1 = 0$.

Now, assume that one candidate reaches the last period with a worse reputation than her opponent. Without loss of generality, $\mathfrak{R}_L^1 > 0$. Using the same reasoning as before, this means that $\mathfrak{R}_R^1 = 0$. To begin, I will calculate the best replies for both candidates. Take any $p_L^1 \in \mathbb{R}$. Then, candidate R will chose any promise p_R^1 such that he wins, which implies that

$$|p_R^1| < |p_L^1| + \mathfrak{R}_L^1$$

Or, equivalently,

$$p_R^1(p_L^1) = \left[-|p_L^1| - \mathfrak{R}_L^1, |p_L^1| + \mathfrak{R}_L^1\right]$$

Next, take $p_R^1 \in \mathbb{R}$. Whenever it is possible, candidate L wants to choose p_L^1 such that

$$|p_L^1| < |p_R^1| - \mathfrak{R}_L^1$$

Notice that, if $|p_R^1| < \mathfrak{R}_L^1$, the set of p_L^1 meeting this condition is empty. In this case, candidate L is indifferent between any p_L^1 as she will lose for every p_L^1 she chooses. With this, the best reply is

$$p_L^1(p_R^1) = \begin{cases} \mathbb{R} & \text{if } p_R^1 \in [-\mathfrak{R}_L^1, \mathfrak{R}_L^1] \\ (-|p_R^1| + \mathfrak{R}_L^1, |p_R^1| - \mathfrak{R}_L^1) & \text{if } p_R^1 \notin [-\mathfrak{R}_L^1, \mathfrak{R}_L^1] \end{cases}$$

Candidate R has a set of promises that allows him to win with certainty given any possible promise of candidate L. If candidate R promises a policy in the set $[-\mathfrak{R}_L^1, \mathfrak{R}_L^1]$, candidate L has no possible promise to win. So, in this case, she is indifferent between all the policies she can choose. Notice that if candidate R goes for a promise outside of that interval, candidate L can promise something closer enough to the voter and win the election with probability one. Consequently, when both candidates best reply, they choose

$$p_R^1(p_L^1) = \left[-\mathfrak{R}_L^1, \mathfrak{R}_L^1\right], \quad p_L^1 \in \mathbb{R}$$

□

Proof of Proposition 3.3. Assume candidate R wins at $t = 0$ with $p_R^0 \in \mathbb{R}$. Now, candidate R must choose a policy to apply. If candidate R applies her promise, $\pi_R^0 = p_R^0$, she will keep her reputation untouched. Given the results in the previous section, she will win in the last period with a probability of one-half. Thus, she expects a utility of the last stage equal to -2. Consequently, her utility for the game is the utility of applying the policy π_R^0 plus the expected utility of the last period.

$$U_R(p_R, \pi_R; p_L, \pi_L) = -|1 - p_R^0| + \frac{\gamma}{2}(-2) = -|1 - p_R^0| - \gamma$$

If she applies a policy different from her promise, $\pi_R^0 \neq p_R^0$, she will incur reputation costs. Given the equilibrium results of the previous section, she will lose with certainty, and her utility at the last period will be -2. Therefore, if she decides to apply a policy different from her promise, it must be her preferred point, as she is sacrificing all her chances of winning in exchange for utility in the first period. If she chooses $\pi_R^0 = 1$, her utility will be

$$U_R(p_R, \pi_R; \pi_L, p_L) = -|1 - 1| - \gamma 2 = -2\gamma$$

Comparing the previous two equations, I can determine for what range of promises candidate R prefers to be honest and for what range she will deviate from her promise. Candidate R will choose $\pi_R^0 = p_R$ iff

$$2\gamma > |1 - p_R^0| + \gamma$$

Rearranging,

$$\gamma > |1 - p_R^0|$$

Which implies that

$$1 + \gamma > p_R^0 > 1 - \gamma$$

Candidate R's best reply for the policy in the first period is

$$\pi_R^0 = \begin{cases} p_R^0 & \text{if } 1 + \gamma > p_R^0 > 1 - \gamma \\ 1 & \text{otherwise} \end{cases}$$

□

Proof of Proposition 3.4. The proof has two parts. First, given the symmetry, I will show that there is only equilibrium if both candidates seek to win. Second, I find that the only promises both candidates can choose to maximize their chances of winning are $p_i^0 = 0$. By symmetry, if candidate R wants to lose, candidate L also, and vice versa. Therefore, in this case, given p_{-i}^0, candidate i would best reply with a promise farther from the ideal policy of the voter.

$$p_i^0 = (-\infty, -|p_{-i}^0|) \cup (|p_{-i}^0|, \infty)$$

But, if both players want to lose, there is no equilibrium. Assume, instead, that both candidates want to win in the first stage. As reputation is equal for the two candidates here, both want to choose a promise closer to the voter's preferred point than the promise of her rival. Then, the best reply for candidate i is

$$p_i^0 = \begin{cases} (-|p_{-i}^0|, |p_{-i}^0|) & \text{if } |p_i^0| > 0 \\ 0 & \text{if } p_i^0 = 0 \end{cases}$$

Considering both best responses, if one candidate promises a policy different from zero, the other can win with certainty with any policy closer to zero. Hence, the only pair of promises that come from the mutual best responses are $p_R^0 = p_L^0 = 0$, which gives the same probability of winning for both candidates. □

Proof of Theorem 3.1. From proposition 3.4, $p_i^0 = 0$. Proposition 3.3 when $p_i^0 = 0$ reads as: if candidate i wins with $p_i^0 = 0$, $\pi_i^0 = 0$ if $\gamma > 1$, and $\pi_i^0 = x_i$ otherwise. From proposition 3.1, candidate $-i$ wins with certainty with any promise $p_{-i} \in [-\sqrt[q]{\delta}, \sqrt[q]{\delta}]$, and will apply her preferred point, $\pi_{-i}^0 = x_{-i}$. □

Proof of Proposition 4.1. The proof is the same than in Proposition 3.1, as it doesn't depend on the probability of each candidate being elected. □

Proof of Proposition 4.2. As shown in proposition 4.1, payoffs in equilibrium do not depend on promises. The expected utility in equilibrium for candidate R given p_L^1 at period 1 is

$$\mathbb{E}(u_R^1(p_R^1; p_L^1, \pi_L^1, \pi_R^1)) = P(Win_L)(-2) = \begin{cases} \frac{-1}{a}\left(a + |p_R^1| - |p_L^1| - \mathfrak{R}_L^t\right) & \text{if } -|p_R^1| + |p_L^1| + \mathfrak{R}_L^t \in [-a, a] \\ 0 & \text{if } -|p_R^1| + |p_L^1| + \mathfrak{R}_L^t > a \\ -2 & \text{if } -|p_R^1| + |p_L^1| + \mathfrak{R}_L^t < -a \end{cases}$$

If $\mathfrak{R}_L \geq a$, for every p_L^1 there is a p_R^1 close enough to zero such that candidate R wins with probability one and gets zero utility at $t = 1$. In particular, given p_L^1, candidate R best reply must meet the following condition

$$|p_R^1| \leq |p_L^1| + \mathfrak{R}_L^1 - a$$

If candidate L plays a promise different from zero in equilibrium, candidate R can best reply with a promise bigger, in absolute value, than $\mathfrak{R}_L^1 - a$. Notice that this can not happen in equilibrium, as candidate L will be willing to deviate and choose a p_L^1 closer to zero such that the previous condition fails. Hence, for $\mathfrak{R}_L^1 > a$ there are multiple equilibria where candidate R plays $p_R^1 \in [a - \mathfrak{R}_L^1, \mathfrak{R}_L^1 - a]$. As candidate L can not choose any promise to win, she is indifferent to any promise that she can choose. In equilibrium, $p_L^1 \in \mathbb{R}$.

If $a > \mathfrak{R}_L^1 \geq 0$, candidate L can guarantee herself a positive probability of winning choosing $p_L^1 = 0$, as

$$\mathfrak{R}_L^t - a < 0 \text{ and } 0 \geq |p_R^1|$$

Both candidates, choosing a promise close to the voter's ideal policy, can have a strictly positive probability of winning. With this, candidate's R utility maximization is equivalent to maximize

$$\frac{-1}{a}\left(b + |p_R^1| - |p_L^1| - \mathfrak{R}_L^t\right)$$

which is decreasing for $|p_R^1|$. Reasoning equivalently for candidate L, I can state that both candidates best reply to each other with $p_R^1 = p_L^1 = 0$.

□

Proof of Proposition 4.3. The expected utility of candidate R at $t = 0$ when she wins with p_R^0 reads as

$$\mathbb{E}\left[U_R(\pi_R^0; p_R^0)\right] = \begin{cases} -|1 - \pi_R^0| - \frac{\gamma}{a}(a + \delta|\pi_R^0 - p_R^0|) & \text{if } \delta|\pi_R^0 - p_R^0| < a \\ -|1 - \pi_R^0| - 2\gamma & \text{if } \delta|\pi_R^0 - p_R^0| > a \end{cases} \tag{7}$$

The two parts of the function depend on the reputation cost. Equivalently, I can say that the difference between the policy and the promise determines the boundaries of the utility function. For both parts, the first term corresponds to the utility derived from applying the policy π_R^0. The second term is the expected utility in the last period of the game. It's important to note two issues with this function. First, the function is continuous for every π_R^0. In particular, when $\delta|\pi_R^0 - p_R^0| = a$, as

$$\lim_{\mathfrak{R}_R^0 \longrightarrow a^+} \mathbb{E}\left[U_R(\pi_R^0; p_R^0)\right] = \lim_{\mathfrak{R}_R^0 \longrightarrow a^-} \mathbb{E}\left[U_R(\pi_R^0; p_R^0)\right]$$

Second, the function has a unique maximum for $\mathfrak{R}_R^0 > a$, and it is $\pi_R^0 = 1$. Consequently, to find the maximum, it is enough to study the π_R^0 maximizing the function when $\mathfrak{R}_R^0 \leq a$ and comparing the values of the expected utility.

The expected utility when $\mathfrak{R}_R^0 \leq a$ is increasing on $\pi_R^0 \in [p_R^0, 1]$ if $1 > \frac{\gamma\delta}{a}$. In this case, $\pi_R^0 = 1$ is the maximum of this function.

If $1 < \frac{\gamma\delta}{a}$, the function is decreasing in the same interval for π_R^0. Hence, the maximum of the function will be p_R^0 if the first part of the function is the biggest, and π_R^0 otherwise:

$$\pi_R^0 = \begin{cases} p_R^0 & \text{if } -|1 - p_R^0| - \gamma \geq -2\gamma \\ 1 & \text{if } -|1 - p_R^0| - \gamma < -2\gamma \end{cases}$$

So p_R^0 is the maximum if

$$|1 - p_R^0| \leq \gamma$$

Rearranging terms, we have

$$1 + \gamma \geq p_R^0 \geq 1 - \gamma$$

Therefore,

$$\pi_R^0 = \begin{cases} p_R^0 & \text{if } a < \gamma\delta \text{ and } 1 + \gamma \geq p_R^0 \geq 1 - \gamma \\ 1 & \text{Otherwise} \end{cases}$$

□

Proof of Proposition 4.5. If $a < \gamma\delta$ and $p_R^0 \geq (1-\gamma)$, Proposition **??** states that the candidates will apply their promise if they win. The expected utility for candidate R is then,

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p},\boldsymbol{\pi})\right] = &-\frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)\left[|1-p_R^0| + \gamma\right] \\ &-\frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)\left[|1-p_L^0| + \gamma\right]\end{aligned}$$

Notice that $|p_R^0| > 1$ can not happen in equilibrium, as $p_R^0 = 1$ gives higher utility when winning and increases or keeps the probability of winning. In equilibrium, it must be that $p_R^0 \geq 0$, as for any promise smaller than zero, promising the policy of the voter increases the probability and the utility of winning. Reasoning similarly for candidate L, the expected utility can be rewritten as

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p},\boldsymbol{\pi})\right] = &-\frac{1}{2a}\left(-p_R^0 - p_L^0 + a\right)\left[1-p_R^0 + \gamma\right] \\ &-\frac{1}{2a}\left(a + p_R^0 + p_L^0\right)\left[1-p_L^0 + \gamma\right]\end{aligned}$$

Solving the utility maximization problem for p_R^0 and doing the same for candidate L, we get the best replies of each candidate.

$$p_R^0 = \begin{cases}\frac{a}{2} & \text{if } a < 2 \\ 1 & \text{if } a \geq 2\end{cases}, \quad p_L^0 = \begin{cases}-\frac{a}{2} & \text{if } a < 2 \\ -1 & \text{if } a \geq 2\end{cases}$$

But notice that if $a \geq 2$,

$$a \geq \frac{a}{2} \geq 1 \geq \gamma\delta$$

This statement is false by assumption. Therefore, if $a < \gamma\delta$ and $a \geq 2(1-\gamma)$

$$p_R^0 = \frac{a}{2},\ p_L^0 = -\frac{a}{2}$$

Assume now that $a < \gamma\delta$ and $a < 2(1-\gamma)$. Candidate R will only apply her promise if $p_R^0 > 1-\gamma$. If not, the expected utility of candidate R as a function of p_R^0 is

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p},\boldsymbol{\pi})\right] = &-\frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)\left[\frac{\gamma}{a}\left(\delta|1-p_R^0| + a\right)\right] \\ &-\frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)\left[2 + \frac{\gamma}{a}\left(-\delta| - 1 - p_L^0| + a\right)\right] \end{aligned} \tag{8}$$

when $\delta|1-p_R^0| < a$, and

$$\mathbb{E}\left[U_R(\mathbf{p},\boldsymbol{\pi})\right] = -\frac{1}{a}\left(-|p_R^0| + |p_L^0| + a\right)\gamma - \frac{1}{a}\left(a + |p_R^0| - |p_L^0|\right)$$

if $\delta|1-p_R^0| > a$.

Notice that the expected utility in (**??**) reaches a maximum at $p_R^0 = 0$. On the other hand, using the same reasoning of the previous part of the proof, $p_R^0 \in [0,1]$ and $p_L^0 \in [-1,0]$. And then, I can write equation (8) as

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p},\boldsymbol{\pi})\right] = &-\frac{1}{2a}\left(-p_R^0 - p_L^0 + a\right)\left[\gamma\left(\delta(1-p_R^0) + a\right)\right] \\ &-\frac{1}{2a}\left(a + p_R^0 + p_L^0\right)\left[2 + \frac{\gamma}{a}\left(-\delta(1 + p_L^0) + a\right)\right]\end{aligned}$$

The unconstrained maximization problem of the previous equation gives as a maximum $p_R^* = 1 + \frac{a}{2} - \frac{a}{\gamma\delta}$. By symmetry, we can see that $p_L^0 = -1 - \frac{a}{2} + \frac{a}{\gamma\delta}$.

If $\delta(1-p_R^0) \geq a$, candidate R chooses in equilibrium $p_R^0 = 0$. This is because the reputation cost in which candidate R incurs given his optimal promise is too high, and therefore he can choose a better promise. The same holds for candidate L. If instead, $\delta(1-p_R^0) < a$, we have that developing the inequality,

$$1 > \frac{2-\gamma\delta}{2\gamma} \tag{9}$$

This means that $p_R^* < 0$, as

$$1 \leq \frac{a}{\delta}\left(\frac{2-\gamma\delta}{2\gamma}\right)$$

where $\frac{a}{\delta} < \gamma \leq 1$ and the right term is smaller than one. Notice that, condition (9) can be rewritten as $\gamma\delta > 2(1-\gamma)$. Therefore, if $\gamma\delta > 2(1-\gamma) > a$ both candidates choose $p_i^0 = 0$ in equilibrium. □

Proof of Proposition 4.6. If $a > \gamma\delta$, candidate R will apply the policy $\pi_R^0 = 1$ if she wins. Hence, the expected utility of candidate R reads as

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p}, \boldsymbol{\pi})\right] = &- \frac{1}{2a}\left(-|p_R^0| + |p_L^0| + a\right)\left[\frac{\gamma}{a}\left(\delta|1 - p_R^0| + a\right)\right] \\ &- \frac{1}{2a}\left(a + |p_R^0| - |p_L^0|\right)\left[2 + \frac{\gamma}{a}\left(-\delta| - 1 - p_L^0| + a\right)\right]\end{aligned} \tag{10}$$

when $\delta|1 - p_R^0| < a$. Using the same reasoning than in proposition 4.6

$$\begin{aligned}\mathbb{E}\left[U_R(\mathbf{p}, \boldsymbol{\pi})\right] = &- \frac{1}{2a}\left(-p_R^0 - p_L^0 + a\right)\left[\gamma\left(\delta(1 - p_R^0) + a\right)\right] \\ &- \frac{1}{2a}\left(a + p_R^0 + p_L^0\right)\left[2 + \frac{\gamma}{a}\left(-\delta(1 + p_L^0) + a\right)\right]\end{aligned}$$

If $\delta|1 - p_R^0| > a$, the expected utility is

$$\mathbb{E}\left[U_R(\mathbf{p}, \boldsymbol{\pi})\right] = -\frac{1}{a}\left(-|p_R^0| + |p_L^0| + a\right)\gamma - \frac{1}{a}\left(a + |p_R^0| - |p_L^0|\right)$$

This function, when $\delta|1 - p_R^0| > a$, has as maximum at $p_R^0 = 0$. The unconstrained maximization problem of the expected utility when $\delta|1 - p_R^0| < a$ gives as a maximum $p_R^* = 1 + \frac{a}{2} - \frac{a}{\gamma\delta}$. By symmetry, we can see that $p_L^0 = -1 - \frac{a}{2} + \frac{a}{\gamma\delta}$.

Notice that, as the expected utility function is continuous when if $\delta|1 - p_R^0| = a$, I only need to compare the utility of $p_R^0 = 0$ against p_R^* to know which is the maximum. Two conditions must hold for p_R^* being a best reply in equilibrium:

1. $p_R^* \geq 0$. This implies, using the same procedure of the previous proposition,

$$\gamma\delta \geq \frac{2a}{2 + a}$$

2. $\delta(1 - p_R^*) < a$. This implies

$$1 > \frac{2 - \gamma\delta}{2\gamma}$$

If any of these two condition fails, candidate R prefers to choose in equilibrium $p_R^0 = 0$. This can be either because $\delta < a$ and the candidate in equilibrium has a positive probability of winning in the second stage or either because even having zero probability of winning, the candidate values more increasing the probability of winning than the reputation cost.

□

Proof of Proposition 4.6. The proof is done in three different parts, each one corresponding to the three different types of equilibria.

1. If $2(1-\gamma) < \gamma\delta$ the optimal promises in equilibrium are determined by proposition 4.5, and the policies by proposition 4.3. As candidates apply their promise, they arrive to the second stage with same reputation, and hence, they will play the most moderate policy and chose their ideal policy if they win.

2. In this case, promises are determined by proposition 4.6. Proposition 4.3 ensure that the winner will apply her ideal policy. The reputation costs of the candidate that wins are

$$\mathfrak{R}_i^t = \delta \left| 1 + \frac{a}{2} - \frac{a}{\gamma\delta} - 1 \right| = \delta a \left| \frac{2 - \gamma\delta}{2\gamma\delta} \right|$$

   Proposition 4.2 characterizes the promises in equilibrium depending on the relation between reputation and uncertainty. By assumption,

$$\delta a \left| \frac{2 - \gamma\delta}{2\gamma\delta} \right| < a$$

   or, equivalently,

$$\left| \frac{2 - \gamma\delta}{2\gamma} \right| < 1 \Rightarrow 2(1-\gamma) < \gamma\delta$$

   Therefore, both candidates promise the ideal policy of the median voter and apply their ideal policy if they win.

3. For the third type of equilibrium, either $\gamma\delta < 2(1-\gamma)$ or $\gamma\delta < \frac{2a}{2+a}$. In the both cases, the optimal promises are determined by propositions 4.5 and 4.6. Proposition 4.3 guarantees that the winner applies her ideal policy. She incurs on a reputation cost equal to δ. From proposition 4.2, if $\delta < a$ there is a unique equilibrium in which both candidates play $p_i^1 = 0$ and the winner applies her preferred policy. If, instead, $\delta > a$, the advantaged candidate can play anything in the interval $[a-\delta, \delta - a]$ to win and apply her ideal policy with probability one and the other candidate can not play any promise to win.

$\square$

References

Alesina, A. (1988). Credibility and policy convergence in a two-party system with rational voters. *The American Economic Review*, *78*(4), 796–805. Retrieved 2023-04-11, from http://www.jstor.org/stable/1811177

Aragones, E., & Palfrey, T. (2002). Mixed equilibrium in a downsian model with a favored candidate. *Journal of Economic Theory*, *103*(1), 131-161. Retrieved from https://EconPapers.repec.org/RePEc:eee:jetheo:v:103:y:2002:i:1:p:131-161

Aragones, E., & Xefteris, D. (2013). *Imperfectly informed voters and strategic extremism* (Working Papers No. 725). Barcelona School of Economics. Retrieved from https://EconPapers.repec.org/RePEc:bge:wpaper:725

Aragonés, E., Palfrey, T., & Postlewaite, A. (2007, 02). Political reputations and campaign promises. *Journal of the European Economic Association*, *5*, 846-884.

Ashworth, S., & Bueno de Mesquita, E. (2009). Elections with platform and valence competition. *Games and Economic Behavior*, *67*(1), 191-216. Retrieved from https://EconPapers.repec.org/RePEc:eee:gamebe:v:67:y:2009:i:1:p:191-216

Austen-Smith, D., & Banks, J. (1989). Electoral accountability and incumbency. In P. Ordeshook (Ed.), *Models of strategic choice in politics.* University of Michigan Press.

Barro, R. J. (1973). The control of politicians: An economic model. *Public Choice*, *14*, 19–42. Retrieved from http://www.jstor.org/stable/30022701

Bischoff, I., & Siemers, L.-H. (2013). Biased beliefs and retrospective voting: why democracies choose mediocre policies. *Public Choice*, *156*(1/2), 163–180. Retrieved 2023-04-11, from http://www.jstor.org/stable/42003153

Born, A., van Eck, P., & Johannesson, M. (2018). An experimental investigation of election promises. *Political Psychology*, *39*(3), 685–705. Retrieved 2023-04-11, from http://www.jstor.org/stable/45095198

Buisseret, P., & Van Weelden, R. (2022, September). Polarization, valence, and policy competition. *American Economic Review: Insights*, *4*(3), 341-52. Retrieved from https://www.aeaweb.org/articles?id=10.1257/aeri.20210169 doi: 10.1257/aeri.20210169

Calvert, R. L. (1985). Robustness of the multidimensional voting model: Candidate motivations, uncertainty, and convergence. *American Journal of Political Science*, *29*(1), 69–95. Retrieved 2023-04-11, from http://www.jstor.org/stable/2111212

Denter, P. (2021). Valence, complementarities, and political polarization. *Games and Economic Behavior*, *128*, 39-57. Retrieved from https://www.sciencedirect.com/science/article/pii/S0899825621000427 doi: https://doi.org/10.1016/j.geb.2021.04.003

Downs, A. (1957). An economic theory of political action in a democracy. *Journal of Political Economy*, *65*. Retrieved from https://EconPapers.repec.org/RePEc:ucp:jpolec:

v:65:y:1957:p:135

Fearon, J. D. (1999). Electoral accountability and the control of politicians: Selecting good types versus sanctioning poor performance. In A. Przeworski, S. C. Stokes, & B. Manin (Eds.), *Democracy, accountability, and representation* (p. 55–97). Cambridge University Press. doi: 10.1017/CBO9781139175104.003

Fong, C., Malhotra, N., & Margalit, Y. (2019). Political legacies: Understanding their significance to contemporary political debates. , *52*(3), 451–456.

Galeotti, F., & Zizzo, D. J. (2015). Competence versus honesty: What do voters care about? Retrieved from https://halshs.archives-ouvertes.fr/halshs-01180812/document

Gouret, F., Hollard, G., & Rossignol, S. (2011). An empirical analysis of valence in electoral competition [Post-Print]. Retrieved from https://EconPapers.repec.org/RePEc:hal:journl:halshs-00867711

Groseclose, T. (2001). A model of candidate location when one candidate has a valence advantage. *American Journal of Political Science*, *45*(4), 862–886. Retrieved 2022-04-11, from http://www.jstor.org/stable/2669329

Hotelling, H. (1929). Stability in competition. *The Economic Journal*, *39*(153), 41–57. Retrieved 2023-04-11, from http://www.jstor.org/stable/2224214

Hummel, P. (2010). On the nature of equilibria in a downsian model with candidate valence. *Games and Economic Behavior*, *70*(2), 425-445. Retrieved from https://www.sciencedirect.com/science/article/pii/S089982561000028X doi: https://doi.org/10.1016/j.geb.2010.01.012

Kartik, N., & Van Weelden, R. (2018, 01). Informative Cheap Talk in Elections. *The Review of Economic Studies*, *86*(2), 755-784. Retrieved from https://doi.org/10.1093/restud/rdy009 doi: 10.1093/restud/rdy009

Rivas, J. (2015, 12). Private agenda and re-election incentives. *Social Choice and Welfare*(46), 899-915.

Schnakenberg, K. E. (2016). Directional cheap talk in electoral campaigns. *The Journal of Politics*, *78*(2), 527–541. Retrieved 2023-04-11, from https://www.jstor.org/stable/26550729

Stokes, D. E. (1963). Spatial models of party competition. *American Political Science Review*, *57*(2), 368–377. doi: 10.2307/1952828

Weelden, R. V. (2013). Candidates, credibility, and re-election incentives. *The Review of Economic Studies*, *80*(4 (285)), 1622–1651. Retrieved 2023-04-11, from http://www.jstor.org/stable/43551569

Weelden, R. V. (2015). The welfare implications of electoral polarization. *Social Choice and Welfare*, *45*(4), 653–686. Retrieved 2023-04-11, from http://www.jstor.org/stable/43662436

Wittman, D. (1983). Candidate motivation: A synthesis of alternative theories. *The American Political Science Review*, *77*(1), 142–157. Retrieved 2023-04-11, from http://www.jstor.org/stable/1956016

Xefteris, D. (2013). Equilibrium in a discrete downsian model given a non-minimal valence advantage and linear loss functions. *Mathematical Social Sciences*, *65*(2), 150-153. Retrieved from https://EconPapers.repec.org/RePEc:eee:matsoc:v:65:y:2013:i:2:p:150-153