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The cost of ruling, cabinet duration, and the "median-gap" model

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Abstract. In a recent article Paldam and Skott (1995) provide a theoretical explanation for an important empirical phenomenon in democratic countries: incumbent governments tend to lose votes. In this paper, I show that Paldam and Skott's theoretical explanation for this "cost of ruling" is potentially much stronger than they recognize. Specifically, when generalized in a straightforward way, their model explains not only the cost of ruling itself, but also a second well established empirical fact: that the longer an incumbent government has been in power, the more votes it loses. Further, this generalization of the model produces two additional empirical hypotheses that have not yet been tested in the empirical literature.

1. Introduction

In a recent article, Paldam and Skott (1995) provide a theoretical explanation for an important empirical phenomenon in democratic countries: that incumbent governments tend to lose votes. Their explanation is based on a median voter model that assumes parties are unable to converge completely to the position of the median voter. Consequently, some voters, centered on the median voter, find that their most preferred policies lie in the gap between the policy positions offered by the parties. Under reasonable assumptions about the way that parties are able to move policy between elections, Paldam and Skott show that some of these "median-gap" voters will always want to vote against the incumbent. The reason for this is that voters who prefer policies that lie between the positions of the parties will want an alternation in power so that the policies that obtain will, on average, be closer to their positions than if a there were no alternation in government. A very simple theoretical framework, then, elegantly accounts for the fact that governments usually lose votes.

In this paper, I show that Paldam and Skott's theoretical explanation for the cost of ruling is potentially much stronger than they recognize in their article. Specifically, I show that, when generalized in a straightforward way, the median-gap model explains not only the cost of ruling itself, but also a second well established empirical fact: that the longer an incumbent govern-

ment has been in power, the more votes it loses. In addition, I show that this generalization of the model produces two additional empirical hypotheses about the cost of ruling that have not yet been tested in the empirical literature. These hypotheses make specific predictions about how differences in the *expected* duration of cabinets and in the efficiency with which cabinets can make policy (i.e., how quickly incumbent cabinets can change the status quo policy) impact the size of the cost of ruling. In what follows in Section 2 I review the empirical evidence for the cost of ruling and its dependence on cabinet duration. In Section 3, I outline Paldam and Skott's theoretical model and review their main results. Following this, in Section 4 I suggest an intuitive way to incorporate the notion of government duration into their theoretical framework and show that the modified model implies that the cost of ruling will be greater for cabinets that last longer. Finally, in Section 5 I draw out the additional empirical implications mentioned above and conclude with a discussion of how those implications might be tested and how the model might be further generalized.

2. The empirical regularities

The *cost of ruling* has been estimated to be between 1.7% and 2.5% of the vote for the developed democracies (Paldam, 1991; Paldam and Nannestad, 1999; Powell and Whiten, 1993; Stevenson, 1997, 1998). In addition, this cost is generally constant across countries and over time. For example, in a sample of 282 elections in 19 established democracies over the post-war period, Paldam and Nannestad find that in every country, except for Germany, the average incumbent government lost votes. This cost, which averaged about 2.5% in the sample, was remarkably stable across countries and over time. Similarly, scholars who have estimated multivariate regression models in which the electoral performance of the government is the dependent variable have consistently found negative intercepts in samples of elections drawn from Western democracies. Further, these studies confirm that this negative incumbency effect is about 2% of the vote even after controlling for various economic and political influences (Powell and Whiten, 1993; Stevenson, 1997, 1998; Palmer and Whitten, 1999).

Although not as well known, a second empirical regularity has also emerged in studies of the cost of ruling: the size of the negative incumbency effect tends to increase with the length of time the incumbent cabinet has been in power. Again, Paldam and Nannestad provide the raw data, which shows that the average cost of ruling (as a percentage of the vote) is only –0.95% in governments that last less than one year, –0.88% in those that last between one and two years, –2.5% in those that list between two and three

years, –2.49% in those that last between three and four years, and –6.12% in those few governments that last longer than four years (few constitutions allow cabinets to govern more than four years without an election). Besides this evidence, Stevenson (1998) and Palmer and Whitten (1999) include cabinet duration as an independent variable in multivariate models of incumbent electoral performance and both find the variable to have statistically significant negative effects.

The empirical work on the cost of ruling is, thus, quite clear. Incumbent governments in the established democracies tend to lose votes and they lose more votes the longer they stay in office. In Sections 3 and 4 I show that the theoretical explanation for the cost of ruling that has been offered by Paldam and Skott (1995), the median-gap model, is easily extended in a way that allows it to account not only for the existence of a cost of ruling, but also for the fact that this cost is greater for longer durations. While this involves relaxing some of the assumptions of their original model, these changes are quite modest and leave the model almost completely intact. Consequently, I argue that we should upgrade our confidence in the median-gap model accordingly.

3. The "median-gap" model

The median gap model proposed by Paldam and Skott has two parties (or party blocks) competing for votes by adopting policies on a one-dimensional policy space.[1] Voters are assumed to have single-peaked preferences over the possible policies, with the median voter having ideal point μ. Unlike the traditional median voter model, Paldam and Skott assume that the two parties adopt distinct policy positions, α and β, where $\alpha < \mu < \beta$ (so α is the position of the Left party and β is the position of the Right party). The theoretical and empirical justifications for such and assumption are well known. These include partisan pressures, alienation of extreme voters, parties holding mixed preferences over policy and office, and the effects of partisan primaries (Downs, 1957).

Also different from the traditional median voter model, the authors assume that the winning party in an election can not immediately implement its full agenda (i.e., the policy position α or β). Instead, it takes time for a new incumbent party to move policy from the status quo to its announced policy position. Hence, following any election in which party j takes office, policy follows some time path, $x_j(t)$, along which policy moves from the status quo towards party j's ideal policy.

Figure 1 provides a representation of the kind of time path that Paldam and Skott had in mind. Of interest to us is the implicit assumption embodied in this graph (and the formal utility functions that follow) that the duration

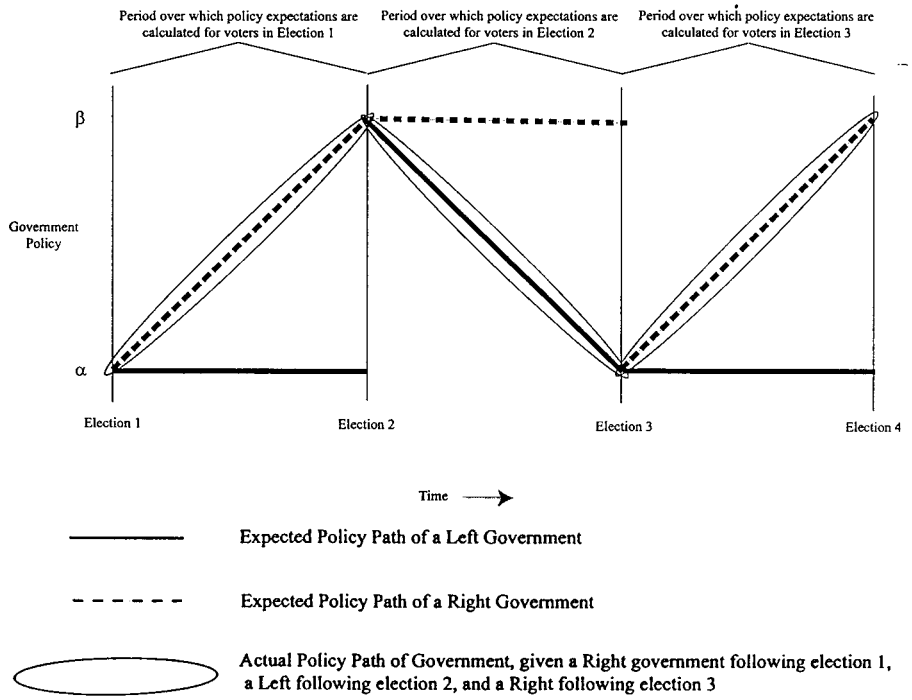


Figure 1.

of the inter-electoral period (the time between elections) is equal to the time it takes for policy to traverse the space between α and β. The status quo policy in any election, then, will always be either α or β. As we will see below, it is this assumption that robs Paldam and Skott's formulation of the median-gap model of its ability to speak to the question of cabinet duration. When we relax this implicit definition of the time between elections, however, the model can produce a clear hypothesis relating duration to the number of voters voting for the incumbent and opposition parties.

Given the time path that policy takes between elections, the voters' utilities for a given party at any time t is given by a loss function, $L(q_i - x_j(t))$, in which q_i is voter i's ideal point. At the time of the election, then, the voter must determine the total utility that she will derive from the policy path that she expects to obtain if each of the parties should win the current election. She votes for the party whose victory will give her the greatest utility (or the least loss). The voter's expected utility for a given party, j, in the election can thus be written as:

$$EU_t[j|q_i, x_j(t)] = \int_0^{\infty} L(q_i - x_j(t))e^{vt}dt \quad (1)$$

where v is the time preference.

To make the voter's inter-temporal maximization problem tractable, Paldam and Scott make some simplifying assumptions, some of which they relax in later parts of their paper. I discuss the issue of relaxing assumptions in a later section but, for now, stick with their simplest specification. In this specification they assume that the time path of policy is linear between elections and that during the inter-election period, policy traverses the whole space between α and β. This just means that at each election voters are choosing either to keep the policy at the status quo for the next period (i.e., at the position the incumbent announced in the previous election) or to change the policy (over the course of the next inter-electoral period) to the announced position of the other party. Further, Paldam and Skott assume that voters completely discount utility from the policy making that will occur following future elections and that the voter's loss function is quadratic. These assumptions lead to the following specification of the voter's expected utility for the different strategies available to her in any given election:

$$EU_i[\text{Right Vote}|q_i, \alpha, \beta, \text{Left Incumbent}] = \int_0^1 (q_i - (r(\beta - \alpha) + \alpha))^2 dt \quad (2)$$

$$EU_i[\text{Left Vote}|q_i, \alpha, \beta, \text{Left Incumbent}] = \int_0^1 (q_i - \beta)^2 dt \quad (3)$$

$$EU_i[\text{Right Vote}|q_i, \alpha, \beta, \text{Right Incumbent}] = \int_0^1 (q_i - \alpha)^2 dt \quad (4)$$

$$EU_i[\text{Right Vote}|q_i, \alpha, \beta, \text{Right Incumbent}] = \int_0^1 (q_i - (r(\beta - \alpha) + \beta))^2 dt \quad (5)$$

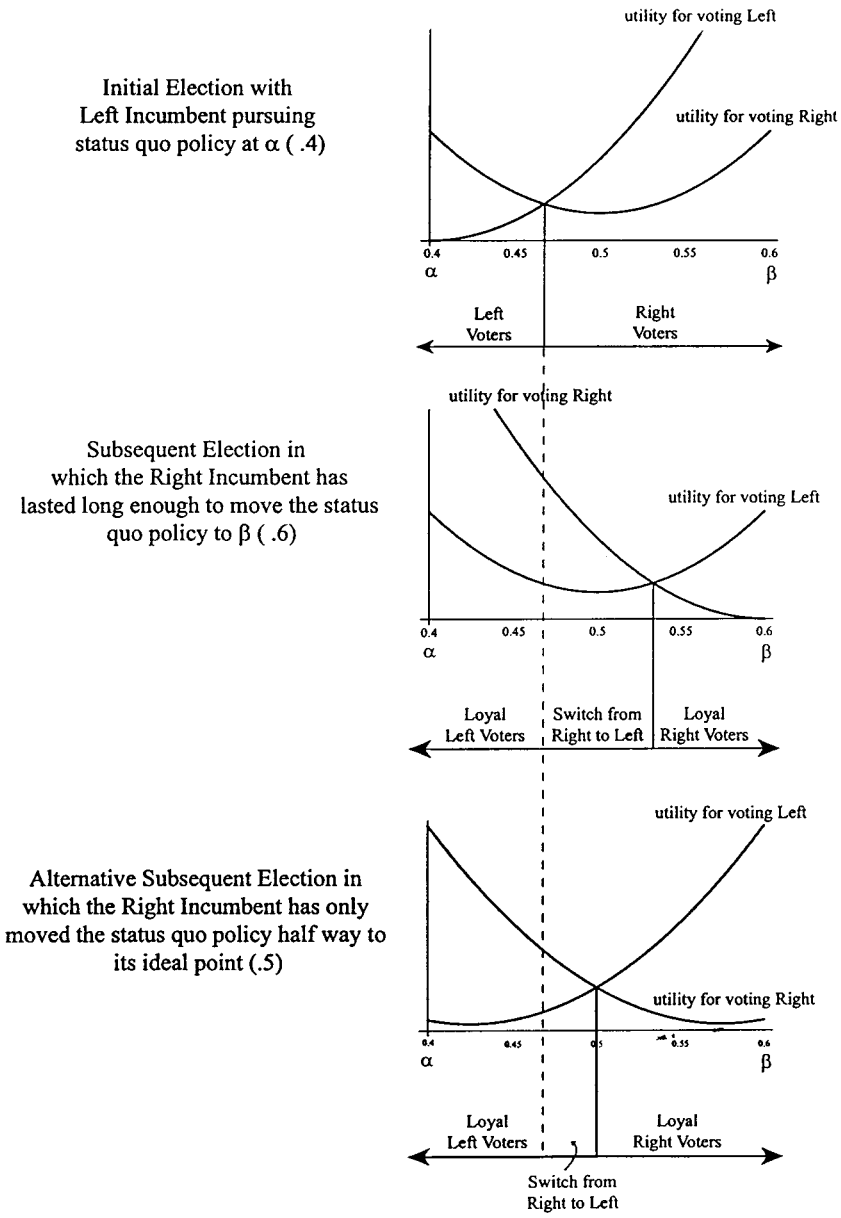
To determine what a utility maximizing voter should do in an election with a given incumbent, one can solve these integrals and compare them. Each one represents the utility that a voter with ideal point q_i expects to accumulate over the inter-election period, given a victory by either of the parties. Equations 2 and 5 (the utilities for voting against the Left and Right incumbents, respectively) are equivalent, given Paldam and Skott's assumptions.

The first two panels in Figure 2 graph these utility functions and illustrate that there will always be a group of voters, centered around the median voter, who want to change their votes in every election (ignore the last panel for now – we will return to it in Section 4). If we further assume that the incumbent is the party that won the vote of the median voter in the last election, then the desire of some voters to switch parties in every election corresponds to votes against the incumbent and thus produces a cost of ruling.

The median gap model was developed by Paldam and Skott in order to explain the cost of ruling and so the fact that it actually does so cannot itself provide a test of the model. A proper test of the model requires that it explain some additional empirical phenomenon that it was not designed specifically to address. In searching for such additional empirical implications, it seems reasonable to expect that a model that can account for the observed cost of ruling would also be able to account for the apparent dependence of this cost on the duration of the incumbent cabinet. As we will see below, however, the median-gap model as formulated currently, cannot provide such an explanation. What is needed then is a generalization of the model that continues to produce the cost of ruling result but that can also speak to the issue of cabinet duration. Further, if a correspondence with the empirical evidence is to provide any real support for the extended model, this model should not stray far from that of Paldam and Skott. Specifically, new evidence will only provide a proper test be of Paldam and Skott's median-gap model if it can be shown to be a special case of a more general model that includes a prediction about the relationship between the cost of ruling and cabinet duration (otherwise, we have simply created a different theoretical model – one specifically designed to explain the dual phenomena of a cost of ruling and its dependence on cabinet duration and so not testable by showing an empirical correspondence with them).

4. Government duration in the "median-gap" model

The idea that it takes time to move policy from one point to another is the most important assumption of the median-gap model. It is this assumption that drives some voters in the median gap to want to keep policy moving back and forth between the positions of the parties and so induces a cost of ruling. Fortunately, this assumption provides a natural way in which to investigate what the model implies about cabinets that have different durations. Specifically, if we suppose that governments of short duration would find it difficult to move policy very far from the status-quo (toward their preferred policy), it follows that the status quo in the subsequent election will not be α or β as Paldam and Skott assume, but rather some



The utility functions are loss functions so a lower point is prefered to a higher one.

Figure 2.

policy between the two. Consequently, the voter in such an election does not face the same decision problem as the one described by Paldam and Skott (choosing between an incumbent who will simply implement its ideal point throughout the inter-election period and a challenger who will move policy linearly from the ideal of the incumbent to its ideal point). Instead, the voter is choosing between continuing on the policy path that the incumbent has already started and sending policy back toward the other party's position. It is not possible to handle this situation in Paldam and Skott's formulation of the median-gap model, because they do not allow for the status quo policy at the time of the election to be anything other than α or β. Consequently, in order to completely characterize the voter's expected utility for different governments in cases in which the status quo policy is not α or β at the time of the election, some generalization of their assumptions is required. Below, I do this with five specific generalizations of their model. Only the first of these generalizations is required to show that the median gap implies that the cost of ruling is dependent on cabinet duration. However, I present all the generalizations at this point in the argument in order to avoid having to repeat the model presentation in the sections that follow (and that exploit generalizations 2–5). The statements in brackets are provided to ease comparison between Paldam and Skott's model (referred to as PS in the bracketed expressions) and to show how their model is easily expressed as a special case of the one developed here.

1. At each election, there is a status quo policy, sq, in which $\alpha \leq \text{sq} \leq \beta$. [PS implicitly assume sq = α or β].[2]
2. Between elections, policy changes linearly at a constant rate, γ, until it reaches α or β and then is constant at that level. [PS implicitly assume $\gamma = \beta - \alpha$].
3. The *expected* duration of the cabinet, d, is how long voters think the cabinet will last and is assumed to be constant across all voters and all possible incumbents in an election [PS's assumptions corresponding to 1 and 2 above imply that d = 1 or 0 (trivially) in their model].[3]
4. At the time of an election, voters discount completely any utility that may result from government policy after the expected duration of the cabinet d [for PS, this is an assumption that voters discount utility that may come after subsequent elections and is equivalent to my assumption when d = 1].
5. While the party composition of the cabinet may change without an election, voters do not expect such changes at the time of the election [in both PS and this model this is implied by 4].

Assumptions 2 and 3 imply that for each status quo, γ, and set of policy positions of the parties, there exists a time, $f_L(\alpha, sq, \gamma) = (sq - \alpha)/\gamma$, at which the policy of the leftist incumbent will reach α. Similarly, $f_R(\beta, sq, \gamma) = (\beta - sq)/\gamma$, is the time at which the policy of the rightist incumbent will reach β. Notice that unlike the Paldam and Skott model these times can be before, after, or exactly equal to d. Given this, we can write the time path of policy for each party, L and R, as:

$$x_L(t) = \begin{cases} sq - \gamma t & \text{if } t < f_L \\ \alpha & \text{if } t \geq f_L \end{cases} \text{ and } x_R(t) = \begin{cases} sq - \gamma t & \text{if } t < f_R \\ \beta & \text{if } t \geq f_R \end{cases}$$

Figure 3 provides a hypothetical time path for policy and incorporates the assumptions that I make about how this time path evolves and how voters form expectations about what policy will be following any given election, even if the election occurs earlier than expected. For clarity, this figure maintains Paldam and Skott's assumptions that $\gamma = \beta - \alpha$ and that $d = 1$. Notice that, unlike Paldam and Skott's treatment, there can be a difference between the time an election is expected to take place and when it actually does take place. In Figure 3, the timing of the expected election is labeled above the picture, and the actual elections below. Actual elections 2 and 4 come when expected, but actual election 3 is early. The solid and dotted lines in the figure provide the expected policy paths for the Left and Right following each of the first three actual elections, and the circled path is the one taken by the party that wins office. At election 1, voters face a situation that is exactly the one presented in Paldam and Skott's model. They can either choose to get α for the expected duration of the cabinet or to get a policy that will steadily move toward β. Likewise, from the point of view of the voter, election 2 looks just like election 1 except that now they can choose to get β for the expected duration of the cabinet or to get a policy that will steadily move toward α. Election 3, however, is an early election in which the status quo policy is not α or β, but is about half way between the two parties' ideal points. The voters in this election, then, must forecast new policy paths for what the different parties will do (over the expected cabinet duration) if they win and form the cabinet. In the figure, these expectations are given, for the right, by the dotted line that slants upward from where policy stopped and then is horizontal at β for the rest of the expected duration of the cabinet (which lasts, in expectation, until expected election 4); for the left, the expected policy path is the dark line which continues along the policy path started by the left government that took office after election 2 and then is horizontal at α for the remainder of the expected duration.

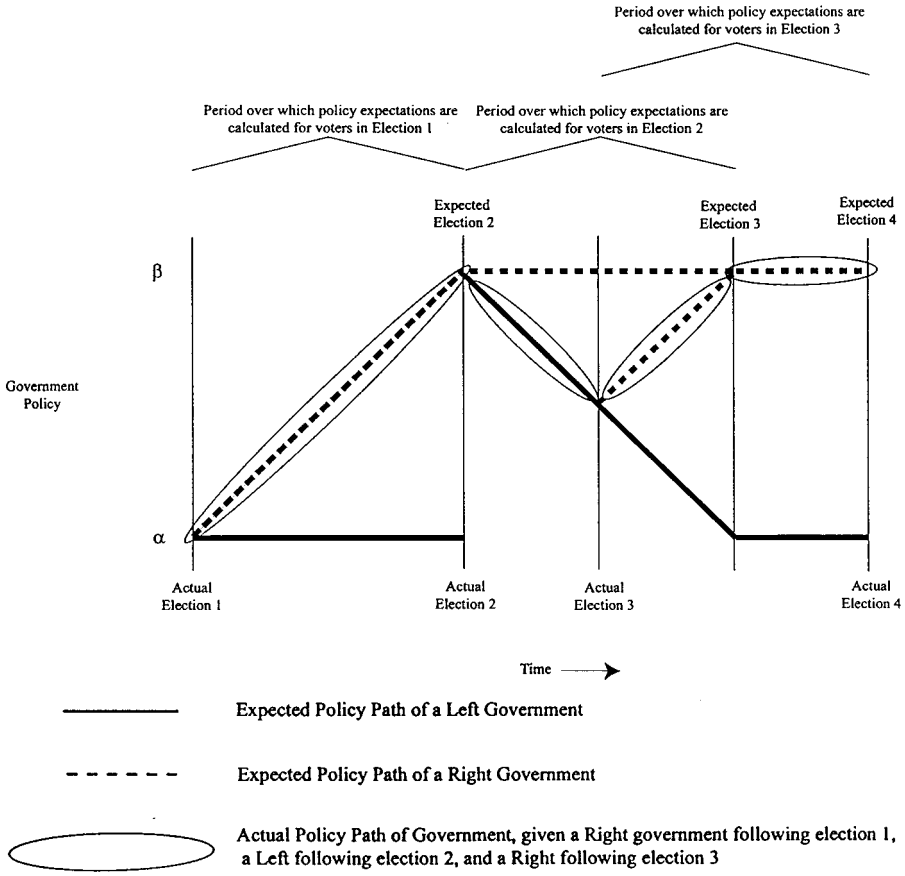


Figure 3.

4.1. *A formal specification of the utility functions*

The assumptions detailed above define a model with the following utility functions for a voter who expects the winning party to form a government and move policy from the status-quo to the party's ideal point at rate γ. The voter further expects that the government will have duration equal to d.

Define,

$$\phi_R = \begin{cases} f_R & \text{if } f_R < d \\ f_R & \text{if } f_R \geq d \end{cases} \quad \text{and } \phi_L = \begin{cases} f_L & \text{if } f_L < d \\ f_L & \text{if } f_L \geq d \end{cases}$$

where f_L and f_R were defined above. Given our earlier definition of $x_L(t)$ and $x_R(t)$ we can write the loss functions for voter i as:

$$EU_t[\text{Right Vote}|q_i, \alpha, \beta, sq, \gamma, d] = \int_0^{\phi_R} (q_i - (sq + \gamma t))^2 dt + \int_{\phi_R}^{d} (q_i - \beta)^2 dt \quad (6)$$

$$EU_t[\text{Left Vote}|q_i, \alpha, \beta, sq, \gamma, d] = \int_0^{\phi_L} (q_i - (sq + \gamma t))^2 dt + \int_{\phi_L}^{d} (q_i - \alpha)^2 dt \quad (7)$$

Assuming that voters vote for the party for whom their utility is greatest, this specification lets us determine, given α, β, γ, d, and a status-quo, exactly which voters will vote for the Left and the Right in each election. Further, and unlike Paldam and Skott's model, the position of the status-quo policy completely characterizes the information that the voter cares about from previous elections, so it is not necessary to write different functions for different incumbents. However, since the status quo is a function of who was incumbent, the model still speaks to the issue of whether there is a cost of ruling. Further, the additional dependence of the status quo on the duration of incumbency means that the model can also be used to explore the effect of cabinet duration on the cost of ruling.

Notice that these utility functions can accommodate cabinet durations of any length. As illustrated in Figure 3, elections can come early or on time, but they can also come later than expected. In such cases, the voters' expectations about the path of policy will look just like those following elections 1 or 2 (depending on who the incumbent is and given the maintained assumption that d = 1).

4.2. *Implications concerning the effects of cabinet duration on the cost of ruling*

Earlier, we saw how Paldam and Skott's model generated an implication that some voters would switch votes in every election. This was illustrated in the first two panels in Figure 2, which showed the number of voters that would switch votes in an election in which a rightist cabinet lasted long enough to move policy from α to its ideal point at β. Paldam and Skott's original model and the generalization proposed here are equivalent in this case (that is, when we set $d = 1$, $\gamma = \beta - \alpha$ and consider only the case when policy traverses the whole space between α and β). The number of vote switchers given in panel 2 of the figure thus provides a baseline to compare the situation of a shorter

duration, as illustrated in panel 3. In this panel, we still assume that d = 1 and $\gamma = \beta - \alpha$, but the loss functions are different from those in panel 2 because we allow that the right incumbent was only able to stay in office long enough to move policy half way from α to its ideal point at β. It is clear from the figure that the percentage of the voter distribution composed of voters that switch parties is much smaller than was the case in panel 2.[4]

The algebraic result that is illustrated in panel 3 of Figure 2 is found by solving Equations (6) and (7) for the intersection point (we still assume d = 1 and $\gamma = \beta - \alpha$). That is:

$$\frac{\text{sq} + \alpha + \beta}{3} \tag{8}$$

Voters with ideal points to the left of this point will vote for the Left and voters with ideal points to the right of this point will vote for the Right. To examine vote switching in any two elections is thus a simple matter. If we have a status quo policy position from the last election, sq_{e-1}, and a new status quo policy for the current election, sq_e, then the voters between $(\text{sq}_e+\alpha+\beta)/3$ and $(\text{sq}_{e-1} + \alpha + \beta)/3$ will switch their votes. The absolute value of this difference is the "size" of the group of voters who switch in any given election (I forgo the absolute value notation since it is always clear where we need to think in terms of absolute values and dropping them simplifies the notation):[5]

$$\left(\frac{\text{sq}_e + \alpha + \beta}{3}\right) - \left(\frac{\text{sq}_{e-1} + \alpha + \beta}{3}\right) = \frac{\text{sq}_e - \text{sq}_{e-1}}{3} \tag{9}$$

When policy traverses the whole space between elections (i.e., moving from α to β) then this gives the largest number of vote switchers, $(\alpha-\beta)/3$. This is equivalent to Paldam and Skott's finding that, among the gap voters, those with ideal points in the middle 1/3 of the space spanned by α and β would always switch between elections. It also shows, however, that *the number of switchers will decrease as the distance policy has moved during the inter-election period decreases*. If the assumption that cabinet duration is positively related to the distance a cabinet is able to move policy away from the status quo is correct, then, one must conclude that cabinet duration should be positively related to the cost of ruling.

It seems, then, that with only minimal alteration of Paldam. and Skott's formulation of the median-gap model (Equation 9 was derived with only one assumption differing from the PS model), the dependence of the cost of ruling on government duration can be explained. Consequently, our confidence in the median-gap model as a sound description of the process that generates the cost of ruling should be enhanced.

4.3. *The more general model: The role of expected duration and policy efficiency*

Thus far, all the analysis has maintained Paldam and Skott's assumptions that expected duration, d, is equal to unity and that policy efficiency, γ, is equal to β–α. As we have seen, given these assumptions, one can easily include a notion of cabinet duration in the model by introducing a variable, status-quo policy, which is the result of what the incumbent managed to accomplish during her tenure, and upon which voters condition their utility calculations. Further, doing so produces the empirical prediction that cabinets that last longer will lose more votes. Does this empirical prediction hold up when we allow the voters' expectations about the duration of cabinets to vary? Likewise, what happens to the result if different cabinets differ in how efficiently they implement policy while in office?

4.4. *Expected duration*

In the median-gap model, voters determine who to vote for by aggregating their expected utility over the expected life of a cabinet. In Paldam and Skott's formulation of the model, this expected cabinet duration is (in the absence of ideological change by the parties) considered constant from election to election, equivalent to realized cabinet durations, and is set equal to the time it takes for policy to move between α and β. Substantively, however, there is no reason to assume that expectations about how long the cabinet is likely to last would not differ from election to election (depending, for example, on whether realized cabinets tended to be short or long-lived). Thus, by allowing the expected duration of a cabinet, the parameter d in the utility functions, to vary, we can make an important substantive generalization of the median-gap model, can explore the question of whether the earlier results about the cost of ruling and its connection with realized cabinet durations continue to hold up when expected duration varies and ask how voting is affected by differences in the expected duration of the cabinet. Further, since it may be reasonable to assume that expectations about cabinet duration are fairly constant across elections within countries, yet differ between countries (e.g., Italy and the United Kingdom), the answer to these questions may provide easily testable hypotheses about how cabinets stability is related to electoral stability across countries.

In order to explore these questions, the first thing one must do is to solve Equations (6) and (7) for their intersection point in the more general case in which d and γ can vary. Doing so produces an expression that is conditional on the value of d relative to the other quantities in the model (Equation (10)):

$$\frac{2\mathrm{sq}^3 + 2\alpha^3 - 3\mathrm{sq}(\alpha^2 + \beta^2) + 3\mathrm{d}\alpha^2\gamma + \beta^2(2\beta - 3\mathrm{d}\gamma)}{3(2\mathrm{sq}^2 + \alpha^2 - 2\mathrm{sq}(\alpha + \beta) + 2\mathrm{d}\alpha\gamma + \beta(\beta - 2\mathrm{d}\gamma))}$$

$$\text{if d} > \frac{\mathrm{sq} + \alpha}{\gamma} \text{and d} > \frac{-\mathrm{sq} + \beta}{\gamma}$$

$$\frac{\mathrm{sq}^3 - 3\mathrm{dsq}^2\gamma + (2\alpha - \mathrm{d}\gamma)(\alpha + \mathrm{d}\gamma)^2 - 3\mathrm{sq}(\alpha^2 + \mathrm{d}^2\gamma^2)}{3(\mathrm{sq}^2 + \alpha^2 + 2\mathrm{d}\alpha\gamma - \mathrm{d}^2\gamma^2 - 2\mathrm{sq}(\alpha + \mathrm{d}\gamma))}$$

$$\text{if d} > \frac{\mathrm{sq} + \alpha}{\gamma} \text{ and d} \leq \frac{-\mathrm{sq} + \beta}{\gamma}$$

$$\frac{\mathrm{sq}^3 - 3\mathrm{dsq}^2\gamma + (2\beta - \mathrm{d}\gamma)(\beta + \mathrm{d}\gamma)^2 - 3\mathrm{sq}(\beta^2 + \mathrm{d}^2\gamma^2)}{3(\mathrm{sq}^2 - 2\mathrm{sq}\beta + \beta^2 + 2\mathrm{dsq}\gamma - 2\mathrm{d}\beta\gamma - \mathrm{d}^2\gamma^2)}$$

$$\text{if d} \leq \frac{\mathrm{sq} + \alpha}{\gamma} \text{ and d} > \frac{-\mathrm{sq} + \beta}{\gamma}$$

In addition if $\mathrm{d} < (\mathrm{sq} + \alpha)/\gamma$ and $\mathrm{d} <= (-\mathrm{sq} + \beta)/\gamma$ then the intersection is equal to the status-quo point.

When $\gamma = \beta - \alpha$ and $\mathrm{d} = 1$ the assumptions that led to Equation (8) are in effect, the first condition in Equation (10) applies, and that equation reduces (as it should) to Equation (8). If, however, d, or γ, or both can vary then the equations do not simplify algebraically. That means that when we define $\mathrm{sq_e}$ and $\mathrm{sq_{e-1}}$ as the status quo in the current election and in the previous election and then use these equations to calculate the switching interval, we get a complicated, unintuitive equation (which I will not reproduce here). Fortunately, however; the equations can be graphed simply and these graphs give us a clear answer to the question of *how* the size of the switching interval changes with the distance between $\mathrm{sq_e}$ and $\mathrm{sq_{e-1}}$ (i.e., with different cabinet durations) for different values of d (i.e., expected durations), holding γ constant. This is done in Figures 4a and 4b.[6]

In each of these figures, the numbers on the vertical axis are the size of the "switching interval". These values are calculated exactly as in Equation (9), except now I use the more general Equation (10) in place of Equation (8). Intuitively, this is just a measure of the relative number of vote switchers that will result if different status-quo policies are presented to the electorate in the current election (given a value for the status-quo in the previous election). The numbers along the horizontal axis, then, are simply values of sq, the

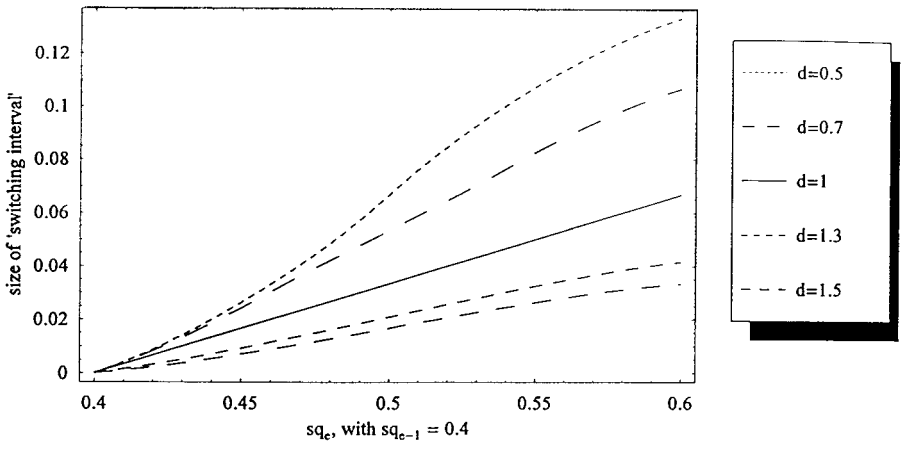


Figure 4a.

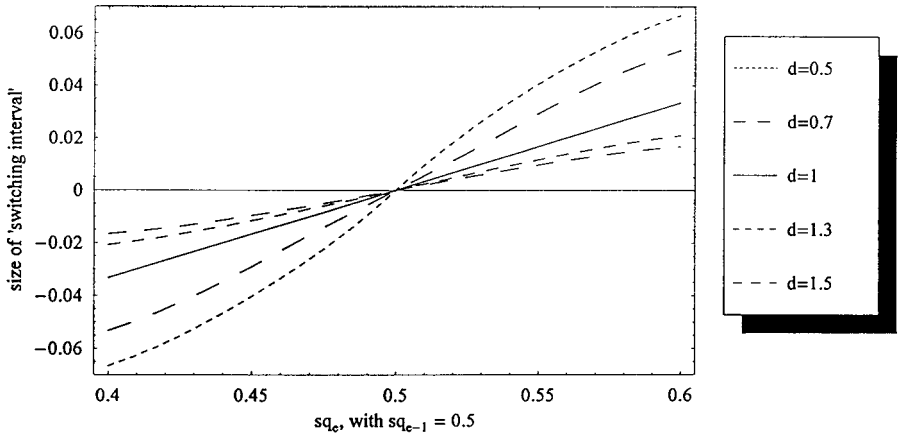


Figure 4b.

status quo at the time of the current election. In the first graph I set sq_{e-1} at 0.4, which is equal to α. This choice suggests that any move of the status quo policy away from α will have been implemented by a rightist incumbent (since a leftist incumbent would leave policy at α). The figure can be read, then, as indicating the size of the interval of voters that, having voted for the right in the election with status quo $sq_{e-1} = \alpha$, will vote left in the new election in which the status quo policy has moved right by the amount indicate on the x-axis.

With respect to the impact of expected cabinet duration on the cost of ruling, the figure shows is that the linear increase in the number of voters

that switch parties as the government lasts longer (i.e., moves policy further from its previous status quo), is modified when we allow expected duration, d, to deviate from unity. Included in the figure are cases in which expected durations are longer than the time that would be needed for policy to traverse the whole policy space ($d > 1$), expected durations are exactly equal to this length of time (the Paldam and Skott assumption that $d = 0$), and expected durations that are shorter than this ($d < 1$).

The straight line from 0 to 0.6 represents the case of $d = 1$. Flatter lines below this are for cases in which $d > 1$ and the curved lines above this are cases in which $d < 1$. In the case of shorter expected durations, the number of vote switches increases rapidly (faster than in the $d = 1$ case) for even small increases in the distance between sq_e, and sq_{e-1}, (a function of the actual duration). Take, for example, three hypothetical governments, all of which start with a status quo policy at 0.4 and that manage to move policy to 0.5 before new elections occur. Now, if the electorate thinks that the next cabinet will last about as long as it would take policy to traverse the entire space between the ideal points of the parties (i.e., $d = 1$), then the total size of the interval of vote switchers would be 0.033. If, however, the electorate thinks the next cabinet will last longer than this (say, $d = 1.3$), then the total size of the interval of vote switchers would be smaller at 0.013. In contrast, if the electorate thinks the next cabinet will last less than the time it would take policy to traverse the whole space between α and β (say, $d = 0.7$), then the total size of the interval of vote switchers would be larger at 0.053.

Figure 4b shows that when the previous status quo is not located at the ideal point of one of the parties, the same effect of expected duration holds (longer expected durations lead to less vote switching). In this figure, the previous status quo, sq_{e-1}, is located at 0.5 and so current status quo policies (sq_e) less than 0.5 represent a movement, since the last election, to the left (ostensibly by a leftist incumbent) and current status quo policies greater than 0.5 are moves to the right. Of course, if for some reason the incumbent from the previous election failed to move policy at all (so that the new status quo, sq_e, was also 0.5 and $sq_e - sq_{e-1} = 0$), then the figure shows that exactly the same electoral result would occur again (the amount of vote switching would be zero). If, however, a rightist were elected and started moving policy right, some voters would begin to abandon it in the next election. The exact number of vote switchers would vary with expected duration in just the way described above. Alternatively, if a leftist incumbent were to move policy left then the symmetry of the graph guarantees that exactly the same size switching interval would obtain and the effects of expected duration would also be the same (of course, the negative numbers should be read as absolute values).

To understand the intuition behind these results (i.e., that shorter expected duration means more vote switching) consider a voter who has an ideal point close to β and an election in which a rightist incumbent has managed to move policy all the way to β. How does the utility that accrues to the voter change over the inter-election period if we assume $\mathrm{d} = 1$ (so Policy will traverse the whole space between β and α before a new election)? This, of course, depends on who gets elected. If it is a rightist, then the voter will experience a small loss (since her ideal point deviates a little from β) at each point in time over the whole inter-election period. If, however, a leftist incumbent wins, then the voter will experience increasingly small losses for a short period (indeed, at some point, as Policy moves over her ideal point, she will have no loss) but then increasingly large losses until, just before the next election (when policy approaches α) she will experience very large losses. These large losses at the end of the leftist cabinet's tenure are important because they will contribute a lot to the total expected loss, aggregated over the expected life of the cabinet, that the voter assigns to a leftist government and compares to the total expected loss from the rightist alternative (which is, in this case, fixed, relatively small and constantly accruing over the whole period). Clearly, if the voter's ideal point is close enough to, β, then the loss associated with a left incumbent will outweigh that of the rightist. But what if the voter did not expect the leftist cabinet to last long enough to move policy all the way to α? In this case, some of the biggest losses that the voter had expected (that would accrue as policy approached α) are no longer relevant. The total loss associated with a left victory, then will be less for this voter than it would have been if the expected duration were longer. Indeed, since the amount of loss associated with a rightist government accrues, in this case, at a constant rate, this voter's utility for a leftist government will go up relative to her utility for the right. Indeed, for every median gap voter (i.e., with an ideal point between α and β), there will be some expected cabinet duration that is short enough that the expected loss from a leftist government will be less than that of a right. Even a voter that is very close (but still to the left) of β, will have some (very short) period in which a leftist incumbent will actually be moving policy toward the voter's ideal point. If the voter thinks that the left government will last only that long, then, despite how close they are to the rightist, they should vote for the left government. More generally (and for less extreme cases), a shorter expected duration will move the line separating right voters from left voters toward the incumbent's ideal point and so increase the size of the group of vote switchers.

This leads to the straightforward hypothesis: holding realized duration and policy efficiency constant, incumbents facing electorates that expect cabinet

duration to be longer will lose less votes than those in which expected cabinet duration is shorter.

4.5. *Policy efficiency*

Another parameter that is allowed to vary in the current model is the rate at which policy is adjusted over time. While I maintain the assumption that this adjustment is linear with respect to time, I let the rate of adjustment vary. Consequently, the implications of differences in this rate for voting, in the context of this theoretical model, can be explored. In addition, these implications may be testable in the real world (think, for example, of the relative difference between the rate of policy change that can be achieved by a presidential party in the U.S. and the majority party in the House of Commons).

Figures 5A and 5B show that changing the levels of γ (this time holding $d = 1$) has much the same effect that changing expected duration did. For governments that are relatively efficient policy makers (say $\gamma > \beta - \alpha$) the effects are similar to that for long expected durations. That is, the function is flatter and you get less vote switchers for a given actual government duration. For less efficient governments (say $\gamma < \beta - \alpha$), the opposite is the case: for a given government duration, one gets more vote switchers. The intuition for this result is exactly the same as that for expected duration. When voters expect policy to move more slowly over time then, for a given expected cabinet duration, they will expect the status-quo policy to have moved a shorter distance than it would have in a more efficient policy making environment. Just as argued above, then, the ideal point at which a voter will be willing to switch her vote will move toward the incumbent's position, resulting in a greater cost of ruling.

The hypothesis that emerges from this is: *holding both realized and expected duration constant, incumbents facing electorates that perceive policy efficiency to be higher will lose less votes than those in which policy efficiency is perceived to be lower.*

4.6. *Other implications*

There are a few other ways in which the implications of the generalized median gap model that was presented above differ from those of Paldam and Skott's original formulation. First, in Paldam and Skott's model, the median voter switched parties in every election. The unrealistic implication of this fact was that the incumbent party would always get turned out of office. There is no such implication in the generalized model. This results because the median voter will switch her vote in the current model only when the

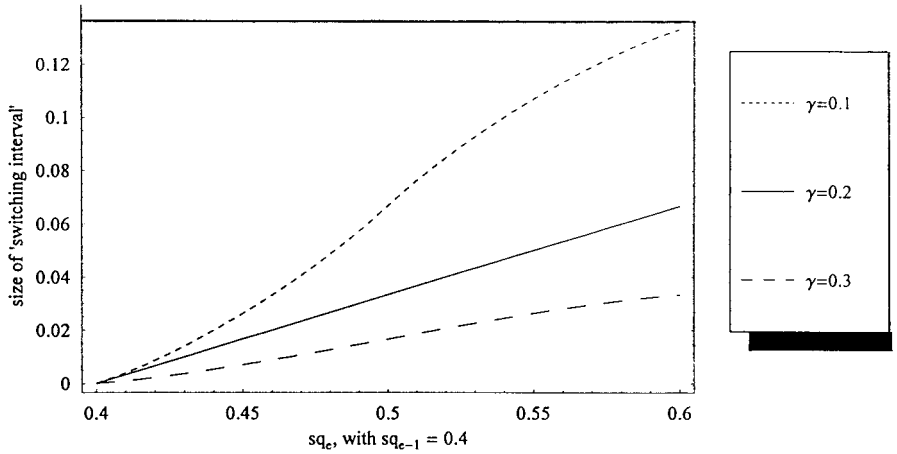


Figure 5a.

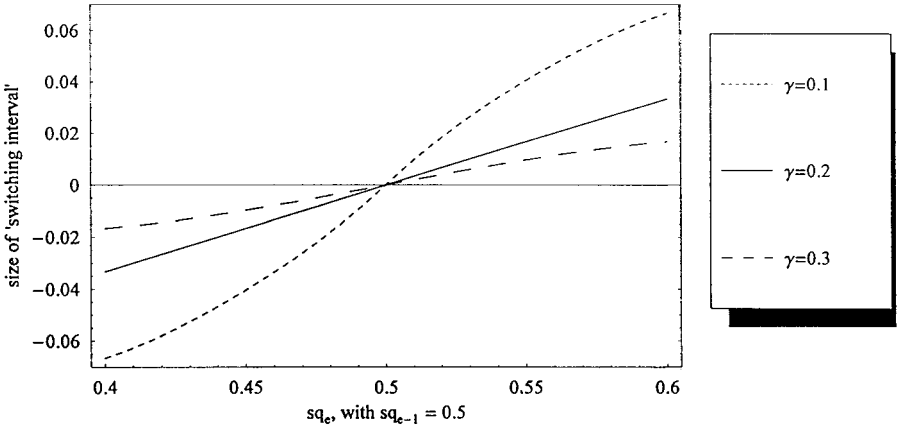


Figure 5b.

inter-election policy change has been of sufficient magnitude to warrant such a switch (notice that even if the median voter does not switch, the incumbent can never gain votes with normal policy moves – i.e., toward its own ideal point).

Although I do not pursue it in this paper, another thing that the model is now flexible enough to incorporate is the real world fact that sometimes the party in government will change between elections (without an election taking place at all). All that occurs in this case is that, after the change in government, the policy begins to move back to where it came from and voters (who in the current formulation of the model do not expect such a change, so do not include the possibility in their utility calculations) observe

this movement. At the next election, then, the status quo will not be where voters had expected it to be, but its position will nonetheless be known and, given their expectations about the expected life of the next cabinet, voters can calculate their utilities and vote as described above. Of course, it is not true that the incumbent cabinet will always lose votes in these cases. Take, for example, a hypothetical case in which a leftist government moves policy left and then falls; next, a rightist government takes over without an election and moves policy to the right but does not make it back to the original status quo before it falls and calls a new election. This sequence of events produces the odd event (at least in terms of this model) that the policy has moved left (in net terms) since the last election despite the fact that the incumbent is a rightist party. Consequently, more voters will vote for the right than in the previous election, so the incumbent will actually gain votes. I am not aware of any empirical work that has pinpointed these sorts of government histories and examined how their electoral performance differs from that of other kinds of incumbents. This theory, however, suggests that such an exercise may be useful.

Finally, the discussion in the previous paragraph may suggest another interesting empirical hypothesis. That is, when two ideologically distinct incumbent cabinets split (exactly) the time between elections, then neither should experience a cost of ruling. It might be useful, then, to test the hypothesis that the cost of ruling for incumbents in elections following periods in which both the left and the right have ruled between elections, will be less than when a single party (or ideological tendence) has controlled the cabinet for an equivalent length of time.

5. Conclusions

Scientific progress is a process of identifying empirical regularities, proposing theories to explain them and then testing these theories on new data and/or for new implications of the theory. This paper is an attempt to make progress on the question of why governments lose votes, and more generally, on how voters make decisions in elections. It does this by taking the median-gap model, which has been used to explain the empirical phenomenon of the cost of ruling, generalizing it in ways that are faithful to the original formulation, and showing that it can also account for the empirical fact that longer lasting cabinets lose more votes than cabinets with a shorter duration.

In addition to these accomplishments, however, the generalized model continues the push toward scientific progress by generating completely new empirical implications (that played no part in the building of the original

model or its generalization) that can be used to further evaluate the usefulness of the generalized model.

Finally, it is worth pointing out that the correspondence between the implications of the median-gap model and the empirical finding about the cost of ruling is all the more striking because of the very simplicity of the model proposed. Indeed, it suggests that simple constructs like conceiving of elections as left/right contests between blocks of parties, and of voters as essentially Downsian in their evaluation of the parties, may get us farther theoretically than we might initially think possible.

Notes

1. One can argue that a two-party model with plurality voting is not widely applicable to most cases of democratic elections. In many democracies, however, block competition between the left and the right does occur regularly and the cabinets that form tend to be clearly leftist or rightist. Even in the Low Countries, one can find a kind of left right competition that is fought between potential partners of the central Christian parties. Such a case would fit naturally into the scenario suggested here. Specifically, knowing that the Christian parties in the center will be dominant, but that they will have to ally with either the left or the right to govern, central voters will want alternation between the left and right partners – just as in the current set up of the model. Finally, in many countries there is a strong plurality component in the government formation process, with the PM usually being the largest party and choosing partners that are ideologically similar (see Warwick, 1996; Stevenson, 1997; Martin and Stevenson, 2001).
2. One could formulate this as $sq_e = x_j(e)$, where e is the time at which an election occurs (making explicit that the sq in election e is the result of the position of policy when the new election occurred). It is simpler, however, to consider each election conditional on a status-quo policy and let the time index start back at zero. In our case, each election is independent of the others, conditional on the status quo, and so we have no need to index any of the variables by the election.
3. One generalization that would be interesting to pursue in the future would be to let voters expectations about the duration of cabinets be conditional on characteristics like the size of the party that will form the cabinet.
4. This observation, and the general result that short realized durations should lead to less vote loss, should not be taken to mean that the model does not apply to countries with fixed election schedules. In the case of fixed elections, I shall show below, that the occurrence of early elections is equivalent to the government not reaching its policy ideal point by the end of its tenure.
5. The actual number of voters will depend on the density of voter ideal points in this region. However, given a static distribution of voter preferences, this difference provides an adequate measure for the comparison being made here.
6. In these graphs, I choose arbitrary values for α and β (0.4 and 0.6 respectively) where nothing depends on this choice as long as $\alpha < \beta$ and, in order to concentrate on the effects of expected duration, hold γ constant at $\beta - \alpha$.

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