Campaign Promises as an Imperfect Signal: The Electoral Advantages of being an Extreme Candidate

Yasushi Asako*

Bank of Japan

February 2, 2011

Abstract

This paper develops a political competition model in which campaign platforms are partially binding. A candidate who implements a policy that differs from his/her platform must pay a cost of betrayal that increases with the size of the discrepancy. I also assume that voters are uncertain about candidate preferences for policies. If voters believe that a candidate is likely to be extreme, there exists a semiseparating equilibrium: an extreme candidate imitates a moderate candidate with some probability, and with the remaining probability, he approaches the median policy. Although an extreme candidate will implement a more extreme policy than a moderate candidate regardless of imitation or approach, partial pooling ensures that voters prefer an extreme candidate who does not pretend to be moderate over an uncertain candidate who announces a moderate platform. As a result, a moderate candidate never has a higher probability of winning than an extreme one.

Keywords: electoral competition, voting, campaign promise, signaling game

JEL Classification Numbers: C72, D72, D82

---

*IMES, Bank of Japan, 2-1-1 Nihonbashi-Hongokucho Chuo-ku, Tokyo, 103-8660. E-mail: yasushi.asako@boj.or.jp. The author benefited from the comments of Scott Gehlbach, Marzena Rostek and William Sandholm, as well as from the comments of Swati Dhingra, Steven Durlauf, Yoichi Hizen, Ching-Yang Lin, John Morrow, Daniel Quint, Ryoji Sawa, Ricardo Serrano-Padial, Marek Weretka, and Mian Zhu. Financial support from the Nakajima Foundation is gratefully acknowledged. Views expressed in this paper are those of the author and do not necessarily reflect the official views of the Bank of Japan.

1 Introduction

Before an election, candidates announce platforms; winners implement their policies after the election. Politicians usually betray their platforms, but if a winner betrays his/her platform, it is likely to be costly. When politicians implement a policy that differs from their platforms, their approval rating may fall because voters and the media criticize them[1]. They will need to undertake costly negotiations with Congress, the party may punish them[2], and the possibility of losing the next election may increase. Therefore, politicians should decide policy based on their platforms and the "cost of betrayal."

However, most previous studies use one of two polar assumptions about platforms. First, models with *Completely Binding Platforms* assume that a politician cannot implement any policy other than the platform.[3] Second, models with *Nonbinding Platforms* assume that a politician can implement any policy freely without cost.[4] In other words, a politician implements his/her ideal policy regardless of platform.

In this paper, I construct a model with *Partially Binding Platforms* that incorporates the two settings described above as extreme cases.[5] My model with partially binding platforms assumes that a candidate can choose any policy, but that betrayal is costly, and this cost increases with the degree of betrayal. I also introduce asymmetric information by assuming that candidate policy preferences are private information. Politician preferences may change depending on local conditions or the particularly important issues in an election. In particular, when candidates are not famous, it is difficult to know their preferences.

The striking result is that an extreme candidate may have a higher probability of winning compared with a moderate candidate, although the extreme candidate will implement a more extreme policy.

The model supposes a two-candidate political competition in a one-dimensional policy space. One candidate's ideal policy is to the left of the median policy, whereas that of

[1]Some studies, such as Reinikka and Svensson (2005) and Djankov et al. (2003), show a relationship between the media and the credible commitment of politicians.

[2]Cox and McCubbins (1994), McGillivray (1997), Aldrich (1997), Snyder and Groseclose (2000), McCarty et al. (2001), and Grossman and Helpman (2005, 2008) indicate that there is party discipline.

[3]Electoral competition models in the Downsian tradition (Downs (1957), Wittman (1973)).

[4]For example, this approach is taken in citizen candidate models, such as Besley and Coate (1997), Osborne and Slivinski (1996), and retrospective voting models such as Barro (1973) and Ferejohn (1986).

[5]As Persson and Tabellini (2000) indicate, "(i)t is thus somewhat schizophrenic to study either extreme: where platforms have no meaning or where they are all that matter. To bridge the two models is an important challenge (p. 483)."

the other candidate is to the right, and candidates are entirely motivated by policy. Each candidate is one of two types—moderate or extreme—and the moderate type's ideal policy is closer to the median policy than that of an extreme type. A candidate knows his/her own type, but voters and the opponent do not. In the following part, I refer to an extreme type as "he" and a moderate type as "she."

If voters believe *ex ante* that a candidate is likely to be extreme, an extreme type has a higher probability of winning than a moderate type in a semiseparating equilibrium. In this equilibrium, an extreme type chooses a mixed strategy. With some probability, the extreme type announces the same platform as the moderate type, and with the remaining probability the extreme type approaches the median policy, revealing his type to voters. We call an extreme type a *pooling extreme type* when he imitates the moderate type, whereas we call him a *separating extreme type* when he approaches the median policy.

A separating extreme type will implement a more moderate policy than a pooling extreme type but a more extreme policy than a moderate type in this equilibrium. This is because an extreme type will betray his platform to a greater extent than a moderate type even though a platform of a separating extreme type is more moderate than that of a moderate type. While voters know the type of a separating extreme type, they remain uncertain about the type of candidate who announces a moderate type's platform because there remains some probability that a pooling extreme type announces a moderate type's platform. Thus, the majority of voters wish to avoid electing a pooling extreme type who will implement the most extreme policy, so they forgo the chance to elect a moderate type who will implement the most moderate policy and choose a separating extreme type. This is also the reason why a separating extreme type can implement a more extreme policy than a moderate type, but defeat her. As a result, a separating extreme type has a higher probability of winning than a moderate type (and a pooling extreme type) in equilibrium.

On the other hand, if voters believe that a candidate is likely to be a moderate type, a separating extreme type needs to approach the median policy greatly to win, so an extreme type just imitates a moderate type with certainty (perfect pooling). At the same time, a separating equilibrium where an extreme type wins against a moderate type also exists. As a result, a moderate type never has a higher probability of winning than an extreme type.

The important reason for this extreme type's electoral advantage is that an extreme type has a stronger incentive to prevent an opponent from winning because his ideal policy is further from the opponent's policy than is that of a moderate type. On the other hand, a moderate type accepts a lower probability of winning because the opponent's policy is closer to her own ideal policy. My paper can describe this reasonable incentive for an extreme type by introducing two reasonable assumptions: partially binding platforms and uncertainty about a candidate's preference.

In several countries, an extreme party has won an election by announcing a moderate platform. My model describes an extreme candidate or party approaching the median policy and winning because he wants to prevent an opponent from winning. This should be an important reason why extremists have compromised and won in some countries. I will discuss the examples in Appendix B.

1.1 Related Literature

Some previous studies have considered a similar idea of the cost of betrayal. In particular, Banks (1990) and Callander and Wilkie (2007) show that a platform can signal an implemented policy. There are two important differences of my paper from theirs. First, in their papers, candidates automatically implement their own ideal policies after an election. However, if there is a cost of betrayal, a rational candidate would wish to adjust the implemented policy to reduce the cost after an election. Second, Banks (1990) and Callander and Wilkie (2007) consider that candidates care about policy only when they win—their utility is set to zero when they lose regardless of what policy their opponent implements. However, *policy-motivated* candidates should care about policy when they lose. With these two assumptions, Banks (1990) and Callander and Wilkie (2007) show that a moderate type may defeat an extreme type when there is asymmetric information about the candidates' ideal policies. I relax these assumptions and make more reasonable ones by examining rational choices regarding an implemented policy and candidates who care about policy regardless of election results. Thus, I obtain the opposite result; that is, an extreme type has a higher probability of winning than a moderate type.

These two differences are critical to obtain my result. First, if candidates implement their own ideal policies automatically, an extreme candidate will lose against a moderate type when he reveals his type to voters. Thus, a separating extreme type cannot obtain a higher probability of winning in a semiseparating equilibrium. Second, if a candidate does not care about policy when he/she loses, an extreme type does not have such a strong incentive to prevent an opponent from winning. Therefore, under the assumptions of Banks (1990) and Callander and Wilkie (2007), an extreme type does not have both a way and an incentive to win against a moderate type. I will clarify these points in Section 3.4.4.

In Huang (2010), candidates strategically choose both a platform and an implemented policy, but do not care about policy when they lose. Huang (2010) also supposes sufficiently large benefits from holding office and shows that candidates cluster around or at the median policy. In Callander (2008), candidates care about what happens when they lose. There are two choices—policy and a level of effort—and candidates can fully commit to policy before an election (completely binding), and decide a level of effort after winning (nonbinding). Then, he shows that a policy position can signal a future level of effort.[6]

Several papers discuss similar ideas concerning partially binding platforms. Harrington (1993) and Aragones et al. (2007) show that, in a repeated game, nonbinding platforms can be completely binding in equilibrium. Austen-Smith and Banks (1989) consider a two-period game based on a retrospective voting model in which, if office-motivated candidates betray their platforms, the probability of winning in the next election decreases. Grossman and Helpman (2005, 2008) develop a legislative model in which office-motivated parties announce platforms before an election, and the victorious legislators, who are policy-motivated, decide policy. If legislators betray the party platform, the party punishes them. In contrast, my model is based on a prospective and two-candidate competition model, and I consider that candidates who are policy-motivated decide both platform and policy.[7]

Section 2 presents the model, Section 3 analyzes political equilibria, and Section 4 concludes the paper.

2 Setting

The policy space is $\Re$. There is a continuum of voters, and their ideal policies are distributed on some interval of $\Re$. The distribution function is continuous and strictly increasing, so

[6] Other papers also consider that a completely binding platform is a signal for the functioning of the economy (Schulz (1996)) and the candidate's degree of honesty (Kartik and McAfee (2007)).

[7] These previous studies consider the case of complete information. Austen-Smith and Banks (1989) consider only a decrease in the probability of winning as the cost of betrayal, and Grossman and Helpman (2005, 2008) consider only party discipline as the cost of betrayal. However, as I indicated, the cost of betrayal also includes many types of costs such as a decrease in approval ratings or the negotiation cost with Congress; therefore, I include them in the current term as the cost of betrayal.

there is a unique median voter's ideal policy, x_m. There are two candidates, L and R, and each candidate is one of two types: moderate or extreme. Let x_i^M and x_i^E denote the respective *ideal policies* for the moderate and extreme types, where $i = L$ or R, and $x_L^E < x_L^M < x_m < x_R^M < x_R^E$. Superscripts M and E represent moderate and extreme types, respectively, and the moderate type's ideal policy is closer to the median policy. Assume $x_m - x_L^t = x_R^t - x_m$ for $t = M$ or E, that is, the ideal policies of the same type are equidistant from the median policy. A candidate knows his/her own type, but voters and the opponent are uncertain about the candidate's type. For both candidates, $p^M \in (0,1)$ is the prior probability that the candidate is a moderate type, and the prior probability that the candidate is an extreme type is $1 - p^M$.

After the types of candidates are decided, each candidate announces a *platform*, denoted by $z_i^t \in \Re$, where $i = L$ or R and $t = M$ or E. On the basis of these platforms, voters decide on a winner according to a majority voting rule. After an election, the winning candidate chooses an *implemented policy*, denoted by χ_i^t, where $i = L$ or R and $t = M$ or E. The relations among an ideal policy, a platform and an implemented policy are summarized in Figure 1.

If the implemented policy is different from the candidate's ideal policy, all candidates—both winner and loser—experience disutility. This disutility is represented by $-v(|\chi - x_i^t|)$, where $i = L$ or R, $t = M$ or E, and χ is the policy implemented by the winner. Assume that $v(.)$ satisfies $v(0) = 0$, $v'(0) = 0$, $v'(d) > 0$, and $v''(d) > 0$ when $d > 0$. If the implemented policy is not the same as the platform, the winning candidate needs to pay costs. The function describing the cost of betrayal is $c(|z_i - \chi|)$. Assume that $c(.)$ satisfies $c(0) = 0$, $c'(0) = 0$, $c'(d) > 0$, and $c''(d) > 0$ when $d > 0$. The loser does not pay it. Moreover, I assume throughout that $\dfrac{c'(d)}{c(d)}$ and $\dfrac{v'(d)}{v(d)}$ decreases as d increases, and one or all of these is strictly decreasing. This assumption means that the relative marginal cost and disutility decrease as $|z_i^t - \chi|$ ($|x_i^t - \chi|$) increases. For example, if the function is monomial, this assumption holds, and many polynomial functions satisfy them. After an election, the winning candidate chooses a policy that maximizes $-v(|\chi - x_i^t|) - c(|z_i - \chi|)$. Note that $\chi_i^t(z_i) = argmax_\chi \ - v(|\chi - x_i^t|) - c(|z_i - \chi|)$.

Upon observing a platform, the utility of voter n when the type t candidate i wins is $-u(|\chi_i^t(z_i) - x_n|)$. Assume that $u(.)$ satisfies $u'(|\chi_i^t(z_i) - x_n|) > 0$ when $|\chi_i^t(z_i) - x_n| > 0$. Let $p_i(t|z_i)$ denote the voters' revised beliefs that candidate i is type t upon observing the platform, z_i. The expected utility of voter n when a winner is candidate i who promises z_i is $-p_i(M|z_i)u(|\chi_i^M(z_i) - x_n|) - (1 - p_i(M|z_i))u(|\chi_i^E(z_i) - x_n|)$. Voters vote sincerely; that is, weakly dominated strategies are ruled out. Assume that all voters and the opponent have the same beliefs about a candidate's type.

Let $Prob_i^t(win|z_j^s, z_i^t)$ denote the probability of type t candidate i winning, given z_j^s and z_i^t. Let $F_i^t(.)$ denote the distribution function of the mixed strategy chosen by a candidate i of type t. The expected utility of the type t candidate i who promises z_i^t is:

$$\begin{aligned} & V_i^t((F_j^M(z_j^M), F_j^E(z_j^E)), z_i^t) \\ = & \sum_{s=M,E} \left[p^s \int_{z_j^s} Prob_i^t(win|z_j^s, z_i^t) dF_j^s(z_j^s) \right] \left[-v(|\chi_i^t(z_i^t) - x_i^t|) - c(|z_i^t - \chi_i^t(z_i^t)|) \right] \\ - & \sum_{s=M,E} p^s \int_{z_j^s} (1 - Prob_i^t(win|z_j^s, z_i^t)) v(|\chi_j^s(z_j^s) - x_i^t|) dF_j^s(z_j^s), \end{aligned} \tag{1}$$

where $i, j = L, R$ and $t = M, E$. The first term indicates when the candidate defeats each type of opponent. The second term indicates when the candidate loses to each type of opponent. In summary, the timing of events and the political equilibrium are as follows.

1. Nature decides each candidate's type, and a candidate knows his/her own type.

2. The candidates announce their platforms.

3. Voters vote.

4. The winning candidate chooses which policy to implement.

Definition 1 *A political equilibrium is a perfect Bayesian equilibrium in the game played by two candidates. The political equilibrium has a distribution function of $F_i^t(.)$, implemented policy $\chi_i(z_i)$, and voters' belief $p_i(t|z_i)$, where $i = L, R$ and $t = M, E$ such that:*

1. *For all z_i in the support of $F_i^t(.)$, $V_i^t((F_j^M(z_j), F_j^E(z_j)), z_i) \geq V_i^t((F_j^M(z_j), F_j^E(z_j)), z_i')$ $\forall z_i'$.*

2. *The posterior beliefs conditional on the platforms $p_i(t|z_i)$ must satisfy Bayes' rule whenever z_i supports $F_i^t(.)$. Voters and the opponent have the same off-path beliefs.*

3. *$\chi_i^t(z_i) = argmax_\chi \ -v(|\chi - x_i^t|) - c(|z_i - \chi|)$.*

3 Political Equilibrium

Following an election, the winning candidate implements a policy that maximizes his/her utility following a win, $-v(|\chi_i^t(z_i^t) - x_i^t|) - c(|z_i^t - \chi_i^t(z_i^t)|)$.

Lemma 1 *The implemented policy* $\chi_i^t(z)$ *satisfies* $v'(|\chi_i^t(z) - x_i^t|) = c'(|z - \chi_i^t(z)|)$*, and* $\chi_i^t(z) \in (x_i^t, z)$*, when* $z > x_i^t$ *and* $\chi_i^t(z) \in (z, x_i^t)$*, when* $z < x_i^t$*.*

When the cost of betrayal is not infinity, and the platform differs from the ideal policy, then the implemented policy must differ from the platform or the ideal policy since it is decided by the winner (who does not care about the loser's platform anymore but cares about the cost of betrayal) after an election. The implemented policy will be between the platform and the candidate's ideal policy as Figure 1 shows. If voters know the candidate's type (ideal policy), they can also know the future implemented policy by observing the platform. However, with asymmetric information, they may not know the candidate's type. The median voter x_m is pivotal, so, if the candidate is more attractive to the median voter than the opponent, this candidate is certain to win.

3.1 Pooling Equilibrium

This section shows that a pooling equilibrium exists if the prior belief that a candidate is a moderate type, p^M, is sufficiently high. In this subsection, I concentrate on a symmetric pooling equilibrium and discuss an asymmetric one in Section 3.4.2. When both extreme and moderate types announce the same platform, if any candidate does not have an incentive to (1) lose or (2) win with certainty, a symmetric pooling equilibrium exists. First, I check whether a candidate has an incentive to lose.

3.1.1 An Incentive to Lose

If both types of opponent announce the same platform z_j, the expected utility of the type t candidate i when the opponent wins is $-p^M v(|x_i^t - \chi_j^M(z_j)|) - (1-p^M)v(|x_i^t - \chi_j^E(z_j)|)$, where $i, j = L, R$, $i \neq j$, and $t = M, E$. The utility of the type t candidate i when this candidate i wins is $-v(|x_i^t - \chi_i^t(z_i^t)|) - c(|z_i^t - \chi_i^t(z_i^t)|)$.

If the utility when the type t candidate i wins is strictly lower than the expected utility when his/her opponent wins ($-p^M v(|x_i^t - \chi_j^M(z_j)|) - (1-p^M)v(|x_i^t - \chi_j^E(z_j)|) > -v(|x_i^t -$

$\chi_i^t(z_i^t)|) - c(|z_i^t - \chi_i^t(z_i^t)|))$, candidate i prefers the opponent winning to winning him/herself. Then, this candidate has an incentive to deliberately lose by choosing any platform that is less attractive to the median voter. Therefore, the following lemma holds.

Lemma 2 *If a symmetric pooling equilibrium exists, the utility when the candidate wins is the same as or higher than the expected utility when the opponent wins for any candidate regardless of type.*

This also means that candidates L and R cannot locate too close together in equilibrium. If the implemented policies of L and R are very close, the difference in the (expected) *disutilities* when this candidate wins and when the opponent wins $(p^M v(|x_i^t - \chi_j^M(z_j)|) + (1-p^M)v(|x_i^t - \chi_j^E(z_j)|) - v(|x_i^t - \chi_i^t(z_i^t)|))$ is very small. For this candidate, the expected utility when the opponent wins becomes higher than the utility when this candidate wins because the candidate will pay a positive cost of betrayal. In this case, they prefer to lose, so it cannot be an equilibrium.[8]

Given the opponent's pooling strategy z_j, let $z_i^t(z_j)$ denote the "*cut-off*" platform where the utility when the candidate i wins and the expected utility when the opponent j wins are the same for type t candidate i. If a candidate approaches the median policy, the disutility after winning and cost of betrayal increase. Thus, if a type t candidate i announces a platform that is further from his/her ideal policy (that is, more moderate) than $z_i^t(z_j)$, the utility when this candidate wins is lower than the expected utility when the opponent wins for this candidate, so he/she prefers not to announce such a platform.

If an extreme type's $z_i^E(z_j)$ is always more moderate than a moderate type's $z_i^M(z_j)$ given any z_j ($z_L^M(z_R) < z_L^E(z_R)$ and $z_R^E(z_L) < z_R^M(z_L)$), the extreme type does not have an incentive to lose when a moderate type also has no incentive to lose in a pooling equilibrium (when the probability of winning is positive). The following lemma shows that it is always true, and Figure 2 also shows it using R's case.

Lemma 3 *Suppose that an opponent announces the same platform z_j regardless of type. Given any p^M, (1) an extreme type's cut-off platform is more moderate than that of a*

[8] If platforms are completely binding, the cost of betrayal is zero in equilibrium because candidates never betray the platform. Thus, both candidates converge as closely as possible until the difference between the disutility when this candidate wins and when the opponent wins becomes zero. This means that the candidate will implement the median policy. See Asako (2010) for more details.

moderate type ($z_L^M(z_R) < z_L^E(z_R)$ and $z_R^E(z_L) < z_R^M(z_L)$), but (2) an extreme type's implemented policy given the cut-off platform is more extreme than that of a moderate type ($\chi_L^E(z_L^E(z_R)) > \chi_L^M(z_L^M(z_R))$ and $\chi_R^M(z_R^M(z_L)) > \chi_R^E(z_R^E(z_L))$).

The second statement means that a moderate type will implement a more moderate *implemented policy* than an extreme type. The proof is in the appendix, and the intuition is as follows. If a candidate approaches the median policy and wins against the opponent with certainty, this candidate will pay a cost of betrayal with certainty. This marginal cost of approaching the median policy depends on the cost of betrayal, $-c(|z_i^t-\chi_i^t(z_i^t)|)$. On the other hand, this candidate can avoid the opponent's victory and decrease this candidate's disutility from policy. This marginal benefit depends on the difference in the (expected) disutilities when this candidate wins and when the opponent wins, $p^M v(|x_i^t-\chi_j^M(z_j)|)+(1-p^M)v(|x_i^t-\chi_j^E(z_j)|)-v(|x_i^t-\chi_i^t(z_i^t)|)$. Following an election, an extreme type will betray the platform more severely and pay a higher cost of betrayal. However, at the same time, the ideal policy for an extreme type is further from the median policy than that of a moderate type, which means that his ideal policy is also further from the opponent's implemented policy. Thus, an extreme type has a higher disutility from the opponent's victory, and an extreme type finds it especially costly for the opponent to win, more so than a moderate type does. As a result, an extreme type has higher marginal benefit and cost than a moderate type. To decide the positions of a platform and an implemented policy, the total change of the utility which depends on $p^M v(|x_i^t-\chi_j^M(z_j)|)+(1-p^M)v(|x_i^t-\chi_j^E(z_j)|)-v(|x_i^t-\chi_i^t(z_i^t)|)-c(|z_i^t-\chi_i^t(z_i^t)|)$ should be analyzed. For an extreme type, if this value is higher than a moderate type, an extreme type has less incentive to lose.

Corollary 1 *Suppose that an opponent announces the same platform z_j regardless of type. Given any p^M, for an extreme type, $p^M v(x_R^t-\chi_L^M)+(1-p^M)v(x_R^t-\chi_L^E)-v(x_R^t-\chi_R^t)-c(\chi_R^t-z_R^t(\chi_R^t))$ is lower than a moderate type when the implemented policies ($\chi_i(z_i)$ and $\chi_j(z_j)$) are fixed, but higher when the platforms (z_i and z_j) are fixed.*

The proof is in the appendix. First, when both type implement the same implemented policy (that is, the implemented policies are fixed), an extreme type will betray the platform more severely, so an extreme type needs to promise platforms that are much further away from his ideal policy. Therefore, an extreme type will pay a much higher cost of betrayal than a moderate type, that is, marginal cost is very high. This is the reason why an extreme type will implement more extreme policy. On the other hand, when both type announces the same platform (that is, the platforms are fixed), an extreme type will betray more severely and implement more extreme policy, so the distance between own implemented policy and the opponent's implemented policy becomes very large. Thus, for an extreme type, the difference in the (expected) disutilities when this candidate wins and when the opponent wins is very high, so the marginal benefit is much larger than a moderate type. This is the reason of why the platform of an extreme type is more moderate.

With asymmetric information, voters observe only platforms, and an extreme type has an incentive to announce more moderate platform than a moderate type. Therefore, in a symmetric pooling equilibrium, when a moderate type has no incentive to lose, an extreme type also never has one.

When I use the term "more moderate platform," it means "this platform is further from the extreme type's ideal policy."[9] In Figure 2, $z_R^E(z_L)$ is further from x_R^E (and x_R^M) than $z_R^M(z_L)$, so $z_R^E(z_L)$ is "more moderate" than $z_R^M(z_L)$. However, first, a more moderate platform does not mean a more moderate implemented policy given this platform. As shown in Figure 2, because an extreme type will betray his platform to a greater extent than a moderate type, the extreme type's implemented policy $\chi_R^E(z_R^E(z_L))$ is more extreme than that of the moderate type $\chi_R^M(z_R^M(z_L))$. Second, a more moderate platform may not mean that this platform is closer to the median policy because there is a possibility that a platform encroaches on the opponent's side of the policy space (i.e., $z_R^t < x_m < z_L^t$). In Figure 2, if both types' platforms encroach on the opponent's side, $z_R^E(z_L)$ is further from the median policy than $z_R^M(z_L)$. On the other hand, the implemented policies never encroach on their opponent's side so a more moderate policy to be implemented means that this implemented policy is closer to the median policy. Therefore, "approaching the median policy" means that a candidate announces a platform such that an implemented policy given this platform approaches the median policy. See Section 3.4.3 for more details.

3.1.2 An Incentive to Win with Certainty

Let z_i^{M*} denote the platform where the (expected) utilities when the candidate i wins and the opponent j wins are the same for a *moderate type* candidate i $(-p^M v(|x_i^M - \chi_j^M(z_j^{M*})|) - (1-p^M)v(|x_i^M - \chi_j^E(z_j^{M*})|) = -v(|x_i^M - \chi_i^M(z_i^{M*})|) - c(|z_i^M - \chi_i^M(z_i^{M*})|))$, and z_L^{M*} and

[9] It does not matter if it is the moderate type's ideal policy.

z_R^{M*} are symmetric ($|x_m - z_L^{M*}| = |x_m - z_R^{M*}|$). This section concentrates on a pooling equilibrium in which both types announce z_i^{M*} (z_j^{M*}). The other possible pooling equilibria are discussed in Section 3.4.2. A moderate type is indifferent to winning or losing in this pooling equilibrium. Thus, from Lemma 3, an extreme type has no incentive to lose when he announces z_i^{M*}. For the next step, I must ascertain whether an extreme type has an incentive to win with certainty by approaching the median policy. Suppose that when a candidate deviates from z_i^{M*}, voters believe with a probability of one that the candidate is an extreme type. That is, I consider the simple off-path beliefs $p_i(M|z_i) = 0$. I discuss other off-path beliefs and show that this simple off-path belief is supported by the intuitive criterion in Cho and Kreps (1987) in Section 3.4.2.

Voters do not know the type in a pooling equilibrium so the expected utility of voters is the weighted average of the utility between a moderate and an extreme type. On the other hand, if an extreme type deviates by approaching the median policy, voters believe that this candidate's type is extreme because of the off-path belief. If an extreme type deviates to announce a sufficiently moderate platform, this extreme type can win over an uncertain opponent who chooses z_i^{M*}. I denote z_i' such that $-p^M u(|\chi_j^M(z_j^{M*}) - x_m|) - (1 - p^M)u(|\chi_j^E(z_j^{M*}) - x_m|) = -u(|\chi_i^E(z_i') - x_m|)$, where $u(.)$ is the disutility function of voters. The left-hand side is the expected utility of the median voter when candidate j, who announces the pooling platform z_j^{M*} wins and the right-hand side is the utility of a median voter when the extreme type candidate i, who deviates to z_i' wins. That is, at z_i', the median voter is indifferent between z_i' and z_j^{M*}. If an extreme type announces a platform that is slightly more moderate than z_i', this candidate wins over an uncertain opponent. Figure 3(a) shows z_i' using R's case when voters have linear utility. Note that because voters are uncertain about the type of candidate who announces z_i^{M*}, an extreme type who deviates needs to implement a more moderate policy than an extreme type who chooses a pooling platform ($\chi_j^E(z_j^{M*})$) but does not need to implement a more moderate policy than a moderate type ($\chi_j^M(z_j^{M*})$), as Figure 3(a) shows.

An extreme type can increase the expected utility from this deviation if:

$$-v(|\chi_i^E(z_i') - x_i^E|) - c(|\chi_i^E(z_i') - z_i'|) > \frac{1}{2}\big[-p^M v(|\chi_j^M(z_j^{M*}) - x_i^E|)$$
$$-(1 - p^M)v(|\chi_j^E(z_j^{M*}) - x_i^E|) - v(|\chi_i^E(z_i^{M*}) - x_i^E|) - c(|\chi_i^E(z_i^{M*}) - z_i^{M*}|)\big] \qquad (2)$$

The right-hand side is the extreme type candidate i's expected utility when this candidate stays in a pooling equilibrium, and his expected utility from this deviation is slightly lower than the left-hand side. If (2) does not hold, this extreme type does not deviate, so a pooling equilibrium where all types announce z_i^{M*} exists.[10]

Suppose that L chooses z_L^{M*} as a pooling equilibrium, and R is an extreme type who originally announces z_R^{M*}. If p^M is high, the extreme type R needs to announce a very moderate platform to win with certainty because the expected utility to the median voter of choosing L is quite high given that there is a strong possibility that L is moderate and will implement a moderate policy. As a result, as in Figure 3(b), z'_R is very far from the extreme type R's ideal policy, so this deviation decreases the expected utility of the extreme type R. However, if p^M is sufficiently low, the expected utility of the median voter to choose L is quite low, so z'_R is closer to z_R^{M*} as in Figure 3(c). Thus, if R approaches the median policy slightly, the implemented policy of R improves for the median voter. For these reasons, if p^M is sufficiently low, the extreme type will deviate. However, if p^M is sufficiently high, a pooling equilibrium exists.

Proposition 1 *If p^M is sufficiently high such that it does not satisfy (2), a symmetric pooling equilibrium exists.*

3.2 Separating Equilibrium

3.2.1 Separating Equilibrium where a Moderate Type Wins

This subsection shows that a separating equilibrium where a moderate type wins against an extreme type does not exist. In a separating equilibrium, the utility of the type t candidate i when he/she wins is $-v(|x_i^t - \chi_i^t(z_i^t)|) - c(|z_i^t - \chi_i^t(z_i^t)|)$, and the utility of the type t candidate i when a *same type* opponent (type t) wins is $-v(|x_i^t - \chi_j^t(z_j^t)|)$. I denote $\hat{z}_i^t$ as the cut-off platform under which both of these utilities are the same for a type t candidate, and they are symmetric ($\hat{z}_R^t - x_m = x_m - \hat{z}_L^t$). Then, the following lemma can be derived for the same reason as Lemma 3.

[10] Note that a candidate has no incentive to deviate to a more extreme platform than z_i^{M*} or $z_i \in [z'_i, z_i^{M*})$ because off-path beliefs are $p_i(M|z_i) = 0$; hence, this candidate will be certain to lose and the expected utility decreases.

Lemma 4 *The extreme type's cut-off platform is more moderate than that of the moderate type ($\hat{z}_R^M - \hat{z}_L^M > \hat{z}_R^E - \hat{z}_L^E$) but the extreme type's implemented policy given the cut-off platform is more extreme than that of the moderate type $\chi_i^E(\hat{z}_i^E)$ ($\chi_R^E(\hat{z}_R^E) - \chi_L^E(\hat{z}_L^E) > \chi_R^M(\hat{z}_R^M) - \chi_L^M(\hat{z}_L^M)$).*

The proof is in the appendix, and Figure 4 shows the positions of $\hat{z}_R^t$ and $\chi_R^t(\hat{z}_R^M)$. A separating equilibrium where a moderate type defeats an extreme type does not exist because an extreme type always has an incentive to pretend to be moderate.

Proposition 2 *There is no separating equilibrium where a moderate type wins against an extreme type regardless of off-path beliefs.*

Proof: If a separating equilibrium in which a moderate type wins against an extreme type exists, regardless of off-path beliefs, an extreme type should announce $\hat{z}_i^E$. If the utility when an extreme type candidate wins is higher than the utility when an extreme type opponent wins, the extreme type candidate has an incentive to win with certainty against the extreme type opponent, and this is made possible by approaching the median policy, regardless of off-path beliefs.

Second, a moderate type never announces a more moderate platform than $\hat{z}_i^E$. On such a platform, the utility when this moderate type candidate wins is lower than the utility when a moderate type opponent wins, so the moderate type has an incentive to lose to the moderate opponent. If this moderate type also has an incentive to lose against an extreme opponent, she will deviate to lose with certainty. If this moderate type has an incentive to win against an extreme opponent, she will deviate to approach $\hat{z}_i^E$ because she can win against an extreme opponent and lose against a moderate opponent.

Finally, suppose that a moderate type announces a more extreme platform than $\hat{z}_i^E$. If an extreme type deviates to a moderate type's platform, the extreme type can improve his chance of winning and can implement a policy closer to his ideal. As a result, the extreme type can increase his expected utility from this deviation. This is true even if z_R^M and z_L^M are asymmetric, as the appendix shows. □

This result contradicts that of Banks (1990) and Callander and Wilkie (2007) in which there exists a separating equilibrium where a moderate type wins.

3.2.2 Separating Equilibrium where an Extreme Type Wins

A separating equilibrium where an extreme type wins against a moderate type exists. Assume again that off-path beliefs are $p_i(M|z_i) = 0$ for any out-of-equilibrium platform. Suppose that an extreme type announces $\hat{z}_i^E$, and a moderate type announces $\hat{z}_i'$ such that the moderate type will implement a more extreme policy than the extreme type; that is, $|x_m - \chi_i^E(\hat{z}_i^E)| < |x_m - \chi_i^M(\hat{z}_i')|$. Because of the above off-path beliefs, although a moderate type approaches the median policy, voters believe that this candidate is an extreme type. To increase the probability of winning, a moderate type needs to approach the median policy greatly. This may decrease her expected utility. An extreme type may not deviate either, because the probability of winning decreases greatly. As a result, a separating equilibrium where an extreme type wins exists.[11] An extreme type will implement more moderate policy than a moderate type.

In this equilibrium, a moderate type does not deviate by approaching the median policy because voters fully misunderstand her type. If $p_i(M|z_i)$ is not too low for any out-of-equilibrium platform, this separating equilibrium where an extreme type wins does not exist. I will discuss about it in Section 3.4.2.

3.3 Semiseparating Equilibrium

If p^M is sufficiently high such that it satisfies (2), a semiseparating equilibrium exists and has the following characteristics.

1. A moderate type announces one platform with certainty (a pure strategy).

2. An extreme type chooses a mixed strategy. With some probability, an extreme type announces the same platform as a moderate type (a *pooling extreme type*). With the remaining probability, an extreme type approaches the median policy (a *separating extreme type*).

[11] There is another case in which a separating equilibrium where an extreme type wins exists. I assume that $\frac{c'(d)}{c(d)}$ and $\frac{v'(d)}{v(d)}$ decrease as d increases, and one or all of these is strictly decreasing. If this assumption is not satisfied, a separating equilibrium may exist, and an extreme type always wins over a moderate type. This assumption is critical to derive Lemma 4. If the above assumption is satisfied, then (8) of Appendix A.1 is also satisfied. If (8) is not satisfied, an extreme type will implement a more moderate policy than will a moderate type ($\chi_R^E(\hat{z}_R^E) - \chi_L^E(\hat{z}_L^E) < \chi_R^M(\hat{z}_R^M) - \chi_L^M(\hat{z}_L^M)$), so the median voter prefers to choose an extreme type. A moderate type has no incentive to pretend to be extreme because she needs to approach the median policy considerably.

3. A separating extreme type defeats a moderate type and a pooling extreme type.

4. Voters are still uncertain about the type of candidate who announces a moderate type's platform because there is some probability that a pooling extreme type also announces it. Thus, to defeat such an uncertain candidate, a separating extreme type does not need to approach the median policy greatly. As a result, the implemented policy of a separating extreme type is more extreme than a moderate type's implemented policy.

Figure 5 shows an example of a semiseparating equilibrium. There are two types of semiseparating equilibria. First, I analyze the simpler one, a *two-policy semiseparating equilibrium* (Figure 5(a)). I concentrate on a symmetric case in the text, but I will show that there is no asymmetric semiseparating equilibrium in the proof. Suppose that when a candidate deviates from the equilibrium platforms, voters believe with a probability of one that the candidate is an extreme type; that is, $p_i(M|z_i) = 0$. Denote σ^M as the probability that an extreme type announces the same platform as a moderate type. With the remaining probability $1 - \sigma^M$, the extreme type approaches the median policy.[12]

A Moderate Type's Choice

Suppose that a moderate type announces z_i^* such that:

$$\begin{aligned} & -\frac{p^M}{p^M + \sigma^M(1-p^M)} v(|\chi_j^M(z_j^*) - x_i^M|) - \frac{\sigma^M(1-p^M)}{p^M + \sigma^M(1-p^M)} v(|\chi_j^E(z_j^*) - x_i^M|) \\ = \; & -v(|\chi_i^M(z_i^*) - x_i^M|) - c(|\chi_i^M(z_i^*) - z_i^*|)) \end{aligned} \quad (3)$$

The left-hand side is the expected utility of the moderate type candidate i when the opponent promising z_j^* wins, and the right-hand side is the utility of the moderate type candidate i when she wins. That is, a moderate type is indifferent between winning and losing against an opponent who announces z_j^*. From Lemma 3, an extreme type has no incentive to lose against an opponent who announces z_j^* when he announces z_i^*.[13] There exist other semiseparating equilibria, but I will discuss them in Section 3.4.2. The difference between the equilibrium in this subsection and others is only that a moderate type chooses another platform, so the basic characteristics are exactly the same.

[12]The details of the semiseparating equilibrium are in the appendix as the proof of Proposition 3.

[13]Replace p^M by $\frac{p^M}{p^M+\sigma^M(1-p^M)}$ in Lemma 3. This result can then be derived in exactly the same way as Lemma 3.

An Extreme Type's Choice

Denote $\bar{z}_i$ as the platform chosen by an extreme type with the probability $1-\sigma^M$. A moderate type chooses z_i^*, so choosing $\bar{z}_i$ reveals his type to voters. The position of $\bar{z}_i$ should be more moderate than z_i^* ($z_L^* < \bar{z}_L$ and $\bar{z}_R < z_R^*$). If not, an extreme type will lose with certainty because of off-path beliefs. Denote again that $\bar{z}_i$ satisfies:

$$-\frac{p^M}{p^M+\sigma^M(1-p^M)}u(|\chi_j^M(z_j^*)-x_m|)-\frac{\sigma^M(1-p^M)}{p^M+\sigma^M(1-p^M)}u(|\chi_j^E(z_j^*)-x_m|) < -u(|\chi_i^E(\bar{z}_i)-x_m|), \tag{4}$$

that is, the median voter prefers $\bar{z}_i$ to z_j^*. The left-hand side is the expected utility of the median voter when the candidate j who announces z_j^* wins. The right-hand side is the expected utility of the median voter when the extreme type candidate i who announces $\bar{z}_i$ wins. Moreover, $\bar{z}_i$ denotes the most extreme platform that satisfies (4).[14]

Denote the expected utility of a pooling extreme type as $V_i^E(z_i^*)$, and the expected utility of a separating extreme type as $V_i^E(\bar{z}_i)$. Then, σ^M are determined by $V_i^E(z_i^*) = V_i^E(\bar{z}_i)$. When an extreme type announces $\bar{z}_i$, his disutility following a win and the cost of betrayal are higher, but the probability of winning exceeds that in the case when an extreme type announces z_i^*. Thus, an extreme type is indifferent between $\bar{z}_i$ and z_i^*.[15]

A two-policy semiseparating equilibrium exists if (2) holds and:

$$-v(|\chi_i^E(\bar{z}_i)-x_i^E|)-c(|\chi_i^E(\bar{z}_i)-\bar{z}_i|) \leq -v(|\chi_j^E(\bar{z}_j)-x_i^E|). \tag{5}$$

When (5) holds, an extreme type has no incentive to defeat with certainty an extreme type opponent announcing $\bar{z}_j$ by approaching the median policy because (5) means that, for the

[14] To be precise, because the policy space is continuous, there is no maximal (minimal) value of z_R (z_L) that satisfies (4). Instead, it is possible to define $\bar{z}_i$ such that a platform satisfies (4) with equality, and assume that if an extreme type announces $\bar{z}_i$, he defeats an opponent who announces z_j^*. Again, to be precise, the median voter is indifferent between z_j^* and $\bar{z}_i$ in this case. It is also possible to suppose that a policy space is discrete with a grid of policies. That is, there are a large number of policy choices, and the distance between sequential policies is ϵ. If ϵ is very close to zero and the situation approximates a continuous policy space, then there exists the most extreme platform that satisfies (4). The following results do not change in all of the above settings.

[15] To be precise, if (2) holds, $V_R^E(z_R^*) < V_R^E(\bar{z}_R)$ at $\sigma^M = 1$. When σ^M converges to zero, the situation converges to a completely separating case in which an extreme type announces $\bar{z}_R$ and never imitates a moderate type. Because voters surmise that a candidate announcing z_L^* is a moderate type who will implement a very moderate policy, an extreme type needs to implement a more moderate policy than a moderate type. From this reason and Lemma 3, $V_R^E(z_R^*)$ is higher than $V_R^E(\bar{z}_R)$ when σ^M is closer to zero. All functions are continuous, so there exists a value of σ^M that satisfies $V_R^E(z_R^*) = V_R^E(\bar{z}_R)$. The equations of $V_i^E(z_i^*)$ and $V_i^E(\bar{z}_i)$ are shown in the appendix.

extreme type candidate i, the utility when the extreme type opponent j wins is higher than the utility when i wins. However, an extreme type with $\bar{z}_i$ does not want to deviate to a more extreme platform because that would mean the candidate also loses to an opponent with z_j^* and decreases the expected utility.

Suppose that an extreme type announces a more moderate platform than $\bar{z}_i$, instead of announcing $\bar{z}_i$, so it cannot be an equilibrium. When (5) holds, this extreme type has an incentive to deviate to $\bar{z}_i$. An extreme type can lose to an extreme type opponent announcing $\bar{z}_j$, but can still win against an opponent announcing z_j^*. The cost of betrayal and the disutility following a win decreases with this deviation.

Voters' Choice

Suppose that candidate R (an extreme type) announces $\bar{z}_R$ while candidate L announces z_L^*. Voters can know that the type of R is extreme, but remain uncertain about the type of L who announces z_L^* because an extreme type L still pretends to be moderate and announces z_L^* with probability σ^M. Therefore, to defeat L (that is, satisfy (4)), R does not need to implement a more moderate policy than a moderate type L; that is, $x_m - \chi_L^E(z_L^*) > \chi_R^E(\bar{z}_R) - x_m > x_m - \chi_L^M(z_L^*)$. In other words, for the median voter, a moderate type L will implement the best policy ($\chi_L^M(z_L^*)$). However, if L wins, there is the possibility that L is an extreme type who implements the worst policy for the median voter ($\chi_L^E(z_L^*)$). Thus, the majority of voters give up the chance to elect a moderate type L to avoid electing an extreme type L, and choose the second best candidate, R, who is a separating extreme type.

Continuous Semiseparating Equilibrium

If (5) does not hold, an extreme type still has an incentive to converge more than $\bar{z}_i$ to win over an extreme type opponent announcing $\bar{z}_j$. Therefore, a two-policy semiseparating equilibrium does not exist, but a *continuous semiseparating equilibrium* (Figure 4(b)) exists.[16] In a two-policy semiseparating equilibrium, an extreme type chooses one platform with $1 - \sigma^M$ so only two platforms are included in his mixed strategy. On the other hand, in a continuous

[16] To determine the mixed strategy in a continuous semiseparating equilibrium, I build on techniques introduced by Burdett and Judd (1983). They consider price competition and show that firms randomize prices when there is a possibility that consumers will observe only one price. Just as Burdett and Judd (1983) show that firms are indifferent over a range of prices, I show that an extreme type is indifferent over a range of platforms.

semiseparating equilibrium, an extreme type's mixed strategy includes z_i^* and a connected support, $[\bar{z}_L, \underline{z}_L]$ for L and $[\underline{z}_R, \bar{z}_R]$ for R as in Figure 5(b). An extreme type chooses any platform in this support with the probability $1-\sigma^M$, and also has a continuous distribution function, $F(.)$, with this support. More specifically, the distribution is $(1-\sigma^M)F(.)$. The platform $\bar{z}_i$ is defined in the same way as $\bar{z}_i$ in a two-policy semiseparating equilibrium.

The basic results are the same as a two-policy semiseparating equilibrium. First, a separating extreme type wins over a moderate type. Second, because of the distribution $F(.)$, when a candidate approaches the median policy in this support, the probability of winning increases continuously, while the cost of betrayal and the disutility following a win increases. Therefore, an extreme type is indifferent among platforms in the connected support and z_i^*. Finally, voters are still uncertain about the type of candidate who chooses z_i^*, so a separating extreme type does not need to implement a more moderate policy than a moderate type, so $\chi_i^E(\underline{z}_i)$ is more extreme than $\chi_i^M(z_i^*)$.

The Electoral Advantages of Being an Extreme Candidate

In both types of semiseparating equilibria, a moderate type has no incentive to defeat a separating extreme type opponent because such an opponent will implement a policy that is sufficiently close to a moderate type's ideal policy. As a result, in both semiseparating equilibria, a separating extreme type defeats an uncertain type (a moderate type and a pooling extreme type).[17] Moreover, this semiseparating equilibrium is always symmetric. The result is summarized in the following proposition, and its proof is in the appendix.

Proposition 3 *If p^M is sufficiently high such that it satisfies (2), a continuous or a two-policy semiseparating equilibria exists, and it is always symmetric.*

3.4 Discussion

3.4.1 Welfare Analysis

In pooling and semiseparating equilibria, *ex post*, the optimal candidate is a moderate type. In a pooling equilibrium, a campaign platform has no means to choose the optimal candidate.

[17]Several semiseparating equilibria may exist because, in a continuous semiseparating equilibrium, both $\underline{z}_i$ and $F(.)$ are decided by a single equation. However, all semiseparating equilibria have the characteristics discussed above.

The expected probability of obtaining a moderate type is the same as the prior belief. In a semiseparating equilibrium, an extreme type has a higher expected probability of winning than a moderate type, so the probability of choosing an extreme type is higher than the prior belief. Therefore, partially binding platforms with asymmetric information lead to an *ex post* inefficient aggregation of preferences.

3.4.2 Equilibrium Refinement

In the previous sections, I assume off-path beliefs as $p_i(M|z_i) = 0$. Under this assumption, there exist multiple equilibria. First, there could be a pooling equilibrium in which both types announce a platform, say z_i^{M**}, which is more extreme than z_i^{M*} ($z_L^{M**} < z_L^{M*}$ and $z_R^{M*} < z_R^{M**}$). From the definition, a moderate type has an incentive to converge until z_i^{M*} if the off-path belief is $p_i(M|z_i) = p^M$. However, the off-path belief is $p_i(M|z_i) = 0$, so a moderate type needs to approach the median policy greatly because voters believe that the type is extreme when a candidate deviates from z_i^{M**} regardless of real type. Thus, a moderate type may not want to deviate. If an extreme type also has no incentive to deviate, such a pooling equilibrium with z_i^{M**} exists. An asymmetric pooling equilibrium can also exist with these off-path beliefs.[18] Second, there could be a semiseparating equilibrium in which a moderate type (and a pooling extreme type) announces a platform, say z_i^{**}, which is more extreme than z_i^*. A moderate type needs to approach the median policy greatly to win because this deviation leads voters to believe that the type is extreme, so a moderate type may have no incentive to deviate from z_i^{**}. In addition, a separating equilibrium in which an extreme type wins has the same situation as discussed in Section 3.2.2. That is, a moderate type does not want to deviate to win since she is thought as an extreme type by this deviation.

These equilibria have several problems. First, a moderate type does not want to approach the median policy because voters completely misunderstand the candidate as an extreme type when a moderate type deviates. Second, if the off-path beliefs $p_i(M|z_i)$ exceed zero for some off-path platforms, many of the above equilibria will be eliminated. Thus, these equilibria

[18] For example, suppose that candidate L's pooling platform is more attractive to the median voter, and L wins with certainty. Because off-path beliefs are $p_i(M|z_i) = 0$, candidate R needs to compromise to a far greater extent than L to defeat L because R is thought to be an extreme type as a result of this deviation while L is still believed to be a moderate type with probability p^M. Therefore, candidate R may not want to deviate. Candidate L also may not have an incentive to deviate to avoid being thought an extreme type by voters.

exist in the restricted value of the off-path beliefs.

On the other hand, the equilibria analyzed in the previous sections exist in the broadest value of the off-path beliefs compared with other equilibria. In a pooling equilibrium, suppose $p_i(M|z_i) = p^M$ if the platform is more extreme than z_i^{M*}. Then a moderate type has an incentive to converge until z_i^{M*}, where she is indifferent to winning or losing. As a result, a moderate type (and thus an extreme type) will announce z_i^{M*} as in Section 3.1, and the other pooling equilibria do not exist. In a semiseparating equilibrium, suppose $p_i(M|z_i) = \frac{p^M}{p^M+\sigma^M(1-p^M)}$ if the platform is more extreme than z_i^*. For the same reasons, a moderate type (so a pooling extreme type) will announce z_i^* as in Section 3.3, and the other semiseparating equilibria do not exist. These equilibria can exist when the off-path belief $p_i(M|z_i)$ is lower than the above values. Therefore, the equilibrium with z_i^{M*} or z_i^* exists in the broadest values of the off-path beliefs compared with other equilibria. Moreover, in a separating equilibrium, suppose $p_i(M|z_i) = 1$ if the platform is more extreme than $\hat{z}_i^M$. Then a moderate type will choose $\hat{z}_i^M$ in a separating equilibrium. An extreme type has no incentive to win against a moderate type who announces $\hat{z}_i^M$ from Lemma 4. Thus, there is no separating equilibrium where an extreme type wins.

Note that the off-path belief $p_i(M|z_i) = 0$ for any off-path platform can be supported by the intuitive criterion in Cho and Kreps (1987). In a pooling equilibrium, a moderate type is indifferent to winning or losing at z_i^{M*}. Thus, a moderate type never chooses a more moderate platform than z_i^{M*} even if voters believe this candidate to be a moderate type as a result of this deviation. For the same reason, a moderate type never chooses a platform that is more moderate than $\hat{z}_i^M$ in a separating equilibrium and z_i^* in a semiseparating equilibrium. On the other hand, an extreme type may have an incentive to choose a platform in these regions. Thus, the intuitive criterion can show that $p_i(M|z_i) = 0$ if platforms are more moderate than z_i^{M*} ($\hat{z}_i^M$ or z_i^*).[19] However, the intuitive criterion cannot restrict the off-path belief if the platforms are more extreme than z_i^{M*} ($\hat{z}_i^M$ or z_i^*). Thus, the intuitive criterion cannot reduce the number of equilibria.

Banks (1990), Callander and Wilkie (2007), and Huang (2010) employ universal divinity introduced by Banks and Sobel (1987). If universal divinity is applied to my model, in

[19] To be specific, there is a cut-off platform at which an extreme type is indifferent to winning or losing. When off-path platforms are more moderate than the extreme type's cut-off platform, the intuitive criterion cannot restrict the off-path belief because neither type has an incentive to deviate to these platforms regardless of the probability of winning. However, we do not need to be concerned about this point because neither type deviates to this region regardless of off-path beliefs.

short, as Lemma 3 shows, an extreme type always has a greater incentive to announce a more moderate *platform* than a moderate type. This means that a moderate type always has a stronger incentive to announce a more extreme platform than an extreme type. Suppose a pooling equilibrium at z_i^{M*}. With universal divinity, if a platform is more moderate than z_i^{M*}, $p_i(M|z_i) = 0$. If not, $p_i(M|z_i) = 1$. With these off-path beliefs, both have an incentive to deviate to a more extreme platform than z_i^{M*}, be thought a moderate type by voters and win. For the same reasons, a semiseparating equilibrium does not exists, and only a separating equilibrium where an extreme type wins against a moderate type, which is discussed in Section 3.2.2, exists. However, such a separating equilibrium seems peculiar as I discussed. Moreover, in this separating equilibrium, an extreme type wins against a moderate type always, so my main result does not change.[20]

3.4.3 Position of the Platforms and a Probabilistic Model

In any equilibrium, implemented policies never encroach on the opponent's side of the policy space, i.e., $\chi_L^t(z_L) \leq x_m \leq \chi_R^t(z_R)$, because otherwise candidates can always find a better choice in which an implemented policy remains on their own side.

On the other hand, platforms may encroach on the opponent's side, i.e., $z_R^t < x_m < z_L^t$. This paper allows for this situation and does not restrict candidates to announcing platforms only within their own halves of the policy space. However, this problem is not a critical one. My model assumes that candidates know every decision-relevant fact about the median voter. If candidates are uncertain about voter preferences—that is, a probabilistic model is considered—in many cases the above situation does not hold. That candidates have a greater divergence of policies in a probabilistic model is well known (see Calvert (1985)). That is, platforms do not encroach on the opponent's in a probabilistic model when the degree of uncertainty is sufficiently high. However, the purpose of this paper is to analyze the effect of partially binding platforms on policy, so for the sake of simplicity I do not consider such probabilistic models in this paper.[21]

[20] Criteria D1 and D2 in Cho and Kreps (1987) have the same result as universal divinity. On the other hand, divinity in Banks and Sobel (1987) cannot reduce an equilibrium because $p_i(M|z_i) = 0$ for any off-path platform is supported by it.

[21] Sometimes, platforms encroach on the opponent's side in real elections. For example, in Japan there are two main parties: the Liberal Democratic Party (LDP), which supports increases in public works to sustain rural areas, and the Democratic Party of Japan (DPJ), which supports economic reform and reduction of government debt. In 2001, the LDP prime minister, Junichirou Koizumi, promised to implement radical economic reforms that were also suggested by the DPJ, including a reduction of government works and debt.

3.4.4 Differences from Past Papers

As I indicated in the introduction, there are two important differences from Banks (1990) and Callander and Wilkie (2007): (1) candidates choose a policy to implement strategically and (2) care about policy when they lose.

In a semiseparating equilibrium, an extreme type reveals his type by approaching the median policy with some probability since this extreme type can obtain a higher probability of winning. However, if candidates implement their own ideal policies automatically, voters only believe that an extreme type will implement his ideal policy, so a separating extreme type cannot increase his probability of winning by revealing his type. That is, a strategic choice of an implemented policy provides a *way* to win for an extreme type.

Suppose that a candidate does not care about policy when he loses. From (1), the expected utility of candidates is $\sum_{s=M,E}\left[p^s \int_{z_j^s} Prob_i^t(win|z_j^s, z_i^t)dF_j^s(z_j^s)\right]\left[-v(|\chi_i^t(z_i^t)-x_i^t|)-c(|z_i^t - \chi_i^t(z_i^t)|)\right]$. Obviously, candidates will announce their ideal policy as platforms (and his/her expected utility is zero) because if not, they will bear disutility from the policy and a cost of betrayal, and the expected utility becomes negative. Thus, benefits from holding office should be introduced to induce candidates to approach the median policy. However, although benefits from holding office are introduced, a semiseparating equilibrium does not exist when candidates do not care about policy after losing. An extreme type has a stronger incentive to prevent the opponent from winning in my model, but extreme types do not have one to such an extent when they do not care about an opponent's policy. Thus, caring about policy after losing provides an extreme type an *incentive* to win.[22]

Thus, Koizumi and the LDP promised DPJ policies (Mulgan (2002) pp. 56–57). Moreover, in the 2007 Upper House election, the LDP and Prime Minister Shinzou Abe promised to continue Koizumi's economic reforms while the DPJ promised policies to recover and support rural areas ("Abe Stumbles on Japan," *The Economist*, July 30, 2007). This was a complete reversal of the original stances of the parties. My model can explain both cases in which the platforms do or do not encroach on the opposing side.

[22] Additionally, even though the benefit from holding office is introduced in my model, the results do not change much when it is not great. Candidates approach the median policy more closely, but the main characteristics of the equilibria do not change. However, if the benefits from holding office are too great, candidates' implemented policies converge to the median policy regardless of type. This is what Huang (2010) shows by introducing sufficiently high benefits from holding office, which compensate for all disutility from policy and cost of betrayal.

4 Conclusion

This paper examines the effects of partially binding platforms in electoral competition. When there is asymmetric information, voters may not determine a candidate's political preferences in equilibrium. In particular, in a semiseparating equilibrium, an extreme candidate pretends to be moderate with some probability, and with the remaining probability reveals his own preferences by approaching the median policy. An extreme candidate who reveals his preference type will defeat an uncertain candidate who may be moderate or extreme, imitating a moderate candidate. As a result, a moderate candidate never has a higher probability of winning than an extreme candidate.

More work is needed to investigate this in the future. For example, in this paper it is assumed that candidates are symmetric, but their characteristics may differ. In particular, an asymmetric degree of uncertainty about candidates should be the next step in investigating the effects of partially binding platforms with asymmetric information.[23] Second, candidates may announce an ambiguous platform, which includes several platforms, called political ambiguity. If there is a cost of betrayal, a candidate may announce an ambiguous platform to avoid paying costs after an election. This would be an interesting avenue of future research.

A Proofs

A.1 Lemma 3

Consider a case of R without loss of generality. Let $\chi_R^t = \chi_R^t(z_R^t(z_L))$ denote the situation where the utility when type t R wins and the expected utility when L wins for type t R are the same, given z_L. This means that:

$$p^M v(x_R^t - \chi_L^M) + (1 - p^M)v(x_R^t - \chi_L^E) - v(x_R^t - \chi_R^t) = c(\chi_R^t - z_R^t(\chi_R^t)). \tag{6}$$

where $z_R^t(\chi_R^t)$ represents the platform where the candidate implements χ_R^t. Then, I differentiate both sides of (6) by x_R^t, given the opponent's strategies ($\chi_L^M = \chi_L^M(z_L)$ and $\chi_L^E = \chi_L^E(z_L)$). Moreover, from Lemma 1, $v'(x_R^t - \chi_R^t) = c'(\chi_R^t - z_R^t(\chi_R^t))$. I fix χ_R^t and differ-

[23] Asako (2010) analyzes candidates who have asymmetric characteristics (positions of ideal policies, costs of betrayal, and policy preferences) with partially binding platforms but with complete information.

entiate $v'(x_R^t - \chi_R^t) = c'(\chi_R^t - z_R^t(\chi_R^t))$ by x_R^t, $\dfrac{\partial z_R^t(\chi_R^t)}{\partial x_R^t} = -\dfrac{v''(x_R^t - \chi_R^t)c'(\chi_R^t - z_R^t(\chi_R^t))}{v'(x_R^t - \chi_R^t)c''(\chi_R^t - z_R^t(\chi_R^t))} < 0$. Then, it becomes:

$$\frac{\partial \chi_R^t}{\partial x_R^t} = \frac{\frac{v''(x_R^t - \chi_R^t)c'(\chi_R^t - z_R^t(\chi_R^t))}{c''(\chi_R^t - z_R^t(\chi_R^t))} - (p^M v'(x_R^t - \chi_L^M) + (1-p^M)v'(x_R^t - \chi_L^E) - v'(x_R^t - \chi_R))}{v'(x_R^t - \chi_R)\frac{\partial z_R^t(\chi_R^t)}{\partial \chi_R^t}}. \tag{7}$$

If (7) is positive, an extreme type will implement a more extreme policy than a moderate type. In the same way as deriving $\frac{\partial z_R^t(\chi_R^t)}{\partial x_R^t}$, $\dfrac{\partial z_R^t(\chi_R^t)}{\partial \chi_R^t} = 1 + \dfrac{v''(x_R^t - \chi_R^t)c'(\chi_R^t - z_R^t(\chi_R^t))}{v'(x_R^t - \chi_R^t)c''(\chi_R^t - z_R^t(\chi_R^t))} > 0$. To prove that (7) is positive, it is sufficient to show that the numerator of (7) is positive. In other words:

$$\frac{p^M v'(x_R^t - \chi_L^M) + (1-p^M)v'(x_R^t - \chi_L^E) - v'(x_R^t - \chi_R^t)}{v''(x_R^t - \chi_R^t)} < \frac{c'(\chi_R^t - z_R^t(\chi_R^t))}{c''(\chi_R^t - z_R^t(\chi_R^t))}. \tag{8}$$

Note that, from (6) and Lemma 1:

$$\frac{p^M v(x_R^t - \chi_L^M) + (1-p^M)v(x_R^t - \chi_L^E) - v(x_R^t - \chi_R^t)}{v'(x_R^t - \chi_R^t)} = \frac{c(\chi_R^t - z_R^t(\chi_R^t))}{c'(\chi_R^t - z_R^t(\chi_R^t))}. \tag{9}$$

As $\frac{c'(d)}{c(d)}$ strictly decreases as d increases, $\dfrac{c'(\chi_R^t - z_R^t(\chi_R^t))}{c''(\chi_R^t - z_R^t(\chi_R^t))} > \dfrac{c(\chi_R^t - z_R^t(\chi_R^t))}{c'(\chi_R^t - z_R^t(\chi_R^t))}$. The right-hand side of (8) is greater than the left-hand side of (9). Therefore, if the left-hand side of (8) is less than the left-hand side of (9), (8) holds. This means $p^M\left(\dfrac{v'(x_R^t - \chi_L^M)}{v''(x_R^t - \chi_R^t)} - \dfrac{v(x_R^t - \chi_L^M)}{v'(x_R^t - \chi_R^t)}\right)$ $+(1-p^M)\left(\dfrac{v'(x_R^t - \chi_L^E)}{v''(x_R^t - \chi_R^t)} - \dfrac{v(x_R^t - \chi_L^E)}{v'(x_R^t - \chi_R^t)}\right) < \dfrac{v'(x_R^t - \chi_R^t)}{v''(x_R^t - \chi_R^t)} - \dfrac{v(x_R^t - \chi_R^t)}{v'(x_R^t - \chi_R^t)}$. Because $\frac{v'(d)}{v(d)}$ strictly decreases as d increases, the right-hand side is positive. If $\chi_L^E = \chi_L^M = \chi_R^t$, both sides are the same. If χ_L^E and χ_L^M becomes further from x_R^t than χ_R^t, the left-hand side decreases. The reason is as follows. I differentiate $\left(\dfrac{v'(x_R^t - \chi_L^k)}{v''(x_R^t - \chi_R^t)} - \dfrac{v(x_R^t - \chi_L^k)}{v'(x_R^t - \chi_R^t)}\right)$ with respect to $x_R - \chi_L^k$, then $\dfrac{v''(x_R^t - \chi_L^k)}{v''(x_R^t - \chi_R^t)} - \dfrac{v'(x_R^t - \chi_L^k)}{v'(x_R^t - \chi_R^t)}$. This value is negative because $\dfrac{v'(x_R^t - \chi_R^t)}{v''(x_R^t - \chi_R^t)} < \dfrac{v'(x_R^t - \chi_L^k)}{v''(x_R^t - \chi_L^k)}$ when $x_R^t - \chi_L^k > x_R^t - \chi_R^k$ and $v''(.) > 0$. As a result, the left-hand side of (8) is less than the left-hand side of (9), so (8) holds, and (7) is positive. This result can be derived even if only $\frac{c'(d)}{c(d)}$ or $\frac{v'(d)}{v(d)}$ strictly decreases as d increases.

To determine the effect on platforms, it is sufficient to know the sign of $\frac{\partial z_R^t(\chi_R^t)}{\partial x_R^t} + \frac{\partial z_R^t(\chi_R^t)}{\partial \chi_R^t}\frac{\partial \chi_R^t}{\partial x_R^t}$. From the above, it is: $-\dfrac{v''(x_R^t - \chi_R^t)c'(\chi_R^t - z_R^t(\chi_R^t))}{v'(x_R^t - \chi_R^t)c''(\chi_R^t - z_R^t(\chi_R^t))}$

$+\dfrac{1}{v'(x_R^t-\chi_R^t)}\dfrac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t(\chi_R^t))}{c''(\chi_R^t-z_R^t(\chi_R^t))}-\dfrac{1}{v'(x_R^t-\chi_R^t)}(p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-$ $\chi_L^E)-v'(x_R^t-\chi_R^t))$. It is $-\dfrac{p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-\chi_L^E)-v'(x_R^t-\chi_R^t)}{v'(x_R^t-\chi_R^t)}<0$. □

A.2 Corollary 1

Consider R without loss of generality. Fix z_R and z_L. Differentiate $p^M v(x_R^t-\chi_L^M)+(1-p^M)v(x_R^t-\chi_L^E)-v(x_R^t-\chi_R^t)-c(\chi_R^t-z_R^t(\chi_R^t))$ with respect to x_R^t. Then, it is $p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-\chi_L^E)-v'(x_R^t-\chi_R^t)+\frac{\partial\chi_R}{\partial x_R}v'(x_R^t-\chi_R^t)-c'(\chi_R^t-z_R)(\frac{\partial\chi_R^t}{\partial x_R^t})$. From Lemma 1, $v'(x_R^t-\chi_R^t)=c'(\chi_R^t-z_R)$, so it is $p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-\chi_L^E)-v'(x_R^t-\chi_R^t)>0$.

Fix $\chi_R(z_R)$ and $\chi_L(z_L)$. Differentiate $p^M v(x_R^t-\chi_L^M)+(1-p^M)v(x_R^t-\chi_L^E)-v(x_R^t-\chi_R^t)-c(\chi_R^t-z_R^t(\chi_R^t))$ with respect to x_R^t. Then, it is $p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-\chi_L^E)-v'(x_R^t-\chi_R^t)+c'(\chi_R^t-z_R)(\frac{\partial z_R}{\partial x_R})$. Suppose Lemma 1. Fix χ_R^t and differentiate $v'(x_R^t-\chi_R^t)=c'(\chi_R^t-z_R)$ with respect to x_R^t, then $\frac{\partial z_R^t(\chi_R^t)}{\partial x_R^t}=-\frac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t(\chi_R^t))}{v'(x_R^t-\chi_R^t)c''(\chi_R^t-z_R^t(\chi_R^t))}<0$. Again, $v'(x_R^t-\chi_R^t)=c'(\chi_R^t-z_R)$. Substitute them into the above equation, then, $p^M v'(x_R^t-\chi_L^M)+(1-p^M)v'(x_R^t-\chi_L^E)-v'(x_R^t-\chi_R^t)+\frac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t)}{c''(\chi_R^t-z_R^t)}$, and it is negative for the same reason as in the proof of Lemma 3. □

A.3 Lemma 4

To prove this, I differentiate (6) by $x_R^t-x_L^t$ instead of x_R^t. The equation (6) can be rewritten as $v(x_R^t+\chi_R^t-2x_m)-v(x_R^t-\chi_R^t)=c(\chi_R^t-z_R^t(\chi_R^t))$, where $x_R^t-\chi_L^t=(x_R^t-x_m)+(\chi_R^t-x_m)=x_R^t+\chi_R^t-2x_m$ because the platforms are symmetric. Differentiating both sides of (6) by $x_R^t-x_L^t$ is the same as differentiating both sides of the rewritten equation by x_R^t. Then, (7) is replaced by $\dfrac{\partial\chi_R^t}{\partial x_R^t}=\dfrac{\frac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t(\chi_R^t))}{c''(\chi_R^t-z_R^t(\chi_R^t))}-(v'(x_R^t-\chi_L^t)-v'(x_R^t-\chi_R^t))}{v'(x_R^t-\chi_L^t)+v'(x_R^t-\chi_R^t)\frac{\partial z_R^t(\chi_R^t)}{\partial\chi_R^t}}$. For the same reason as explained in Lemma 3, this is positive. Moreover, the final equation of Lemma 3, $\frac{\partial z_R^t(\chi_R^t)}{\partial x_R^t}+\frac{\partial z_R^t(\chi_R^t)}{\partial\chi_R^t}\frac{\partial\chi_R^t}{\partial x_R^t}$, is replaced by $-\dfrac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t(\chi_R^t))}{v'(x_R^t-\chi_R^t)c''(\chi_R^t-z_R^t(\chi_R^t))}+\dfrac{\frac{v''(x_R^t-\chi_R^t)c'(\chi_R^t-z_R^t(\chi_R^t))}{c''(\chi_R^t-z_R^t(\chi_R^t))}-(v'(x_R^t-\chi_L^t)-v'(x_R^t-\chi_R^t))}{v'(x_R^t-\chi t_L)+v'(x_R^t-\chi_R^t)\frac{\partial z_R^t(\chi_R^t)}{\partial\chi_R^t}}\dfrac{\partial z_R^t(\chi_R^t)}{\partial\chi_R^t}$. Even though $v'(x_R^t-\chi_L^t)$ exists in the denominator, the value is still negative because the positive part of this equation remains less than the negative part. □

A.4 Proposition 2 (asymmetric cases)

Suppose that z_R^M and z_L^M are asymmetric, so one moderate type candidate defeats a moderate type opponent with certainty. Without loss of generality, suppose that the moderate type R defeats the moderate type L, that is, $\chi_R^M(z_R^M) - x_m < x_m - \chi_L^M(z_L^M)$, and the moderate type R defeats the extreme type L. Note that an extreme type announces $\hat{z}_i^E$. If z_R^M is more extreme than $\hat{z}_R^E$ ($z_R^M < \hat{z}_R^E$), an extreme type R will deviate to pretend to be a moderate type R. Therefore, assume that z_R^M is more moderate than $\hat{z}_R^E$ ($z_R^M < \hat{z}_R^E$). There are three cases.

The first case is that the moderate type L loses to or has the same probability of winning as the extreme type R ($\chi_R^E(\hat{z}_R^E) - x_m \leq x_m - \chi_L^M(z_L^M)$). Regardless of off-path beliefs, if the moderate type R's platform approaches $\hat{z}_R^E$, this moderate type R can win against both moderate and extreme types of L, and the disutility following a win and the cost of betrayal decreases as the platform approaches his ideal policy.

The second case is that the moderate type L defeats the extreme type R ($\chi_R^E(\hat{z}_R^E) - x_m > x_m - \chi_L^M(z_L^M)$) when the moderate type L announces a more moderate platform than $\hat{z}_L^M$. From Lemma 4, the moderate type R has an incentive to lose to the moderate type L. If a moderate type R approaches $\hat{z}_R^E$ more than z_L^M, she can lose to the moderate type L and still win against the extreme type L.

The final case is that the moderate type L defeats the extreme type R ($\chi_R^E(\hat{z}_R^E) - x_m > x_m - \chi_L^M(z_L^M)$) when the moderate type L announces a platform that is the same as or closer to her own ideal policy than $\hat{z}_L^M$. If an extreme type L deviates to a moderate type L's platform (z_L^M), the extreme type L can win against the extreme type R with certainty and so gain a higher probability of winning. With this deviation, an extreme type can implement a policy closer to his ideal policy, so he will deviate. $\square$

A.5 Proposition 3

The precise definition of a semiseparating equilibrium is as follows.

Definition 2 *A continuous semiseparating equilibrium is a collection* $(z_i^*, \sigma^M, F(.), \Pi)$ *and a two-policy semiseparating equilibrium is a collection* $(z_i^*, \sigma^M, \bar{z}_i, \Pi)$*, where* z_i^* *is a platform chosen by a moderate type,* σ^M *is the probability of choosing* z_i^* *in an extreme type's mixed strategy,* $F(.)$ *is a distribution function with the support of* $[\bar{z}_L, \underline{z}_L]$ *for* L *and* $[\underline{z}_R, \bar{z}_R]$ *for* R*,* *and* Π *is a scalar (the value of the expected utility), such that: (a.1)* $\Pi = V_i^E(z_i) = V_i^E(z_i^*)$ *for all* z_i *in support of* $F(.)$ *in a continuous semiseparating equilibrium; (a.2)* $\Pi = V_i^E(z_i^*) = V_i^E(\bar{z}_i)$ *in a two-policy semiseparating equilibrium; and (b) Definition 1 holds.*

A.5.1 Define σ^M and Π

First, a continuous semiseparating equilibrium is discussed. When an extreme type announces z_i^*, the expected utility is $V_i^E(z_i^*) = \frac{1}{2}\big[-p^M v(|\chi_j^M(z_j^*)-x_i^E|)-\sigma^M(1-p^M)v(|\chi_j^E(z_j^*)-x_i^E|)-(p^M+\sigma^M(1-p^M))\big[v(|\chi_i^E(z_i^*)-x_i^E|)+c(|\chi_i^E(z_i^*)-z_i^*|)\big]\big]-(1-\sigma^M)(1-p^M)\int_{\bar{z}_j}^{z_j} v(|\chi_j^E(z_j)-x_i^E|)dF(z_j)$. When an extreme type announces $\bar{z}_i$, the expected utility is $V_i^E(\bar{z}_i) = (p^M + \sigma^M(1-p^M))\big[-v(|\chi_i^E(\bar{z}_i)-x_i^E|)-c(|\chi_i^E(\bar{z}_i)-\bar{z}_i|)\big]-(1-\sigma^M)(1-p^M)\int_{\bar{z}j}^{z_j} v(|\chi_j^E(z_j)-x_i^E|)dF(z_j)$. The value of σ^M is decided at the point at which the extreme type's expected utilities under z_i^* and $\bar{z}_i$ are the same:

$$\begin{aligned}
&\frac{1}{2}\big[-\frac{p^M}{p^M+\sigma^M(1-p^M)}v(|\chi_j^M(z_j^*)-x_i^E|)-\frac{\sigma^M(1-p^M)}{p^M+\sigma^M(1-p^M)}v(|\chi_j^E(z_j^*)-x_i^E|)\\
-\;& v(|\chi_i^E(z_i^*)-x_i^E|)-c(|\chi_i^E(z_i^*)-z_i^*|)\big]\\
=\;& -v(|\chi_i^E(\bar{z}_i)-x_i^E|)-c(|\chi_i^E(\bar{z}_i)-\bar{z}_i|). \qquad (10)
\end{aligned}$$

When $\sigma^M = 1$, the left-hand side is less than the right-hand side because (2) holds. When σ^M becomes 0, if the left-hand side is greater than the right-hand side, the value of $\sigma^M \in (0,1)$ under which an extreme type is indifferent between z_i^* and $\bar{z}_i$ exists. The following condition means that the left-hand side is greater than the right-hand side of (10) when σ^M becomes zero.

$$\begin{aligned}
&-\frac{1}{2}\big[v(|\chi_j^M(z_j^*)-x_i^E|)+v(|\chi_i^E(z_i^*)-x_i^E|)+c(|\chi_i^E(z_i^*)-z_i^*|)\big]\\
>\;& -v(|\chi_i^E(\bar{z}_i)-x_i^E|)-c(|\chi_i^E(\bar{z}_i)-\bar{z}_i|). \qquad (11)
\end{aligned}$$

First, $-v(|\chi_i^E(z_i^*)-x_i^E|)-c(|\chi_i^E(z_i^*)-z_i^*|) > -v(|\chi_i^E(\bar{z}_i)-x_i^E|)-c(|\chi_i^E(\bar{z}_i)-\bar{z}_i|)$ because $\bar{z}_i$ is more moderate than z_i^*. Second, $\bar{z}_i$ is the platform with which an extreme type can defeat a moderate type who announces z_i^*. When σ^M becomes zero, voters guess that a candidate announcing z_i^* is a moderate type. From the definition of $\bar{z}_i$, an extreme type's implemented policy, $\chi_i^E(\bar{z}_i)$, needs to be more moderate than a moderate type's implemented policy, $\chi_i^M(z_i^*)$. From Lemma 3, a moderate type has a greater incentive to converge on the *implemented policy* than an extreme type, and a moderate type is indifferent to winning or losing at z_i^*. This means that $-v(|\chi_j^M(z_j^*) - x_i^E|) > -v(|\chi_i^E(\bar{z}_i) - x_i^E|) - c(|\chi_i^E(\bar{z}_i) - \bar{z}_i|)$. As a result, (11) holds, so if (2) holds, a value of σ^M under which an extreme type is indifferent between $\bar{z}_i$ and z_i^* exists.

A.5.2 The Other Bound of Support for the $F(.)$

The distribution function, $F(.)$, satisfies the following lemma.

Lemma 5 *Suppose that a continuous semiseparating equilibrium exists. In such an equilibrium, $F(.)$ is continuous with connected support.*

Proof: If $F(.)$ has a discontinuity at some policy, say z_i', i.e., $F(z_i'+) > F(z_i'-)$, there is a strictly positive probability that an opponent also chooses z_j' (the probability density function is $f(z_j') > 0$). If this candidate approaches the median policy by an infinitesimal degree, it increases the probability of winning by $\frac{1}{2}f(z_j') > 0$. On the other hand, because this approach is minor, the expected utility changes by slightly less than $\frac{1}{2}f(z_j')[-v(|x_i - \chi_i^E(z_i')|) - c(|z_i' - \chi_i^E(z_i')|) - (-v(|x_i - \chi_j^E(z_j')|))]$, and it is positive (or negative). This implies that if $F(.)$ has a discontinuity, it cannot be part of a continuous semiseparating equilibrium. Assume that $F(.)$ is constant in some region $[z_1, z_2]$ in the convex hull of the support. If a candidate chooses z_1, he has an incentive to deviate to z_2 because the probability of winning does not change, but the implemented policy will approach the candidate's own ideal policy so the expected utility increases. Thus, the support of $F(.)$ must be connected. $\square$

At $\underline{z}_i$, the expected utility is $V_i^E(\underline{z}_i) = -v(|\chi_i^E(\underline{z}_i) - x_i^E|) - c(|\chi_i^E(\underline{z}_i) - \underline{z}_i|)$ because, from Lemma 5, $F(\underline{z}_L) = 0$, the probability of winning is one. If (5) does not hold, $V_i^E(\underline{z}_i)$ is higher than $V_i^E(\bar{z}_i)$, when $\underline{z}_i = \bar{z}_i$, so $\bar{z}_i \neq \underline{z}_i$ in equilibrium, and it means that a continuous semiseparating equilibrium exists. If (5) holds, the extreme bound and the moderate bound are equivalent (a two-policy semiseparating equilibrium). Suppose that (5) does not hold. In equilibrium, $V_i^E(\underline{z}_i)$ and $V_i^E(\bar{z}_i)$ should be the same, so $\underline{z}_i$ and $F(.)$ should satisfy the following equation. Suppose R without loss of generality.

$$
\begin{aligned}
& -v(|\chi_R^E(\underline{z}_R) - x_R^E|) - c(|\chi_R^E(\underline{z}_R) - \underline{z}_R|) \\
= \; & (p^M + \sigma^M(1-p^M))\big[-v(|\chi_R^E(\bar{z}_R) - x_R^E|) - c(|\chi_R^E(\bar{z}_R) - \bar{z}_R|)\big] \\
& -(1-\sigma^M)(1-p^M)\int_{\bar{z}_L}^{z_L} v(|\chi_L^E(z_L) - x_R^E|)dF(z_L).
\end{aligned} \tag{12}
$$

I assume that the two candidates' positions are symmetric, so when $\underline{z}_R$ decreases, $\underline{z}_L$ increases. Then, $V_R^E(\bar{z}_R)$ increases because $\int_{\bar{z}_L}^{z_L} v(|\chi_L^E(z_L) - x_R^E|)dF(z_L)$ decreases while $V_i^E(\underline{z}_i)$ decreases, and $F(.)$ also adjusts the value of $\int_{\bar{z}_L}^{z_L} v(|\chi_L^E(z_L) - x_R^E|)dF(z_L)$. Thus, there exist combinations of $\bar{z}_i$ and $F_j(.)$ that satisfy (12).

I denote $\hat{z}_i^E$ such that $-v(|\chi_j^E(\hat{z}_j^E) - x_i^E|) = -v(|\chi_i^E(\hat{z}_i^E) - x_i^E|) - c(|\chi_i^E(\hat{z}_i^E) - \hat{z}_i^E|)$. The moderate bound, $\underline{z}_i$, should be more extreme than $\hat{z}_i^E$. If $\underline{z}_i$ is more moderate than $\hat{z}_i^E$, it means $-v(|\chi_j^E(\underline{z}_j) - x_i^E|) > -v(|\chi_i^E(\underline{z}_i) - x_i^E|) - c(|\chi_i^E(\underline{z}_i) - \underline{z}_i|)$. Thus, an extreme type with $\underline{z}_i$ has an incentive to lose to an extreme type opponent with a platform close to $\underline{z}_j$. Any platform in the support of $F(.)$, say z_i', needs to satisfy $-v(|\chi_j^E(z_j') - x_i^E|) > -v(|\chi_i^E(z_i') - x_i^E|) - c(|\chi_i^E(z_i') - z_i'|)$ to avoid deviating to lose. Therefore, $\chi_i^E(\underline{z}_i)$ is more extreme than $\chi_i^M(z_i^*)$ as $\chi_i^E(\hat{z}_i^E)$ is more extreme than $\chi_i^M(z_i^*)$.

A.5.3 Define $F(.)$

Suppose R without loss of generality. Let $X(z_L') = \int_{z_L'}^{z_L} v(|\chi_L^E(z_L) - x_R^E|)dF(z_L)$. For any $z_R' \in (\underline{z_R},\ \bar{z}_R)$, the expected utility should be the same as Π.[24] It means that:

$$
F_X(z_R') = \frac{\Pi + v(|\chi_R^E(z_R') - x_R^E|) + c(|\chi_R^E(z_R') - z_R'^M)X(z_L')}{(1-\sigma^M)(1-p^M)(v(|\chi_R^E(z_R') - x_R^E|) + c(|\chi_R^E(z_R') - z_R'|))}.
$$

The distribution function, $F_X(.)$, is defined by the above equation for any platform in support of $F(.)$, given $X(z_L')$. When $F_X(z_R') = 0$, it is $\Pi + v(|\chi_R^E(z_R') - x_R^E|) + c(|\chi_R^E(z_R') - z_R'^M)X(z_L') = 0$. This equation holds if and only if $z_R' = \underline{z_R}$ and $X(z_L') = 0$ to have $\Pi = V_R^E(\underline{z}_R)$. If and only if $z_L' = \underline{z}_L$, $X(z_L') = 0$, so, when z_R' and z_L' becomes $\underline{z}_R$ and $\underline{z}_L$, $F(z_R')$ becomes zero.

When $F(z_R') = 1$, it is $\Pi = (p^M + \sigma^M(1-p^M))(-v(|\chi_R^E(z_R') - x_R^E|) - c(|\chi_R^E(z_R') - z_R'^M)(1-p^M)X(z_L')$. This equation holds if and only if $z_R' = \bar{z}_R$ and $X(z_L') = \int_{\underline{z}_L}^{\bar{z}_L} v(|\chi_L^E(z_L) -$

[24]When the extreme type R chooses $z_R' \in [\underline{z}_R, \bar{z}_R]$, the expected utility is $(1-p^M)F(z_R')\big[-v(|\chi_R^E(z_R') - x_R^E|) - c(|\chi_R^E(z_R') - z_R'|)\big] - (1-\sigma^M)(1-p^M)\int_{z_L'}^{z_L} v(|\chi_L^E(z_L) - x_R^{t\setminus E}|)dF(z_L)$.

$x_R^E|)dF(z_L)$ to have $\Pi = V_R^E(\bar{z}_R)$. It means that when z_R' and z_L' becomes $\bar{z}_R$ and $\bar{z}_L$, $F(z_R')$ becomes one.

When z_L' satisfies $|z_L' - x_m| = |z_R' - x_m|$, that is, $F(.)$ is symmetric for both candidates, the value of $X(z_L')$ increases continuously as z_R' (z_L') becomes more extreme. Therefore, if the platform moves from $\underline{z_R}$ to $\bar{z}_R$, $F(z_R')$ increases from zero to one. Thus, if $F(.)$ is symmetric for both candidates, $F_i(.)$ can be defined for $i = L, R$.

A.5.4 An Extreme Type Does Not Deviate

An extreme type does not deviate to a more moderate platform than $\underline{z_i}$ as the probability of winning is still one, but the cost of betrayal and the disutility following a win increase.

If an extreme type deviates to a platform that is more extreme than z_i^* or between z_i^* and $\bar{z}_i$, this candidate is certain to lose because voters believe that such a candidate is an extreme type based on the off-path belief. Therefore, the expected utility is:

$$\begin{aligned} & -p^M v(|\chi_j^M(z_j^*) - x_i^E|) - \sigma^M(1-p^M)v(|\chi_j^E(z_j^*) - x_i^E|) \\ - \quad & (1-\sigma^M)(1-p^M)\int v(|\chi_j^E(z_j) - x_i^E|)dF(z_j). \end{aligned} \tag{13}$$

Subtracting (13) from $V_i^E(z_i^*)$ yields:

$$\begin{aligned} & -v(|\chi_i^E(z_i^*) - x_i^E|) - c(|\chi_i^E(z_i^*) - z_i^*|) + \frac{p^M}{p^M + \sigma^M(1-p^M)}v(|\chi_j^M(z_j^*) - x_i^E|) \\ + \quad & \frac{\sigma^M(1-p^M)}{p^M + \sigma^M(1-p^M)}v(|\chi_j^E(z_j^*) - x_i^E|). \end{aligned} \tag{14}$$

A moderate type is indifferent to winning and losing at z_i^*, that is, (3) holds. Thus, from Lemma 3, the value of (14) is positive, and this deviation decreases the expected utility. Note that Lemma 3 uses p^M, but the same result holds when p^M is replaced by $\frac{p^M}{p^M+\sigma^M(1-p^M)}$.

A.5.5 A Moderate Type Does Not Deviate

Suppose R without loss of generality. As a moderate type is indifferent between winning and losing at z_R^*, she is indifferent regarding whether to deviate to a platform that is more extreme than z_R^* or between z_R^* and $\bar{z}_R$. The second possibility involves deviating to any platform in $z_R' \in [\underline{z}_R, \bar{z}_R]$. For an extreme type, the candidate is indifferent between z_R^* and

z_R'. This means that:

$$\begin{aligned}
& (p^M+\sigma^M(1-p^M))(v(|\chi_R^E(z_R')-x_R^E|)+c(|\chi_R^E(z_R')-z_R'|)) \\
- & \frac{1}{2}\Big[p^M v(|\chi_L^M(z_L^*)-x_R^E|)+\sigma^M(1-p^M)v(|\chi_L^E(z_L^*)-x_R^E|) \\
+ & (p^M+\sigma^M(1-p^M))(v(|\chi_R^E(z_R^*)-x_R^E|)+c(|\chi_R^E(z_R^*)-z_R^*|))\Big] \\
= & (1-\sigma^M)(1-p^M)\int_{\bar{z}_L}^{z_L'} v(|\chi_L^E(z_L)-x_R^E|)dF(z_L) \\
- & (1-\sigma^M)(1-p^M)(1-F(z_L'))\big[v(|\chi_R^E(z_R')-x_R^E|)+c(|\chi_R^E(z_R')-z_R'|)\big]. \qquad (15)
\end{aligned}$$

A moderate type has no incentive to deviate to z_i' if:

$$\begin{aligned}
& (p^M+\sigma^M(1-p^M))(v(|\chi_R^M(z_R')-x_R^M|)+c(|\chi_R^M(z_R')-z_R'|)) \\
- & \frac{1}{2}\Big[p^M v(|\chi_L^M(z_L^*)-x_R^M|)+\sigma^M(1-p^M)v(|\chi_L^E(z_L^*)-x_R^M|) \\
+ & (p^M+\sigma^M(1-p^M))(v(|\chi_R^M(z_R^*)-x_R^M|)+c(|\chi_R^M(z_R^*)-z_R^*|))\Big] \\
> & (1-\sigma^M)(1-p^M)\int_{\bar{z}_L}^{z_L'} v(|\chi_L^E(z_L)-x_R^M|)dF(z_L) \\
- & (1-\sigma^M)(1-p^M)(1-F(z_L'))\big[v(|\chi_R^M(z_R')-x_R^M|)+c(|\chi_R^M(z_R')-z_R'|)\big]. \qquad (16)
\end{aligned}$$

I disregard $(1-\sigma^M)(1-p^M)$ and differentiate the right-hand side of the above equations with respect to x_R^t to obtain $\int_{\bar{z}_L}^{z_L'} v'(|x_R^t-\chi_L^E(z_L)|)dF(z_L)-(1-F(z_R'))v'(|x_R^t-\chi_R^t(z_R')|)$. This is positive because the opponent's implemented policy is further from the ideal policy compared with z_R', so the right-hand side of (15) is greater than the right-hand side of (16). From (10), at $z_R'=\bar{z}_R$, the left-hand side of (15) is zero. From (3), the left-hand side of (16) is $(p^M+\sigma^M(1-p^M))(v(|\chi_R^M(z_R')-x_R^M|)+c(|\chi_R^M(z_R')-z_R'^M+\sigma^M(1-p^M))(v(|\chi_R^M(z_R^*)-x_R^M|)+c(|\chi_R^M(z_R^*)-z_R^*|))$, so it is positive as z_R' is smaller than z_R^*. I differentiate the left-hand side with respect to z_R'. Note that σ^M and z_R^* are already decided, so only z_R' changes. Then, $(p^M+\sigma^M(1-p^M))[-v'(|x_R^t-\chi_R^t(z_R')|)\frac{\partial\chi_R^t(z_R')}{\partial z_R'}+c'(|\chi_R^t(z_R')-z_R'|))\frac{\partial\chi_R^t(z_R')}{\partial z_R'}-c'(|\chi_R^t(z_R')-z_R'|)]$. I ignore $p^M+\sigma^M(1-p^M)$. From Lemma 1, it is negative, that is, $-v'(|x_R^t-\chi_R^t(z_R')|)<0$. This implies that if z_R' becomes smaller, then the left-hand sides of both equations increase. The next problem is the degree of increase. Differentiating $-v'(|\chi_R^t(z_R')-x_R^t|)$ with respect to x_i^t yields:

$$-v''(|x_R^t-\chi_R^t(z_R')|)(1-\frac{\partial\chi_R^t(z_R')}{\partial x_R^t}). \qquad (17)$$

I differentiate (10) with respect to x_R^t, then $0 < \frac{\partial \chi_R^t(z_R')}{\partial x_R^t} = \frac{v''c'}{v''c' + c''v'} < 1$. Thus, the value of (17) is negative. This implies that if x_R^t is more extreme, the increase of the left-hand side is lower when z_R' becomes smaller. At $z_R' = \bar{z}_R$, the left-hand side of (15) is lower than the right-hand side of (16). If z_R' becomes more moderate, both left-hand sides increase, but an increase in (16) is greater than an increase in (15). As a result, for all z_R', the left-hand side of (15) is lower than the right-hand side of (16), so (16) is satisfied.

Finally, as a moderate type has no incentive to deviate to $\underline{z}_R$, she does not deviate to any policy that is more moderate than $\underline{z}_R$.

A.5.6 A Two-policy Semiseparating Equilibrium

When (5) holds, a two-policy semiseparating equilibrium exists. When an extreme type chooses z_i^*, the expected utility is $V_i^E(z_i^*) = \frac{1}{2}\Big[-p^M v(|\chi_j^M(z_j^*) - x_i^E|) - \sigma^M(1-p^M)v(|\chi_j^E(z_j^*) - x_i^E|) - (p^M + \sigma^M(1-p^M))\big[v(|\chi_i^E(z_i^*) - x_i^E|) + c(|\chi_i^E(z_i^*) - z_i^*|)\big]\Big] - (1-\sigma^M)v(|\chi_j^E(\bar{z}_j) - x_i^E|)$. The expected utility when the candidate chooses $\bar{z}_i$ is $V_i^E(\bar{z}_i) = (p^M + \sigma^M(1-p^M))\big[-v(|\chi_i^E(\bar{z}_i) - x_i^E|) - c(|\chi_i^E(\bar{z}_i) - \bar{z}_i|)\big] - \frac{1}{2}(1-\sigma^M)(1-p^M)\big[v(|\chi_j^E(\bar{z}_j) - x_i^E|) + v(|\chi_i^E(\bar{z}_i) - x_i^E|) + c(|\chi_i^E(\bar{z}_i) - \bar{z}_i|)\big]$. When $\sigma^M = 1$, $V_i^E(\bar{z}_i)$ is greater than $V_i^E(z_i^*)$ as it is assumed that (2) holds. Assume $\bar{\sigma}^M$, which satisfies (10). If (5) holds, then $V_i^E(\bar{z}_i)$ is less than $V_i^E(z_i^*)$ at $\bar{\sigma}^M$. When σ^M increases continuously from $\bar{\sigma}^M$, $V_i^E(\bar{z}_i)$ increases and $V_i^E(z_i^*)$ decreases continuously, so there exists a σ^M under which $V_i^E(\bar{z}_i) = V_i^E(z_i^*)$, and such σ^M should be higher than $\bar{\sigma}^M$.

The platform $\bar{z}_i$ should be such that $\chi_i^E(\bar{z}_i)$ is between $\chi_i^M(z_i^*)$ and $\chi_i^E(z_i^*)$ if $p^M > 0$ and $\sigma^M > 0$ because in this region, there exists a policy that voters prefer the expected implemented policy of a candidate with z_i^*. Thus, $\chi_i^E(\bar{z}_i)$ is more extreme than $\chi_i^M(z_i^*)$.

An extreme type does not deviate for the reason explained in Appendix A.5.4. If an extreme type deviates to a platform that is more moderate than $\bar{z}_i$, the expected utility changes by $\frac{(1-\sigma^M)(1-p^M)}{2}\big[v(|\chi_j^E(\bar{z}_j) - x_i^E|) - v(|\chi_i^E(\bar{z}_i) - x_i^E|) - c(|\chi_i^E(\bar{z}_i) - \bar{z}_i|)\big]$. This is negative because (5) holds.

A moderate type does not deviate to a more extreme policy than $\bar{z}_i$ for the reason explained in Appendix A.5.5. A moderate type does not deviate to $\bar{z}_i$ if:

$$
\begin{aligned}
& (p^M + \sigma^M(1-p^M))[v(|\chi_i^M(\bar{z}_i) - x_i^M|) + c(|\chi_i^M(\bar{z}_i) - \bar{z}_i|) \\
- \; & v(|\chi_i^M(z_i^*) - x_i^M|) - c(|\chi_i^M(z_i^*) - z_i^*|)] \\
- \; & (1-\sigma^M)(1-p^M)\frac{1}{2}\Big[v(|\chi_j^E(\bar{z}_j) - x_i^M|) \\
- \; & v(|\chi_i^M(\bar{z}_i) - x_i^M|) - c(|\chi_i^M(\bar{z}_i) - \bar{z}_i|)\Big] > 0. \qquad (18)
\end{aligned}
$$

As $\bar{z}_i$ is more moderate than z_i^*, $v(|\chi_i^M(\bar{z}_i) - x_i^M|) + c(|\chi_i^M(\bar{z}_i) - \bar{z}_i|) - v(|\chi_i^M(z_i^*) - x_i^M|) - c(|\chi_i^M(z_i^*) - z_i^*|)$ is positive. For an extreme type, $v(|\chi_j^E(\bar{z}_j) - x_i^E|) - v(|\chi_i^E(\bar{z}_i) - x_i^E|) - c(|\chi_i^E(\bar{z}_i) - \bar{z}_i|)$ is negative because (5) holds. From Lemma 3, its value for a moderate type is lower than for an extreme type, so $v(|\chi_j^E(\bar{z}_j) - x_i^M|) - v(|\chi_i^M(\bar{z}_i) - x_i^M|) - c(|\chi_i^M(\bar{z}_i) - \bar{z}_i|)$ is also negative for a moderate type. As a result, (18) is satisfied.

A.5.7 Asymmetric Equilibrium

There does not exist an asymmetric equilibrium in which candidates choose asymmetric platforms or different values of σ^M or $F(.)$. First, suppose that the support of $F(.)$ is asymmetric. Then, the probability of winning is constant in some regions of the support for at least one candidate, and it cannot be an equilibrium for the reason explained in Lemma 5. This means that σ^M should also be symmetric. Second, suppose that moderate types' platforms are asymmetric. This means that the probability of winning for a moderate type is also asymmetric. Suppose moderate type R announces a more extreme platform than moderate type L, and so loses to L. In this case, extreme type R has no incentive to imitate moderate type R. The values of σ^M should be symmetric, so it cannot be a semiseparating equilibrium. $\square$

B Examples

The important equilibrium is a semiseparating equilibrium in which, the important characteristics are (1) one party's platform is more moderate than the other's, (2) voters guess that the party is of an extreme type, (3) voters are uncertain whether the opponent is of an extreme type, and (4) the party that announces the more moderate platform wins the election. Because my model is simple, these examples do not match my model exactly.[25] However, I show that the following examples have at least these four characteristics.

B.1 Turkey

In Turkish politics, there are two large groups, political Islam and secular parties. Broadly speaking, secularists, represented by parties such as the Republican People's Party, support the democratic systems and separation of politics and religion. Political Islam, represented by the Justice and Development Party (AKP), seeks to introduce Islamic doctrines into some policies. In recent years, the AKP and the prime minister, Recep Erdogan, have supported the separation of politics and religion and have promoted the AKP as the party of reform, a party that supports democratic systems, including separation of politics and religion. Most citizens support secularism in Turkey, and the AKP's promises were almost the same as those in the opponent's policies. Nevertheless, voters realized that the AKP is the extreme Islamic party (Daği (2006)). On the other hand, in the 2007 Turkey presidential election, the Turkish military, which supports secularism, stated that "the Turkish armed forces have been monitoring the situation with concern." People interpreted this as a threat of a coup, and began to worry that the secular parties would support extreme secular policies such as using violence against Political Islam. Thus, voters were uncertain about the secular party's type. Finally, the AKP won the 2007 elections.

B.2 Japan

In Japan, there are two main parties, the Liberal Democratic Party (LDP), which supports increasing government spending such as on public works to sustain rural areas, and the Democratic Party of Japan (DPJ), which supports economic reforms and reduction of government debt. In 2001, the LDP chose Junichirou Koizumi as the leader; Koizumi promised to implement economic reforms such as reducing government works and debt, and moreover promised to "destroy" the (traditional) LDP. After the "great depression" of the 1990s,

[25] For example, my model considers only two parties, a plural voting system, and a single policy issue. In Japan and Turkey, there are several parties. Turkey uses Proportional Representation (PR), and Japan employs parallel voting, which includes both PR and single-member districts. Additionally, it is rare to have an election with a single policy issue (the only exception may be the 2005 election in Japan in which privatization of postal offices was the major issue). However, these problems apply not only to my model but also to most voting models in the Downsian tradition. In these examples, the decisions of "parties" are considered instead of "candidates." I use "candidates" in the model, but it can be replaced by "parties."

many Japanese supported economic reforms rather than traditional economic policies, so the LDP's position should be further from the median policy than that of the DPJ after the 1990s. Indeed, voters were afraid that the LDP would not implement the economic reforms (Mulgan (2002)). The opposition DPJ had no experience in government, so voters remained uncertain about the party. Finally, the LDP of Koizumi won elections 2001, 2003, and 2005.

B.3 The UK

In the UK, there are two major parties, the Conservative Party and the Labour Party. Broadly speaking, while the Conservative Party supports the free market, the Labour Party is famous for its support of socialist policies and for being supported by labor unions. The Labour Party was not in government from 1979 because many citizens did not support socialist policies. In 1994, the Labour Party chose Tony Blair as a leader who promised the "Third Way" and free-market policies. Most members of the Labour Party supported Blair although some, such as members of labor unions, still supported socialist policies. This means that the Labour Party converged greatly by choosing Blair as the leader. On the other hand, voters were uncertain about the Conservative Party preferences because of infighting between factions. As a result, the Labour Party won the 1997 election (Clarke (2004)).

References

Aldrich, John, 1997, *Why Parties? The Origin and Transformation of Political Parties in America,* Chicago: University of Chicago Press.

Aragones, Enriqueta, Thomas Palfrey and Andrew Postlewaite, 2007, "Political Reputations and Campaign Promises," *Journal of the European Economic Association* 5, 846–884.

Asako, Yasushi, 2010, Partially Binding Platforms: Campaign Promises as a Partial Commitment Device, IMES Discussion Paper Series 2010-E-1, Bank of Japan.

Austen-Smith, David and Jeffrey Banks, 1989, "Electoral Accountability and Incumbency," in P. Ordeshook ed., *Models of Strategic Choice in Politics*, Ann Arbor: University of Michigan Press.

Banks, Jeffrey, 1990, "A Model of Electoral Competition with Incomplete Information," *Journal of Economic Theory* 50, 309–325.

Banks, Jeffrey and Joel Sobel, 1987, "Equilibrium Selection in Signaling Games," *Econometrica* 55, 647–661.

Barro, Robert, 1973, "The Control of Politicians: An Economic Model," *Public Choice* 14, 19–42.

Besley, Timothy and Stephan Coate, 1997, "An Economic Model of Representative Democracy," *Quarterly Journal of Economics* 112, 85–114.

Burdett, Kenneth and Kenneth Judd, 1983, "Equilibrium Price Dispersion," *Econometrica* 51, 955–970.

Callander, Steven, 2008, "Political Motivations," *Review of Economic Studies* 75, 671–697.

Callander, Steven and Simon Wilkie, 2007, "Lies, Damned Lies and Political Campaigns," *Games and Economic Behavior* 80, 262–286.

Cho, In-Koo and David Kreps, 1987, "Signaling Games and Stable Equilibria," *Quarterly Journal of Economics* 102, 179–222.

Clarke, Peter, 2004, *Hope and Glory: Britain 1900-2000,* London: Penguin Books.

Cox, Gary and Mathew McCubbins, 1994, *Legislative Leviathan: Party Government in the House,* Los Angeles: University of California Press.

Dağt, İsan, 2006, "The Justice and Development Party: Identity, Politics, and Human Rights Discourse in the Search for Security and Legitimacy," in M. Yavuz ed., *The Emergence of a New Turkey: Democracy and the AK Party*, Salt Lake City: The University of Utah Press.

Djankov, Simeon, Caralee McLiesh, Tatiana Nenova and Andrei Shleifer, 2003, "Who Owns the Media?" *Journal of Law and Economics* 46, 341–382.

Downs, Anthony, 1957, *An Economic Theory of Democracy*, New York: Harper and Row.

Ferejohn, John, 1986, "Incumbent Performance and Electoral Control," *Public Choice* 50, 5–26.

Grossman, Gene and Elhanan Helpman, 2005, "A Protectionist Bias in Majoritarian Politics," *Quarterly Journal of Economics* 120, 1239–1282.

Grossman, Gene and Elhanan Helpman, 2008, "Party Discipline and Pork-Barrel Politics," in E. Helpman ed., *Institutions and Economic Performance*, Cambridge MA: Harvard University Press.

Harrington, Joseph, 1993, "The Impact of Re-election Pressures on the Fulfillment of

Campaign Promises," *Games and Economic Behavior* 5, 71–97.

Huang, Haifeng, 2010, "Electoral Competition when Some Candidates Lie and Others Pander," *Journal of Theoretical Politics* 22, 333-358.

Kartik, Navin and Preston McAfee, 2007, "Signaling Character in Electoral Competition," *American Economic Review* 97, 852–870.

McCarty, Nolan, Keith Poole and Howard Rosenthal, 2001, "The Hunt for Party Discipline in Congress," *American Political Science Review* 95, 673–687.

McGillivray, Fiona, 1997, "Party Discipline as a Determinant of the Endogenous Formation of Tariffs," *American Journal of Political Science* 41, 584–607.

Mulgan, Aurelia, 2002, *Japan's Failed Revolution: Koizumi and the Politics of Economic Reform*, Asia Pacific Press.

Osborne, Martin and Al Slivinski, 1996, "A Model of Political Competition with Citizen Candidates," *Quarterly Journal of Economics* 111, 65–96.

Persson, Torsten and Guido Tabellini, 2000, *Political Economics: Explaining Economic Policy*, Cambridge and London: The MIT Press.

Reinikka, Ritva and Jakob Svensson, 2005, "Fighting Corruption to Improve Schooling: Evidence from a Newspaper Campaign in Uganda," *Journal of European Economic Association* 3, 259–267.

Schultz, Christian, 1996, "Polarization and Inefficient Policies," *Review of Economic Studies* 63, 331–344.

Snyder, James and Timothy Groseclose, 2000, "Estimating Party Influence in Congressional Role-Call Voting," *American Journal of Political Science* 44, 193–211.

Wittman, Donald, 1973, "Parties as Utility Maximizers," *American Political Science Review* 67, 490–498.

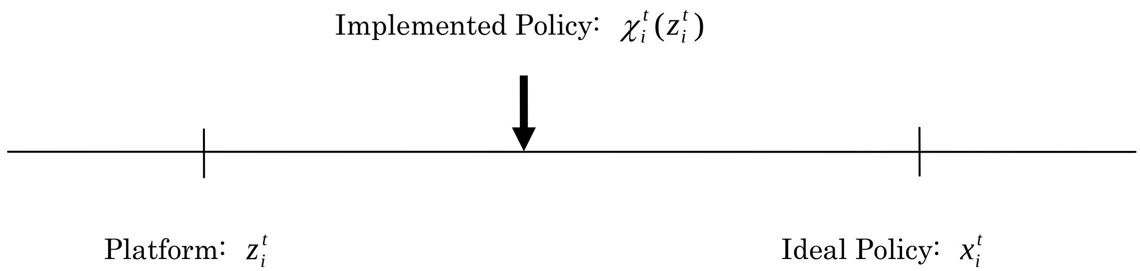


Figure 1: Ideal Policy, Platform and Implemented Policy

Each candidate has an ideal policy, and announces a campaign platform before an election. Given the ideal policy and the platform, the winning candidate decides the implemented policy which will be between the ideal policy and the platform.

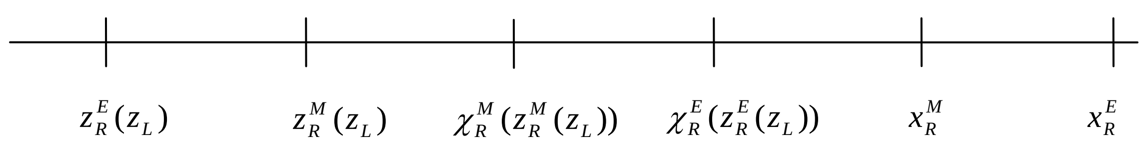
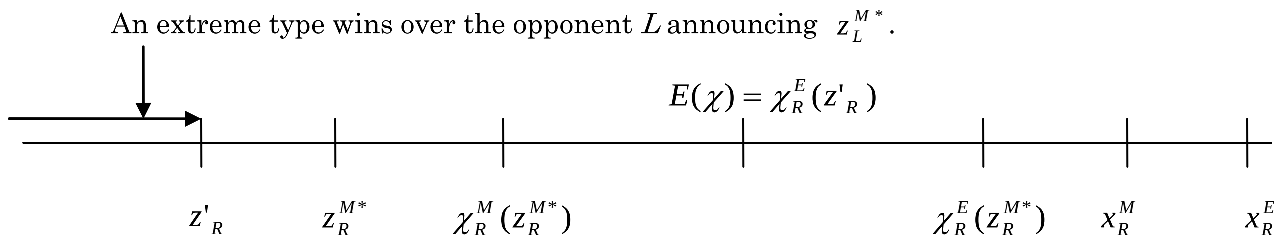
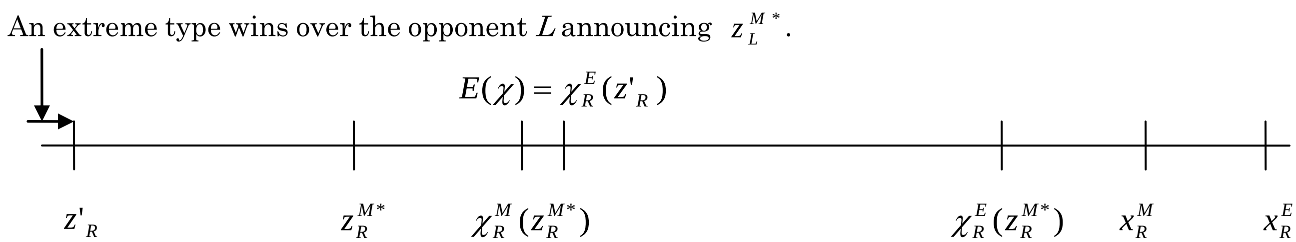


Figure 2: Lemma 3

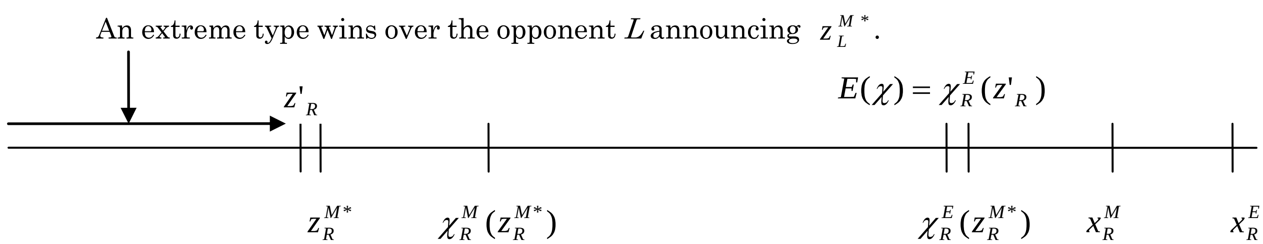
While an extreme type's implemented policy given the cut-off platform $\chi_R^E(z_R^E(z_L))$ is more extreme than a moderate type's one $\chi_R^M(z_R^M(z_L))$, an extreme type's cut-off platform $z_R^E(z_L)$ is more moderate than a moderate type's one $z_R^E(z_L)$.



(a): With $p^M = 1/2$



(b): With Sufficiently High p^M



(c): With Sufficiently Low p^M

Figure 3: Pooling Equilibrium

Let $E(\chi)=p^M\chi_R^M(z_R^{M*})+(1-p^M)\chi_R^E(z_R^{M*})$ denote the expected policy implemented by a candidate announcing z_R^{M*}. Suppose that voters have a linear utility. If an extreme type's platform is more moderate than z'_R, such an extreme type wins over the opponent L announcing z_L^{M*}.

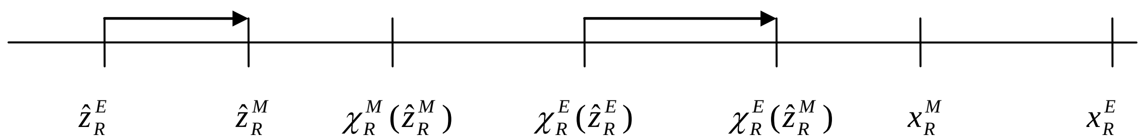
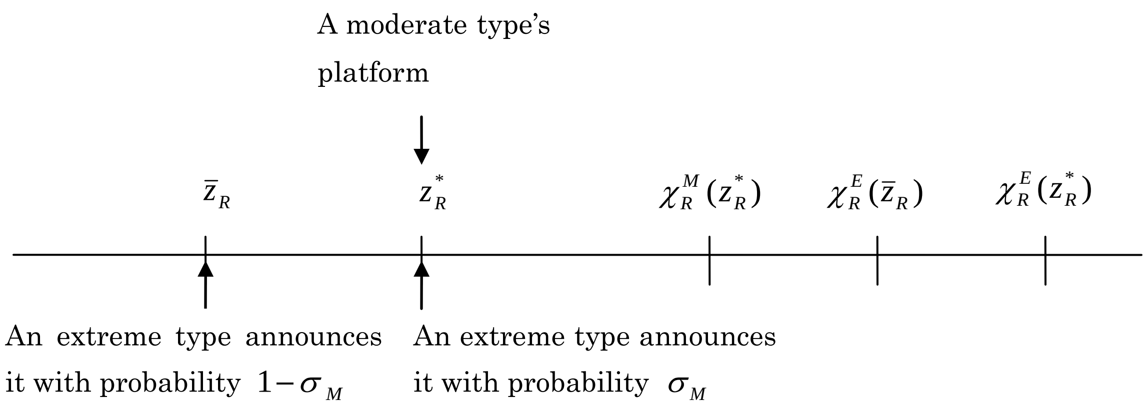
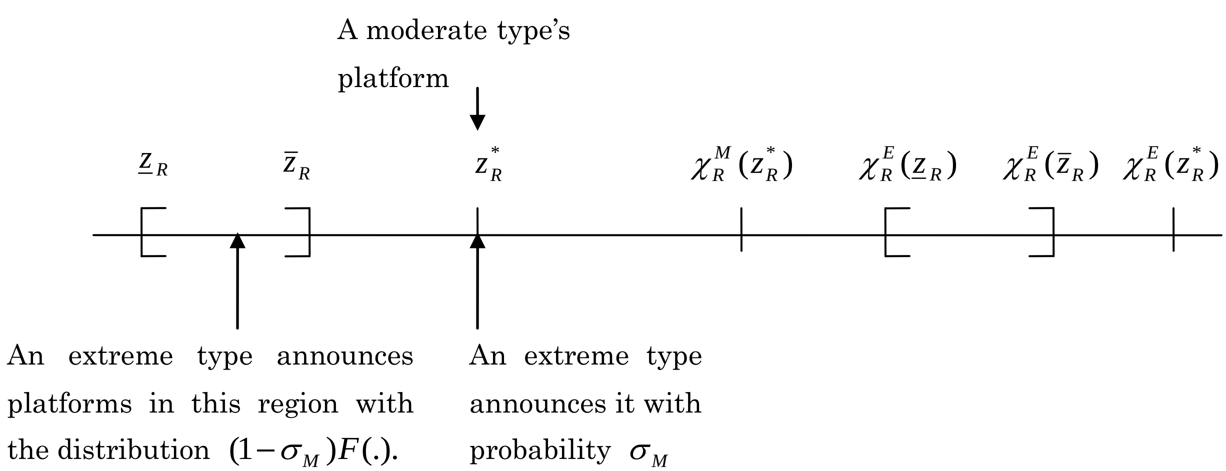


Figure 4: Separating Equilibrium

An extreme type has an incentive to pretend to be moderate by choosing the moderate type's platform $\hat{z}_R^M$ because the probability of winning increases, and the implemented policy approaches the ideal policy. (The implemented policy is $\chi_R^E(\hat{z}_R^M)$ when an extreme type announces $\hat{z}_R^M$.)



(a) A two-policy semiseparating equilibrium



(b) A continuous semiseparating equilibrium

Figure 5: Semiseparating Equilibrium