(De)Selection of Prime Ministers by Party Members

Hande Mutlu-Eren
New York University
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1 Introduction

In January 2010, two senior figures in the governing British Labour Party attempted to unseat Gordon Brown from his position as party leader and, by extension, as Prime Minister of the United Kingdom. The dissidents’ letter said “continued speculation and uncertainty [about Mr.Brown’s leadership] is allowing our opponents to portray us as dispirited and disunited. It is damaging our ability to set out our strong case to the electorate. It is giving our political opponents an easy target” (Cowell 2010, NYTimes). This challenge to Brown’s position - the third since he took power in 2007 - is one example of the many instances that show that prime ministers do not always assume office following elections and that a new prime minister may be selected by the ruling party. The decision on who will fill the highest office in a country is often not in the hands of the entire electorate, but an exclusive party selectorate that may include party members, party activists, party legislators or simply an informal party elite group. In Israel, for example, half of the prime ministers initially assumed office following intra-party politics (Kenig 2009). Likewise, in Britain, five of the last nine prime ministers (Macmillan, Home, Callaghan, Major and Brown) assumed the premiership after their respective parties installed them as leader of the sole governing party and thus, by implication as prime minister. This pattern is common in other countries as well. In Japan,
for instance, each of the past five prime ministers first assumed office following an internal contest within the ruling Liberal-Democratic Party (LDP). Indeed, notwithstanding the de jure constitutional position, the de facto political reality is that many prime ministers hold their position by virtue of their party leadership. In order to be elected, they have to garner the support of their party members. But, this initial support may not carry through until the next election. Therefore, prime ministers may be replaced in the inter-electoral period by another party notable.

The main question asked in this paper is as follows: When would party members decide to replace their leader and when would they not force a leadership change? Conversely, when would party leaders take actions that are not supported by their party members and when would they refrain from doing so? These questions point to a tension that often exists within parties: while party members want their party leader to implement policies closer to their ideal points they also want them to be elected. The model presented below analyzes ways in which non-policy factors, such as superior charisma, superior intelligence, better name recognition, which Stokes (1963) called valence factors, play an instrumental role in the calculations of both party members and party leaders. In particular, party members benefit from high-valence leaders who are more likely to win elections for a given policy position, while leaders who are popular with voters can have more freedom in setting party policy. My model, thus, puts valence factors at the heart of leadership selection. For instance, in the British context, both Gordon Brown and Tony Blair were viewed as potential candidates for the leadership of the Labour Party after the death of John Smith in 1994. Although Brown was the senior of the two, Blair was widely seen to have greater electoral valence. In fact, despite his actions during the Iraq war crisis that were opposed by many in his party, Blair was able to remain in office, due to his continuing popularity, until 2007. He decided to step

\[1\]
Throughout the paper the terms party leader and the prime minister are used interchangeably since it is assumed that the prime minister is also the leader of the main government party.
down as his popularity within the party and the electorate decreased.

In the model I develop below, a decrease in the valence of a party leader is, hence, often a necessary and sufficient condition for his or her replacement. Another striking example can be seen in the British Conservative Party in 1990, when the leadership faction lost its majority status inside the party following Margaret Thatcher’s deteriorating approval ratings. As a result, she lost her party leadership and had to hand the prime minister position to John Major, whose approval ratings were on the rise. Other factors that affect the intra-party politics of leadership selection and analyzed in the model I present below concern the policy position and the strength of the opposition parties. The stakes of being in government are higher when there are vast ideological differences between parties. For instance, if the policy position of the main opposition party is far from the governing party’s policy, an electorally weak but like-minded leader may be replaced by a more popular but not so like-minded challenger in order to avoid the policy position that would be implemented in the event the opposition party wins the general election.

The driving assumption behind the model presented in this paper is that parties are not unitary actors, contrary to the assumption made by many formal models of party competition. Instead, I assume that parties are composed of legislators and notables with diverse policy preferences, all competing inside the party for resources and influence. The central aim of this paper is to contribute to our understanding of political competition without assuming parties to be unitary actors, which, in turn, requires examining intra-party dynamics. This paper also contributes to our understanding of the discipline exerted on party leaders by their party members. While the existing literature on party discipline focuses on the discipline exerted on legislators by their party leaders, much less research analyzes the dependence of party leaders on their followers. Finally, this paper by focusing on valence

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2 In the rest of the paper, I use “he” to refer to the party leader and prime minister.
3 For a comprehensive study of party discipline see Kami (2009). For the dependence of party leaders on their party members see, for example, Weller (1983) and Weller (1994). Quinn (2012) provides a detailed
evaluations of parties and relating this to leadership changes and policy polarization adds to the literature on valence.4

The theoretical model I develop is similar to intra-party models of Padró i Miquel and Snowberg (2012) and Serra (2011). Padró i Miquel and Snowberg (2012) ask whether parties can hold politicians accountable and analyze conditions under which an unpopular incumbent will be dismissed by the party even if he toes the party line perfectly, and a popular incumbent will be kept despite the fact that he defects from the party line. As in this paper, they take personal valence and polarization as the two important variables that condition the strategies of the party leader and party members. However, the model assumptions and the equilibrium concepts used in their paper are different from those used here. In particular, they assume that politicians can be opportunists or loyalists, and ex-ante their type is unknown to party members. Therefore, they use perfect-bayesian equilibrium concept to find out the strategies of the actors. Furthermore, politicians in their model care about whether the party’s agreed policy is implemented or not, and not about the policy per se. In my model, along the lines of Padró i Miquel and Snowberg (2012), the decision to replace the party leader comes as a response to his actions; however, unlike their model that assumes that dismissing leaders is costless, here, replacing the party leader is costly since this may result in a party policy that is further from the ideal point of the median party member. In a similar vein, Serra (2011) provides an account of intra-party politics, but in the context of primaries.5 In his

4For notable work on party competition with a valence dimension see Groseclose (2001); Ansolabehere and Snyder (2000); Adams, Merrill III, Grofman (2005); Serra (2011).

5In particular, his model analyzes the conditions under which the party elite decides to have a primary election or not in anticipation of both intra-party and inter-party elections. This paper contributes especially to the growing literature on intra-party politics and the incentives for leaders to hold primary elections. Adams and Merrill III (2008) in a similar account of primaries, in which candidates also compete in the intra-party election by proposing platforms, conclude that holding a primary increases a party’s chance of success in the general election. Kemahlioglu, Weitz-Shapiro, and Hirano (2009) explain the adoption of presidential primaries in the context of Latin American countries basing their claim on the existence of
model, the party elite trades-off between a high-skilled candidate and a less-preferred policy platform. Here, as in Serra (2011), politicians are assumed to be policy-motivated. Their policy position determines the party’s policy in the inter-party election. Nevertheless, during the election campaign, when the relative valence of the candidates are revealed, they may reformulate the party’s policy in order to win in the election.\(^6\)

The remaining of the paper is organized as follows: the next section starts with the definition of parties as coalition of factions, which also lays out the basic premises of a theory of leadership selection. Then, I present my leadership selection model and its main predictions. The following section explains the data and the model used to test the main hypothesis derived from the theoretical model. I then present and interpret the results. The final section concludes with broader implications of the theory and evidence presented in the paper.

2 Leadership Selection: Theoretical Framework

2.1 Parties as Coalitions

I consider parties as coalitions of factions composed of legislators and groups with diverse policy positions and often competing claims on party resources. I model faction leaders as exogenously determined notables within the party.\(^7\) Legislators, in turn, form the sets of factions within parties; Hortala-Vallve and Mueller (2009) examine the adoption of primaries in a situation in which underrepresented factions within a party can threaten to leave the party unless the party elite introduces primaries.

\(^6\) At the intra-party leadership selection phase, that will be analyzed later in the paper, candidates commit to the announced policy positions as the policy that the party will run in the election. If, the party’s candidate has a large valence advantage over the opposition candidate, the party will run based on his leader’s policy platform and the winning platform in the general election will be the leader’s policy. If, however, there is no valence difference between the party’s candidate and the opposition candidate, they may converge to the position of the median voter in the electorate. This exception is valid for both leadership candidates, and therefore does not bind the party members when they ex-ante choose their leader.

\(^7\) While it would be interesting to analyze the endogenous emergence of party notables here they are treated as an exogenously given fact of party life.
followers of faction leaders. A party faction is a common knowledge set of party legislators who would support a given faction leader in the event of a contest for the party leadership. The model assumes that faction leaders have conflicting policy preferences and want to move the party’s policy towards their own preferred position. The way to achieve this in the model arises from the process of leadership selection.

The model assumes that only the party leader has the formal power to change the party’s policy, resulting in some interesting dynamics. If the party’s policy is moved towards a position that is not liked by the leader’s support coalition, then the leader risks losing his position, unless balancing benefits are delivered to the support coalition in the form of higher electoral valence. Party leaders, besides having policy preferences, also value being party leader as a private benefit in and for itself. Aspiring leaders want to replace them, in part to affect party policy and in part because they want to enjoy the benefits of being a party leader. In contrast, I assume that rank and file legislators have no realistic ambition to become party leader and are motivated solely by party policy. Thus, faction leaders build a client base inside the party selectorate to position themselves for a political leadership challenge. They are political entrepreneurs: they increase their chance of being elected (and remaining) party leader to the extent that they advance the policy position of their followers and provide rewards to those who support them as an investment for future.\footnote{Thus, factions within a party serve both the distribution mechanism and the leadership selection mechanism. In this paper, I particularly provide an empirical test of the leadership selection model based purely on policy motivation of legislators. There is also a stream of non-policy benefits, such as cabinet portfolios, disproportionately accruing to the legislators of the governing party faction. I develop the distribution of these in another paper.}

These factional affiliations, however, are not fixed. If the faction leader loses some of his support coalition, dissatisfied party members will switch their support to some alternative faction leader. Thus, the party leader’s control of the leadership is always conditional. Leaders who lose support may be forced to resign. Indeed, as discussed later in the paper, it is an empirical regularity that party leaders are often replaced in the interelectoral period.
The dynamics between intra-party factions are fundamentally not much different from the dynamics of inter-party coalitions. This is especially the case in majoritarian systems, which are usually governed by single party majorities, implying that the real politics take place inside parties. Governments may fall because of internal politics that may have nothing to do with inter-party competition. Competition for party leadership is often at the heart of this, since the person who gains the leadership of the party is typically, as a matter of political practice, also the holder of the prime minister position.

The following entry in *Keesing’s Record of World Events* describes intra-party dynamics in New Zealand National Party leading to a leadership change and hence the replacement of the prime minister in late 1997:

“Jim Bolger [of New Zealand] on Nov. 3 [1997] announced his intention to resign as Prime Minister, a position he had held since 1990. The announcement followed intense lobbying by Transport Minister Jenny Shipley, who had advised him that *she had sufficient support within the parliamentary party to force his resignation*. Later that day Shipley was elected leader of the ruling National Party at a parliamentary caucus meeting. *Shipley, who was from the right-wing of the party*, had been challenging Bolger’s leadership for the previous six months. Party members confirmed that Bolger’s two-week absence at the Commonwealth Heads of Government Meeting in Scotland, followed by an official visit to France and a week’s parliamentary recess, had been used by Shipley to consolidate her challenge. Even before her formal appointment, Shipley announced a Cabinet reshuffle on Dec. 5. *She rewarded her supporters by promoting them in the Cabinet ranking, whilst at the same time downgrading the position of a number of Bolger loyalists.*” (Keesing’s Record of World Events, italics added)

This example suggests that, when there is a party with an incumbent leader and a rival faction leader, who have diverging policy positions, things may change depending on the changes in the inputs into the political processes. My goal in modeling intra-party dynamics is to derive changes in the equilibrium resulting from these changes. For instance, as long as the policy positions and valence characteristics of the leaders in the system remain the same, the status quo government stays in place. If, however, elections are looming on the
horizon and the party leader has decreasing approval ratings, the median party member may reconsider his support for the party leader and force a leadership change by aligning with the leader of a rival faction even if the latter is ideologically more distant to the median party member than the party leader.\(^9\)

The decision of the party members to replace their party leader is also contingent on the ideological position of the opposition leader. In particular, if the government party and the main opposition party are ideologically far from each other, the fear of a distant policy further increases the incentives of the party members to replace their party leader with a challenger who has a higher chance of winning. Therefore, while a decrease in the valence of the party leader is predicted to increase the probability of his replacement, an increased ideological distance between the government party and the opposition party would make the replacement even more likely. Next, I turn to a model of party leader replacement where I elaborate on these.

### 2.2 Theory and Hypothesis

I analyze intra-party politics in the presence of a shock that forces the party leader to change his policy. In the absence of such a shock and when the approval ratings of the party leader are high, the party is assumed to be in equilibrium. When there is a policy shock in the system, the leader of the government may decide to take a position that is not supported by his party members, or he can keep the status-quo.\(^{10}\) The median party member, in turn, decides whether to continue supporting him or cease his support, which implies the median

\(^9\)Note that while in this case the leadership change is a viable solution, it may not be the case in other situations and the party may split. This is especially true when the electoral system permits and the cost of forming a new party is not too high. The assumption in this theoretical model is that defecting from the party as a bloc is very costly. I analyze party splits as another destabilizing factor in a separate paper.

\(^{10}\)Policy shocks, as defined in Laver and Shepsle (1996) are shocks to the party policy positions. They may involve the creation of a completely new policy dimension. They may also involve the perturbation of the actors’ policy position on existing policy dimensions. Policy shocks, for instance, can move the party’s policy further away from the median party member’s policy.
member can switch faction, and subsequently the prime minister can be replaced by his main challenger within the party.\footnote{The assumption here is that the faction leader whom the median party member gives his support becomes the party leader.} Elections determine the winning party, which in turn forms a single-party majority government. Thus, in order to analyze the conditions under which party leaders take policy decisions that are not supported by their party members and the conditions under which party members decide to replace their party leader, I provide a comprehensive model that takes both the intra-party leadership selection and inter-party competition. Below, I examine each stage of the game separately.

2.2.1 General Election Stage (Inter-Party Competition)

The analysis at this stage is based on Serra (2011) and corresponds to a general election fought between the leaders of the government party and the main opposition party, who are assumed to be the two credible candidates for the position of prime minister. I assume that the party system is composed of two parties, a majority government party and a minority opposition party. While the formal model which I present below is limited to two party case and does not take into account the electoral system that parties operate in, the intuition derived from the model applies to more general settings. In particular, whether the party system is composed of two parties or more than two parties, the PM usually comes from either of the two largest parties in the system. According to my dataset which I present in the empirical section of this paper below, out of the 304 governments formed in 12 advanced industrialized democracies between 1960 and 2005, 242 (80 percent) had the largest party’s leader and 38 (12 percent) had the second largest party’s leader as the PM. This trend is more evident in the case of single-party governments. Of the 136 single-party governments, 130 (96 percent) had the largest party’s leader and 4 (3 percent) had the second largest party’s leader as the PM. Therefore, whether the system is composed of two parties or more than two parties, what we really observe during an election is a competition between the
leaders of the two major parties for the PM position.

In the model without loss of generality, the party that is in government is the right-wing party, denoted as $R$, and the main opposition party is the left-wing party, denoted as $L$. $X$ is assumed to be one-dimensional policy space, and $x$ is the implemented policy. There are two sets of actors at this stage in the game: party leaders, who represent their party, and voters in the electorate. Party leaders care about policy and holding the PM position with a trade-off between the two. It is assumed that both party leaders value office and policy the same way. The preferred policy positions of the party leaders are denoted by $X_L$ and $X_R$ respectively, with an ordering of: $X_L < X_M < X_R$, where $X_M$ denotes the ideal point of the median voter in the electorate.

Party leaders also possess valence, denoted as $v$, that appeals to voters. Thus, voters’ comparative evaluations of the candidates in the general election depend on their evaluation of the candidates’ policy position, plus a valence component $v_L$ and $v_R$ for party leaders that is identical across all party voters. Valence can take a low or high value, corresponding to low valence and high valence candidates respectively. So, $v$ is a member of the set $\{0, 1\}$. The exact values of the valence are unknown before the election, yet, there is a prior information about the valence of the candidates. Specifically, the probabilities that the candidates have high valence are $\pi_L$ and $\pi_R$, with $\pi_L, \pi_R \in (0, 1)$. The utility function of $M$, the median voter who is decisive in the electorate, is:\footnote{Note that as it will be clear in the next page under Proposition 1, $x$ is in $[-1,1]$. This implies that if the winning platform in the inter-party competition is $X_L$, where $\delta \leq X_L$, $v$ may not dominate policy.}

$$U_M(x, v) = -|X_M - x| + v$$

The inter-party competition follows the logic outlined in Adams, Merill, and Grofman (2005), which assumes that higher valence leaders are more likely to win elections for a given policy position. This has the implication that an increase in valence causes the candidate to
translate this advantage into a policy position closer to his ideal point. Likewise, a decrease in his valence will result in a policy toward the median member in the electorate. For a given policy, the candidate who has the highest valence will win. If \( M \) is indifferent between the two candidates, his probability of choosing either candidate is \( 1/2 \).

The sequence of the game is as follows:

1. Parties announce their prime minister candidate; \( v_L \) and \( v_R \) are then revealed.

2. Candidates announce their platforms, \( x_L \) and \( x_R \), which they decide considering the platform of the opposition candidate and their relative valence advantage, and therefore may not correspond to their own ideal point.

3. General elections are held and the median voter elects the opposition party, \( L \), or the government party \( R \).

The results derived using subgame perfect equilibrium concept in pure strategies, lead to the following proposition.

**Proposition 1** (Theorem 1 in Serra (2011)). The equilibrium strategies and equilibrium outcomes of the general election for given values of \( v_L \) and \( v_R \) are listed in the following table, where \( \delta \equiv v_R - v_L \), which can take one of three values: \( \delta \in \{-1, 0, 1\} \).

<table>
<thead>
<tr>
<th>Value of ( \delta )</th>
<th>Equilibrium platforms, ( x_R^<em>, x_L^</em> )</th>
<th>Winning platforms</th>
<th>Winning party</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_R \leq \delta )</td>
<td>( x_R^* = X_R, x_L^* \in \mathbb{R} )</td>
<td>( X_R )</td>
<td>( R )</td>
</tr>
<tr>
<td>( \delta = 0 )</td>
<td>( x_R^* = X_M, x_L^* = X_M )</td>
<td>( X_M )</td>
<td>( R ) or ( L )</td>
</tr>
<tr>
<td>( \delta \leq X_L )</td>
<td>( x_R^* \in \mathbb{R}, x_L^* = X_L )</td>
<td>( X_L )</td>
<td>( L )</td>
</tr>
</tbody>
</table>

This table shows that when there is no valence difference between the candidates (i.e., \( \delta = 0 \)), both candidates will converge to the ideal point of the median voter. When either of the candidates is highly advantaged compared to the other candidate, he can win with his party’s ideal point, without making any compromise.
2.2.2 Leader (De)Selection Stage (Intra-Party Politics)

This stage, preceding the general election stage, determines the prime minister candidate in the governing party. The status quo single party majority government is formed by the $R$ party, which is assumed to be composed of two factions, with their leaders $R1$ and $R2$. The current prime minister is $R1$ who is also the leader of the majority faction. The non-leadership faction leader is $R2$. Each party member belongs to a faction. Party members give their support to a faction leader, who in turn advances their policy position. That is, the party members, care about policy, and they factor in the relative valence of the faction leaders only in anticipation of the election outcome. They switch factions if they believe the new faction leader will give them more utility. The decisive member of the party is the median party member, who initially belongs to the leadership faction and the faction leader he supports becomes the party leader. For ease of presentation of the results, I set the location of the median party member, denoted as $X_{RM}$ to 0, such that $X_M < X_{RM} = 0 < X_{R1} < X_{R2}$. Note that of the six possible orderings of $X_{RM}$, $X_{R1}$, and $X_{R2}$, I am concentrating for now on this one because the case I analyze corresponds to the more extreme and interesting situation in which the median party member may decide to replace the current party leader even though the challenger is further away from the median party member than the party leader. When the ordering of the ideal policy positions is altered, however, the subsequent analysis remains the same.\footnote{If $X_M < X_{RM} = 0 < X_{R2} < X_{R1}$, this makes the median party member replace the incumbent party leader with the challenger more easily because the challenger is now closer to the median party member. When either faction leader is more centrist than the median party member, that is, $X_M < X_{R1} < X_{RM} = 0 < X_{R2}$ or $X_M < X_{R2} < X_{RM} = 0 < X_{R1}$, depending on the relative distance of the faction leaders, it may be easier or more difficult for the median party member to change the party leader. When the median party member is located at the extreme right, again, it will be easier for him to change the party leader since the challenger is closer to either the median in the electorate or to the median party member.} The utility function of the median party member is indicated as:

$$U_{RM}(x) = -|x|$$
The status quo policy that the prime minister implements corresponds to the median member’s policy position, that is \( x = X_{RM} \). There is a shock in the system, which gives to the prime minister the opportunity to implement his ideal policy as the party’s new policy. In other words, the prime minister chooses between defecting from the party’s previously agreed policy and implement \( x = X_{R1} \), or keep the status quo policy at \( x = X_{RM} \). \( \eta \in (0,1) \) parametrizes the value the leader puts on implementing his preferred agenda. Yet, the party leader, besides policy, also receives utility from holding the PM position and hence the leadership of the party, normalized to 1. Thus, the party leader (and hence the PM) wants to keep his position, but he also wants to implement his own policy as the party’s new policy. Hence, the utility function of the party leader is:

\[
U_{R1} = \begin{cases} 
1 - \eta|X_{R1} - x| & \text{if } R1 \text{ keeps his party leadership position and is re-elected as PM} \\
-\eta|X_{R1} - X_{R2}| & \text{if } R1 \text{ loses the PM position to } R2 \text{ or to } L 
\end{cases}
\]

When elections are looming on the horizon, party members often face a dilemma: they want to replace a leader whose policies are diverging from theirs, but they also want to keep him if he possesses high charisma knowing that this charisma will translate into an increased probability of re-election for the party in the general election, avoiding the possibility that the policy position of the opposition party is put into practice. Party members thus want to have a party leader who is close to their ideal policy, but they also want the party to be in government. Thus, in some cases, even if the party’s implemented policy still corresponds to the median member’s policy, the party leader will be replaced because of his low valence compared to the rival candidate for the party leadership.\(^{15}\) It is the median party member

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\(^{14}\)The party’s initial policy could in fact be located anywhere. What matters here is a change in favor or against one of the factions.

\(^{15}\)Note that a replacement occurs when a party leader is changed by an aspiring leader following all sorts of reasons except death. These may include personal reasons, a scandal, or an open challenge. That is, instances of voluntarily resignation also count as replacement as a party leader is often replaced without
who decides whether to keep the current party leader or replace him with his challenger in the party. The selected leader of the party automatically becomes the prime minister candidate. I assume that party members believe the party leader’s replacement to have an extra probability $A$ of having high valence compared to the current party leader. Put differently, it is assumed that the probability that the challenger has high valence is at least as high as the probability that the party leader has high valence.

The strategies of the party leader and the median party member will depend on the anticipated outcome of the general election. In other words, the party leader will either take a policy stance that is not supported by the median party member or follow the party line, and the median party member will either replace the party leader with the challenger or keep him based on the anticipated election results. In particular, the relative valence of leaders will determine their actions. Note that a party leader who defects from the party line will run in the general election with a party platform corresponding to his preferred policy (i.e., $X_R = X_{R1}$, and a party leader who remains loyal to the status quo policy will run in the general election with a party platform corresponding to the median party member’s preferred policy (i.e., $X_R = X_{RM}$).

To summarize, the sequence of the game is as follows:

1. The party leader decides to defect from the party line, in which case $x = X_{R1}$ becomes the party’s policy or follow the party line, in which case $x = X_{RM}$ remains as the party’s policy.

2. Party members decide whether to retain him or replace him with the challenger.

3. The selected candidate fights in the general elections as outlined above.

Below, I analyze the possible outcomes based on the relative valence of the leaders. The appropriate solution concept for this dynamic game of complete information is sub-game
perfect equilibrium (SPE).

**Proposition 2**

(2.1) The party leader will defect from the party line and he will be kept when

\[ \pi_{R1} \geq \frac{A[(|X_M| - |X_R^2|)(1 - \pi_L) - (|X_M| - |X_L|)\pi_L]}{|X_{R2} - |X_{R1}|}(1 - \pi_L) = \pi^*_R \]

(2.2) The party leader will be indifferent between defecting and not defecting from the party line and he will be replaced anyway by the challenger when

\[ \pi_{R1} \leq \frac{A[(|X_M| - |X_R^2|)(1 - \pi_L) - (|X_M| - |X_L|)\pi_L]}{|X_{R2} - |X_{R1}|}(1 - \pi_L) = \pi^{**}_R \]

(2.3) (a) The party leader will defect from the party line and he will be replaced by the challenger when

\[ \frac{A\eta(|X_R1 - X_R2| - |X_M|) + \pi_L(|X_R1 - X_M| - |X_R1 - X_L|) + \frac{1}{2}(1 - \pi_L)}{(1 - \pi_L)\eta|X_{R1}| - \frac{1}{2}} \leq \pi_{R1} < \pi^{**}_R \]

(b) The party leader will follow the party line and he will be kept when

\[ \pi^{**}_R \leq \pi_{R1} < \frac{A\eta(|X_R1 - X_R2| - |X_M|) + \pi_L(|X_R1 - X_M| - |X_R1 - X_L|) + \frac{1}{2}(1 - \pi_L)}{(1 - \pi_L)\eta|X_{R1}| - \frac{1}{2}} \]

The formal derivations of the equilibria are given in the Appendix.

In all these equilibria, \( A \) indicates the additional probability that the party leader replacement has high valence compared to the probability that the party leader has high valence. At a minimum, when there is a leader replacement in the governing party, party members think of the new leader as being at least as qualified as the outgoing leader. (2.1) corresponds to the situation in which the party leader has a high valence advantage, which results in his retention even if he defects from the party line (**High Valence Case**). Thus, the leader will defect from the party line knowing that he will be kept. As expected, this equilibrium is more likely to occur as his valence increases; that is, he will be freer to move the party’s
policy to where he wants, but the party will keep him because of his high chance of winning in the general election.

(2.2) corresponds to the case in which the party leader has a very low valence compared to the leader of the opposition party, which will result in his replacement even if he does not defect from the party line (Low Valence Case). The party leader may therefore make policy decisions not supported by the party members anticipating that he will be replaced anyway by his challenger in the party, who has more chance to win in the general election. The party leader will be more likely to be replaced by a rival faction leader within the party as his valence decreases.

As the non-leadership faction leader becomes more extreme, the median party member has less to benefit from a leader replacement and therefore will be more likely to keep the current party leader even if he defects from the party line. Likewise, the party leader is more likely to be kept if a leader replacement conveys minimal benefit to party members in terms of additional probability that the new leader has high valence. In contrast, an extreme opposition party makes the party leader’s retention less likely. These comparative statics results are summarized in the following proposition:

**Proposition 3.** The probability of replacing the party leader even if he follows the party line decreases with an increase in $X_{R2}$ and increases with an increase in $X_L$ and $A$, and a decrease in his valence, $\pi_{R1}$. Likewise, the probability of keeping him even if he defects from the party line increases with an increase in $X_{R2}$ and decreases with an increase in $X_L$ and $A$, and a decrease in his valence, $\pi_{R1}$.

(2.3) corresponds to the situation in which the median party member can credibly threaten to replace the party leader (Intermediate Valence Case). In particular, the party leader will be replaced if he makes policy decisions contrary to the preferences of his party
members, but he will be kept if he follows the party line. As in the previous two cases, in this case the ideological distance between political parties in the system exerts an influence on the likelihood of retention or replacement of the leader of the government party. The probability of defection increases especially when the distance between the incumbent party and the opposition party platform increases and this is valid as long as \( \pi_L > 1 - \frac{1}{2|X_R1|\eta} \).

This implies that, when the stakes of being in government are high and the incumbent party leader is uncertain that his party will win at the general election (a high \( \pi_L \)), he will be more likely to defect from the party line (less likely to follow the party line), hence increasing the probability of his replacement (decreasing the probability of his retention). This is summarized in the following proposition:

**Proposition 4.** The probability that the party leader defects from (follows) the party line and hence is replaced (kept) increases when the party system polarization increases, and the opposition party leader has a relatively high (low) valence.

Put differently, polarization between the two major parties in the system increases the effect of a marginal impact of a valence decrease on the probability of replacement especially when the challenger has a high chance of winning. This results from the fact that as polarization increases and given a charismatic opposition leader, the party leader will be more likely to be replaced by his party members. The party leader, in turn, will defect from the party line and be replaced by a faction leader who has a higher probability of winning due to his higher valence. This implies that, when party leaders value policy enough and they think that their opposition party leader has a high valence compared to theirs, they may in effect voluntarily relinquish their position to a strong intra-party challenger. If, on the other hand, the party leader follows the party line and keeps his position, it is highly likely that the opposition party will win the general election, and the implemented policy will be
further away from the party leader's preferred policy.

If the opposition party leader has a relatively low valence, the party leader knowing that he has a high chance of keeping the prime ministerial position is more likely to refrain from making policy decisions that are not supported by his party members, resulting in lower (higher) probability of replacement (retention) for the party leader. If he moves the policy, precipitating his replacement, the general election will determine the winning party and he will surrender his chance of holding the prime minister position.

Combined with Proposition 3, this leads to the following hypothesis to be tested in the next section:

*The Leadership (De)Selection Hypothesis:* A decrease in the valence of the party leader (hence the prime minister) will increase the probability of his replacement, and this effect should be stronger as the policy distance between the government party and the main opposition party as well as the valence of the opposition party leader increase.

## 3 Data and Empirical Model

The leadership (de)selection model makes predictions specifically for single-party governments. Therefore, to test the first hypothesis derived from the model, I gathered a dataset on leadership change and leadership retention in single-party governments in 12 advanced industrialized democracies comprising the electoral periods between 1960 and 2005.\(^{16}\)

I coded all instances of government formation. It is worth noting that following the definition by Woldendorp, Keman, and Budge (2000), government coding encompasses any administration that is formed after an election and continues in the absence of (a) a change of prime minister, (b) a change in the party composition of the cabinet, or (c) resignation in an inter-electoral period followed by re-formation of the government with the same prime

\(^{16}\)The countries in the dataset are Australia, Austria, Canada, Denmark, Finland, Germany, Ireland, Italy, New Zealand, Norway, Sweden and United Kingdom.
minister and party composition. Subsequently, each observation in the dataset is a change that occurs in an inter-electoral period, either immediately after an election took place or in the middle of the electoral period. While most inter-electoral periods which involve a change of government contain 2 governments, they may sometimes contain 5 or 6 governments as in the case of Italy. I identified a total 136 single-party governments, of which 93 enter the analysis. These are the governments that have as their head either the same prime minister of the outgoing government or a new prime minister from the party of the outgoing prime minister. My classification of these 93 cases returned 27 cases of government formation accompanied with a change in leadership (i.e., a new prime minister from the same party) and 66 cases of government formation in which the outgoing prime minister could have lost his position in the party, but he did not and therefore is re-instated as prime minister.

It is worth mentioning some of the practical problems associated with determining which of these 27 government formation instances resulted from a leader replacement in the governing party. After all, a party leader can be replaced by a new leader following the death or deteriorating health of the former. Besides, if a prime minister dies in office, there is often an acting prime minister that replaces him temporarily. When the acting prime minister is later replaced by an elected prime minister, the replacement of the prime minister does not count as a valid case for my purposes. The cases included in the analysis, however, were not as

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17 By restricting the analysis to these cases, I consider all instances of government formation where a new government is formed by the outgoing party. In some cases, the government is formed following the replacement of the leader of the outgoing government party, and in some other cases by the same leader of the outgoing government party. I, thereby, overcome the problem of case selection bias and subsequently differentiate between cases in which a prime minister replacement could have taken place, but the government party kept the old leader, and cases in which a prime minister replacement took place in the government party.

18 I do not account for changes in the party leadership of the outgoing prime minister if the new government is formed by a new prime minister from a different party, since those governments are not qualified to enter my analysis in the first place. After all, these cases are uninteresting because we do often observe a change in the leadership of a party losing an election. I am particularly interested in understanding the conditions under which members of the prime minister’s party decide to replace him prior to elections.

19 Of all the 136 single-party governments that underwent a leader replacement only 4 of them fall in the category of replacement unrelated to intra-party politics. The 27 government formation cases resulting from a leader replacement in the governing party therefore exclude these 4 cases that are unrelated to intra-party politics.
easy to determine. *Keesing’s Record of World Events*, the main source used to construct the dataset, rarely refers explicitly to intra-party politics as the cause for the resignation of the prime minister. In these cases, there is often an ongoing opposition within the party and a faction leader ready to challenge the prime minister. In other cases, the prime minister resigned either because of “health reasons” or “a desire to spend more time with the family” or some other publicly announced reason, which by all contemporary accounts, was not the “real” reason. I coded all such “suspected” cases as change in government due to prime minister replacement by party members.

Another important practical problem relates to the measurement of valence of prime ministers. As stated earlier, conceptually valence parameter takes into account all non-policy factors that contribute to a politician’s success. These include, among others, competence, experience, credibility, charisma, and better name recognition. Empirically, the ideal measure for valence would therefore include, for instance, the level of education if the source of valence is taken to be competence, jobs held in the bureaucracy prior to holding office if the source of valence is taken to be experience, a track record of kept promises if the source of valence is taken to be credibility, a survey asking people how charismatic they perceive their party leader in comparison to other party leaders if the source of valence is taken to be charisma, and the number of times the name of a leader appears in the media if the source of valence is taken to be better name recognition. Since valence usually implies several of these sources at the same time what is needed is a comprehensive measure of valence independent of policy. This, however, is really hard to get and to my best knowledge so far has not been done by anyone.

Notwithstanding the difficulty in coming up with a good measure of valence, several proxies have been suggested in the literature. In particular, it has been argued that many of these sources of valence, such as better name recognition and constituency service are
associated with incumbency advantage (Groseclose 2001). Accordingly, it is assumed that incumbents are expected to have a valence advantage compared to their opponents who have usually less media coverage and constituency service. It has also been argued that members of the party that is given credit for the strength of the economy possess a valence advantage (Butler and Stokes 1969; Fiorina 1977). This latter measure, while may not be perfectly independent from policy position, has been widely used in the economic voting literature.\footnote{For the difference between economy as a valence issue and economy as a policy position issue see, for instance, Stokes 1963, p.373; Lewis-Beck and Nadeau 2011} Accordingly, it can be argued that worsening economy is associated with deteriorating valence images of party leaders, while good economic conditions are associated with improved valence images.

To test the first part of my hypothesis, I need data only on the valence of the prime minister. As a first attempt, I rely on the strength of the economy to make inferences about this. Using the strength of the economy as a proxy for valence and measuring the impact of this on party leader replacement makes the current model a variant of the economic voting model which states that voters tend to punish their government when the economy is bad and reward their government when the economy is good.\footnote{It is worth noting that it is assumed here that any change in the strength of economy is seen as the success (or failure) of the party leader and not the whole party.} However, below, to cross-validate the robustness of this measure I also use an alternative measure of valence that looks at the approval ratings of the governing party and the opposition party. The point is that while the measurement of valence is problematic, the results I present below are robust to these different measures that I use.

The first part of the hypothesis states that valence-decreasing factors increase the likelihood of replacement of the prime ministers by their party members, the marginal effect of which increases with an increase in the distance between the government party and the main opposition party. Given the dichotomous nature of my dependent variable, I use a
probit model with clustered standard errors to test the leadership (de)selection hypothesis. Accordingly, the latent variable $PM_{Replacement}^*$ measures the underlying propensity of party members to replace the prime minister by replacing their leader. The model specification used to test the hypothesis is as follows:

\[
PM\ Replacement^* = \beta_0 + \beta_1 \Delta Unemployment + \beta_2 Polarization + \beta_3 \Delta Unemployment * Polarization + \varepsilon
\]

$\Delta Unemployment$ is the change in the unemployment rate at the time of replacement of prime minister compared to the unemployment rate at the previous year - as I have just argued, used as a proxy measure for prime ministerial “valence” in the hypothesis. The data on unemployment rate is from Nickell and Nunziata (2001) up until 1995 and is based on OECD standardized rates. For the years after 1995, I supplemented the data from Nickell (2006) which extends the original dataset using data taken from OECD labour market statistics database. The change in the unemployment rate ranges from -2 to 2.6, with positive values indicating a downgrading in the economy, and negative values indicating an improvement of the economy.

$Polarization$ indicates the distance between the government party and the main opposition party in the system measured as the absolute value of the difference of their policy positions.\(^{22}\) I drew on data from the Comparative Manifesto Project (CMP) for the party positions in the left-right dimension (Klingemann et al 2006). These data include information for each party on the proportion of manifestos dedicated to several issues. The coders

\(^{22}\)It is worth noting that this not a measure of party system polarization as it has been widely employed in the literature which takes into account all the parties in the system. Remember that the leadership (de)selection model makes prediction based particularly on the policy position of the main opposition party. In my dataset, this party is often the next largest party in the system since the prime minister’s party is most likely to be the largest party. In cases where the prime minister’s party is the next largest party or a rather small party, the main opposition party is the largest party in the system.
match up quasi-sentences in the policy program with a category of policy (e.g. the environment, international relations, welfare, etc.) and take the percentages of each category as a measure of the party’s priorities. The original CMP data published in 2001 has been extended to incorporate a wide range of party manifestos by 651 parties in 51 countries in the advanced industrialized countries as well as Eastern Europe. I used the left-right index from the extended dataset, constructed by the authors, measuring the overall left-right ideology for each party’s manifesto in each election year. The left-right index ranges from -100 to +100 and for which high numbers represent a more right-wing emphasis. While the data has been widely used by scholars, the estimates of policy points are problematic because of the lack of estimates of uncertainty, implying that the differences in policy that we observe could be random noise and not real policy differences. Benoit et al. (2009) compute error estimates for the CMP dataset, and provide a corrected version of the dataset with bootstrapped standard errors for all key estimates. The following statistical analysis uses this updated version of the CMP data. The polarization variable that measures the distance between the government party and the main opposition party on the left-right dimension ranges from 0.93 to 89.4. Note that this variable is available only for the election years. Nevertheless, the unit of analysis in my dataset is a government. As there is often more than one government formed in the inter-electoral period, I have calculated the polarization variable for the governments formed in-between election years. More specifically, for a given government, I assumed the policy positions of the parties to be identical to their policy announced at the nearest election.23

The interaction term $\Delta Unemployment \times Polarization$ is included in the model specification in order to measure the impact of a change in valence (measured by unemployment rate) on party minister replacement, conditional on the location of the main opposition party. The

23In an alternative coding of the polarization variable for a given government, I interpolated the data points. In particular, I assumed the policy position of the parties to be the average of their policy positions in the nearest two elections. The results were similar in both specifications.
marginal effect of unemployment on the likelihood of replacement of the prime minister is captured by \((\partial PM\ Replacement^*/\partial \Delta Unemployment = \beta_1 + \beta_3 Polarization)\). The hypothesis predicts that this quantity should be positive, and that it should increase when the polarization between the government party and the main opposition party increases.

4 Results and Interpretation

Table 1 reports the estimates of the probit model with robust standard errors. The coefficient on the \(\Delta Unemployment\) variable is in the expected direction and significant at the 95 percent level. Both the \(Polarization\) variable and the interaction variable have a negative and insignificant sign. This should not lead the reader to conclude that unemployment does not have a conditional effect on the probability of the replacement of the prime minister. First, as Benoit et al. (2009) note, the CMP data on left-right party positions are noisy, and the use of noisy independent variables in regressions such as those I estimate here may result in attenuation bias. This lowers the size of estimated effects and can generate false negatives on the significance of key coefficients. Second, as Brambor, Clark and Golder (2006) show, it is quite possible for the marginal effect of an independent variable on the dependent variable to be significant for substantively relevant values of the modifying variable even if the coefficient on the interaction term is insignificant. They make the compelling argument that what matters here is whether the marginal effect of unemployment is ever significant and not whether any specific coefficient is individually significant.24

[Table 1 about here]

Figure 1 clearly illustrates this point. Indeed, one can get meaningful interpretation by plotting the marginal effect of a unit increase in unemployment from its mean on the probability

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24 More specifically, if the covariance terms in the standard error of the marginal effect are negative, it is entirely possible for the effect of unemployment to be significant even if the coefficients are insignificant.
of prime minister replacement for a wide range of values of system polarization. In Figure 1, the solid line indicates how this marginal effect changes with the level of polarization. The two-tailed 95 percent confidence intervals around the line indicate the areas under which this effect is statistically significant. The marginal effect is statistically significant when the upper and lower bounds of the confidence interval are both above or below the zero line. Accordingly, one standard deviation (0.73) point increase in unemployment rate differential from its mean of 0.1 increases the probability of prime minister replacement when the distance between the prime minister party and the main opposition party is between 0 and 40. What is important in this context is that 80 percent of the cases in the sample fall in this range.

[Figure 1 about here]

Figure 1 also shows that, at all levels of polarization up until polarization measure of 65, a decrease in valence, measured here as increased unemployment rate, increases the likelihood of prime minister replacement in single-party governments, however, unlike the prediction of the leadership replacement hypothesis, this positive effect decreases with polarization. This, in turn, implies that the hypothesis is only partially supported when I use the unemployment data as a proxy for the valence of the prime minister.

As a remedy and to take into account the second part of the hypothesis, in an alternative specification, I looked at the marginal effect of a decreasing approval rating of the prime minister on his replacement when the party system is polarized. Using public opinion data I could also analyze the modifying effect of a low and high approval rating of the opposition party leader. As I noted above, a time-series cross-sectional data on prime ministerial approval ratings distinct from the approval ratings of the governing party is needed.

25 A similar interpretation of a probit model with interaction variables is presented in Golder (2005).
26 Note that the frequency distribution of polarization variable indicates that only 4 of the cases (less than 5 percent) fall in the region beyond this point.
for all the single-party governments included in my dataset. However, it is usually difficult to differentiate between the approval rating of the prime minister and the governing party. Moreover, time-series cross-sectional data exists for only a few governments in my dataset, hence making it impossible to draw any inference.\footnote{27}

With these caveats in mind, I collected data on approval ratings of all single-party governments as well as main opposition party for which there exist comparable public opinion data. This exercise, however, returned very few data points making it impossible to do any statistical analysis. Since the implications of the theory modeled in the context of single-party governments extend beyond this type of government, I increased the range of governments by including approval ratings of all governing parties, single-party or coalition. Thus, I estimated the model parameters with public opinion data, for 10 European countries in my dataset, for the years between 1975 and 2002 (Austria, Finland, Sweden have shorter ranges) using Euro-Barometer surveys.\footnote{28} For all these governments, in order to have a measure of deteriorating approval ratings I calculated the change in the approval rating of governing party between the previous election and the most recent public opinion poll conducted immediately prior to the formation of a new government. Higher values imply higher decrease in approval ratings of the governing party. I also included in the analysis the most recent approval rating of the main opposition party and a triple interaction between the approval ratings of the governing party, approval ratings of the opposition party, and polarization variables in order to take into account the marginal effect of decreasing approval ratings of the governing party for high and low approval ratings of the opposition party. This exercise

\footnote{27}Another difficulty with using approval ratings data is to disentangle the cause from the effect. In other words, conceptually it is hard to find out whether voters intend to vote for a particular candidate because of his or her increasing approval ratings, or the candidate’s approval ratings increase because more people are intending to vote for him or her.

\footnote{28}I downloaded all the Euro-Barometer original files for Austria, Belgium, Finland, Germany, Ireland, Italy, Luxembourg, Netherlands, Sweden, and the United Kingdom from the following link: http://zacat.gesis.org/webview/index.jsp. Note that not all Eurobarometer polls contain the “vote intention” question.
returned a total of 81 governments, 58 of which have as their head either the same prime minister of the outgoing government or a new prime minister from the party of the outgoing prime minister.

I used the following model specification to test the leadership hypothesis:

\[
PM\ Replacement^* = \beta_0 + \beta_1 \Delta PM\ Approval + \beta_2 Polarization \\
+ \beta_3 Opposition\ Approval \\
+ \beta_4 \Delta PM\ Approval*Polarization \\
+ \beta_5 \Delta PM\ Approval*Opposition\ Approval \\
+ \beta_6 Polarization*Opposition\ Approval \\
+ \beta_7 PM\ Approval*Polarization*Opposition\ Approval + \varepsilon
\]  

The estimates of the probit model with robust standard errors are reported in Table 2. The coefficient on the \(\Delta PM\ Approval\ Rating\) variable is in the expected direction and significant at the 1 percent level.

Figure 2 plots the marginal effect of a unit decrease in the PM approval rate on the probability of his replacement for a wide range of values of party system polarization. The upper panel shows the marginal effect of a unit decrease in the PM approval rate on the probability of his replacement when the opposition party’s approval rating is set to a low value (0.1), and the lower panel shows the same marginal effect when the opposition party’s approval rating is set to a high value (0.4).\(^{29}\) The solid lines indicate how the marginal effect changes with the level of polarization. The two-tailed 95 percent confidence intervals around the lines indicate the areas under which this effect is statistically significant. This marginal effect is

\(^{29}\)Note that the opposition party’s approval rating ranges between 0.1 and 0.49.
statistically significant only when the upper and lower bounds of the confidence intervals are both above or below the zero line. In both cases, one standard deviation point decrease in PM approval rating from 0.05 (its mean being around 0) decreases the probability of prime minister replacement for low values of party system polarization, and increases the probability of prime minister replacement for high values of party system polarization.

[Figure 2 about here]

Substantively, when we decrease the PM approval rating by one standard deviation after holding the polarization variable around it mean (25) and setting the approval rating of the opposition party at a high value (0.4), prime ministers are 26 percent more likely to be replaced by their party members. On the other hand, when we increase the polarization variable by one standard deviation, a decrease in PM approval rating by one standard deviation increases the probability of replacement of prime ministers by 29 percent, hence corroborating the predictions of my model.

It is noteworthy that the theoretical model is predicting polarization variable to exert a positive effect on the probability of prime minister replacement especially when the opposition party candidate’s valence is high. In order to test this claim, I calculated the marginal effect of a decrease in the PM approval rating by one standard deviation holding the polarization variable around its mean and after setting the approval rating of the opposition party at a low value. The results show that in this scenario, prime ministers are 17 percent more likely to be replaced by their party members. As predicted, this percentage is lower than 26 percent, calculated above for the case of high approval rating for the opposition party. This finding in turn lends full support to my hypothesis.
5 Conclusion

This paper aims at contributing to our understanding of political competition without assuming parties to be unitary actors. Considering parties as political systems in their own right and studying internal dynamics, in turn, allowed me to shed light on the (de)selection of the party leader- and hence of the prime minister.

In the theoretical model I focused particularly on single-party majority governments. The reason for this is two-fold: First, this allowed me to single out the constraints posed on party leaders by party factions, and consequently to treat one-party majority governments as an important area of application for models of coalition bargaining. Second, single-party majority governments set the dynamics of intra-party politics in the context of inter-party competition, since the replacement of the party leader results in the immediate formation of a new government, and also determines the candidate who will compete with other parties in the general election to form a new government and hence become prime minister.

Since in the theoretical model I focused on leadership (de)selection within the framework of single-party majority governments, I first tested the hypothesis derived from the theoretical model in a comparative study that drew on data on all single-party governments, for which the prime minister in the subsequent government is from the same party as the prime minister of the outgoing government. While in some cases the prime minister is replaced by a new leader from the prime minister’s party, in some other cases the same prime minister is reinstated even though he could have been internally replaced. In this first analysis, I used unemployment data as a proxy for valence of the prime minister. I also tested the model’s predictions on a dataset gathering data on both single-party and coalition governments and using an alternative measure of valence, namely the approval rating of the government and opposition parties.

The results of the statistical analyses support the hypothesis that prime ministers are
more likely to be replaced by an internal challenger when their valence is on decline. Further-
more, polarization between the government party and the main opposition party exerts a reinforcing effect on the probability of replacement. I argued that this result follows especially when the valence of the opposition party leader is relatively high because the fear of losing in the general election gives incentives to party members to replace their leader with a challenger who has a higher chance of winning. This also makes the outgoing party leader better-off. Therefore, to avoid a policy that is too far from his ideal point, the party leader may in effect be willing to relinquish his position to a strong intra-party challenger.

Due to the lack of data on valence images of leaders which are completely independent of their policy, this paper relied on deteriorating economic conditions and decreasing approval ratings as proxies for decreased valence for the PM. While the current results cross-validated by these measures support my hypothesis, further tests for robustness using other measures of valence are needed. Furthermore, the dataset used in the empirical analysis is selecting on party leadership changes that result in the formation of the government by the same party. I leave for future work the analysis of all instances of party leader replacement in governing parties, even if the subsequent government is not formed by the same party following the next election. This analysis would in turn help us understand how voters react to a change in party leadership.
Appendix

Formal Derivation of Equilibrium

Proposition 1 Theorem 1 in Serra (2011)

Proposition 2

Proof. First, I calculate the distribution of possible values of $\delta$ with $\delta \equiv v_R - v_L$. These values are given in Serra (2011)

$$\delta = \begin{cases} 
1 & \text{with probability } (1 - \pi_L)\pi_{R1} \\
0 & \text{with probability } \pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1}) \\
-1 & \text{with probability } \pi_L(1 - \pi_{R1})
\end{cases}$$

which, according to Proposition 1 and given the condition $X_{R1}, X_{RM}, -X_L < 1$, results in the following equilibrium platforms:

$$x^* = \begin{cases} 
X_{R1} & \text{with probability } (1 - \pi_L)\pi_{R1} \\
X_M & \text{with probability } \pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1}) \\
X_L & \text{with probability } \pi_L(1 - \pi_{R1})
\end{cases}$$

Given the equilibrium platforms at the general election phase, the payoffs for the party leader and the party median are as follows. Note that these payoffs are calculated for each of the following four cases, in which the party leader defects or does not defect from the party’s previously agreed policy by moving the policy to his preferred policy position, and the median party member keeps him or replaces him with the challenger, $R2$.

$$EU_{R1}(\text{defect | kept}) = (1 - \pi_L)\pi_{R1}$$

$$+ \left( \frac{1}{2} - \eta |X_{R1} - X_M| \right) \left[ \pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1}) \right]$$

$$- \eta |X_{R1} - X_L| \pi_L(1 - \pi_{R1}) \quad (1)$$
\[ EU_{R1} \text{ (don't defect | kept)} = (1 - \eta|X_{R1}|)(1 - \pi_L)\pi_{R1} \]
\[ + \left( \frac{1}{2} - \eta|X_{R1} - X_M| \right) [\pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1})] \]  
\[ - \eta|X_{R1} - X_L|[\pi_L(1 - \pi_{R1})] \]  
\[ (2) \]

\[ EU_{R1} \text{ (defect | replaced)} = EU_{R1} \text{ (don't defect | replaced)} = \]
\[ - \eta|X_{R1} - X_{R2}|(1 - \pi_L)(\pi_{R1} + A) \]
\[ - \eta|X_{R1} - X_M|[\pi_L(\pi_{R1} + A) + (1 - \pi_L)(1 - (\pi_{R1} + A))] \]
\[ - \eta|X_{R1} - X_L|[\pi_L(1 - (\pi_{R1} + A))] \]  
\[ (3) \]

\[ EU_{RM} \text{ (keep | defect)} = -|X_{R1}|(1 - \pi_L)\pi_{R1} \]
\[ - |X_M|[\pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1})] \]
\[ - |X_L|\pi_L(1 - \pi_{R1}) \]  
\[ (4) \]

\[ EU_{RM} \text{ (keep | don't defect)} = -|X_M|[\pi_L\pi_{R1} + (1 - \pi_L)(1 - \pi_{R1})] \]
\[ - |X_L|\pi_L(1 - \pi_{R1}) \]  
\[ (5) \]

\[ EU_{RM} \text{ (replace | defect)} = EU_{RM} \text{ (replace | don't defect)} = \]
\[ - |X_{R2}|(1 - \pi_L)(\pi_{R1} + A) \]
\[ - |X_M|[\pi_L(\pi_{R1} + A) + (1 - \pi_L)(1 - (\pi_{R1} + A))] \]
\[ - |X_L|\pi_L(1 - (\pi_{R1} + A)) \]  
\[ (6) \]
In calculating the above payoffs, it is assumed that a defecting party leader will run in the general election with a party platform corresponding to his preferred policy (i.e., $X_R = X_{R1}$), and a non-defecting party leader will run in the general election with a party platform corresponding to the median party member’s preferred policy (i.e., $X_R = X_{RM}$). In equations (3) and (6), $A$ indicates the additional probability that the leader replacement has high valence compared to the probability that the party leader has high valence, in that party members think that the probability that the new leader has more valence than the outgoing leader; that is, they perceive as if $\pi_{R2} > \pi_{R1}$.

The following three lemmas follow from the analysis:

**Lemma 1** The party leader will be kept even if he defects from the party line when $(4) > (6)$ and $(5) > (6)$, and the party leader will defect when $(1) > (2)$, which is always true.

**Lemma 2** The party leader will be replaced even if he does not defect from the party line when $(6) > (4)$ and $(6) > (5)$, and the party leader is indifferent between defecting and not defecting.

**Lemma 3** The party leader will be replaced if he defects from the party line, and he will be kept if he follows the party line when $(6) > (4)$ and $(5) > (6)$, and the party leader defects if $(3) > (2)$ and does not defect if $(2) > (3)$.

These lemmas are used in the following proposition, where it is assumed without loss of generality that $|X_L| > |X_{R2}|$, that is, the median party member is closer to the non-leadership faction leader than the opposition party leader:

**Proposition 2:**

(1) The party leader will defect from the party line and he will be kept when

$$\pi_{R1} \geq \frac{A[(|X_M| - |X_{R2}|)(1 - \pi_L) - (|X_M| - |X_L|)\pi_L]}{(|X_{R2}| - |X_{R1}|)(1 - \pi_L)} = \pi_{R1}^*$$

(2) The party leader will be indifferent between defecting and not defecting from the party line and he will be replaced anyway by the challenger when
\[ \pi_{R1} \leq A\left(\frac{|X_M|-|X_{R2}|(1-\pi_L)-(|X_M|-|X_L|)\pi_L}{|X_{R2}|(1-\pi_L)}\right) = \pi_{R1}^* \]

(3) (a) The party leader will defect from the party line and he will be replaced by the challenger when

\[
\frac{A\pi_L(|X_{R1}-X_{R2}|(|X_{R1}-|X_{R1}|)+\pi_L(|X_{R1}-X_M|-|X_{R1}-X_L|)+\frac{1}{2}(1-\pi_L)}{(1-\pi_L)|X_{R1}|-\frac{1}{2}} \leq \pi_{R1} < \pi_{R1}^* 
\]

(b) The party leader will follow the party line and he will be kept when

\[
\pi_{R1}^* < \pi_{R1} < \frac{A\pi_L(|X_{R1}-X_{R2}|(|X_{R1}-|X_{R1}|)+\pi_L(|X_{R1}-X_M|-|X_{R1}-X_L|)+\frac{1}{2}(1-\pi_L)}{(1-\pi_L)|X_{R1}|-\frac{1}{2}}
\]

Proposition 3.

Proof.

Differentiating \(\frac{A\pi_L(|X_{R1}-X_{R2}|(|X_{R1}-|X_{R1}|)+\pi_L(|X_{R1}-X_M|-|X_{R1}-X_L|)+\frac{1}{2}(1-\pi_L)}{(1-\pi_L)|X_{R1}|-\frac{1}{2}} = \pi_{R1}^*\) with respect to \(X_{R2}\) gives:

\[
\frac{\partial \pi_{R1}^*}{\partial X_{R2}} = \frac{-A(1-\pi_L)^2(|X_{R2}| - |X_{R1}|)}{[(|X_{R2}| - |X_{R1}|)(1-\pi_L)]^2} < 0
\]

Differentiating \(\pi_{R1}^*\) with respect to \(X_L\) gives:

\[
\frac{A\pi_L}{(|X_{R2}|-|X_{R1}|)(1-\pi_L)} > 0
\]

Differentiating \(\pi_{R1}^*\) with respect to \(A\) gives:

\[
\frac{(|X_M|-|X_{R2}|)(1-\pi_L) - (|X_M|-|X_L|)\pi_L}{(|X_{R2}|-|X_{R1}|)(1-\pi_L)} > 0
\]

All these imply that the probability of keeping the party leader even if he defects from the party line increases with an increase in \(X_{R2}\), and decreases with an increase in \(X_L\) and \(A\). Differentiating \(\pi_{R1}^{**}\) with respect to \(X_{R2}, X_L,\) and \(A\) gives results also in the same direction,
yet, their interpretation is the opposite of the previous case. In particular, the probability of replacing the party leader even if he follows the party line decreases with an increase in $X_{R2}$, and increases with an increase in $X_L$ and $A$.

Moreover, the party will decide to keep the party leader with the challenger as long as $\pi_{R1} \geq \pi^*_{R1}$ and replace him if $\pi_{R1} \leq \pi^*_{R1}$. The probability of replacement (retention) therefore increases (decreases) with a decrease in $\pi_{R1}$.

**Proposition 4.**

**Proof.** The impact of party system polarization on the probability of defection and replacement is measured by the distance between $L$ and $RM$. Rearranging and differentiating 

$$A\eta[(1-\pi_L)(|X_{R1}-X_{R2}| - |X_{R1}-X_M|) + \pi_L(|X_{R1}-X_M| - |X_{R1}-X_L|)] + \frac{1}{2}(1-\pi_L)$$

with respect to $X_L$ gives:

$$\frac{A\eta \pi_L}{(1 - \pi_L) \eta |X_{R1}| - \frac{1}{2}}$$

(10)

which is positive when $\pi_L < 1 - \frac{1}{2|X_{R1}| \eta}$, in which case the party leader follows the party line and he is kept in return.
References


Table 1: PM Replacement by Party Members in Single-Party Governments, 1960-2005

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th></th>
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<tr>
<td>ΔUnemployment</td>
<td>0.823**</td>
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<td>Polarization</td>
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<td></td>
<td>0.663</td>
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<tr>
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<td></td>
<td>0.153</td>
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<tr>
<td>Constant</td>
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<td></td>
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<tr>
<td>N</td>
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<tr>
<td>Log likelihood</td>
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Dependent variable is 1 if the prime minister is replaced by a challenger from the same party, 0 otherwise. Robust standard errors are in parentheses; the observations are clustered by country * significant at 10% ** significant at 5%
Figure 1: Marginal effect of increasing unemployment rate differential on PM replacement
Table 2: PM Replacement by Party Members, 1975-2002

<table>
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<tr>
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<tr>
<td>ΔPM Approval</td>
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<tr>
<td>Opposition Approval</td>
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<td>ΔPM Approval*Opposition Approval</td>
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<tr>
<td>Log likelihood</td>
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</tbody>
</table>

Dependent variable is 1 if the prime minister is replaced by a challenger from the same party, 0 otherwise. Robust standard errors are in parentheses; the observations are clustered by country * significant at 10% ** significant at 5% *** significant at 1%
Figure 2: Marginal effect of decreasing approval ratings on PM replacement when the opposition approval ratings are low (upper panel) and high (lower panel)