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Partially Binding Platforms: Political Promises as a Partial Commitment Device

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Abstract

This paper examines the effects of campaign platforms in political competition when campaign platforms are partially binding: a candidate who implements a policy different from his/her platform must pay a cost of betrayal that increases with the size of the discrepancy. With partially binding platforms, the median-voter theorem does not hold, and candidates always implement different policies in equilibrium. If and only if the cost of betrayal goes to infinity for any degree of betrayal, the median-voter theorem holds. Partially binding platforms also can predict who wins. A candidate who is more moderate, less policy-motivated and whose cost of betrayal is higher than the opposition with the same degree of betrayal wins. The degree of honesty can be derived endogenously, and candidates who have the above characteristics are more honest.

Keywords: Electoral Competition; Median-voter Theorem; Valence; Campaign Platforms

JEL classification: C72, D72

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1 Introduction

There are two important questions for political competition: "what policies do candidates adopt?" and "which candidate wins?" To my knowledge, this paper is the first to show that campaign platforms are an important factor in answering these questions.[1] Most past studies introduce two polar assumptions about platforms. First, electoral-competition models in the Downsian tradition suppose that a politician cannot implement any policy other than the platform, and I call such models *completely binding platforms*.[2] Such models show quite unrealistic outcomes of elections, that is, the median-voter theorem. In equilibrium, both candidates will implement the median policy, and the outcome of elections is always a tie.[3] There is another assumption regarding campaign platforms. Models with *nonbinding platforms* assume that a politician can implement any policy freely with no cost.[4] Such models can show the divergence of policies and predict which candidate wins, but candidates' implemented policies are given exogenously as their ideal policies, and obviously a candidate whose ideal policy is closer to the median policy wins. On the other hand, this paper examines the effects of campaign platforms in political competition when campaign platforms are partially binding: a candidate who implements a policy different from his/her platform must pay a "cost of betrayal."

Politicians may betray their platform severely, a little or not at all depending on elections in the real world, and if the winner betrays his platform, such betrayal should be costly. When politicians implement a different policy to their platforms, the people and the media criticize the politicians[5], and their approval rating may fall. As a result, it becomes difficult to manage the government. In order to betray the platform, a politician needs to negotiate with

[1] I also study partially binding platforms as in Asako (2009).

[2] Models based on Downs (1957) and Wittman (1973). See Roemer (2001).

[3] When policy-motivated candidates have uncertainty about voters' preferences, a divergence of policies appear (Wittman (1983) and Calvert (1985)), and one candidate may have a higher probability of winning than the opposition if candidate's policies are not equidistance from the median policy. In a citizen candidate model, one candidate also may have a higher probability of winning than the others when there are three or more candidates. On the other hand, my paper considers a politican competition with two candidates and without any uncertainty, but shows such results.

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

[5] Some papers show the relationship between the media and the credible commitment of politicians. Reinikka and Svensson (2005) study newspaper campaigns in Uganda, and show that such campaigns reduces corruption. Djankov et al. (2003) show empirically that policy making is distorted if the media is owned by the government.

the Congress, and if there are many legislators of the opposition party in the Congress, the negotiation cost should be quite high. The party should also be able to discipline politicians in order to keep their platform.[6] Moreover, the possibility of losing the next election may increase. Therefore, there should exist a cost of betrayal. For example, in his campaign, Bill Clinton promised to "end welfare as we know it," i.e., he promised welfare reform, and became president in 1992. In the 1994 midterm election, the Republican Party won; it made it more difficult to negotiate with the Congress, and the Congress pressured Clinton to keep his promise, and he signed the welfare reform bill in 1996 (Weaver (2000) Ch. 5). On the other hand, in 1988, George H. W. Bush promised "read my lips, no new taxes," but he increased taxes after he became president. The media and voters visibly noted this betrayal, and he lost in the 1992 presidential election (Campbell (2008) p. 104). Politicians decide policy based on their platforms and the cost of betrayal, so actual campaign platforms should be a *partial* commitment device, and not full commitment devices in models of completely binding platforms or no commitment in models of nonbinding platforms.[7]

I build a model with *partially binding platforms* that supposes that a candidate can choose any policy, but bears costs depending on the degree of betrayal. My model is based on the Downs–Wittman tradition with fully policy-motivated candidates. Two candidates compete in unidimensional policy space. One candidate prefers to implement a policy to the left of the median policy, and the other candidate prefers to implement a policy to the right. Before an election, candidates announce their platforms. Based on the cost of betrayal and the platform, the winner decides the implemented policy after the election. Thus, the implemented policy will be between the platform and the ideal policy because of the cost of betrayal as Figure 1 shows. This paper provides three new contributions from the introduction of partially binding platforms.

The first contribution is that the median-voter theorem does not hold with partially binding platforms. The median-voter theorem means that two candidates will implement the same policy, so that voters and candidates do not care who wins because they are indifferent between candidates' policies. However, if platforms are partially binding, candidates also

[6] Cox and McCubbins (1994) and Aldrich (1997) show this point from the historical aspects of the US parties. Snyder and Groseclose (2000) and McCarty et al. (2001) show empirically that there are various party disciplines in the US Congress. McGillivray (1997) compares high and low disciplines in trade policies. Grossman and Helpman (2005, 2008) suppose that there is a punishment from the party if the legislator betrays the party's platform.

[7] Persson and Tabellini (2000) also 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)."

care about the cost of betrayal, so they have an incentive to lose when the divergence of policies is very small. If the cost of betrayal approaches infinity for any degree of betrayal, the degree of betrayal of the winner goes to zero, so the median-voter theorem holds, i.e., the outcome becomes the same as models with completely binding platforms. If the cost of betrayal is reduced to zero for any degree of betrayal, the implemented policy converges to the ideal policy such as in models with nonbinding platforms. Therefore, complete binding and nonbinding platforms are extreme cases of partially binding platforms.

The second contribution is that the model of partially binding platforms can predict which candidate wins when candidates are asymmetric, that is, have different characteristics. In real elections, candidates are usually asymmetric. For example, their ideal policies are not equidistant from the median policy. One candidate cares about policy more than the opposition, that is, more policy motivated. The cost of betrayal may also be different among candidates. More senior politicians may not care about future elections or a party's discipline compared with young politicians, or if the media supports one candidate, this candidate's betrayal may not be announced to the public, in which case the cost of betrayal should be low for such candidates. In models of completely binding platforms, both candidates commit to the median policy even though candidates are asymmetric when there is not any uncertainty about voters' preference. On the other hand, in the model of partially binding platforms, because of the cost of betrayal, candidates may not have large incentives to win. If candidates' characteristics differ, one candidate may always have a higher incentive to win and a higher probability of winning.

This paper analyzes three cases in which the probability of winning is asymmetric. First, the moderate candidate whose ideal policy is closer to the median policy wins against a more extreme candidate. A more moderate candidate always has a higher incentive to win than an extreme candidate because it is easy to commit to a more moderate policy with the lower cost of betrayal. In models of nonbinding platforms, a more moderate candidate wins too, but candidates cannot commit to any policy so the winner is decided exogenously. On the other hand, in my model, an extreme candidate *can* win against a moderate one, but an extreme candidate chooses to lose in equilibrium. Second, one candidate's cost of betrayal may be higher than the opposition when the degree of betrayal is the same for both candidates. Higher costs of betrayal with *the same degree of betrayal* do not mean higher costs of betrayal *in equilibrium*. If the cost is higher with the same degree of betrayal, a candidate will not betray his/her platform so severely, so the *realized* cost of betrayal becomes lower, and such a candidate can commit a more moderate policy with a lower cost. As a result, if a candidate's cost of betrayal is higher than the opposition when the degree of betrayal is the same for both candidates, this candidate wins. Third, a less policy-motivated candidate wins against a more policy-motivated one. If a candidate is more policy motivated, he/she will betray the platform more severely, so the cost of betrayal is also higher.

The final contribution is that the model of partially binding platforms can derive "valence," in particular the degree of honesty endogenously. Several past studies consider the effects of a candidate's character or personality as indicated by Stokes (1963) as valence including the degree of honesty, and they also show an asymmetric probability of winning in a political competition. These past studies assume that the valence of a candidate is decided exogenously, and voters care not only about the policy but also valence[8], therefore such an advantaged candidate with valence has a higher probability of winning in an election.[9] On the other hand, my paper derives a candidate's degree of honesty (and the winner) endogenously. I define that candidates are more honest when candidates' platforms are closer to their ideal policies, they do not betray the platform so severely, and the winner's implemented policy is more moderate. Three cases are also shown. First, more moderate candidates are more honest, and more extreme candidates are more disingenuous. More extreme candidates will implement more extreme policy because they will have a higher cost of betrayal and a disutility from policy following a win. However, they also know that they will betray very severely, therefore they need to announce platforms that are very far from the candidate's ideal policy. Second, if the candidates' costs of betrayal are higher for any degree of betrayal, these candidates are also more honest. Third, less policy-motivated candidates are more honest. The situation is similar to the second contribution, therefore it can be concluded that the more honest candidate wins in a political election.

While some papers mainly analyze the signaling aspect of campaign platforms[10], few

[8] For example, in Ansolabehere and Snyder (2000), Aragones and Palfrey (2002), Groseclose (2001), Kartik and McAfee (2007) and Callander (2007), there are advantaged and disadvantaged candidates. An advantage is given exogenously as a valence, and a voter's utility is affected by not only a policy but also by such a valence.

[9] In Kartik and McAfee (2006), the situation is possibly the reverse. However, they assume that the candidate with valence does not behave strategically.

[10] For example, Harrington (1992), Banks (1990) and Callander and Wilkie (2007) assume that the platform is a signal about the implemented policy. Some other papers assume a completely binding platform to be a signal about something other than implemented policies, such as the functioning of the economy (Schulz, 1996), the candidate's political motivation (Callander, 2007) or the candidate's degree of honesty (Kartik and McAfee, 2007). This paper considers only the complete-information case, and an incomplete-information case is analyzed in Asako (2009). Additionally, Harrington (1992) and Aragones et al. (2002) show that, in a repeated game, nonbinding platforms can be completely binding in equilibrium.

papers consider platforms as a partial commitment device. Austen-Smith and Banks (1989) consider a two-period game based on a retrospective voting model in which if office-motivated candidates betray the platform, 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. On the other hand, my model is based on the prospective and two-candidate competition model, and assumes that candidates who are policy-motivated decide on both a platform and a policy. Additionally, Austen-Smith and Banks (1989) consider only a decrease in the probability of winning as a cost of betrayal, and Grossman and Helpman (2005, 2008) consider only a party's discipline as a cost of betrayal. However, as I indicated, the cost of betrayal also includes many types of costs such as a decrease of approval ratings or the negotiation cost with the Congress, therefore I include them in the current term as the cost of betrayal. Banks (1990) and Callander and Wilkie (2007) consider a similar idea as the cost of betrayal. They consider nonbinding platforms, and, because there is a "cost to lie," which is born after an election, a candidate does not want to announce a platform that is far from his/her ideal policy. In their papers, candidates implement their own ideal policies automatically, but if there is such a cost, a rational candidate should want to adjust the implemented policy rather than automatically implementing the ideal policy to reduce the cost. A politician's decision after the election should also be rational, so I examine rational choices on both platforms and policy.

Section 2 presents the model, and Section 3 shows a political equilibrium with symmetric candidates and the endogenous degree of honesty. Section 4 examines who wins among asymmetric candidates and discusses the political motivations of candidates. Section 5 concludes.

2 Setting

The policy space is $\Re$. There is a continuum of voters with ideal policies in $\Re$. Their ideal policies are distributed on some interval of $\Re$, and the distribution function is continuous and strictly increasing, therefore there is a unique median voter's ideal policy, x_m. There are two candidates, L and R. Denote x_i as the ideal policy where $i = L, R$, and $x_L < x_m < x_R$.

At the first period, each candidate announces a platform, denoted by $z_i \in \Re$ where $i = L$ or R. Based on their platforms, voters decide on a winner according to a majority voting rule. In the last period, the winning candidate decides the implemented policy, denoted by χ_i where $i = L$ or R.

If the implemented policy is different from the candidate's ideal policy, the candidate experiences a disutility. This disutility is represented by $-v(|\chi - x_i|)$ where $i = L$ or R, and χ is the policy implemented by the winner. Assume that $v(.)$ satisfies $v(0) = 0$, $v'(0) = 0$, $v'(d) > 0$ and $v''(d) \geq 0$ when $d > 0$. If the implemented policy is not the same as the platform, the winning candidate needs to pay some costs. The function describing the cost of betrayal is $\lambda c(|z_i - \chi_i|)$. Assume that $c(.)$ satisfies $c(0) = 0$, $c'(0) = 0$, $c'(d) > 0$ and $c''(d) > 0$ when $d > 0$. The parameter, $\lambda > 0$, represents the relative importance of betrayal. In the last period, the winning candidate chooses a policy that maximizes $-v(|\chi - x_i|) - \lambda c(|z_i - \chi|)$. Denote $\chi_i(z_i) = argmax_\chi \; -v(|\chi - x_i|) - \lambda c(|z_i - \chi|)$.

Upon observing z_i, the utility of voter n when candidate i wins is $-u(|\chi_i(z_i) - x_n|)$. Assume that $u(.)$ satisfies $u'(|\chi_i(z_i) - x_n|) > 0$ when $|\chi_i(z_i) - x_n| > 0$.

Let $F_i(z_i)$ denote the distribution function of the mixed strategy chosen by i. Denote $\pi_i(z_i, z_j)$ as the probability of winning of candidate i given z_i and z_j. The expected utility of the candidate i who promises z_i in the first period is:

$$V_i(z_i, F_j(z_j)) = \int_{z_j} \pi_i(z_i, z_j) dF_j(z_j) \Big[-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) \Big]$$
$$- \int_{z_j} (1 - \pi_i(z_i, z_j)) v(|\chi_j(z_j) - x_i|) dF_j(z_j), \tag{1}$$

where $i, j = L, R$. In summary, the timing of events and a political equilibrium are as follows. I show the definition including a mixed strategy, but I will show that there is no equilibrium with a mixed strategy.

1. The candidates announce their platforms.

2. Voters vote.

3. The winning candidate chooses which policy to implement.

Definition 1 *A political equilibrium is a sub-game perfect Nash equilibrium in the game played by two candidates. A political equilibrium has a distribution function $F_i(.)$ and the implemented policy $\chi_i(z_i)$ for $i = L, R$ such that:*

- *For all z_i in the support of $F_i(z_i)$, $V_i(z_i, F_j(z_j)) \geq V_i(z'_i, F_j(z_j))$ $\forall z'_i \in \Re$.*

- *$\chi_i(z_i) = argmax_\chi \; -v(|\chi - x_i|) - \lambda c(|z_i - \chi|)$.*

3 Symmetric Candidates

First, symmetric candidates are analyzed. Symmetric candidates mean that the forms of cost and disutility functions are the same for both candidates, and their ideal policies are equidistant from the median policy.

3.1 An Implemented Policy

In the last period, the winning candidate implements the policy that maximizes the utility after a win, $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)$ given z_i.

Lemma 1 *Consider that $v''(d) > 0$ for any $d > 0$. In a political equilibrium, $\chi_i(z_i)$ satisfies:*

$$\lambda = \frac{v'(|\chi_i(z_i) - x_i|)}{c'(|z_i - \chi_i(z_i)|)}. \tag{2}$$

If λ goes to infinity, $\chi_i(z_i)$ converges to z_i. If λ goes to zero, $\chi_i(z_i)$ converges to x_i.

It is straightforward from the first-order condition, and the implemented policy will be between the platform and the ideal policy as Figure 1 shows using R as an example. When λ increases, the winning candidate's implemented policy approaches the platform. When λ decreases, the winning candidate's implemented policy approaches the ideal policy. When $v''(d) = 0$ for all $d \geq 0$, the above proposition becomes the following corollary.

Corollary 1 *When $v''(d) = 0$ for all $d \geq 0$, $\chi_i(z_i)$ satisfies $\lambda \leq \frac{v'(|\chi_i(z_i)-x_i|)}{c'(|z_i-\chi_i(z_i)|)}$. If λ is sufficiently low, $\chi_i(z_i) = x_i = z_i$, and $\lambda < \frac{v'(|\chi_i(z_i)-x_i|)}{c'(|z_i-\chi_i(z_i)|)}$.*

When $v''(d) = 0$ for all $d \geq 0$, $v'(|\chi_i(z_i) - x_i|)$ is a constant value, therefore $\chi_i(z_i)$ depends not only on the platform, but also the ideal policy. When λ is low, $\chi_i(z_i)$, which satisfies (2), may be more extreme than the ideal policy because $|z_i - \chi_i(z_i)|$ goes to infinity when λ goes to zero. In this case, the winner prefers to implement x_i instead of $\chi_i(z_i)$, which satisfies (2), therefore $\chi_i(z_i) = x_i = z_i$.

3.2 Platforms

The Condorcet winner is the median policy, therefore if the candidate's implemented policy approaches the median policy more than the opposition's does, this candidate is certain to win. The next lemma shows that the implemented policy does not take any value that is more extreme than the ideal policy, and it is not further from the candidate's ideal policy than the median policy.

Lemma 2 *In a political equilibrium, the pair of platforms,* $\{z_R, z_L\}$*, satisfies* $x_L \leq \chi_L(z_L) \leq x_m \leq \chi_R(z_R) \leq x_R$*.*

Proof See Appendix A.1.

When the candidate i wins, the utility of i is $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)$. When the opposition j wins, the utility of i is $-v(|\chi_j(z_j) - x_i|)$. In equilibrium, these two utilities must be same.

Proposition 1 *Suppose* $v''(d) > 0$ *for any* $d > 0$*. The pair of platforms,* $\{z_L,\ z_R\}$*, is a political equilibrium if and only if:*

$$-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) = -v(|\chi_j(z_j) - x_i|), \tag{3}$$

for $i, j = L, R$ *and* $i \neq j$*. A political equilibrium exists, and it is symmetric and unique.*

Proof See Appendix A.2.

The main idea of the proof is as follows. When two candidates tie, if $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) > -v(|\chi_j(z_j) - x_i|)$, the candidate prefers to be certain to win because the utility when the candidate wins is higher than the utility when the opposition wins. If the candidate approaches x_m, this candidate is certain to win, therefore the candidate deviates in this way. If $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) < -v(|\chi_j(z_j) - x_i|)$, the candidate does not want to win because he/she prefers that the opposition wins. The candidate deviates to move away from x_m and is certain to lose. Note that if a candidate's implemented policy approaches the median policy, the cost of betrayal and the disutility after a win increases when $v''(d) > 0$ for any $d > 0$. A political equilibrium is unique, therefore there does not exist any mixed-strategy equilibrium.

Models of completely binding platforms have the restriction that the platform and implemented policy must be same, $z_i = \chi_i(z_i)$. There is not any cost of betrayal, so a political equilibrium should satisfy $-v(|\chi_i(z_i)-x_i|) = -v(|\chi_j(z_j)-x_i|)$, and, if and only if $\chi_i(z_i) = x_m$, is it satisfied. On the other hand, with partially binding platforms, $z_i \neq \chi_i(z_i)$, if there exists a term for the cost of betrayal, $\lambda c(|z_i - \chi_i(z_i)|)$, therefore $\chi_i(z_i)$ and $\chi_j(z_j)$ should diverge to satisfy (3). Models of nonbinding platforms have the restriction that the implemented policy and ideal policy must be same, therefore candidates cannot commit to any policy to be implemented other than ideal policies.

If the disutility function, $v(.)$, is linear, the situation may change. As Corollary 1 indicated, an implemented policy will depend on only the platform. When $x_R - x_L$ is quite small, a candidate does not mind if the opposition wins because the opposition's ideal policy is similar to its own ideal policy, and the cost of betrayal is high if it commits any policy other than his/her ideal policy. Therefore, the candidates may prefer to stay with their ideal policies. Denote $z_i(x_i) = \chi_i^{-1}(x_i)$ as a platform that commits the candidate to implement x_i, and this platform differs from x_i.

Corollary 2 *Suppose $v''(d) = 0$ for all $d > 0$. If $\frac{1}{2}v(x_R - x_L) < \lambda c(|x_i - z_i(x_i)|)$, the candidates choose the ideal policy as their platform and the implemented policy, that is, $z_i = x_i = \chi(z_i)$. If not, Proposition 1 holds.*

The condition, $\frac{1}{2}v(x_R - x_L) < \lambda c(|x_i - z_i(x_i)|)$, means that the candidate has no incentive to deviate to be certain to win when the candidate chooses $z_i = x_i = \chi_i(x_i)$. When a candidate chooses $z_i = x_i$, the expected utility is $-\frac{1}{2}v(x_R - x_L)$ because $v(x_i - x_i) = 0$ and $v(.)$ is linear. When the candidate commits a policy that is slightly lower than his/her ideal policy and wins, the expected utility is slightly lower than $-\lambda c(|x_i - z_i(x_i)|)$. As a result, when $-\frac{1}{2}v(x_R - x_L) > -\lambda c(|x_i - z_i(x_i)|)$, candidates do not want to deviate from $z_i = x_i$.

3.3 Comparative Statics and the Endogenous Degree of Honesty

The next assumptions are used in the following sections:

Assumption 1 $\dfrac{c'(d)}{c(d)}$ *strictly increases as d decreases, and it goes to infinity as d goes to zero.*

Assumption 2 $\dfrac{v'(d)}{v(d)}$ *does not decrease as d decreases.*

These assumptions mean that the relative marginal cost and disutility decrease as $|z_i - \chi_i|$ ($|x_i - \chi_i|$) increases. For example, if the function is monomial such as quadratic, these assumptions hold, and many polynomial functions satisfy them. Therefore, these assumptions are quite weak ones.

3.3.1 Cost of Betrayal

This subsection shows the comparative statics of the relative importance of betrayal, λ. In order to commit the same implemented policy, a candidate needs to pay a larger cost of betrayal when λ decreases.

Proposition 2 *Consider Assumption 1. The cost of betrayal ($\lambda c(|z_i - \chi_i(z_i)|)$) decreases as λ increases given the implemented policy. The cost of betrayal goes to zero as λ goes to infinity, and the candidates' implemented policies and platforms converge to x_m.*

Proof See Appendix A.3.

When λ increases, a candidate does not want to betray the platform, therefore $|z_i - \chi_i(z_i)|$ and $c(|z_i - \chi_i(z_i)|)$ decrease, and the decrease in $c(|z_i - \chi_i(z_i)|)$ is faster than the increase in λ. As a result, $\lambda c(|z_i - \chi_i(z_i)|)$ decreases as λ increases. When $\lambda c(|z_i - \chi_i(z_i)|)$ goes to zero, condition (3) becomes $-v(|\chi_i(z_i) - x_i|) = -v(|\chi_j(z_j) - x_i|)$, and it holds if and only if $\chi_i(z_i) = \chi_j(z_j) = x_m$ in equilibrium. Therefore, if λ reaches infinity, the median-voter theorem holds as in completely binding platforms. When $\lambda < \infty$, they prefer to diverge. When λ goes to zero, the implemented policy converges to the ideal policy.[11] Therefore, completely binding and nonbinding platforms are extreme cases of partially binding platforms.

The value of λ is decided by many factors. For example, when the freedom of the press is not sufficient, λ is low because the media will not report politicians' betrayals. When a large special interest group supports politicians, politicians are assured a large number of votes in an election and the probability of losing in the next election is quite low, therefore the candidate does not care about the cost of betrayal. If the power of a party or Congress is not very strong, λ is low because the discipline from them is not very strong.

In other words, λ measures the level of a democracy's maturity. Some political scientists and economists indicate that politicians in mature democracies have a greater ability to make binding platforms. For example, in immature democracies, politicians have strong relationships with specific groups of voters.[12] If the democracy is mature, it has freedom of the press and government transparency, and strong parties monitor the politicians, who therefore do not betray their platforms as often.[13] Thus, the value of λ is higher in mature democracies and lower in immature democracies. Indeed, using cross-country data, Keefer (2007) shows the differences between younger and older democracies, and that these differences arise from the inability to make credible platforms to voters in younger democracies. According to my model, when the maturity of a democracy increases, the implemented poli-

[11] If $v(.)$ is linear, and λ is sufficiently low, then a candidate promises the ideal policy as a platform from Corollary 2.

[12] Robinson and Verdier (2002) and Keefer and Vlaicu (2008) study a clientelism. Gehlbach et al. (2010) analyze transition economies, especially Russia, in which platforms are nonbinding while platforms are completely binding in mature democracies.

[13] Reinikka and Svensson (2005), Djankov et al. (2003), Cox and McCubbins (1994) and Aldrich (1997) indicate these points.

cies converge to x_m, and the politicians do not renege on their platforms so often. In an immature democracy, the divergence of an implemented policy is large, and the politicians betray the platform severely.

3.3.2 Endogenous Degree of Honesty

This subsection shows that a candidate's degree of honesty is decided endogenously. First, I show comparative statics of the distance between two candidates' ideal policies.

Proposition 3 *Consider Assumption 1 and 2, and $v''(d) > 0$ for any $d > 0$. When $x_R - x_L$ (the distance between the ideal policies) increases, $\chi_R(z_R) - \chi_L(z_L)$ (the distance between the implemented policies) increases, and $z_R - z_L$ (the distance between the platforms) decreases in a political equilibrium. If $v''(d) = 0$ for any $d > 0$, even though $x_R - x_L$ changes, $\chi_R(z_R) - \chi_L(z_L)$ and $z_R - z_L$ do not change.*

Proof See Appendix A.4.

Assume that $v''(d) > 0$ for any $d > 0$. As Figure 2 shows, when the candidates' ideal policies have more divergence (higher $x_R - x_L$), they prefer to implement more extreme policies (higher $\chi_R(z_R) - \chi_L(z_L)$). However, their platforms are further from their ideal policies (lower $z_R - z_L$). On the other hand, moderate candidates whose ideal policies are closer to the median policy announce more honest platforms that are closer to their ideal policies, do not betray them as severely, and implement more moderate policies. Thus, it can be concluded that more moderate candidates are more honest. The intuition is from the next corollary. Denote $\Psi_i(z_i, z_j) = -v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) + v(|\chi_j(z_j) - x_i|)$. If $\Psi_i(z_i, z_j)$ is higher, it means that the utility that the candidate wins becomes higher compared with the utility when the opposition wins. The candidate wants to win if $\Psi_i(z_i, z_j) > 0$ while the candidate wants to lose if $\Psi_i(z_i, z_j) < 0$, and the candidate with higher positive $\Psi_i(z_i, z_j)$ has a higher incentive to win, therefore $\Psi_i(z_i, z_j)$ is the degree of incentive to win.

Corollary 3 *Consider Assumptions 1 and 2 and $v''(d) > 0$ for any $d > 0$. When candidates prefer more extreme policies (higher $x_R - x_L$), $\Psi_i(z_i, z_j)$ is lower 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.*

Proof See Appendix A.5.

First, in order to implement the same policy (that is, the implemented policies are fixed), more extreme candidates will betray the platform more severely, therefore they need to promise platforms that are much further away from their ideal policies. Thus, they will pay a higher cost of betrayal, therefore the degree of the incentive to win becomes lower to avoid paying such a high cost of betrayal. This is the reason why more extreme candidates will implement more extreme policies. On the other hand, before an election, if candidates prefer more extreme policies, they find it more costly for the opposition to win. Their ideal policies are then further from the median policy, which means that their ideal policies are also further from the opposition's implemented policy. Thus, when platforms are fixed, more extreme candidates have more incentive to avoid the opposition winning, therefore the degree of the incentive to win becomes higher, and this is the reason of why the platforms of more extreme candidates are further from their ideal policies. If $v(.)$ is linear, an implemented policy will depend only on the platform. Thus, even though ideal policies change, it will not affect the positions of platforms and implemented policies.

From the same reasons as Proposition 3, the following result about the relative importance of betrayal λ can be derived.

Proposition 4 *Suppose Assumption 1 and the platform are not the same as the ideal policy, that is, $z_i \neq x_i$ in equilibrium. When λ (the relative importance of betrayal) increases for both candidates, $\chi_R(z_R) - \chi_L(z_L)$ (the distance between the implemented policies) decreases, and $z_R - z_L$ (the distance between the platform) increases in a political equilibrium.*

Proof See Appendix A.6.

When λ increases, they will implement more moderate policies, but their platforms become closer to their ideal policies. When λ is higher, the cost of betrayal is lower as Proposition 2 shows, therefore they can commit to a more moderate policy with a lower cost. Such a candidate does not betray the platform so severely, therefore their platforms do not need to be so far from their ideal policy. In other words, candidates with a higher λ announce a more honest platform that is closer to their ideal policy and do not betray it as severely, therefore they are rather honest. Therefore, this is another way to derive the candidate's degree of honesty endogenously. From Propositions 3 and 4, a candidate is rather honest when they are more moderate (lower $x_R - x_L$), and betrayal is important for them (higher λ).

3.4 Position of the Platforms and a Probabilistic Model

In my model, there is a possibility that platforms are further from the candidate's ideal policy than the median policy. In other words, platforms may enter the opposition side, i.e., $z_R < x_m < z_L$. This paper allows this situation and does not restrict candidates announcing their platforms, but only on their own halves of the policy space. This could happen when $v(|\chi_j(x_m) - x_i|) - v(|\chi_i(x_m) - x_i|) > \lambda c(|x_m - \chi_i(x_m)|)$. If this equation holds, the parties have an incentive to compromise more when their platforms are the same as x_m. Note that implemented policies do not enter the opposition side, i.e., $\chi_L(z_L) \leq x_m \leq \chi_R(z_R)$ in equilibrium from Lemma 2.

My model assumes that candidates know every decision-relevant fact about the median voter. If candidates are uncertain about voters' preferences—that is, a probabilistic model is considered—the above situation does not hold in many cases. That candidates have a greater divergence of policies in a probabilistic model is well known. The following part is based on Calvert (1985). In a probabilistic model, candidate i announces z_i which maximizes $\pi_i(z_i, z_j)(-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)) + (1 - \pi_i(z_i, z_j))(-v(|\chi_j(z_j) - x_i|))$. Denote again $\Psi_i(z_i, z_j) = -v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) + v(|\chi_j(z_j) - x_i|)$. Candidates actually maximizes;

$$\pi_i(z_i, z_j)\Psi_i(z_i, z_j).$$

I denote z_R^* and z_L^* as the platforms in equilibrium without any uncertainty, that is they satisfy (3). Assume that $z_i^* \neq x_i$. If $z_i^* = x_i$, it is the case of Corollary 2, and candidates announce their own ideal policy as a platform even though a probabilistic model is introduced. At z_R^* and z_L^*, $\pi_i(z_i^*, z_j^*)\Psi_i(z_i^*, z_j^*)$ is zero because $\pi_i(z_i^*, z_j^*) = \frac{1}{2}$ and $\Psi_i(z_i^*, z_j^*) = 0$. Suppose that both candidates announce z_i^* and z_j^*. If one candidate deviates from z_i^* and announces a platform that is closer to x_i than z_i^*, that is, he/she commits to a more extreme implemented policy than $\chi_i(z_i^*)$, then $\pi_i(z_i^*, z_j^*)$ decreases, but $\Psi_i(z_i^*, z_j^*)$ increases, therefore $\pi_i(z_i, z_j^*)\Psi_i(z_i, z_j^*)$ increases. As a result, candidates have an incentive to deviate and commit to a more extreme policy when they announce z_i^*, therefore z_R^* and z_L^* cannot be an equilibrium, and they prefer to have more divergence.[14]

Corollary 4 *Consider the probabilistic model of Calvert (1985). Then, the pair of platforms that are a political equilibrium in a deterministic model, z_i^* and z_j^*, is not a political equilibrium. In particular, either candidate will prefer to move a short distance toward their ideal policies.*

However, does the platform never enter the opposition side in the real election? The answer should not be yes. Sometimes, the platforms enter the opposition side. In Japan,

[14] This corollary shows that z_i^* and z_j^* are not equilibria using the same proof as Calvert (1985). The existence of equilibrium can be shown in the same way as Theorem 3.3 of Roemer (2001) because my model satisfies all the assumptions of this theorem. The only difference is that when $v''(d) = 0$ for all $d > 0$, $x_i = z_i = \chi_i(z_i)$ can be an equilibrium.

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 in government debt. In 2001, the prime minister, Junichirou Koizumi, a member of the LDP, promised to implement radical economic reforms that were also suggested by the DPJ, including a reduction of government works and debt. Thus, Koizumi and the LDP promised the DPJ's policies (Mulgan (2002) pp. 56–57).[15] Moreover, in the 2007 Upper House election, the LDP and Prime Minister Shinzou Abe promised to continue to implement Koizumi's economic reforms while the DPJ promised some policies to recover and support rural areas.[16] This was a complete reversal of the original stances of the parties. My model can explain both cases in which the platforms enter or do not enter the opposition side.

4 Asymmetric Candidates

In real elections, the probability of winning may differ from 1/2 when candidates are not symmetric. The purpose of this section is to predict who will win when candidates are asymmetric.

However, a political equilibrium may not exist in a deterministic model with a continuous policy space. Suppose that L wins with certainty, that is, L commits a more moderate policy than R, $|\chi_L(z_L) - x_m| < |\chi_R(z_R) - x_m|$. In this case, at least, L prefers to commit a more extreme policy such that L still wins against R, and there exists such a policy because the policy space is continuous.[17] On the other hand, if a discrete policy space is introduced, in the above case, L may not be able to find such a more extreme policy with the same probability of winning. Thus, this section supposes that a policy space is discrete.

Suppose a grid of policies, i.e., the policies are evenly spaced. The distance between sequential policies is $\epsilon > 0$. The other settings are the same as the previous model. Denote again $\Psi_i(z_i, z_j) = -v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) + v(|\chi_j(z_j) - x_i|)$. Assume that there exists $\chi_i(z_i)$ that satisfies (2). Denote $z_i(z_j)$ as the platform that commits a slightly more moderate

[15] Mulgan (2002) also indicates that most platforms are partially achieved, i.e., Koizumi's platforms were partially binding. For example, his platform about government debt, i.e., a 30 trillion yen ceiling on the annual issuance of government bonds, was achieved only in 2001 and 2006.

[16] "Abe Stumbles on Japan", *The Economist*, July 30, 2007.

[17] A mixed strategy cannot be a political equilibrium. First, symmetric mixed-strategies cannot be equilibria as I showed in the proof of Proposition 1. Second, asymmetric mixed strategies cannot be equilibria for the same reasons as the case of asymmetric pure strategies discussed above.

implemented policy than z_j, i.e., $z_L(z_R)$ satisfies $\chi_L(z_L(z_R)) = x_m - (\chi_R(z_R) - x_m) + \epsilon$, and $z_R(z_L)$ satisfies $\chi_R(z_R(z_L)) = x_m + (x_m - \chi_R(z_R)) - \epsilon$. If one candidate, say L, wins against the opposition R, and R announces z_R, then L should announce $z_L(z_R)$ in order to be equilibrium. If not, for the same reason as the continuous case, L has an incentive to deviate to a more extreme policy and still wins against R. Suppose that for any pair of *symmetric* implemented policies, that is, $|x_m - \chi_L(z_L)| = |x_m - \chi_R(z_R)|$, $\Psi_L(z_L, z_R)$ is always strictly higher than $\Psi_R(z_L, z_R)$. In words, given any symmetric implemented policies, L always has a higher degree of incentive to win than R.

The purpose of introducing a discrete policy space is to ensure the existence of equilibrium, not show new implications from a discrete case. Thus, assume that ϵ is a very small value in which the situation is almost the same as for a continuous policy space. The precise assumption is as follows.

Assumption 3 *The distance between the sequential policies, ϵ, is sufficiently small such that there exists z_R such that $\Psi_R(z_L(z_R), z_R) \leq 0$ and $\Psi_L(z_L(z_R), z_R) > 0$ when $\Psi_i(z_i, z_j)$ is always higher than $\Psi_j(z_i, z_j)$ for any pair of symmetric implemented policies.*

Then, R never wins against L with certainty. Suppose that L announces z_L. If R wins with certainty, it means $\Psi_R(z_L, z_R(z_L)) \geq 0$ because R has an incentive to lose with certainty if not. If Assumption 3 holds, when $\Psi_R(z_L, z_R(z_L)) \geq 0$, $\Psi_L(z_L + \epsilon, z_R(z_L)) > 0$. Thus, L has an incentive to approach the median policy, and at least tie with R. For almost the same reason, they never tie in equilibrium. If they tie in equilibrium, it also means $\Psi_R(z_L, z_R) \geq 0$ where $|x_m - z_L| = |x_m - z_R|$, but L has an incentive to win against R with certainty because $\Psi_L(z_L + \epsilon, z_R) > 0$ when $\Psi_R(z_L, z_R) \geq 0$ from Assumption 3.

On the other hand, suppose that L wins against R with certainty, and $\Psi_L(z_L(z_R), z_R) > 0$ and $\Psi_R(z_L(z_R), z_R) \leq 0$. Then, it is an equilibrium. Candidate R does not have any incentive to win with certainty or tie, and L does not need to approach the median policy any more, and if L commits a symmetric implemented policy with R or a more extreme policy, then the probability of winning decreases, and the expected utility decreases because $\Psi_L(z_L(z_R), z_R) > 0$. There exists such an equilibrium if Assumption 3 holds.

Lemma 3 *Suppose that for any pair of symmetric implemented policies, $\Psi_i(z_i, z_j)$ is always higher than $\Psi_j(z_i, z_j)$, and Assumption 3 holds. Then, i wins with certainty.*

Therefore, in order to check who has the advantage in political competition, it is sufficient to compare the values of $\Psi_i(z_i, z_j)$. In the following parts, I compare $\Psi_i(z_i, z_j)$ to derive the advantaged candidate in the three cases of asymmetric candidates.[18] In the following section, I assume Assumption 3 when $\Psi_i(z_i, z_j)$ is always higher than $\Psi_j(z_i, z_j)$ for any pair of symmetric implemented policies.

Even though there are some differences in the method of the proof, the situation is very similar to Section 3.3. In all cases, a more honest candidate wins against a less honest candidate. It can be concluded that when candidates are asymmetric, one candidate wins against the other because this candidate has a higher degree of honesty.

4.1 Asymmetric Ideal Policies

This section assumes that $x_R - x_m \neq x_m - x_L$, i.e., the position is asymmetric. The cost and disutility functions are the same for both candidates.

Proposition 5 *Consider Assumptions 1 and 2, and $v''(d) > 0$ for any $d > 0$. When candidate i is more moderate, i.e., $|x_i - x_m| < |x_j - x_m|$, but the candidates are symmetric in other respects, then Candidate i wins with certainty. Candidate i has a higher expected utility. When the candidates' utility function is linear, the result is a tie or candidate i wins with certainty.*

Proof See Appendix A.7.

A more moderate candidate will not betray his/her platform so severely after an election. It means that a more moderate candidate can commit to a more moderate policy with a lower cost of betrayal than an extreme candidate. As a result, a more moderate candidate wins. In addition, a moderate candidate who wins has a higher expected utility in equilibrium. When the candidates' utility functions are linear, they tie in most cases. When the candidate has a linear utility function, the implemented policy is not affected by the ideal policy, x_i, therefore the situation is the same for both candidates, and they have the same probability

[18] In my model, one candidate wins with certainty, but the winner may have a probability of winning that is higher than 1/2 but strictly lower than one in the real world. However, if a probabilistic model with uncertainty about the median policy is introduced, the probability of winning changes continuously when the positions of candidates change continuously. Thus, candidates may have a probability of winning that is not zero, one or 1/2, and an equilibrium can be defined with a continuous policy set. However, there are many types of probabilistic models, and each may have different results (see Roemer (2001)). The purpose of this paper is to examine some important effects of the cost of betrayal (partially binding platforms) on political elections, therefore this paper concentrates on only a deterministic model to exclude the effects of probabilistic settings.

of winning.[19] However, if candidates (or at least a moderate candidate) announce their ideal policy as a platform for the same reasons as Corollary 2, a more moderate candidate wins with certainty.

4.2 Asymmetric Costs of Betrayal

This section assumes that λ is not the same for both candidates. The ideal policies and disutility functions are symmetric for both candidates.

Proposition 6 *Consider Assumption 1. When candidate i has a higher relative importance of betrayal, i.e., $\lambda_i > \lambda_j$, but the candidates are symmetric in other respects, then Candidate i wins with certainty. Candidate i has a higher expected utility.*

Proof See Appendix A.8.

The intuition is straightforward. From Proposition 2, a higher λ_i means that the candidate does not betray severely, therefore the cost of betrayal is lower, and this candidate can compromise more with a lower cost. As a result, the candidate with the higher λ_i wins.

When do candidates have an asymmetric cost of betrayal? More senior politicians may have a lower value of λ. They do not care about the next election or a party's discipline because they may retire before the next election. Some candidates (or parties) are supported by a large special interest group or the media. If one candidate has more supporters than another candidate, the value of λ could be asymmetric. When a candidate is supported by a large group, this candidate does not care about the probability of winning in the next election because he/she will get a certain percentage of votes from members of the special interest group.[20] When the media supports a candidate, the media does not blame the candidate even though he/she betrays more severely. As a result, if the candidate is supported by a larger number of biased media or special interest groups than the opposition, the probability of wining and expected utility decreases.

The candidate may make decisions that affect the value of λ. For example, sometimes the candidate decides to intervene in the media. If the candidate intervenes in and controls the media, the cost of betrayal, λ, decreases, and the candidate can betray easily. It seems

[19] While the model with complete information shows that a moderate candidate wins, Asako (2009) shows that an extreme candidate may win in the presence of asymmetric information about the candidate's ideal policy.

[20] Figlio (1995) shows that the retirement decision induces political shirking, and Figlio (2000) shows that some senators in "safer" seats face a lower punishment using the data of US congressional elections. It can be concluded that candidates who has a safer seat or does not care about the next election has a lower λ.

good for the candidate, but candidates usually support freedom of the press even though the media criticize them. Why? There is another case. In Japan in 2003, the Democratic Party of Japan began to issue *manifestos*. In a manifesto, the party records its platform, allowing voters and the media to compare it with the implemented policy after the election. Before 2003, candidates and parties revealed their platforms in speeches, campaign posters and talks to the media, but there were no written documents outlining their platforms. Thus, after 2003, it became easier to check whether or not the governing party betrayed its platforms. For the parties, the publication of a manifesto increases the cost of betrayal, so it seems bad for the parties. However, other parties also started to issue their manifestos in 2003 (Kanai (2003)). Why?

One answer is shown in Proposition 6, namely, a higher λ results in a higher probability of winning and higher expected utility. Thus, if the candidate can change λ, he/she will choose a value of λ that is as high as possible in a political equilibrium. Sometimes, politicians prefer to use explicit and impressive words, promising, for example, to "end welfare as we know it." Such words are easy to remember, and so increase the value of λ.

After the election, do they prefer to have a higher λ? The answer is No.

Corollary 5 *After the election, the winning candidate prefers to set λ to the lowest possible value.*

Proof See Appendix A.9

Therefore, before the election, candidates may support the freedom of the press (higher λ), but they prefer to interfere with the media (lower λ) after the election.

4.3 Political Motivations

In previous sections, I assumed that only fully policy-motivated candidates exist. However, candidates may care about the benefits from holding office, and may not care much about policy. This section analyzes the case in which candidates are not fully policy motivated. Based on Calvert (1985), suppose that the utility following a win is:

$-\beta_i v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) + W,$

and the utility when the opposition wins is $-\beta_i v(|\chi_j(z_j) - x_i|)$. Thus, $\Psi_i(z_i, z_j) = -\beta_i v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) + W + \beta_i v(|\chi_j(z_j) - x_i|)$. The level of political motivation is $\beta_i > 0$, and a higher β_i means a candidate is more policy motivated, and a lower β_i means a candidate is the more office motivated. The candidate can obtain W as the benefit from holding office when he/she wins. First of all, the following simple corollary holds. Denote $z_i(x_m)$ as the promise to commit to implement x_m.

Corollary 6 *When W is sufficiently high, i.e., $W > \lambda c(|x_m - z_i(x_m)|)$ for both candidates, both candidates commit to x_m, and the voting result is a tie.*

When both candidates commit to the median policy, the disutility from an implemented policy is same regardless of the winning candidate, but if W is higher than the realized cost of betrayal for both candidates, they compromise until they reach the median policy. This corollary is true in both cases, symmetric and asymmetric candidates. As W increases, their implemented policies approach the median policy. The main proposition for asymmetric political motivations is as follows.

Proposition 7 *Assume Assumption 1. Suppose that candidate i is less policy motivated, i.e., $\beta_i < \beta_j$, but the candidates are symmetric in other respects, and $W < \lambda c(|x_m - z_j(x_m)|)$ for Candidate j, then candidate i wins with certainty. Candidate i has a higher expected utility.*

Proof See Appendix A.10.

A more policy-motivated candidate will betray the platform more severely, and it induces a higher cost of betrayal. On the other hand, a less policy-motivated candidate does not care about policy so much, so such a candidate does not betray the platform so severely, and can commit a more moderate policy with a lower cost of betrayal. As a result, a less policy-motivated candidate wins in an election. A more policy-motivated candidate has a higher incentive to implement a policy that is near to his/her ideal policy. Thus, such a candidate becomes disingenuous, and a less policy-motivated candidate is more honest. Consider symmetric candidates.

Proposition 8 *Consider Assumption 1 and the platform is not the same as the ideal policy, that is, $z_i \neq x_i$ in equilibrium. When β (the level of political motivation) increases for both candidates, $\chi_R(z_R) - \chi_L(z_L)$ (the distance between the implemented policies) increases, and $z_R - z_L$ (the distance between the platform) decreases in a political equilibrium.*

Proof See Appendix A.11.

4.4 Discussion

This paper only examines the effects of partially binding platforms (the cost of betrayal) on political competitions, and shows who wins among asymmetric candidates. However, other factors affect political competitions. For example, in the case of asymmetric costs of betrayal, I showed that less support from the media or special interest groups means a higher probability of winning. However, the support of these groups may increase the probability of winning because special interest groups may ensure a certain percentage of votes, and the media may control public opinion. The model including such a situation may have some implications for the media and special interest groups in the political-competition model. In the case of asymmetric political motivations, I showed that a more policy-motivated candidate has a lower probability of winning. On the other hand, Callander (2007) assumes that platforms are completely binding, and they can also be a signal of the future effort level of candidates. He shows that office-motivated candidates are favored in electoral competitions, but policy-motivated candidates win a significant fraction of elections because more policy-motivated candidates will make more effort. If platforms are interpreted as not only a *partial* commitment device but also a signal about something, the result may be different to my analyses. This paper concentrates on investigating the effects of partially binding platforms, therefore these points remain for future research.

5 Conclusion

This paper examined the effects of partially binding platforms in elections. Because of the cost of betrayal, the candidates always have a divergence between implemented policies in equilibrium. Models with completely binding platforms and nonbinding platforms are two extreme cases of the model with a partially binding platform. The degree of honesty is derived endogenously, and being more moderate or less policy motivated means being more honest. If the candidate's cost of betrayal is higher than the opposition when the degree of betrayal is the same for both candidates, this candidate is also more honest. Partially binding platforms also imply that, when candidates have different characteristics, one candidate wins with higher probability. A more moderate or less policy-motivated candidate wins. The candidate whose cost of betrayal is higher than the opposition when the degree of betrayal is the same for both candidates wins too. As a result, partially binding platforms can show more realistic candidates' positions and the winner in elections compared with the past models with completely binding or nonbinding platforms.

One possible area of future research is to endogenous the cost of betrayal. In this paper, the cost of betrayal just depends on the degree of betrayal, but it may be decided endogenously. For example, one kind of cost of betrayal is a decrease in the probability of winning in the next election. In order to analyze such reputational costs, a dynamic model with two or more periods should be analyzed. Second, depending on the economic situation, the cost of betrayal and/or the ideal policies of candidates or voters change before and after an election. For example, if an economic depression or a natural disaster occurs after an election, voters may allow politicians to betray their platforms such as changing taxes. This is another important topic to discuss when considering what happens after the election. Third, models of political competition are applied in many other topics that use models of completely binding or nonbinding platforms. As this paper shows, partially binding platforms induce many different predictions, therefore applying a model of partially binding platforms should also be the subject of interesting future research.

A Appendix

A.1 Lemma 2

Suppose $\chi_L(z_L) < x_L$.

1. When $\chi_R(z_R) < \chi_L(z_L) < x_L$, L wins with certainty. When $\chi_R(z_R) = \chi_L(z_L) < x_L$, they tie. When $\chi_L(z_L) < \chi_R(z_R) = x_R$, R wins with certainty. In all cases, L deviates to choose $z_L = x_L = \chi_L(z_L)$.

2. When $\chi_L(z_L) < \chi_R(z_R) < x_R$, or $\chi_L(z_L) < x_R < \chi_R(z_R) < x_m + (x_m - \chi_L(z_L))$, then R wins with certainty. Candidate R deviates to choose $z_R = x_R = \chi_R(z_R)$.

3. When $\chi_L(z_L) < x_m + (x_m - \chi_L(z_L)) \leq \chi_R(z_R)$, L wins with certainty or 1/2. Both candidates have an incentive to deviate to choose $z_i = x_i = \chi_i(z_i)$.

From the same reasons, if $x_R < \chi_R(z_R)$, it is not a political equilibrium. Next, suppose $x_m < \chi_L(z_L)$.

1. Suppose $\chi_R(z_R) < x_L$. Note that $x_R < x_m + (x_m - \chi_R(z_R))$.

    (a) When $\chi_L(z_L) < x_m + (x_m - \chi_R(z_R))$, L wins with certainty. Candidate L deviates to choose $z_L = x_L = \chi_L(z_L)$.

(b) When $\chi_L(z_L) = x_m + (x_m - \chi_R(z_R))$, they tie. Both candidates have an incentive to deviate from the ideal policy, $x_i = z_i = \chi_i$.

(c) When $x_m + (x_m - \chi_R(z_R)) < \chi_L(z_L)$, R wins with certainty. Candidate R deviates to choose $z_R = x_R = \chi_L(z_R)$.

2. Suppose $x_L < \chi_R(z_R) < x_m$.

   (a) When $\chi_R(z_R) < x_m - (\chi_L(z_L) - x_m)$, L wins with certainty. Candidate L deviates to choose any platform that is far away from x_m and loses because R's policy is better than his/her own policy.

   (b) When $\chi_R(z_R) = x_m - (\chi_L(z_L) - x_m)$, they tie. Both candidates have an incentive to deviate to choose any platform that is far away from x_m and loses because the opposition's policy is better than his/her own policy.

   (c) When $x_L < x_m - (\chi_L(z_L) - x_m) < \chi_R(z_R)$, R wins with certainty. Candidate R deviates to choose any platform that is far away from x_m and loses because L's policy is better than his/her own policy.

   (d) When $x_m - (\chi_L(z_L) - x_m) < x_L < \chi_R(z_R)$, R wins with certainty. Candidate R deviates to choose $z_R = x_R = \chi_R(z_R)$ because the ideal policy is implemented with certainty.

3. Suppose $x_m \leq \chi_R(z_R) < \chi_L(z_L)$, then R wins with certainty.

   (a) When $x_R \leq \chi_L(z_L)$, R deviates to choose $z_R = x_R = \chi_R(z_R)$.

   (b) When $\chi_L(z_L) < x_R$, R deviates to choose any platform that is far away from x_m and loses because L's policy is better than his/her own policy.

4. When $x_m < \chi_L(z_L) = \chi_R(z_R)$, they tie. When $x_m < \chi_L(z_L) < \chi_R(z_R)$, L wins with certainty.

   (a) When $x_m < \chi_L(z_L) = \chi_R(z_R)$ and $x_R < \chi_L(z_L) = \chi_R(z_R)$, R deviates to choose $z_R = x_R = \chi_R(z_R)$.

   (b) When $x_R = \chi_L(z_L) = \chi_R(z_R)$ and $x_m < \chi_L(z_L) = \chi_R(z_R)$, or $\chi_R(z_R) = x_R$ or $x_R < \chi_R(z_R)$ and $x_m < \chi_L(z_L) < \chi_R(z_R)$, L deviates to choose $z_L = x_L = \chi_L(z_L)$.

   (c) When $\chi_L(z_L) = \chi_R(z_R) < x_R$ and $x_m < \chi_L(z_L) = \chi_R(z_R)$, or $\chi_R(z_R) < x_R$ and $x_m < \chi_L(z_L) < \chi_R(z_R)$, L deviates to choose $x_m - (\chi_R(z_R) - x_m)$.

From the same reasons, if $\chi_R(z_R) < x_m$, it is not a political equilibrium. □

A.2 Proposition 1

The Sufficient Condition

If the pair of platforms satisfies (3), and it is symmetric, this pair is a political equilibrium. If no one deviates, the payoff for candidate i is $\frac{1}{2}[-v(|\chi_i(z_i)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|)-v(|\chi_j(z_j-x_i)|)]$.

If candidate i deviates to any policy that diverges from x_m, this candidate is certain to lose, and the payoff becomes $-v(|\chi_j(z_j-x_i)|)$. The change in payoff from this deviation is $\frac{1}{2}[-v(|\chi_i(z_i)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|)+v(|\chi_j(z_j)-x_i|)]$. From (3), it is zero, therefore there is no profitable deviation from x_m.

If the candidate deviates to a more moderate platform, say z_i', this candidate is certain to win, but the utility when the opposition wins becomes higher than the utility when the candidate wins. Suppose that the candidate deviates from z_i to z_i'. After this deviation, the payoff becomes $-v(|\chi_i(z_i')-x_i|)-\lambda c(|z_i'-\chi_i'|)$. The change in the payoff from this deviation is $-v(|\chi_i(z_i')-x_i|)-\lambda c(|z_i'-\chi_i'|)-\frac{1}{2}(-v(|\chi_i(z_i)-x_i|)-v(|\chi_j(z_j)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|))$. Since $-v(|\chi_i(z_i')-x_i|)<-v(|\chi_i(z_i)-x_i|)$, $-v(|\chi_i(z_i')-x_i|)-\frac{1}{2}(-v(|\chi_i(z_i)-x_i|)-v(|\chi_j(z_j)-x_i|))<v(|\chi_j(z_j)-x_i|)-v(|\chi_i(z_i)-x_i|)$. On the other hand, $\lambda c(|z_i'-\chi_i(z_i')|)>\lambda c(|z_i-\chi_i(z_i)|)$. Because $-v(|\chi_i(z_i)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|)=-v(|\chi_j(z_j)-x_i|)$, the change in the payoff from this deviation is negative. Therefore, there is no profitable deviation approaching x_m. As a result, if the pair of platforms satisfies (3) and is symmetric, it is a political equilibrium.

The Necessary Condition

To show the necessity, I use a contradiction, i.e., if this pair does not satisfy (3) or is not symmetric, it is not a political equilibrium.

First, if the pair of platforms is asymmetric, one candidate loses and the other candidate wins. The winning candidate prefers another platform that has a higher utility, i.e., approaches their own ideal point, x_i, and still wins. The policy space is continuous, therefore there is such a platform. Thus, the asymmetric position is not a political equilibrium. In the following parts, I assume that their positions of platforms (and implemented policies) are symmetric.

Second, if (3) is not satisfied, it is not a political equilibrium. If $-v(|\chi_i(z_i)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|)<-v(|\chi_j(z_j)-x_i|)$ and there is a tie, the candidate has an incentive to deviate to lose. The candidate can choose any platform that is worse for the median voter and lose. Before this deviation, the expected utility is $\frac{1}{2}[-v(|\chi_i(z_i)-x_i|)-\lambda c(|z_i-\chi_i(z_i)|)]+\frac{1}{2}[-v(|\chi_j(z_j)-x_i|)]$.

After the deviation, it is $-v(|\chi_j(z_j) - x_i|)$. Thus, this candidate can increase their utility by $\frac{1}{2}[\lambda c(|z_i - \chi_i(z_i)|) + v(|\chi_i(z_i) - x_i|) - v(|\chi_j(z_j) - x_i|)]$ from this deviation. Becuase $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) < -v(|\chi_j(z_j) - x_i|)$, any candidate will deviate.

If $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) > -v(|\chi_j(z_j) - x_i|)$ and there is a tie, then the candidate has an incentive to deviate to be certain to win. The candidate can move slightly to any platform that is better for the median voter and be certain to win. Assume that the deviation to approach x_m is minor. Before this deviation, the utility is $\frac{1}{2}[-v(|\chi_i(z_i) - x_i|) - v(|\chi_j(z_j) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)]$. After the deviation, it is slightly lower than $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)$. This candidate can increase their utility by slightly less than $\frac{1}{2}[v(|\chi_j(z_j) - x_i|) - v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|)]$ from this deviation. Because $-v(|\chi_i(z_i) - x_i|) - \lambda c(|z_i - \chi_i(z_i)|) > -v(|\chi_j(z_j) - x_i|)$ and the policy space is continuous, then there exists a platform that can increase the candidate's payoff, so any candidate has an incentive to deviate.

Finally, a candidate never chooses a mixed strategy in a political equilibrium. Suppose that a candidate chooses a mixed strategy. Denote $\hat{z}_i$ as the platform under which the utility when the candidate wins and the utility when the opposition wins are the same, that is, $-v(|\chi_i(\hat{z}_i) - x_i|) - \lambda c(|\hat{z}_i - \chi_i(\hat{z}_i)|) = -v(|\chi_j(\hat{z}_j) - x_i|)$. If this mixed strategy is discrete, a candidate whose mixed strategy includes a more extreme platform than $\hat{z}_i$ has an incentive to deviate to approach the median policy slightly because the probability of winning increases discretely but the cost of betrayal and the disutility increases slightly. If all strategies in a mixed strategy are more moderate than $\hat{z}_i$, a candidate deviates to lose. If a mixed strategy is distributed on a continuous policy space, the probability of winning is zero when a candidate announces the most extreme platform in his mixed strategy when two candidates' positions are symmetric. Then, a candidate never chooses such the platform. As a result, (3) is the necessary condition.

Existence and Uniqueness

From (3):

$$v(|\chi_j(z_j) - x_i|) - v(|\chi_i(z_i) - x_i|) = \lambda c(|z_i - \chi_i(z_i)|). \tag{4}$$

When $z_i = x_i$ for both candidates, $z_i = x_i = \chi_i$, therefore the left-hand side of (4) is $v(|x_R - x_L|)$. When $\chi_i = x_m$ for both candidates, the left-hand side is 0. The value of the left-hand side continuously and strictly decreases to zero as $\chi_i(z_i)$ and $\chi_j(z_j)$ approach x_m. When $z_i = \chi_i(z_i)(= x_i)$, the cost of betrayal is zero. It is positive, continuous and increases as $\chi_i(z_i)$ approaches x_m. There exists a point at which the value of the left-hand side is the same as the cost of betrayal. Because the left-hand side strictly decreases, and the cost of betrayal does not decrease as $\chi_i(z_i)$ approaches x_m, it is unique. □

A.3 Proposition 2

Fix $\chi_i(z_i)$, and denote it as $\bar{\chi}_i$. Denote $z_i(\bar{\chi}_i)$ as the platform that commits to $\bar{\chi}_i$, that is $\bar{\chi}_i = \chi_i(z_i(\bar{\chi}_i))$. Differentiate $\lambda c(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)$ by λ. Then:

$$c(|z_i(\bar{\chi}_i) - \bar{\chi}_i|) - \lambda c(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)\frac{\partial z_i(\bar{\chi}_i)}{\partial \lambda}. \tag{5}$$

Differentiate (2) by λ, then $1 = \dfrac{v'(|\bar{\chi}_i) - x_i|)c''(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)\frac{\partial z_i(\bar{\chi}_i)}{\partial \lambda}}{c'(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)^2}$.

Thus, $\dfrac{\partial z_i(\bar{\chi}_i)}{\partial \lambda} = \dfrac{c'(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)^2}{v'(|\bar{\chi}_i) - x_i|)c''(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)}$. Moreover, $\lambda = \dfrac{v'(|\bar{\chi}_i) - x_i|)}{c'(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)}$ in equilibrium from Lemma 1. Substitute them into (5). Then, (5) becomes:

$$c(|z_i(\bar{\chi}_i) - \bar{\chi}_i|) - \frac{c'(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)^2}{c''(|z_i(\bar{\chi}_i) - \bar{\chi}_i|)}, \tag{6}$$

and it is negative from Assumption 1.

From Lemma 1, if λ goes to infinity, $|\chi_i(z_i) - z_i|$ converges to 0. From (2), $\lambda c(|\chi_i(z_i) - z_i|) = \frac{c(|\chi_i(z_i) - z_i|)}{c'(|\chi_i(z_i) - z_i|)} v'(|\chi_i(z_i) - x_i|)$. From Assumption 1, $\frac{c(|\chi_i(z_i) - z_i|)}{c'(|\chi_i(z_i) - z_i|)}$ decreases to zero when $|z_i - \chi_i(z_i)|$ reaches zero. Because $|\chi_i(z_i) - z_i|$ goes to zero as λ approaches infinity, $|\chi_i(z_i) - x_i|$ also goes to $|z_i - x_i|$. From Lemma 2, $|\chi_i(z_i) - x_i|$ does not exceed $|x_m - x_i|$ in equilibrium, therefore $|z_i - x_i|$ goes to a certain positive value when λ goes to infinity. Therefore, $v'(|\chi_i(z_i) - x_i|)$ goes to a certain positive value when $v''(|\chi_i(z_i) - x_i|) > 0$, and it is a constant positive value when $v''(|\chi_i(z_i) - x_i|) = 0$. As a result, the cost of betrayal, $\lambda c(.)$, approaches zero, then the condition (3) becomes $-v(|\chi_i(z_i) - x_i|) = -v(|\chi_j(z_j) - x_i|)$, and it holds if and only if $\chi_i(z_i) = \chi_j(z_j) = x_m$ in equilibrium. □

A.4 Proposition 3

Suppose $v''(d) > 0$ for any $d > 0$. Consider R without loss of generality. In equilibrium, the utilities when the candidate wins and when the opposition wins must be the same for both candidates, and platforms should be symmetric from Proposition 1. This means that:

$$v(x_R + \chi_R - 2x_m) - v(x_R - \chi_R) = \lambda c(\chi_R - z_R(\chi_R)). \tag{7}$$

Denote $z_R(\chi_R) = \chi_R^{-1}(\chi_R)$, which is the platform committing him/her to χ_R. In addition, $x_R - \chi_L = (x_R - x_m) + (\chi_R - x_m) = x_R + \chi_R - 2x_m$ because the platforms are symmetric. Then, differentiate both sides of (7) by x_R. The differential of the left-hand side with respect to x_R is $v'(x_R + \chi_R - 2x_m) - v'(x_R - \chi_R) + \frac{\partial \chi_R}{\partial x_R}(v'(x_R + \chi_R - 2x_m) + v'(x_R - \chi_R))$. The differential of the right-hand side with respect to x_R is $\lambda c'(\chi_R - z_R(\chi_R))(\frac{\partial \chi_R}{\partial x_R} - \frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial x_R} - \frac{\partial z_R(\chi_R)}{\partial x_R})$. Both of these differentials should be the same. From Lemma 1, $\lambda = \frac{v'(x_R - \chi_R)}{c'(\chi_R - z_R(\chi_R))}$, therefore the condition becomes:

$$v'(x_R + \chi_R - 2x_m) - v'(x_R - \chi_R) + \frac{\partial \chi_R}{\partial x_R} v'(x_R + \chi_R - 2x_m) = -v'(x_R - \chi_R)(\frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial x_R} + \frac{\partial z_R(\chi_R)}{\partial x_R}). \tag{8}$$

Suppose Lemma 1. Fix χ_R and differentiate $\lambda = \frac{v'(x_R - \chi_R)}{c'(\chi_R - z_R(\chi_R))}$ with respect to x_R, then $\frac{\partial z_R(\chi_R)}{\partial x_R} = -\frac{v''(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R - \chi_R)c''(\chi_R - z_R(\chi_R))} < 0$. Substitute it into (8), therefore it becomes:

$$\frac{\partial \chi_R}{\partial x_R} = \frac{\frac{v''(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))} - (v'(x_R - \chi_L) - v'(x_R - \chi_R))}{v'(x_R - \chi_L) + v'(x_R - \chi_R)\frac{\partial z_R(\chi_R)}{\partial \chi_R}}. \tag{9}$$

If (9) is positive, an extreme type will implement a more extreme policy than a moderate type. In the same way as we derived $\frac{\partial z_R(\chi_R)}{\partial x_R}$, $\frac{\partial z_R(\chi_R)}{\partial \chi_R} = 1 + \frac{v''(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R - \chi_R)c''(\chi_R - z_R(\chi_R))} > 0$. To prove that (9) is positive, it is sufficient to show that the numerator of (9) is positive. In other words:

$$\frac{v'(x_R - \chi_L) - v'(x_R - \chi_R)}{v''(x_R - \chi_R)} < \frac{c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))}. \tag{10}$$

Note that, from (7) and Lemma 1:

$$\frac{v(x_R - \chi_L) - v(x_R - \chi_R)}{v'(x_R - \chi_R)} = \frac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}. \tag{11}$$

Because $\frac{c'(d)}{c(d)}$ strictly decreases as d increases, $\frac{c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))} > \frac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}$. The right-hand side of (10) is higher than the left-hand side of (11). If $\frac{v'(x_R - \chi_L) - v'(x_R - \chi_R)}{v''(x_R - \chi_R)} < \frac{v(x_R - \chi_L) - v(x_R - \chi_R)}{v'(x_R - \chi_R)}$, (10) holds. This equation can be changed to $\frac{v'(x_R - \chi_L)}{v''(x_R - \chi_R)} - \frac{v(x_R - \chi_L)}{v'(x_R - \chi_R)} < \frac{v'(x_R - \chi_R)}{v''(x_R - \chi_R)} - \frac{v(x_R - \chi_R)}{v'(x_R - \chi_R)}$. Because $\frac{v'(d)}{v(d)}$ strictly decreases as d increases, the right-hand side is positive. If $x_R - \chi_L = x_R - \chi_R$, both sides are the same. If $x_R - \chi_L$

increases, the left-hand side decreases. The reason is as follows. Differentiate the left-hand side with respect to $x_R - \chi_L$, then $\dfrac{v''(x_R-\chi_L)}{v''(x_R-\chi_R)} - \dfrac{v'(x_R-\chi_L)}{v'(x_R-\chi_R)}$. This value is negative because $\dfrac{v'(x_R-\chi_R)}{v''(x_R-\chi_R)} < \dfrac{v'(x_R-\chi_L)}{v''(x_R-\chi_L)}$ when $x_R - \chi_L > x_R - \chi_R$ and $v''(.) > 0$. As a result, the left-hand side of (10) is lower than the left-hand side of (11), therefore (10) holds. This result can be derived even if $\frac{v'(d)}{v(d)}$ does not change as d increases because the left-hand side of (10) is the same as the left-hand side of (11) in this case. Thus, (9) is positive.

If $v''(d) = 0$ for all $d > 0$, (9) is zero because $\dfrac{v''(x_R-\chi_R)c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))}$ is zero, and $v'(x_R-\chi_L) - v'(x_R-\chi_R)$ is also zero. Thus, even though $x_R - x_L$ changes, it does not affect the position of the implemented policies, $\chi_i(z_i)$ for $i = L, R$.

Suppose again that $v''(d) > 0$ for any $d > 0$. To determine the effect on platforms, it is sufficient to know the sign of $\frac{\partial z_R(\chi_R)}{\partial x_R} + \frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial x_R}$. From the above, it is:

$$-\frac{v''(x_R-\chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R-\chi_R)c''(\chi_R - z_R(\chi_R))} + \frac{\frac{v''(x_R-\chi_R)c'(\chi_R-z_R(\chi_R))}{c''(\chi_R-z_R(\chi_R))} - (v'(x_R-\chi_L) - v'(x_R-\chi_R))}{v'(x_R-\chi_L) + v'(x_R-\chi_R)\frac{\partial z_R(\chi_R)}{\partial \chi_R}} \frac{\partial z_R(\chi_R)}{\partial \chi_R}. \tag{12}$$

Assume that $v'(x_R - \chi_L)$ in the denominator is zero. Then, $-\dfrac{v''(x_R-\chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R-\chi_R)c''(\chi_R - z_R(\chi_R))} + \dfrac{\frac{v''(x_R-\chi_R)c'(\chi_R-z_R(\chi_R))}{c''(\chi_R-z_R(\chi_R))} - (v'(x_R-\chi_L) - v'(x_R-\chi_R))}{v'(x_R-\chi_R)} = -\dfrac{v'(x_R-\chi_L) - v'(x_R-\chi_R)}{v'(x_R-\chi_R)} < 0.$ Even though $v'(x_R - \chi_L)$ in the denominator is positive, the value is still negative because the positive part of (12) is still smaller than the negative part. As a result, a more extreme type promises a more moderate platform.

If $v''(d) = 0$ for all $d > 0$, (12) is zero because $\dfrac{v''(x_R-\chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R-\chi_R)c''(\chi_R - z_R(\chi_R))}$ is zero, and $\dfrac{\partial \chi_R}{\partial x_R}$ is also zero. Thus, even though $x_R - x_L$ changes, it does not affect the position of the platforms, z_i for $i = L, R$. $\square$

A.5 Corollary 3

Consider R without loss of generality. Fix z_R and z_L. Differentiate $\Psi_R(z_R, z_L) = v(x_R + \chi_R - 2x_m) - v(x_R - \chi_R) - \lambda c(\chi_R - z_R)$ by x_R. Note that $x_R - \chi_L = (x_R - x_m) + (\chi_R - x_m) = x_R + \chi_R - 2x_m$ because the platforms are symmetric in equilibrium. Then, it is $v'(x_R+\chi_R-2x_m) - v'(x_R-\chi_R) + \frac{\partial \chi_R}{\partial x_R}(v'(x_R+\chi_R-2x_m) + v'(x_R-\chi_R)) - \lambda c(\chi_R - z_R)(\frac{\partial \chi_R}{\partial x_R})$. From Lemma 1, $\lambda = \frac{v'(x_R-\chi_R)}{c'(\chi_R-z_R)}$, so it is $v'(x_R+\chi_R-2x_m) - v'(x_R-\chi_R) + \frac{\partial \chi_i}{\partial x_i}v'(x_R+\chi_R-2x_m) > 0$ since $\frac{\partial \chi_R}{\partial x_R}$ is positive.

Fix $\chi_R(z_R)$ and $\chi_L(z_L)$. Differentiate $v(x_R+\chi_R-2x_m)-v(x_R-\chi_R)-\lambda c(\chi_R-z_R)$ with respect to x_R. Then, it is $v'(x_R+\chi_R-2x_m)-v'(x_R-\chi_R)+\lambda c(\chi_R-z_R)(\frac{\partial z_R}{\partial x_R})$. Suppose Lemma 1. Fix χ_R and differentiate $\lambda=\frac{v'(x_R-\chi_R)}{c'(\chi_R-z_R(\chi_R))}$ with respect to x_R, then $\frac{\partial z_R(\chi_R)}{\partial x_R}=-\frac{v''(x_R-\chi_R)c'(\chi_R-z_R(\chi_R))}{v'(x_R-\chi_R)c''(\chi_R-z_R(\chi_R))}<0$. Again, $\lambda=\frac{v'(x_R-\chi_R)}{c'(\chi_R-z_R)}$. Substitute them into the above equation, then, $v'(x_R+\chi_L)-v'(x_R-\chi_R)+\frac{v''(x_R-\chi_R)c'(\chi_R-z_R)}{c''(\chi_R-z_R)}$, and it is negative for the same reason as in the proof of Proposition 3. □

A.6 Proposition 4

Consider R without loss of generality. In equilibrium, the utilities when the candidate wins and when the opposition wins must be the same for both candidates, and platforms should be symmetric from Proposition 1. This means that:

$$v(x_R+\chi_R-2x_m)-v(x_R-\chi_R)=\lambda c(\chi_R-z_R(\chi_R)). \tag{13}$$

Denote $z_R(\chi_R)=\chi_R^{-1}(\chi_R)$, which means the platform committing him to χ_R. In addition, $x_R-\chi_L=(x_R-x_m)+(\chi_R-x_m)=x_R+\chi_R-2x_m$ because the platforms are symmetric. Then, differentiate both sides of (13) by λ. The differential of the left-hand side with respect to λ is $\frac{\partial\chi_R}{\partial\lambda}(v'(x_R+\chi_R-2x_m)+v'(x_R-\chi_R))$. The differential of the right-hand side with respect to λ is $c(\chi_R-z_R(\chi_R))+\lambda c'(\chi_R-z_R(\chi_R))(\frac{\partial\chi_R}{\partial\lambda}-\frac{\partial z_R(\chi_R)}{\partial\chi_R}\frac{\partial\chi_R}{\partial\lambda}-\frac{\partial z_R(\chi_R)}{\partial\lambda})$. Both of these differentials should be the same. From Lemma 1, $\lambda=\frac{v'(x_R-\chi_R)}{c'(\chi_R-z_R(\chi_R))}$, therefore the condition becomes:

$$\frac{\partial\chi_R}{\partial\lambda}v'(x_R+\chi_R-2x_m)=c(\chi_R-z_R(\chi_R))-v'(x_R-\chi_R)(\frac{\partial z_R(\chi_R)}{\partial\chi_R}\frac{\partial\chi_R}{\partial\lambda}+\frac{\partial z_R(\chi_R)}{\partial\lambda}). \tag{14}$$

Suppose Lemma 1. Fix χ_R and differentiate $\lambda=\frac{v'(x_R-\chi_R)}{c'(\chi_R-z_R(\chi_R))}$ with respect to λ, then: $\frac{\partial z_R(\chi_R)}{\partial\lambda}=\frac{c'(\chi_R-z_R(\chi_R))^2}{v'(x_R-\chi_R)c''(\chi_R-z_R(\chi_R))}>0$. Substitute it into (14), therefore it becomes:

$$\frac{\partial\chi_R}{\partial\lambda}=\frac{c(\chi_R-z_R(\chi_R))-\frac{c'(\chi_R-z_R(\chi_R))^2}{c''(\chi_R-z_R(\chi_R))}}{v'(x_R-\chi_L)+v'(x_R-\chi_R)\frac{\partial z_R(\chi_R)}{\partial\chi_R}}. \tag{15}$$

In the same way as we derived $\frac{\partial z_R(\chi_R)}{\partial x_R}$, $\frac{\partial z_R(\chi_R)}{\partial\chi_R}=1+\frac{v''(x_R-\chi_R)c'(\chi_R-z_R(\chi_R))}{v'(x_R-\chi_R)c''(\chi_R-z_R(\chi_R))}>0$. Because $\frac{c'(d)}{c(d)}$ strictly decreases as d increases, $\frac{c'(\chi_R-z_R(\chi_R))}{c''(\chi_R-z_R(\chi_R))}>\frac{c(\chi_R-z_R(\chi_R))}{c'(\chi_R-z_R(\chi_R))}$. Therefore, (15) is negative, and it means that when λ increases, $\chi_R(z_R)-\chi_L(z_L)$ decreases.

To determine the effect on platforms, it is sufficient to know the sign of $\frac{\partial z_R(\chi_R)}{\partial \lambda} + \frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial \lambda}$. From the above, it is:

$$-\frac{c'(\chi_R - z_R(\chi_R))^2}{v'(x_R - \chi_R)c''(\chi_R - z_R(\chi_R))} + \frac{c(\chi_R - z_R(\chi_R)) - \frac{c'(\chi_R - z_R(\chi_R))^2}{c''(\chi_R - z_R(\chi_R))}}{v'(x_R - \chi_L) + v'(x_R - \chi_R)\frac{\partial z_R(\chi_R)}{\partial \chi_R}}\frac{\partial z_R(\chi_R)}{\partial \chi_R}. \tag{16}$$

Assume that $v'(x_R - \chi_L)$ in the denominator is zero. Then, the above equation is positive, and even though $v'(x_R - \chi_L)$ in the denominator is positive, the value is still positive because the positive part is still greater than the negative part. This means that when λ increases, $z_R - z_L$ increases. □

A.7 Proposition 5

Consider R without loss of generality. Fix χ_L and χ_R, and differentiate $v(x_R - \chi_L) - v(x_R - \chi_R) - \lambda c(\chi_R - z_R)$ by x_R. Then, it is $v'(x_R - \chi_L) - v'(x_R - \chi_R) + \lambda c'(\chi_R - z_R)(\frac{\partial z_R}{\partial x_R})$. Suppose Lemma 1. Fix χ_R and differentiate $\lambda = \frac{v'(x_R - \chi_R)}{c'(\chi_R - z_R(\chi_R))}$ by x_R, then $\frac{\partial z_R(\chi_R)}{\partial x_R} = -\frac{v''(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R - \chi_R)c''(\chi_R - z_R(\chi_R))} < 0$. Moreover, $\lambda = \frac{v'(x_R - \chi_R)}{c'(\chi_R - z_R)}$ in equilibrium from Lemma 1. Substitute them into the above equation, then $v'(x_R - \chi_L) - v'(x_R - \chi_R) + \frac{v''(x_R - \chi_R)c'(\chi_R - z_R)}{c''(\chi_R - z_R)}$. It is negative for the same reason in the proof of Proposition 3. It means that $\Psi_R(z_R, z_L)$ is always lower than $\Psi_L(z_R, z_L)$ for any pair of symmetric implemented policies when $|x_R - x_m| > |x_L - x_m|$. From Lemma 3, the candidate with lower $|x_i - x_m|$ wins with certainty.

Consider $|x_i - x_m| < |x_j - x_m|$, then, Candidate i wins with certainty, and, for Candidate i, $\Psi_R(z_R, z_L)$ is positive, that is, $-v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i(z_i) - z_i|) > -v(|x_i - \bar{\chi}_j|)$ where $\bar{\chi}_j$ satisfies $|x_m - \chi_i(z_i)| = |x_m - \bar{\chi}_j|$. Because $|x_i - x_m| < |x_j - x_m|$, $-v(|x_i - \bar{\chi}_j|) > -v(|x_j - \chi_i(z_i)|)$, therefore $-v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i(z_i) - z_i|) > -v(|x_j - \chi_i(z_i)|)$. The left-hand side is the (expected) utility of Candidate i, and the right-hand side is the (expected) utility of Candidate j, and Candidate i has higher expected utility.

When the candidates have a linear utility function, $v'(x_R - \chi_L) = v'(x_R - \chi_R)$ and $\frac{\partial z_R(\chi_R)}{\partial x_R} = 0$, therefore the change in both sides of the first-order condition are zero as x_R changes. Thus, regardless of the position of the candidates, they still tie. □

A.8 Proposition 6

Consider R without loss of generality. Fix χ_L and χ_R, and assume that χ_L and χ_R are symmetric. Differentiate $v(x_R - \chi_L) - v(x_R - \chi_R) - \lambda_R c(\chi_R - z_R)$ with respect to λ_R. Then, it is $-c(\chi_R - z_R) + \lambda_R c'(\chi_R - z_R)\frac{\partial z_R}{\partial \lambda_R}$. Suppose Lemma 1. Fix χ_R and differentiate $\lambda_R = \frac{v'(x_R - \chi_R)}{c'(\chi_R - z_R)}$

by λ_R, then $\frac{\partial z_R}{\partial \lambda_R} = -\frac{c'(\chi_R - z_R(\chi_R))^2}{v'(x_R-\chi_R)c''(\chi_R - z_R(\chi_R))} < 0$. Moreover, $\lambda_R = \frac{v'(x_R-\chi_R)}{c'(\chi_R - z_R)}$ in equilibrium from Lemma 1. Substitute them into the above equation, then $-c(\chi_R - z_R) + \frac{c'(\chi_R-z_R)^2}{c''(\chi_R-z_R)}$. It is positive from Assumption 1. This means that $\Psi_R(z_R, z_L)$ is always higher than $\Psi_L(z_R, z_L)$ for any pair of implemented policies when $\lambda_R > \lambda_L$. From Lemma 3, the candidate with the lower $|x_i - x_m|$ wins with certainty.

For candidate i, the utility when candidate i wins is higher than the utility when the opposition wins, that is $-v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i(z_i) - z_i|) > -v(|x_i - \bar{\chi}_j|)$ where $\bar{\chi}_j$ satisfies $|x_m - \chi_i(z_i)| = |x_m - \bar{\chi}_j|$. Because $|x_i - x_m| = |x_j - x_m|$, $-v(|x_i - \bar{\chi}_j|) = -v(|x_j - \chi_i(z_i)|)$. Therefore, $-v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i(z_i) - z_i|) > -v(|x_j - \chi_i|)$. The left-hand side is the (expected) utility of i, and the right-hand side is the (expected) utility of j. □

A.9 Corollary 5

Consider R without loss of generality. After the election, the utility of R is $-v(x_R - \chi_R(z_R)) - \lambda c(\chi_R(z_R) - z_R)$. Note that z_R is given after the election. The differential of it with respect to λ is $v'\frac{\partial \chi_R}{\partial \lambda_R} - c - \lambda c' \frac{\partial \chi_R}{\partial \lambda_R}$. It is always negative because $(v'(x_R - \chi_R(z_R)) - \lambda c(\chi_R(z_R) - z_R))$ is zero from Lemma 1. □

A.10 Proposition 7

Suppose $W < \lambda c(|x_m - z_i(x_m)|)$ for both candidates. Consider R without loss of generality. Fix χ_L and χ_R, and assume that χ_L and χ_R are symmetric. Differentiate $\beta_R v(x_R - \chi_L) - \beta_R v(x_R - \chi_R) - \lambda c(\chi_R - z_R) + W$ with respect to β_R. Then, it is $v(x_R - \chi_L) - v(x_R - \chi_R) + \lambda c'(\chi_R - z_R)(\frac{\partial z_R}{\partial \beta_R})$. Suppose Lemma 1. Fix χ_R and differentiate $\lambda = \frac{\beta_R v'(x_R - \chi_R)}{c'(\chi_R - z_R)}$ with respect to β_R, then $\frac{\partial z_R}{\partial \beta_R} = -\frac{c'(\chi_R - z_R(\chi_R))}{\beta_R c''(\chi_R - z_R(\chi_R))} < 0$. Moreover, $\lambda = \frac{\beta_R v'(x_R - \chi_R)}{c'(\chi_R - z_R)}$ in equilibrium from Lemma 1. Substitute them into the above equation, then:

$$v(x_R - \chi_L) - v(x_R - \chi_R) - v'(x_R - \chi_R)\frac{c'(\chi_R - z_R)}{c''(\chi_R - z_R)}. \tag{17}$$

From (7) and Lemma 1, $\frac{v(x_R - \chi_L) - v(x_R - \chi_R)}{v'(x_R - \chi_R)} + \frac{W}{\beta_R v'(x_R - \chi_R)} = \frac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}$. From Assumption 1, $\frac{c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))} > \frac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}$. As a result, (17) is negative. It means that $\Psi_R(z_R, z_L)$ is always lower than $\Psi_L(z_R, z_L)$ for any pair of implemented policies when $\beta_R > \beta_L$. From Lemma 3, the candidate with lower β_i wins with certainty.

Suppose $W < \lambda c(|x_m - z_j(x_m)|)$ for j, but $W > \lambda c(|x_m - z_i(x_m)|)$ for i, i has an incentive to commit the median policy, therefore it means that i has an incentive to commit to a more moderate policy to implement than j. Therefore, i wins with certainty. Note that if $W > \lambda c(|x_m - z_j(x_m)|)$ for j, $W > \lambda c(|x_m - z_i(x_m)|)$ for i. From the above, $\frac{\partial z_R}{\partial \beta_R} < 0$, and it means that a more policy motivated candidate has a higher cost of betrayal. Thus, when $\beta_j > \beta_i$, $\lambda c(|x_m - z_j(x_m)|) > \lambda c(|x_m - z_i(x_m)|)$.

Consider $\beta_i < \beta_j$, then, i wins with certainty, and, for i, $\Psi_R(z_R, z_L)$ is positive, that is, $-\beta_i v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i(z_i) - z_i|) > -\beta_i v(|x_i - \bar{\chi}_j|)$ where $\bar{\chi}_j$ satisfies $|x_m - \chi_i(z_i)| = |x_m - \bar{\chi}_j|$. Because $\beta_i < \beta_j$, $-\beta_i v(|x_i - \bar{\chi}_j|) > -\beta_j v(|x_j - \chi_i(z_i)|)$, so $-\beta_i v(|x_i - \chi_i(z_i)|) - \lambda_i c(|\chi_i - z_i|) > -\beta_j v(|x_j - \chi_i(z_i)|)$. The left-hand side is the (expected) utility of i, and the right-hand side is the (expected) utility of j.□

A.11 Proposition 8

Consider R without loss of generality. In equilibrium, the utilities when the candidate wins and when the opposition wins must be the same for both candidates, and platforms should be symmetric from Proposition 1. This means that:

$$\beta v(x_R + \chi_R - 2x_m) - \beta v(x_R - \chi_R) = \lambda c(\chi_R - z_R(\chi_R)). \tag{18}$$

Denote $z_R(\chi_R) = \chi_R^{-1}(\chi_R)$, which is the platform committing him to χ_R. In addition, $x_R - \chi_L = (x_R - x_m) + (\chi_R - x_m) = x_R + \chi_R - 2x_m$ because the platforms are symmetric. Then, differentiate both sides of (18) with respect to β. The differential of the left-hand side with respect to β is: $v(x_R + \chi_R - 2x_m) - v(x_R - \chi_R) + \dfrac{\partial \chi_R}{\partial \beta}\beta(v'(x_R + \chi_R - 2x_m) + v'(x_R - \chi_R))$. The differential of the right-hand side with respect to β is $\lambda c'(\chi_R - z_R(\chi_R))(\dfrac{\partial \chi_R}{\partial \beta} - \dfrac{\partial z_R(\chi_R)}{\partial \chi_R}\dfrac{\partial \chi_R}{\partial \beta} - \dfrac{\partial z_R(\chi_R)}{\partial \beta})$. Both of these differentials should be the same. From Lemma 1, $\lambda = \frac{\beta v'(x_R - \chi_R)}{c'(\chi_R - z_R(\chi_R))}$, therefore the condition becomes:

$$v(x_R + \chi_R - 2x_m) - v(x_R - \chi_R) + \frac{\partial \chi_R}{\partial \beta}\beta v'(x_R + \chi_R - 2x_m) = -\beta v'(x_R - \chi_R)(\frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial \beta} + \frac{\partial z_R(\chi_R)}{\partial \beta}). \tag{19}$$

Suppose Lemma 1. Fix χ_R and differentiate $\lambda = \frac{\beta v'(x_R - \chi_R)}{c'(\chi_R - z_R(\chi_R))}$ with respect to β, then: $\dfrac{\partial z_R(\chi_R)}{\partial \lambda} = -\dfrac{c'(\chi_R - z_R(\chi_R))}{\beta c''(\chi_R - z_R(\chi_R))} < 0$. Substitute it into (19), therefore it becomes:

$$\frac{\partial \chi_R}{\partial \beta} = \frac{-(v(x_R - \chi_L) - v(x_R - \chi_R)) + \frac{v'(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))}}{\beta v'(x_R - \chi_L) + v'(x_R - \chi_R)\frac{\partial z_R(\chi_R)}{\partial \chi_R}}. \tag{20}$$

In the same way as we derived $\frac{\partial z_R(\chi_R)}{\partial x_R}$, $\dfrac{\partial z_R(\chi_R)}{\partial \chi_R} = 1 + \dfrac{v''(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{v'(x_R - \chi_R)c''(\chi_R - z_R(\chi_R))} > 0$, so the denominator is positive. From (18) and Lemma 1, $\dfrac{v(x_R - \chi_L) - v(x_R - \chi_R)}{v'(x_R - \chi_R)} + \dfrac{W}{\beta_R v'(x_R - \chi_R)} = \dfrac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}$. From Assumption 1, $\dfrac{c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))} > \dfrac{c(\chi_R - z_R(\chi_R))}{c'(\chi_R - z_R(\chi_R))}$. As a result, the numerator is positive, and it means that when β increases, $\chi_R(z_R) - \chi_L(z_L)$ increases.

To determine the effect on platforms, it is sufficient to know the sign of $\frac{\partial z_R(\chi_R)}{\partial \beta} + \frac{\partial z_R(\chi_R)}{\partial \chi_R}\frac{\partial \chi_R}{\partial \beta}$. From the above, it is:

$$-\frac{c'(\chi_R - z_R(\chi_R))}{\beta c''(\chi_R - z_R(\chi_R))} + \frac{-(v(x_R + \chi_R - 2x_m) - v(x_R - \chi_R)) + \frac{v'(x_R - \chi_R)c'(\chi_R - z_R(\chi_R))}{c''(\chi_R - z_R(\chi_R))}}{\beta v'(x_R - \chi_L) + v'(x_R - \chi_R)\frac{\partial z_R(\chi_R)}{\partial \chi_R}} \frac{\partial z_R(\chi_R)}{\partial \chi_R}. \tag{21}$$

The above equation is always negative, and it means that when β increases, $z_R - z_L$ decreases. □

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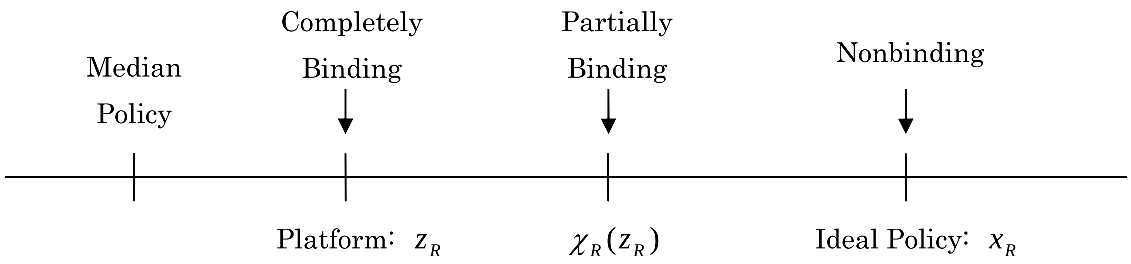

Figure 1: Complete, Non- and Partially Binding Platforms

In models of completely binding platforms, candidates implement their platform. In models of nonbinding platforms, candidates implement their ideal policy. In the model of partially binding platform, candidates will implement a policy that is between their platform and ideal policy.

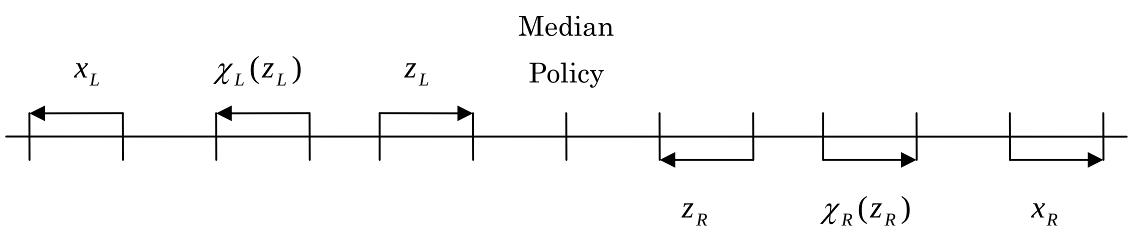

Figure 2: Ideal Policies and Endogenous Degree of Honesty

Suppose that the distance between the ideal policies, $x_R - x_L$, increases. Then, the distance between the platforms, $z_R - z_L$, decreases, and the distance between the implemented policies, $\chi_R(z_R) - \chi_L(z_L)$, increases.