

## **Time Horizons Matter: The Hazard Rate of Coalition Governments and The Size of Government**

Bumba Mukherjee

Visiting Associate Research Scholar,  
439 Robertson Hall, Woodrow Wilson School  
Princeton University, NJ 08544

Assistant Professor, Departments of Political Science and Economics & Econometrics  
University of Notre Dame, IN 46556  
[smukherj@Princeton.edu](mailto:smukherj@Princeton.edu)

Will H. Moore

Professor, Department of Political Science  
Florida State University  
Tallahassee, FL 32306  
[will.moore@fsu.edu](mailto:will.moore@fsu.edu)

Sergio Bejar

PhD. Candidate  
Department of Political Science  
University of Notre Dame, IN 46556  
[sbejar@nd.edu](mailto:sbejar@nd.edu)

**Abstract:** This study examines how coalition governments affect the size of government, measured by total central government expenditure as a share of GDP. Existing studies suggest that common pool resource problems or the presence of veto players within multiparty coalitions lead to more government spending when coalition governments are in office. We demonstrate that coalition governments have shorter time horizons than single party governments and use that finding to motivate a model which shows that coalition governments have greater incentives to increase government spending because of a lower discount factor in office. Results from empirical models estimated on a global sample of 62 democracies and on subsamples of OECD and non-OECD democracies between 1975 and 2000 provide strong statistical support for the aforementioned theoretical prediction. We also find that alternative political explanations for the level of government spending such as government partisanship, veto players, and electoral systems (Majoritarian and Proportional Representation) do not have a statistically significant impact on government expenditure.

## 1. Introduction

Economists have long recognized that the political time horizons of incumbent governments may influence fiscal policy, but have not carefully tested this claim (Alesina & Tabellini 1990; Roubini & Sachs 1989; Velasco 1999). Political scientists studying the impact of political variables on the size of government, measured by total central government expenditure as a share of GDP, have neither theorized nor tested how the political time horizons of incumbent governments affect government spending. For instance, early work by political scientists focused on the impact of government partisanship on government spending (Garrett & Lange 1991; Hicks & Swank 1992). Political scientists and political economists have also suggested that the Majoritarian electoral system leads to lower government spending, while the Proportional Representation system engenders higher spending (Persson & Tabellini 2003; Persson, Roland & Tabellini 2005; Milesi-Ferretti, et al. 2002; Tavits 2004; Thames & Edwards 2006). Alternatively, scholars claim that government spending in Parliamentary democracies is higher than Presidential democracies (Persson, et al 1997).

More recent studies focus on the distinction between coalition and single party governments and argue that the former will spend more than the latter. Three distinct claims have been advanced to explain why coalition governments have been less fiscally responsible. First, Bawn & Rosenbluth (2006) suggest that coalition governments are characterized by common pool resource problems that encourage parties in governing coalitions to increase government spending. Other scholars conjecture that the greater number of veto players in coalition governments generates bargaining inefficiencies, which leads to higher deficits, public debt or government spending (Hallerberg & Von Hagen 1999; Franzese 2004; Tsebellis & Chang 2005). Finally, some argue that the partisan fractionalization produced by multiparty government is responsible (Kontoupoulos & Perrotti 1999; Franzese 2002).

We focus on the impact of coalition governments on government spending, but offer a rival argument compared to extant explanations. Specifically, we suggest that because coalition governments tend to hold office less long than single party governments they will increase government spending much more than single party governments. Data on total central government expenditure as a percentage of GDP and the duration of governments in office from a global sample of 62 democracies (1975-2000)—listed in Table 1—bear this out: coalition governments both have shorter durations in office *and* spend more than single party governments. Further, contrary to many studies that focus only on OECD countries<sup>1</sup> the difference of means test in Table 2 reveals that there is no statistically significant difference in the mean level of central government expenditure as a % of GDP between (i) Majoritarian and Proportional Representation countries and (ii) Presidential and Parliamentary democracies. Yet, we find that the mean level of total central government expenditure as a % of GDP under coalition governments is substantially and significantly, in the statistical sense, higher than government expenditure under single party governments in the global sample. Finally, the mean duration of coalition governments in office is significantly lower than single party governments.<sup>2</sup>

<<Insert Tables 1 and 2 About Here>>

Is it possible that the relatively short time horizons of coalition governments in office encourage policy-makers in ruling coalitions to increase government spending? Anecdotal evidence suggests that the short time horizons of coalition governments may indeed encourage them to increase government expenditure. For example, before the November 1986 election in Austria, the European edition of *The Guardian* (Frankfurt) reported that since ministers in the SPO (Socialist Party)-FPO (Freedom Party) coalition led by Sinowatz believed that their

---

<sup>1</sup> Bawn & Rosenbluth (2006), Tavits (2004), Cusack (1997) and Garrett & Lange (1991) focus on OECD countries in their studies on government spending. Milessi-Ferretti et al (2002) examine government spending in OECD and Latin American countries, but exclude developing countries from other regions.

<sup>2</sup> The mean duration of coalition and single party governments in office are derived from discrete time hazard models that are described later in this paper.

electoral prospects were poor and thus did not expect the coalition to retain office after the election, they dramatically increased government spending on welfare benefits in a last-minute bid to appease voters and improve their electoral fortunes.<sup>3</sup> Similarly, the *Times Of India* reported in 1997 that ministers in the multiparty coalition headed by Prime Minister Gujral were taking bribes to “fill their pockets” and wastefully spending government revenue on populist policies targeted at the urban poor since the ministers expected that the “coalition would not survive in office for more than 8 months”.<sup>4</sup>

The anecdotal evidence described above and the descriptive statistical results in Table 2 from our global sample motivate us to provide a more accurate and generalizable causal theory to explain why government spending is higher under coalition governments. In particular, unlike existing studies which suggest, for example, that common pool resource problems within coalition governments encourage leaders of such governments to spend more, we present a formal model that provides a different causal mechanism. Given that estimates from hazard models (described below) show that the hazard (survival) rate of coalition governments in office is statistically higher(lower) than single party governments, we assume in our model that coalition governments have relatively short time horizons. Our model shows that a short time horizon in office not only induces rent-seeking by parties in the coalition government but also encourages them to increase government expenditure and direct the benefits of higher spending to constituents in order to maximize their vote share and maintain their bargaining leverage in the legislature. Further, short time horizons in office reduce coalition governments’ incentive to internalize the future costs of higher spending and give them incentive to buck-pass the burden of reducing high government expenditure to the future. In short, our model predicts that coalition governments’ shorter time horizons lead to higher government spending precisely

---

<sup>3</sup> Matt Engel, “More Public Spending: Cheap Populism?” *The Guardian* (Frankfurt), 5<sup>th</sup> October 1986, p. 3.

<sup>4</sup> Bharat Raman, “Ministers in Shaky Coalition Misuse Office,” *The Times of India*, 14<sup>th</sup> June 1997, p. 6.

because it induces parties in the coalition to (i) appease constituents with more government money, (ii) engage in rent seeking, and (iii) shift the burden of higher expenditure to the future.

We test the claim from our model—that shorter time horizons in office lead coalition governments to spend more—on a global sample of 62 democracies (1975-2000), and on sub-samples of OECD and non-OECD democracies. We find strong statistical support from these data. We also find that alternative political explanations for government spending such as electoral systems (PR and Majoritarian), government partisanship and veto players do not have a statistically significant effect on the level of government spending in our empirical models.

This study has three main implications that we discuss more fully below. First, by identifying a plausible causal mechanism that has to date been overlooked our study contributes to the literature on government spending. Second, some scholars suggest that because coalition governments are more adept at income redistribution social welfare increases more under coalition governments than it does under single party governments (Austen-Smith 2000). While we have no cause to dispute that coalition governments may be better for redistribution, our study indirectly suggests that economic inefficiency increases under coalition governments and that this has adverse welfare consequences. Third, since our data indicates that the frequency of coalition governments has increased over time,<sup>5</sup> we believe that global trends in government spending will increase in the future owing to the higher frequency of multiparty coalitions.

The study proceeds in three sections. In the next section, we first briefly show empirically that coalition governments have shorter time horizons in office than single party governments. Having established that fact we develop a model that assumes that coalition governments have short time horizons and produces the implication that short time horizons encourage leaders of coalition governments to increase government spending. In section three

---

<sup>5</sup> For example, among our 62 countries coalition governments comprised 32% of all democratic governments between 1975 and 1988, but as much as 57% of all governments between 1989 and 2000.

we describe our data, variables and the results from our empirical models. In the conclusion we summarize the study and discuss its implications for theory, policy and future work.

## **2. The Model: Laying the Groundwork**

We present a formal model to study how the political discount factor of chief executives of coalition governments—that is determined by their hazard rate in office—affects government spending. We assume in our model that the political discount factor (time horizons) of leaders of coalition governments in office is lower (shorter) compared to single party governments. This assumption rests on two uncontroversial empirical findings. First, the empirical literature on government termination shows that coalition governments have a higher (lower) hazard (survival) rate and survive in office for a shorter period of time relative to single party governments. This holds for coalition governments in OECD democracies (Woldendorp, et al. 2000) and, as we show below, in non-OECD democracies.

Second, we examine the *duration of government*, measured as the number of months that each government was in office, for 62 democracies in the 1975 to 2000 period. As reported in Table 2, the mean duration of the dummy *Coalition Government* – that takes a value of 1 if the incumbent government consists of more than one party ( $>1$ )—is 24 months, while the mean duration of *Single Party Government* is 38 months. The difference in the means reported above is statistically significant. Hence, coalition governments survive in office for a significantly shorter time than single party governments in our sample. The mean duration of coalition governments is also statistically lower than the mean duration of single party governments in the sub-samples of OECD and non-OECD democracies. Further, as described later, results from discrete time hazard models indicate that the mean hazard rate of coalition governments (0.62) is statistically higher than the mean hazard rate of single party governments (0.43) in our global sample of 62 democracies, 1975-2000. Because a higher hazard rate implies shorter time horizons in office,

the results in Table 2 statistically support our model’s assumption that coalition governments have a relatively low discount factor/short time horizons in office.

The model is a dynamic incomplete information game with voters—who have a distribution of preferences over government spending—and the government. The government is either coalition or single party, and though we model both types of governments, due to space constraints we focus our explication of the model in the text on the more substantively interesting case of coalition governments, while describing the single party government’s maximization problem in a footnote. Because coalition governments are comprised of multiple parties, we include three parties—left, median, and right—in the model and assume that the coalition government comprises of at least two of these three parties. Our objective is to model the impact of the discount factor of the coalition government in office on government spending, so it is natural to specify a game between a multiparty incumbent coalition and voters where the coalition government selects a level of expenditures, which is influenced by their expectations about the voters’ decision at the polls and their desire to extract rent. We describe this game more formally below.

## **2.1 Voters and Parties Utility functions**

The polity consists of an odd finite number of voters  $j=1,2,3\dots N$ . Some voters prefer that the government implements high levels of spending while other voters prefer lower levels of government spending. We conceptualize this heterogeneity in each voter’s preference over government spending as his or her “type” labeled as  $\alpha$  (certain types of voters prefer higher spending while other types prefer lower spending). Formally, each voter prefers a unique ideal level of government spending  $g_t^\alpha \in [0,1]$ . For analytic convenience, we label the highest spending level that voters prefer in the  $[0,1]$  interval as  $\bar{g}$  and the lowest preferred spending

level as  $\underline{g}$ . The objective function of a type- $\alpha$  voter is defined over a finite time period  $\sum_{t=0}^T \delta(u_t^j, \alpha_t)$ ,<sup>6</sup> where his per-period utility is the following quadratic loss function,

$$(u_t^j, \alpha_t) = -(g_t^\alpha - g_t)^2 + \pi_t \quad (1)$$

In equation (1), which is quasi-concave,  $g_t \in [0,1]$  is the level of spending implemented by the government at  $t$ , and  $\pi_t$  is each voter's individual non-policy characteristics (for e.g., class or partisan identification). Since spending preferences among voters vary according to their type, we define  $F_\alpha^j$  as the distribution of spending preference types among  $j$  voters and assume that  $F_\alpha^j$  is normally distributed,  $F_\alpha^j \sim N(0, \sigma_{g_t}^2)$ .<sup>7</sup> We turn to describe the utility function of political parties below.

There are three political parties in the model,  $i \in I = \{L, M, R\}$  where  $I$  is the set of parties.  $L$  stands for left-wing party,  $M$  denotes median party and  $R$  indicates the right-wing party. At each  $t$ , the three parties have a certain position on government spending  $g_t^i \in [0,1]$ . We assume that  $g_t^L > g_t^M > g_t^R$ . That is, following existing findings on government partisanship and public spending (e.g., Garrett & Lange 1991), the left party in our model prefers higher spending than the median party, which, in turn, prefers higher spending than the right party.

Since our objective is to study how the discount factor of the incumbent coalition government *in office* affects spending, we do not explicitly model the process of coalition government formation.<sup>8</sup> Rather, we assume without loss of generality that the coalition

---

<sup>6</sup> Since the life-span of voters is finite, their objective function is defined over a finite time horizon.

<sup>7</sup> The results from the model presented below hold for other types of distributions commonly used to capture heterogeneity in voters' preferences (e.g., the log normal and uniform distribution).

<sup>8</sup> Modeling coalition government formation increases the length and complexity of the model without providing additional insights. Further, our objective is not to study how coalition government formation affects spending, but rather how the discount factor of the coalition government in office affects spending.

government includes at least two of the three parties—this could be a combination of the left and median parties or the right and median parties or the left and right parties.<sup>9</sup> The solution and the implications of our comparative static analyses do not change regardless of whether the coalition is comprised of the left and median, right and median or left and right parties.

The objectives of the incumbent coalition government are to (i) choose a certain level of government spending and (ii) appropriate rent. The rent extracted by each party in the coalition differs since some parties may appropriate greater rent in office than other parties in the coalition. Since each party's preference and propensity for extracting rent is private information (known to the party but not to voters), we define each party's type with respect to its propensity for appropriating rent as  $\lambda^L, \lambda^M$  and  $\lambda^R$ , where  $\lambda^i \sim U[0,1]$ . The profile of party types is  $\lambda^i = (\lambda^L, \lambda^M, \lambda^R)$ . In office, parties in the coalition government derive utility at each  $t$  from the spending policy and the extracted rent. The objective function of parties in the multiparty coalition is defined over a finite time period,<sup>10</sup> while their *per-period* quasi-concave utility is

$$v_t^i(g_t, r_t, \lambda) = -\left(g_t^i - g_t\right)^2 + br_{C,t}^\lambda \quad (2)$$

In (2), the parameter  $b$  is the benefit derived from rent  $r_{C,t}^\lambda \in [0,1]$  extracted by parties in the government;  $b$  is assumed to be concave with respect to  $r_{C,t}^\lambda$ . Further, in (2),  $C$  in  $r_{C,t}^\lambda$  denotes the number of parties in the coalition government,  $-\left(g_t^i - g_t\right)^2$  is a quadratic loss function in which  $g_t$  is the spending level implemented by the governing coalition at  $t$  and  $g_t^i$  is the ruling parties' preferred spending policy. The distribution of spending preferences among voters  $F_\alpha^j$  and  $g_t^i$  is common knowledge, but voters cannot observe each party's propensity for

---

<sup>9</sup> Though due to space constraints we do not report it here, we also solve the model for single party governments and conduct comparative statics like those described below for coalition governments. The results show that the discount factor of single party governments does *not* affect their spending decisions.

<sup>10</sup> This is because the coalition knows *ex ante* that it will not survive in office beyond some finite time  $T$ .

appropriating rent in office. Voters thus have prior beliefs about each party's type, namely each party's propensity for extracting rent in office, which we define as  $\theta^j \in (0,1)$ . The profile of voters' prior belief about party types is  $\Theta \equiv (\theta^L, \theta^M, \theta^R)$ . Having defined the voters prior beliefs, we describe below the sequence of moves in the game, the voters' voting rule, the government's optimization problem and the equilibrium concept used to solve the model.

## 2.2 Sequence of moves, optimization problem and equilibrium concept

The sequence of moves in the dynamic game is as follows: First, Nature independently draws each party's type. Second, the incumbent coalition government chooses a level of government spending at  $t$ ,  $p_t(g_t)$ , and some amount of rent. Third, voters observe  $p_t(g_t)$  and elections occur in which voters decide whether or not to retain the incumbent government. We describe the election period and the voters' voting rule in more detail below. Fourth, after the election, a new government is formed which chooses  $p_{t+1}(g_{t+1})$  and some rent  $r_{t+1}$ .

In the election held at the end of  $t$  voters make their decision based on the spending policy outcome  $p_t(g_t)$ , anticipation of the future government's spending policies  $p_{t+1}(g_{t+1})$ , and updated beliefs about each party's type. Voters update their beliefs about each party's type—given their prior belief profile  $\Theta$ —after observing  $p_t(g_t)$ . Let  $\mu^i(\Theta, p_t)$  denote voters' posterior beliefs about each party's type. The posterior beliefs for voters are derived from the prior and the incumbent coalition government's choice of  $p_t(g_t)$  through Bayes' rule. Given voters beliefs the voting strategy of a type  $\alpha$  voter is the function  $\phi_\alpha^j$ , which is the probability  $\phi_\alpha^j(i | \Theta, F, p_t, r_{C,t}^\lambda)$  that he or she votes for the coalition government. Let  $\phi$  be the profile of voting decisions and  $EU_\alpha^j(\Theta, p_t, \phi, r_{C,t}^\lambda)$  the expected utility that a type- $\alpha$  voter anticipates given the profile of voting decisions, the spending policy outcome at  $t$  and his beliefs about each party's type/rent seeking behavior. The voters' voting rule is,

**Voting rule:** Given voters' prior belief profile  $\Theta$ , the distribution of voters spending preferences  $F_\alpha^j$  and the spending level  $p_t(g_t)$ , voters will vote for the coalition government if  $EU_\alpha^j(\Theta, p_t, \phi, r_{C,t}^\lambda) > EU_\alpha^j(\Theta, p_t, \phi, r_{-C,t}^\lambda)$ , where  $EU_\alpha^j(\Theta, p_t, \phi, r_{-C,t}^\lambda)$  is each voter's expected utility when the opposition party or parties are in office.<sup>11</sup>

In office, the coalition government chooses some level of spending  $p_t(g_t)$ . While choosing  $p_t(g_t)$ , parties in the coalition consider four factors: (i) the inherited level of spending from the previous government labeled as  $p_0(g_0)$ , (ii) the degree of rent extracted by the parties in the coalition given their type, (iii) anticipation of the voters voting decisions, which is based on  $\Theta$  and  $F_\alpha^j$ , and, (iv) spending level that may be implemented in the future  $p_{t+1}(g_{t+1})$ . Hence, the incumbent choice of  $p_t(g_t)$  is determined, in part, by the function  $\gamma_t(\Theta, \lambda, F_\alpha^j, p_0)$ . While choosing some level of spending the coalition government will not only take into account the four aforementioned factors but also its discount factor  $\delta \in (0,1)$ . Note that the discount factor accounts for the ex ante uncertainty that the incumbent coalition government has with respect to how long it may survive in office and the electoral outcome.

Let  $V_\lambda^i(p_{t+1})$  be the future ( $t+1$ ) expected utility for parties in the coalition when the current period spending policy is  $p_t(g_t)$ . Gathering the above information together, the coalition government's finite horizon<sup>12</sup> dynamic optimization problem is,

$$\begin{aligned} & \arg \max_{g_t} \{v^i(g_t(\gamma_t), r_{C,t}^\lambda) + \delta V_\lambda^i(g_{t+1}(\gamma_{t+1}), r_{C,t+1}^\lambda)\} \\ & \text{s.to. } g_t \in [0,1] \text{ and } r_t^\lambda \in [0,1] \end{aligned} \quad (3)$$

---

<sup>11</sup> Formally  $EU_\alpha^j(\Theta, p_t, \phi, r_{-C,t}^\lambda)$  is  $EU_\alpha^j(\Theta, p_t, \phi, r_{S,t}^\lambda)$  when a single party government is in office, but is defined as  $EU_\alpha^j(\Theta, p_t, \phi, r_{C,t}^\lambda)$  when the coalition in office is different from the current incumbent coalition.

<sup>12</sup> It is a finite horizon problem because the coalition will not survive in office beyond some finite time  $T$ .

We define the single party government's optimization problem in a footnote,<sup>13</sup> but to save space, we focus on solving the Perfect Bayesian equilibrium (PBE) of the game only when a coalition government is in office. We then conduct comparative static analyses to derive the hypothesis that we test on data. The PBE of our model should satisfy the following criteria: (i) the level of spending chosen by the coalition government must be optimal given voters voting strategies and beliefs, (ii) each voters strategy must be optimal given his or her beliefs and the level of spending that the government chooses and (iii) voters posterior beliefs are derived from the coalition government's spending level through Bayes' rule where possible.

### 2.3 Comparative Statics and Testable Hypothesis

From the coalition government's optimization problem, we obtain

**Lemma 1:** *For the voters' distribution of spending preference  $F_\alpha^j$  and the profile of party types  $\lambda^i$ , the optimal spending level implemented by the coalition government in a perfect Bayesian equilibrium is*

$$p_t^*(g_t) = \frac{(1-\delta)(2br_{C,t}^\lambda) + \delta(1+br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta g'_{t+1}(\gamma_{t+1})} \quad (4)$$

**Proof:** See Appendix

We show formally in the appendix that the level of government spending implemented by the coalition government in (4) satisfies the conditions of a Perfect Bayesian equilibrium in that  $p_t^*(g_t)$  is optimal given the distribution of spending preference types among voters, the voters' beliefs and the voters' optimal strategy after observing  $p_t^*(g_t)$ .

Our interest in time horizons leads us to examine the comparative static for  $p_t^*(g_t)$  with respect to the government's discount factor  $\delta \in (0,1)$ , which produces:

---

<sup>13</sup> A single party government's spending decision ( $p_t^S(g_t)$ ) is influenced by its discount factor  $\delta_S \in (0,1)$ , the initial spending level, the rent it extracts  $r_{S,t}^\lambda$  and the voters voting decision. The voters' belief *profile*  $\Theta$  does not matter in this case since the government comprises of only one party. Hence, the single party's spending decision is determined by the function  $\beta_t(\lambda, F_\alpha^j, p_0)$  and its dynamic optimization problem  $\arg \max_{g_t} \{v(g_t, \beta_t, r_{S,t}^\lambda) + \delta_S V(g_{t+1}, \beta_{t+1}, r_{S,t+1}^\lambda)\}$  s.to.  $g_t \in [0,1]$  and  $r_t^\lambda \in [0,1]$ .

**Proposition 1:** *For voters' prior belief profile  $\Theta \equiv (\theta^L, \theta^M, \theta^R)$  and  $F_\alpha^j$ , the level of government spending under multiparty coalitions increases since coalition governments have shorter time horizons/ lower discount factor in office. More formally,  $p_t^*(g_t)$  strictly increases, ceteris paribus, when  $\delta$  decreases (i.e. when  $\lim \delta \rightarrow 0$ ).*

**Proof:** See Appendix

Building on our finding in Table 2 that coalition governments' survival is brief relative to single party governments, comparative statics from our model predict that government spending increases under coalition governments primarily because they have a low discount factor in office. The causal intuition that explains the result in Proposition 1 is as follows.

To begin with, note that a low (and decreasing) discount factor ( $\lim \delta \rightarrow 0$ ) implies a situation where policy makers and parties within the coalition government have short time horizons since they anticipate that their likelihood of remaining in office in the future is low owing to expectations of government dissolution.<sup>14</sup> According to our model, a low discount factor has three effects—which we describe in detail below – that lead to higher government spending under coalition governments: (i) incentives to increase government expenditure and direct the benefits of high spending to constituents, (ii) extraction of high levels of rent in office and (iii) failure to fully internalize the future costs of high government spending.

First, a low discount factor encourages parties in the incumbent coalition to hedge against the possibility of electoral defeat by appeasing constituents that may be favorably disposed toward the coalition parties. Specifically, a low discount factor provides incentives to the coalition parties to both increase government expenditure on subsidies, transfers, etc. and target the benefits of high spending to their constituents and other sections of the voting

---

<sup>14</sup> Numerous reasons may increase the likelihood of dissolution for the incumbent coalition government – that are not relevant to the model's result in Proposition 1 or the analysis that follows – and contribute to the low discount factor of parties in the coalition. For example, a stochastic event such as a political crisis or political scandal could weaken the incumbent coalition government and hastens its fall from office. Second, it is plausible that poor economic performance by the coalition government and failure to deliver on its promises or the rise of a popular opposition leader could increase the prospects of dissolution for the governing coalition. This could also contribute to the coalition government's low discount factor.

population that may gain from such spending. Bribing constituents with the benefits of high government expenditure provides two political advantages to the coalition government.

For one, constituents and voters that gain from higher spending targeted toward them are likely to support the coalition government in elections. This, in turn, helps each coalition party to strengthen electoral support among its constituents and potentially increase its “vote-bank” among other sections of the voting population, therein maximizing its vote share. Maximizing vote share increases the prospects of each coalition party joining a new (or the same) coalition government that may form after the election. Second, strengthening their vote share by providing the benefits of higher levels of public spending to their supporters allows each party in the coalition to at least maximize their chances of obtaining sufficient legislative seats in an upcoming election, which acts as an insurance mechanism. In particular, even if parties in the current coalition are unable to cobble together the same coalition or join a new government after elections, they anticipate that strengthening their electoral support among constituents may give them enough representation in the legislature to minimize their electoral losses and maintain their bargaining leverage. Maintaining their bargaining leverage in the legislature is crucial since it ensures that policies implemented by the future government may not stray too far from the policy preferences of the parties in the current coalition if they are in the opposition in the future. In short, the low discount factor of the coalition government gives it incentives to both increase government expenditure and direct the benefits of higher spending toward constituents to increase their vote share for purposes of political insurance.

The second effect of short time horizons is that it encourages parties in the coalition government to maximize their personal consumption by extracting more rent in office, which also translates to a higher level of government spending. We derive the aforementioned claim from comparative statics conducted on equation (4) which show that  $p_t^*(g_t)$  strictly increases

when  $r_{C,t}^\lambda$  increases, i.e.  $\partial p_t^*(g_t)/\partial r_{C,t}^\lambda > 0$ .<sup>15</sup> The result  $\partial p_t^*(g_t)/\partial r_{C,t}^\lambda > 0$  is not surprising since rent extraction implies that parties in the coalition are spending government finances for their consumption. Therefore, greater rent extraction means that government expenditure is *directly* being increased, in part, for consumption. The link between greater rent extraction and higher government spending is straightforward. But the key question that remains to be answered is: why does the low discount factor of coalition governments encourage parties in the coalition to appropriate more rent in office? We posit two reasons to answer this question.

First, when their discount factor is low, ruling parties in the coalition may anticipate that their opportunities for extracting rent in the future may end abruptly if they are unable to retain office and/or join a new government that forms after elections. Anticipating that their rent-seeking opportunities may be drastically curtailed in the future gives them incentives to appropriate substantial amount of rent in office. In fact, we show in the appendix that the rent extracted by parties ( $r_{C,t}^\lambda$ ) increases in equilibrium when their discount factor decreases ( $\lim \delta \rightarrow 0$ ). Second, parties in the coalition government know that voters cannot observe their rent-seeking behavior and are incompletely informed about each party's type, namely its propensity for extracting rent.

This is a crucial point because if the coalition government has a short time-horizon, then coalition parties have added incentives to exploit voters' incomplete information of their type by extracting more rent in office. To see why, first consider that rational parties in the multiparty coalition recognize that (i) voters cannot observe their rent-seeking behavior and (ii) voters do not know which particular coalition party to "blame" or hold accountable for extracting rent especially when a multiparty coalition is in office. Voters may thus find it difficult to electorally punish parties or actors within the coalition since they cannot identify the party (or parties) in

---

<sup>15</sup> The proof of this claim is provided in the appendix.

the coalition government responsible for extracting rent. Note that since coalition parties know that voters find it impossible to identify and punish those guilty of extracting rent during elections, they can do so without incurring political costs. Thus, to summarize the arguments posited above, the low discount factor of the coalition government gives parties in the coalition incentives to extract rent. But it is the voters' incomplete information of each party's type that drives the coalition parties' behavior to actually extract more rent in office. Or, more succinctly, the low discount factor of the coalition government *combines* with voters' incomplete information of each party's type to foster greater levels of rent seeking by parties in the coalition. And, as mentioned above, more rent seeking translates to higher government spending.

Apart from encouraging rent seeking behavior, the third effect of short time horizons is that it makes coalition governments less sensitive to the future costs that result from increasing government expenditure in the current period. A low discount factor, in particular, leads to a situation where parties in the coalition fail to adequately internalize the future costs of implementing policies that increase the level of government spending. This occurs because parties within short-lived coalition governments may believe that since their likelihood of retaining office after elections may be low, they can always buck pass the responsibility of reducing government spending to some future time. Indeed, the possibility that parties within short-lived coalition governments believe that they can potentially buck pass the burden of reducing government expenditure to the future gives them incentives to increase current government spending to meet their short term political goals since they may not have to bear the burden of reducing government expenditure in the near future. Hence, the short time horizon of the coalition government in office produces a "lame-duck term" effect where parties in the coalition are unable to fully internalize the potential costs of excessive public spending. This induces fiscal irresponsibility by the coalition government, which engenders an increase in government spending, as predicted in Proposition 1.

As noted above, space constraints prohibit us from presenting the formal model with a single party government, but a similar analysis in which we replace the coalition government in the model with a single party government produces the proposition that the discount factor of a single party government in office will not influence its incentives to engage in greater levels of either rent seeking or target the benefits of higher government spending to voters. Thus:

**Proposition 2:** *For  $\lambda$ ,  $F_\alpha^j$  and the single party government's discount factor  $\delta_s \in (0,1)$ , the level of government spending under single party governments does not increase.*

Though we lack space to present the formal analysis, we can sketch the causal intuition. First, as reported in Table 2, single party governments have substantially longer time-horizons in office compared to coalition governments. Hence, unlike multiparty coalitions, single party governments will internalize the future costs of high spending and will also be relatively more politically secure about their prospects of retaining office or maintaining the seats they control in the legislature. This will give them incentives to avoid raising government expenditure to bribe voters and buck-pass the costs of higher spending. Indeed, when we replace the coalition government in our model with a single party government, we find that equilibrium spending ( $p_t^{S^*}(g_t)$ ) does not increase under the single party government.<sup>17</sup>

Second, because single party governments contain only one party, voters find it easier to hold such governments accountable for rent-seeking behavior. As a result, during elections voters can more easily blame and punish the ruling party in a single party government if they believe that it has extracted excessive rent in office. Since single party governments will realize that voters find it easier to hold them accountable when they are in power and because they wish to avoid electoral punishment their incentives to extract rent in office will decrease dramatically, even when their discount factor is low. More formally, the rent extracted by a

---

<sup>17</sup> We briefly show in the appendix that the level of spending implemented by a single party government in equilibrium,  $p_t^{S^*}(g_t)$ , does not increase for all  $\delta_s \in (0,1)$

single party government ( $r_{s,t}^\lambda$ ) in our model does not increase in equilibrium for all  $\delta_s \in (0,1)$ <sup>16</sup>, therein reducing the possibility of higher expenditure engendered by greater rent-seeking. Further, as shown empirically in the next section, tests on our sample indicate that in contrast to coalition governments, the discount factor of single party governments does not statistically increase government spending, which is perhaps not surprising given the above claim.

The two propositions and the causal intuition that explains the results in these propositions imply the following hypothesis that we test below:

*Hypothesis 1: Under coalition governments government spending will be greater the lower the discount factor in office (i.e. higher hazard rate), but the incumbent's discount factor in office (hazard rate) will not influence government spending under single party governments.*

### 3. Sample, Dependent Variable and Statistical Methodology

We compiled a comprehensive time-series cross-sectional (hereafter TS-CS) dataset for 62 democracies<sup>17</sup> from the developed and developing world from 1975 to 2000 –listed in Table 1—to test hypothesis 1.<sup>21</sup> Of these 62 democracies 27 are OECD countries and the remaining 35 are non-OECD countries. We include presidential and mixed democracies in our sample along with parliamentary democracies<sup>18</sup> because our data and Cheibub, et al's (2004:575) study reveal, contrary to a widespread belief (e.g., Linz 1994), that the formation of coalition governments is common in Presidential and mixed democracies. For example, in

---

<sup>16</sup> The proof that  $r_{s,t}^\lambda$  does not increase for decreasing  $\delta_s$  (discount factor) of single party governments is available on request; note that if  $r_{s,t}^\lambda$  does not increase, then  $p_t^{S^*}(g_t)$  will not increase either because of a monotonic relationship between these two parameters.

<sup>17</sup> The democracies in our sample satisfy Przeworski et al's (2000) criteria for a democracy: (i) the chief executive and legislature must be directly elected; (ii) there must be more than one party in the legislature and (iii) incumbents must allow a lawful alternation of office if defeated in elections.

<sup>21</sup> The absence of data for some variables prevented us from including more countries in our sample.

<sup>18</sup> Following Cheibub, et al. (2004: 582), we classify systems in which governments must enjoy the confidence of the legislature as Parliamentary democracies; systems in which governments serve on the authority of the elected president are coded as Presidential democracies while systems in which governments must respond to the legislature *and* elected Presidents are classified as mixed democracies.

our data, we find that out of a total of 681 instances of coalition governments, 380 coalitions occurred in Parliamentary democracies, 192 in Presidential, and 109 in mixed democracies.

The fact that our global sample contains both developed and developing democracies is an advantage because unlike many studies that only focus on advanced industrial OECD countries,<sup>19</sup> we are able to make much more generalizable claims if our hypothesis is supported by the empirical evidence. A second advantage of our sample is that it contains substantial cross-sectional and temporal variation in the dependent variable and key independent variables, therein allowing us to test our hypothesis more effectively.

Following existing studies that use total central government expenditure as a share of GDP to operationalize the size of government (e.g., Persson, et al. 2005), the dependent variable for our tests is total central government expenditure as a percentage of a country's GDP. Data for our dependent variable is taken from: *Penn World Tables*, Version 6.1, *Government Finance Statistics* (CD-Rom) from the International Monetary Fund, and the *World Development Indicators* (CD-Rom) from the World Bank. The mean of the dependent variable in our sample is 27.4% and the standard deviation is 19.6%.

We estimate TSCS regression models with panel-corrected standard errors (PCSE's) that are adjusted to correct for heteroskedasticity and contemporaneous correlation. We include country fixed effects are included in each empirical model, and then verify the robustness of our results by estimating random effects models. We initially included dummies for each year in the specifications, but dropped these as F-tests indicate that the temporal dummies are jointly insignificant. To account for serial correlation, we include the lag of the dependent variable in the TSCS regressions (Beck & Katz 1995). Because introducing the lag of the dependent variable may weaken the explanatory power of other variables in the specification (Achen 2000), we

---

<sup>19</sup> For e.g, Bawn & Rosenbluth (2006) focus on government spending in advanced OECD countries, while Hallerberg & Von Hagen (1999) examine public debt and deficits in advanced OECD democracies.

estimated some models via the Prais-Winsten procedure with PCSE's, fixed effects and a single autocorrelation parameter. We also conduct robustness and diagnostic tests described later to check the econometric validity of our results.

### 3.1 Independent and Control Variables

To test the prediction in hypothesis 1, we need a measure that captures the *ex ante* discount factor (i.e., time horizon) of the chief executive of each government, including coalition and single party governments, in our sample of 62 democracies during the 1975-2000 period. Doing so is not straightforward. Unlike existing studies that use the mean turnover rate of leaders to proxy for the time horizons of incumbents (e.g., Alesina, et al. 1996), which both capture the *ex post* discount factor of governments and lack temporal variation, we develop a measure that captures the *ex ante* discount factor of chief executives in office. Specifically, we derived the predicted probability of government duration for each government in our sample since it provides a good proxy for each chief executive's *ex ante* discount factor. We did so by estimating parameters and then multiplying the values of the independent variables for each government by those parameters to create a unique expected duration for each government in our sample. More specifically, we proceeded in several steps.

First, we estimated some discrete time hazard models with a logit specification (Beck, Katz and Tucker 1998) to derive the predicted probability of failure of each government in our sample. We use the hazard model to examine the duration (in months) of all governments in our sample in the January 1975 to December 2000 period. Formally, the discrete time hazard

model with a logit specification is  $P(y_{i,t} = 1) = h(t | \mathbf{x}_{i,t}) = \frac{1}{1 + \exp-(\mathbf{x}_{i,t}\beta' + k_{t-t_0})}$ , where  $i$

denotes each government in the sample,  $\mathbf{x}_{i,t}$  the vector of independent variables in the hazard model and the temporal dummies  $k_{t-t_0}$  capture the length of the time that each government

has been in office from  $t_0$  until the time period  $t$  at which the government collapses.<sup>20</sup> The hazard rate in this model, therefore, represents the probability that a government will end at a particular time given that the government has survived to that point. The dependent variable in the hazard model with a logit specification, *Failed*, is a dummy variable coded one for each instance of government dissolution, due either to election or to a change in the composition of parties, no-confidence votes or voluntary resignations.

Because we have data on the month of entry (into office) and exit of every government across 62 democracies during the 1975 to 2000 period, we can use the estimates from the discrete time hazard model to calculate the predicted probability of government failure, i.e. the hazard rate, of each government. The predicted probability of failure in office – the hazard

rate for each government – is calculated by  $\hat{P}(y_{i,t} = 1) = \frac{1}{1 + \exp(-(\mathbf{x}_{i,t}\hat{\beta}' + \hat{k}_{t-t_0})}$ .  $\hat{\beta}'$  is the estimated log hazard odds ratio for each government given  $\mathbf{x}_{i,t}$ , while  $\hat{k}_{t-t_0}$  captures how long each government has been at risk via the estimated baseline hazard probability  $h_0(t)$ .

The variables we include in the hazard model are drawn from existing works on government termination in democracies, which largely focus on advanced OECD democracies and to a lesser extent on developing democracies.<sup>21</sup> We do not carry out a detailed study of government termination and duration here since our objective is to derive the hazard rate of each government in our sample to operationalize our independent variable. Hence, we briefly define below the variables included in the hazard model rather than describe them in detail.

First, given that research shows that the duration of governments, including coalition governments, are lower in parliamentary democracies compared to presidential democracies

---

<sup>20</sup> Beck, Katz and Tucker (1998) show that the hazard rate of a discrete hazard model with a logit specification and temporal dummies is similar to the hazard rate in the Cox duration model.

<sup>21</sup> Studies of government termination for OECD democracies include King, et al. (1990) and Warwick (1994) and for developing democracies see Maeda and Nishikawa (2006) and Cheibub & Limongi (2002).

(Cheibub, et al. 2004) we include the dummy *Parliamentary Democracy* for countries that are parliamentary democracies in the sample. Second, we added information on the *length of term* to the hazard model. The length of presidential terms in Presidential democracies affects the duration of governments. For parliamentary systems, the length of legislative terms (*term length*) is used for this variable. Third, we control for the chief executive's *term limit*, which is a dummy variable. Since Presidential systems have term limits, the ruling party has to find a new candidate if the incumbent President is not allowed to run for the next term. *Term limit* is coded as 1 if the incumbent chief executive cannot seek the next term and is zero otherwise.

Fourth, we account for the possibility that many parliamentary democracies are characterized by endogenous electoral timing and that this may increase the likelihood of government termination. Specifically, recent research suggests that as constitutionally mandated elections approach in parliamentary democracies, government leaders attempt to dissolve the government at the most optimal time Smith (2003: 407). Hence, we include a variable labeled as *electoral clock*, counting down the time to when an election must, by law, be called. The *electoral clock* variable, which is bounded between 0 and 1,<sup>22</sup> accounts for the fact that countries in our sample have different constitutionally mandated election periods. Fifth, since policy-makers in government cannot call elections at opportune times in countries with exogenous electoral timing, we add a dummy for systems with *exogenous electoral timing* in the hazard model.

Sixth, King, et al. (1990: 358) suggests that higher legislative fractionalization and government polarization increases the likelihood of government termination. The variables *Government Polarization* from the World Bank's Database of Political Institutions (DPI) (Keefer et al 2002) and Laakso and Taagepera's (1979) measure of *Effective Number of Legislative Parties*

---

<sup>22</sup> We normalized the electoral clock variable to reflect the fact that countries have different constitutionally mandated election periods: 36, 48 or 60 months. The formula for the 0 to 1 electoral clock variable is: (Number of Months Until Election Must be Called)/(Constitutional Electoral period), with 1 implying that the full electoral period is remaining, 0 indicating no time remaining and 0.5 indicates that half the electoral period remains before elections must be called.

(ENLP) are thus added to the hazard model. We control for *Growth Rate of GDP per capita*, drawn from the Penn World Tables (version 6.1), in the hazard model to account for the possibility that an incumbent party is more likely to lose office when the economy is not doing well.

We also include the dummy *Coalition Government* – takes a value of 1 if the government consists of more than one party (>1) in the government—in the hazard model and treat single party governments as the reference category. We estimated another discrete time hazard model where we add the dummy *Single Party Government* and treat coalition governments as the reference category. Other variables were added to the hazard model for robustness tests;<sup>23</sup> inclusion of these additional variables did not alter the hazard rate of each government that we derive from our hazard models. Data for the duration of governments and the other variables in the hazard model are from King, et al. (1990), Delury (1999), Woldendorp, et al. (2000), *Keesings' Record of World Events* (2001), the World Bank's DPI (Beck et al 2002), Cheibub, et al. (2004), Cheibub & Limongi (2002), and Maeda & Nishikawa (2006).

To save space we do not report the estimates from the discrete time hazard models, although the models do a good job predicting when a government is going to end (95% of the cases). To operationalize their discount factor in office we calculate the predicted probability of failure of each coalition and single party government from the respective hazard models (described above). We label the predicted probability of failure of each coalition government as *Hazard Rate (Coalition)* and each single party government as *Hazard Rate (Single Party)*.<sup>24</sup> The *Hazard Rate* variables are each bounded between 0 and 1. Tests reveal that the mean of *Hazard Rate (Coalition)*—which is 0.62—is statistically higher than the mean for *Hazard Rate (Single Party)*—which is 0.43 ( $p=0.000$ ). This confirms our formal model's assumption that the hazard rate (discount factor) of coalition governments is higher (lower) than single party governments.

---

<sup>23</sup> These additional variables include *Inflation*, dummy for *Minority Government* and *Veto Players*.

<sup>24</sup> By definition the *Hazard Rate (Coalition)* variable is set to zero for single party governments, and the *Hazard Rate (Single Party)* variable is set to zero for coalition governments.

The *Hazard Rate (Coalition)* variable nicely captures the *ex ante* discount factor –and thus time horizons –of coalition governments in office since higher values of this variable indicates that the government’s *ex ante* discount factor is low, while low values of this variable indicates the government’s *ex ante* discount factor is high. We include the *Hazard Rate (Coalition)* variable, which is the key independent variable used to test hypothesis 1, in our specification for government spending. We also include *Hazard Rate (Single Party)* in our specification for government spending in order to test the latter half of the prediction in hypothesis 1, which states that the discount factor of single party governments does not affect spending.

Apart from *Hazard Rate (Single Party)*, we control for several political and economic variables that capture alternative explanations for government spending. First, some scholars predict that left governments spend more than right governments (Garrett & Lange 1991). We thus include the variable *Government Partisanship* from the World Bank’s DPI, which measures political parties on a 0-2 right to left scale and expect that it will have a positive effect on the dependent variable. Persson & Tabellini (2004) and Milessi-Ferretti, et al. (2002) suggest that government spending is lower in countries with a Majoritarian electoral system. We introduce *Majoritarian*, a variable we code as 1 for countries with a majoritarian electoral system, and treat countries with a PR or mixed electoral system as the reference category. Extant research expects *Majoritarian* to have a negative effect on the dependent variable. We add the dummy *Parliamentary Democracy* and treat Presidential and Mixed Democracies as the reference categories since Persson, et al. (1997) predict that parliamentary democracies are associated with higher spending. Data for *Majoritarian* and *Parliamentary Democracy* are from the World Bank’s DPI.

Numerous scholars claim that the presence of more than one party in coalition governments generates a common pool resource problem that leads to higher government expenditure (Bawn & Rosenbluth 2006, Persson et al 2005). Hence, we control for the dummy *Coalition Government*. To code *Coalition Government* we use Cheibub, et al. (2004), Woldendorp, et

al. (2000), Delury (1999) and *Keesing's Record of World Events*. It is possible that *Hazard Rate (Coalition)* may be correlated with *Coalition Government* in the empirical model. Fortunately, tests revealed that the correlation between *Hazard Rate (Coalition)* and *Coalition Government* is statistically insignificant, therein mitigating concerns of collinearity between these two variables. To be sure, we also estimated a separate empirical model where we include *Hazard Rate (Coalition)* and all the control variables listed here, but excluded *Coalition Government*.

Scholars suggest that greater legislative fragmentation—operationalized via the effective number of parties in the legislature—increases government spending (Scartascini & Crain 2002; Mukherjee 2003). We add Laakso and Taagepera's (1979) measure of *Effective Number of Legislative Parties* (ENLP) and expect that it will have a positive effect on the dependent variable. We incorporate the dummy *Minority Government* coded as 1 for minority governments since Roubini & Sachs (1989) claim that minority governments are associated with higher expenditure.

We include the number of *Veto Players* in government—drawn from the *Checks* variable in the World Bank's DPI (Beck, et al. 2002)—since scholars predict that more veto players in government makes it difficult for policy-makers to adjust policy and reduce government spending (Hallerberg & Von Hagen 1999; Tsebellis & Chang 2005). We expect that *Veto Players* will have a positive effect on the dependent variable. We also add *Government Polarization* from the World Bank's DPI, which is operationalized as the absolute maximum difference of partisan orientation among all parties in the government on a 0-2 scale. Since greater government polarization makes it difficult for policy-makers to adopt fiscal reforms to reduce spending (Franzese 2002), *Government Polarization* is likely to be positive.

The first economic control that we include is *Trade Openness*, measured as imports plus exports divided by a state's GDP, because Rodrik (1997) claims that greater trade openness induces governments to spend more, while Garret & Mitchell (2001) suggest that trade openness does not statistically influence public spending. We add *Log population* and *Log of*

*GDP per capita* in the model, which are standard controls in models of government spending. Data for *Log of GDP per capita*, *Trade Openness* and *Log Population* are from Penn World Tables. Finally, Franzese (1999: 11) suggests that an independent central bank may dissuade governments from excessive spending. We control for *Central Bank Independence* (CBI), which is operationalized using the Cukierman, et al. (2002) 0-1 index of central bank independence.<sup>25</sup>

#### 4. Findings and Analyses

In Table 3 we present the results from several lagged dependent variable models estimated with fixed effects and PCSEs. In model 1, Table 3, we report the results from a complete specification estimated on the global sample where we incorporate *Hazard Rate (Coalition)* and all control variables, including *Hazard Rate (Single Party)* and *Coalition Government*. To check whether or not the results in model 1 remain consistent in different specifications, we estimate three more models on the global sample. First, in model 2 we drop *Coalition Government* but retain *Hazard Rate (Coalition)*, *Hazard Rate (Single Party)* and the other controls. In model 3 we include *Hazard Rate (Coalition)* and other controls, but exclude *Hazard Rate (Single Party)* and *Coalition Government*. In model 4 we focus on the effect of *Hazard Rate (Single Party)* on government spending when *Hazard Rate (Coalition)* is excluded but other controls are retained. To assess the robustness of our results, we re-estimate the full specification in model 1 on subsamples of OECD (model 5) and non-OECD countries (model 6).

<<Insert Table 3 about here>>

The coefficient of *Hazard Rate (Coalition)* is positive and highly significant at the 1% level in model 1 for the global sample. It is also positive and statistically significant in model 2 where we drop *Coalition Government* as well as in model 3 where *Hazard Rate (Single Party)* and *Coalition Government* are excluded. Further, *Hazard Rate (Coalition)* is positive and

---

<sup>25</sup> Cukierman, et al's (2002) CBI measure accounts for 16 different aspects of central bank statutes including the relative autonomy between the government and central bank, which political actor can decide replacement of the central bank chair and the scope of decision-making for monetary policy.

statistically significant in the models estimated for the OECD (model 5) and the non-OECD sample (model 6). These results statistically corroborate the prediction in hypothesis 1.

In contrast, *Hazard Rate (Single Party)* is statistically *insignificant* in models 1, 2 and 4 (where *Hazard Rate (Coalition)* is dropped) for the global sample and in the models estimated for the OECD and non-OECD sub-samples. Thus the hazard rate of single party governments (i.e. non-coalition governments) does not lead to an increase in government spending, as predicted in hypothesis 1. Indeed, as indicated by the statistical significance of the positive coefficient of *Hazard Rate (Coalition)*, it is primarily the low discount factor of coalition governments that has a significant positive effect on the size of government, which is precisely what our model predicts.

*Coalition Government* is statistically insignificant in not just the full specification in model 1 but also in model 4 where we exclude *Hazard Rate (Coalition)*. The *Coalition Government* dummy is insignificant in the models estimated for OECD (model 5) and non-OECD (model 6) countries. We also found, but do not report to save space, that *Coalition Government* is insignificant if we include all control variables but exclude *Hazard Rate (Coalition)* and *Hazard Rate (Single Party)* in the model. This suggests, in contrast to Bawn & Rosenbluth's (2006) and Persson, et al's (2005) claim, that it is not merely the presence of multiparty coalition governments in office *per se* that leads to higher government spending. Instead, as mentioned above, it is the low discount factor of coalition governments that engenders higher government expenditure.

Apart from the statistical significance of *Hazard Rate (Coalition)*, the substantive effect of this variable is strong. When we increase *Hazard Rate (Coalition)* in model 1 by one standard deviation above its mean and hold other variables in the model at their mean, central government expenditure as a share of GDP increases by 12%, which is a substantively large effect. This is reflected in Figure 1 (derived from model 1), which shows that an increase in *Hazard Rate (Coalition)* by one standard deviation above its mean (i.e. from .62 to .80) leads to an

increase in government spending by almost 12% in the global sample. Likewise, increasing *Hazard Rate (Coalition)* by one standard deviation above its mean and holding other variables at the mean for the OECD (non-OECD) sub-sample increases the dependent variable by 10% (13%) in OECD (non-OECD) democracies.

<<Insert Figure 1 about here>>

Unlike the strong statistical support for our theoretical prediction, we find that alternative political explanations for government spending captured by our control variables are for the most part statistically insignificant in the models estimated for the global, OECD and non-OECD samples. For example, we noted earlier that the extant literature predicts that the presence of minority governments, greater number of veto players or ideological fragmentation within incumbent governments engenders higher spending. Unfortunately, *Veto Players*, *Government Polarization* and *Minority Government* are statistically insignificant in all the models in Table 3, therein contradicting the existing claims mentioned above.

The estimate of ENLP and *Government Partisanship* is insignificant as well in all the models in Table 3. Hence, neither legislative fragmentation nor government partisanship statistically affects government spending in the global, OECD and non-OECD samples. With respect to the economic controls, *Log Population* and *Log GDP per capita* have the predicted sign and are each significant but the other economic variables are insignificant.

The coefficient of *Parliamentary Democracy* has the predicted positive sign, but is statistically insignificant in all the empirical models. This contradicts Persson, et al's (1997) claim that government spending is higher in parliamentary democracies. The estimate of *Majoritarian* has the predicted negative sign but is statistically insignificant in the empirical models estimated for the global sample, the OECD and the non-OECD sub-sample in Table 3. This suggests weak empirical support for the claim that government spending is low in countries with a Majoritarian system (Persson & Tabellini 2004; Milessi-Ferretti et al. 2002).

Readers might suspect that the estimates of the political control variables reported above are consistently insignificant in the empirical models in Table 3 since these models are estimated with fixed effects. While this concern is justifiable, we present additional results later, which show that the political control variables mentioned above remain statistically insignificant in empirical models that are estimated with random effects.

Scholars often claim that the Proportional Representation electoral system engenders higher spending (e.g., Persson & Tabellini 2003). To check the validity of this claim, we estimated fixed and random effects models on the global sample where we retained the specification in model 1, but included the dummy *Proportional Representation*, which is coded as 1 for countries with a PR electoral system. Countries with a Majoritarian electoral system are treated as the reference category in the models estimated with the PR dummy. The results from the specifications with the PR dummy estimated on the global sample with (i) fixed effects are reported in model 7 in Table 3 and (ii) random effects in model 8 in Table 4.

<<Insert Table 4 about here>>

*Proportional Representation* (PR) has the predicted positive sign, but is statistically insignificant in the fixed and random effects models for the global sample. Further, *Hazard Rate (Coalition)* remains positive and highly significant, while *Hazard Rate (Single Party)* and *Coalition Government* is insignificant in models 7 and 8, thus indicating robust support for hypothesis 1. We also found, but do not report to save space, that PR is insignificant in the models estimated with fixed and random effects for the OECD and non-OECD samples.

Taken together, the results reported in models 1-8 indicate that once we incorporate the hazard rate of coalition governments in our empirical model, alternative political explanations for higher government spending, including *Veto Players*, *Majoritarian* and PR do not statistically affect the size of government. While PR, *Majoritarian* and *Veto Players* is insignificant in the models, we do *not* want to claim that these variables do not affect

government spending. It is possible, for instance, that electoral institutions and veto players in government have an *indirect* rather than a direct effect on government spending. We lack the space to explore the potential indirect effect that electoral systems and veto players may have on government spending, but we believe that this is a fruitful area for future research. Second, unlike *Hazard Rate (Coalition)*, political controls such as electoral systems and veto players lack substantial temporal variation, which may explain why these variables do not have a statistically significant effect on government spending. We check below the robustness of the reported results by estimating additional models and conducting diagnostic tests.

#### **4.1 Robustness Checks and Diagnostic Tests**

For the first robustness test, we checked whether or not the results from the complete specification in model 1 remains robust in models estimated with random effects. Note that *Hazard Rate(Coalition)* remains positive and significant at the 1% level in the random effects models estimated for the global (model 9, Table 4), OECD (model 10, Table 4) and non-OECD (model 11, Table 4) samples. However, *Hazard Rate (Single Party)* and *Coalition Government* are insignificant in models estimated with random effects. Hence, hypothesis 1 finds strong support in the random effects models.

Second, it is possible that introducing the lag of the dependent variable may have weakened the explanatory power of the variables in models 1-11, thus leading to spurious results. To address this problem, we followed Achen's (2000) advice and estimated the impact of *Hazard Rate (Coalition)* on the dependent variable, while controlling for other variables in Prais-Winsten models estimated with fixed effects, PCSEs and an AR(1) parameter. The results from the Prais-Winsten models for the global, OECD and non-OECD samples are reported in models 12, 13 and 14 (Table 4) respectively. The estimate of *Hazard Rate (Coalition)* remains positive and highly significant, while *Hazard Rate (Single Party)* and *Coalition Government*

is insignificant in each Prais-Winsten model. The positive and significant estimate of *Hazard Rate (Coalition)* is thus consistent across models estimated with different techniques.

For the third robustness test, we estimated another model on the global sample with fixed effects where the dependent variable is *change* in government spending –i.e. change in total central government expenditure as a % of a country’s GDP from year  $t-1$  to  $t$ . Results from this robustness test in model 15 show that *Hazard Rate (Coalition)* remains positive and highly significant, while *Hazard Rate (Single Party)* and *Coalition Government* is insignificant. *Veto Players*, *ENLP*, *Majoritarian* and *Government Partisanship* remain insignificant in model 15. Finally, we included additional controls such as *Log of Inflation*, separate dummies for *Divided* governments and *Federal* countries and *Mean District Magnitude* in each model. Space constraints prevent us from reporting the models with the additional variables. Inclusion of these additional variables did not statistically alter the results reported in the tables.

Are the results being driven by the correlation between *Hazard Rate (Coalition)* and other variables such as *Veto Players*, *Majoritarian*, *ENLP*, *PR* or *Parliamentary Democracy*. Tests reveal that the correlation between *Hazard Rate (Coalition)* and each of the five variables mentioned above is weak and statistically insignificant<sup>26</sup>, therein mitigating concerns of collinearity. Variance Inflation Factor (VIF) tests indicate that none of the models in Tables 3 and 4 suffer from multicollinearity.<sup>27</sup> Other diagnostic tests show that the residuals from the models are not serially correlated<sup>28</sup>, are normally distributed and are homoscedastic. Regression specification error tests show that each model does not suffer from omitted variable bias.

## 5. Conclusion

---

<sup>26</sup> The correlation between *Hazard Rate (Coalition)* and (i) *Veto Players* is .11, (ii) *Majoritarian* is -.093, (iii) *ENLP* .20, (iv) *Proportional Representation* is .27 and (v) *Parliamentary Democracy* is .15.

<sup>27</sup> The mean and largest VIF values for each empirical model are smaller than the threshold values of 10 and 1 respectively; hence the models do not suffer from multicollinearity (Chatterjee et al 1999).

<sup>28</sup> The Breusch-Godfrey LM tests for the lagged dependent variable models and Durbin-Watson tests for the Prais-Winsten models show that the residuals from these models are not serially correlated.

In this paper we presented a novel theory to explain how coalition governments affect the size of government. Specifically, we suggest that the lower discount factor of coalition governments in office (i) induces rent-seeking behavior by coalition parties, (ii) encourages them to increase government spending and direct the benefits of higher expenditure toward voters and (iii) increases their *inability* to internalize the future costs of high expenditure. These three factors lead to higher levels of government spending under coalition governments. Results from empirical models support the key prediction from our model.

The findings presented in this study have three main implications. First, much of the extant literature focuses on how partisanship, electoral systems and veto players affect government spending. After estimating many empirical models on data, we found little evidence supporting alternative political explanations for government spending mentioned above. This should not be taken to mean that veto players, electoral systems or partisanship has no effect on government spending. Instead, as noted earlier, it is possible that electoral systems, veto players and partisanship have an *indirect* rather than a direct effect on government spending, which requires further exploration. However, the results reported in this study suggest that scholars need to pay greater attention toward understanding how and why the hazard rate (discount factor) of governments affects government spending and perhaps other fiscal policy variables.

Second, some scholars claim that coalition governments have superior welfare effects on society compared to single party governments because coalitions redistribute income more equitably than their single party counterpart (Austen-Smith 2000). While our study does not permit judgment on whether coalition governments are good or bad for redistribution, our findings imply that economic inefficiency increases under coalition governments since they are more prone to resort to higher and perhaps excessive levels of government spending. By promoting inefficiency with respect to fiscal policy, coalition governments may actually have a

detrimental welfare effect on citizens. Hence, we should be more cautious before concluding that coalition governments have better welfare effects on society.

Finally, our data reveals that coalition governments have increased in frequency over space and time. For instance, coalition governments comprised 32% of all democratic governments between 1975 and 1988 and 57% of all governments between 1989 and 2000. Across space, we find that 47% of all coalition governments in our sample occurred in Parliamentary democracies, 29% in Presidential democracies and 24% in mixed democracies. We also find that 47% of coalition governments in our sample occurred in countries with a Proportional Representation (PR) system and 33% of coalition governments occurred in Majoritarian countries, thus suggesting that coalition governments are not unique to PR countries. Since the incidence of coalition governments has progressively become the norm rather than the exception across space and time our results suggest that we are likely to observe a trend toward higher levels of government spending *globally* in the future.

Turning to research implications, while useful we see two main directions in which our study can be extended. First, extending the temporal domain of our sample to the years before 1975 may enhance the empirical generalizability of our findings. This may be a difficult task given the paucity of data on specific political variables for many developing democracies prior to 1975. Second, in future research, we hope to extend the analysis in this paper to examine how the time horizons of leaders of coalition governments also affect the *composition* of government spending. This might also be difficult considering that data on the composition of government spending is not easily available for many developing democracies in Asia and Africa. Whatever future direction this study might take, we hope that our study provides a more plausible and accurate explanation for why government spending increases under coalition governments.

---

## Appendix

**Proof of Claim 1:** To conserve space, we only present below the main steps of this proof. In particular, details of the algebra used to derive  $p_t^*(g_t)$  are not presented to save space but are available on request. To begin with, note that the full functional form of the Bellman equation of the coalition government's dynamic programming problem in equation (2) is

$$\max_{g_{t+1}} \{-(g_t^i - g_t)^2 + br_{C,t}^\lambda + \delta V(-(g_{t+1}^i - g_{t+1})^2 + br_{C,t+1}^\lambda)\} \quad (A1)$$

Since for  $g_t > 0$  and  $g_t \in [0,1]$  is bounded with  $\bar{g}$  being its maximum value and  $\underline{g}$  its minimum value, the instantaneous utility of the parties in the coalition government is bounded, continuous differentiable and strictly concave in  $g_t$ . By standard arguments, the value function  $V(g_t, \cdot)$  is thus strictly concave and continuously differentiable. The first order condition (FOC) of (A1) w.r.t  $g_{t+1}$  yields  $\delta V'[2(g_{t+1}^i - g_{t+1})]$ ; note that  $\partial^2 V(g_t, \cdot) / \partial g_{t+1}^2 < 0$  which establishes strict concavity of  $V(g_t, \cdot)$  w.r.t  $g_{t+1}$ . The FOC of (A1) w.r.t  $g_t$  is  $2(g_t^i - g_t)$ . Solving for  $g_t$  and  $g_{t+1}$  from these FOC's, substituting the solutions into (A1) and letting  $\sum_{t=0}^T \delta^t = 1 - \delta^{T+1} / 1 - \delta$ , we obtain after substantial algebra and collecting terms

$$p_t^*(g_t) = \frac{(1 - \delta)(2br_{C,t}^\lambda) + \delta(1 + br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta g_{t+1}'(\gamma_{t+1})}. \text{ Suppose, w.l.o.g, that the distribution of spending}$$

preferences in the voting population is normally distributed with  $F_\alpha^j \sim N(0, \sigma_{g_t}^2)$ . Further, let voters prior beliefs  $\theta^j \in (\underline{\theta}, \bar{\theta})$  are uniformly distributed such that  $\underline{\theta} \sim [\theta', \theta'']$  and  $\bar{\theta} \sim [\theta', \theta'']$  where  $0 \leq \underline{\theta} \leq \bar{\theta} \leq 1$ . We now prove that for  $F_\alpha^j \sim N(0, \sigma_{g_t}^2)$  as well as  $\underline{\theta}$  and  $\bar{\theta}$  (where  $0 \leq \underline{\theta} \leq \bar{\theta} \leq 1$ ), voters have no incentives to reject  $p_t^*(g_t^M, g_t^R)$  and will therefore reelect parties M and R in the coalition. We then prove that the incumbent parties M and R have no incentives to deviate from the optimal spending level  $p_t^*(g_t^M, g_t^R)$  in equilibrium. Without loss of generality, the remainder of this proof also holds if parties L and M or L and R constitute the coalition government.

Suppose that parties M and R are in the coalition. Given (i)  $g_t^L > g_t^M > g_t^R$ , (ii)  $F_\alpha \sim N(0, \sigma_{g_t}^2)$  and prior beliefs of each parties type  $0 \leq \underline{\theta} \leq \bar{\theta} \leq 1$  with belief profile  $\Theta$  and (iii) the voters' quadratic loss function (equation 1), we get  $EU_\alpha^j(\Theta, p_t^*(g_t^M, g_t^R), \phi, r_{C,t}^\lambda) > EU_\alpha^j(\Theta, p_t(g_t^L, g_t^M), \phi, r_{C,t}^\lambda)$  and  $EU_\alpha^j(\Theta, p_t^*(g_t^M, g_t^R), \phi, r_{C,t}^\lambda) > EU_\alpha^j(\Theta, p_t(g_t^L, g_t^R), \phi, r_{C,t}^\lambda)$  for  $\underline{\theta} \sim [\theta', \theta'']$ ,  $\bar{\theta} \sim [\theta', \theta'']$ ,  $\forall 0 \leq \underline{\theta} \leq \bar{\theta} \leq 1$  and  $\forall g_t^\alpha \in [0,1]$ , which  $\Rightarrow \sum_i \phi_\alpha^j(i | \Theta, F, p_t^*(g_t^M, g_t^R), r_{C,t}^\lambda) \rightarrow 1$ . Hence, for  $\Theta$  and  $F_\alpha^j \sim N(0, \sigma_{g_t}^2)$ , voters will rationally vote for the two incumbent parties M and R in the governing coalition over all other possible combinations (in the three party case) when these two parties implement  $p_t^*(g_t^M, g_t^R)$ . Algebra shows that for  $\Theta$  and  $F_\alpha^j \sim N(0, \sigma_{g_t}^2)$ , voters vote for M and R (or any other two party combination) in the coalition instead of voting for the single party opposition (in this case formed by L) since in this particular example,  $EU_\alpha^j(\Theta, p_t^*(g_t^M, g_t^R), \phi, r_{C,t}^\lambda) > EU_\alpha^j(\Theta, p_t(g_t^L), \phi, r_{C,t}^\lambda)$  for  $\underline{\theta} \sim [\theta', \theta'']$ ,  $\bar{\theta} \sim [\theta', \theta'']$ ,  $\forall 0 \leq \underline{\theta} \leq \bar{\theta} \leq 1$  and  $\forall g_t^\alpha \in [0,1]$ .

Working backward, we can show that parties M and R in the coalition government have no incentives to deviate from  $p_t^*(g_t^M, g_t^R)$  when they know that voters will vote for  $p_t^*(g_t^M, g_t^R)$  given  $F_\alpha \sim N(0, \sigma_{g_t}^2)$  and  $\Theta$ . To see why, suppose that  $\exists \hat{g}_t^M$  and  $\tilde{g}_t^M$  such that  $\hat{g}_t^M > g_t^M$  and  $\tilde{g}_t^M < g_t^M$  where  $g_t^M$  is chosen by party M in  $p_t^*(g_t^M, g_t^R)$ . Similarly, assume that  $\exists \hat{g}_t^R$  and  $\tilde{g}_t^R$

such that  $\hat{g}_t^R > g_t^R$  and  $\tilde{g}_t^R < g_t^R$  where  $g_t^R$  is chosen by party R in  $p_t^*(g_t^M, g_t^R)$ . For  $EU_j^\alpha(\Theta, p_t^*(g_t^M, g_t^R), \phi, r_{C,t}^\lambda) > EU_j^\alpha(\Theta, \hat{p}_t(\cdot), \phi, r_{-C,t}^\lambda)$  (where  $\hat{p}_t(\cdot)$  stands for  $p_t(g_t^L, g_t^M)$ ,  $p_t(g_t^L, g_t^R)$ ,  $p_t(g_t^L)$ ,  $p_t(g_t^M)$  or  $p_t(g_t^R)$ ) one can check that the maximum intertemporal utility that party M can get is  $-(g_t^M - g_t)^2 + br_{C,t}^\lambda + \delta(-(g_{t+1}^M - g_{t+1})^2 + br_{C,t+1}^\lambda)$  which is greater than  $-(\hat{g}_t^M - g_t)^2 + br_{C,t}^\lambda + \delta(-(\hat{g}_{t+1}^M - g_{t+1})^2 + br_{C,t+1}^\lambda)$  and  $-(\tilde{g}_t^M - g_t)^2 + br_{C,t}^\lambda + \delta(-(\tilde{g}_{t+1}^M - g_{t+1})^2 + br_{C,t+1}^\lambda)$   $\forall \delta \in (0,1)$  since the choice of  $g_t^M$  by party M in  $p_t^*(g_t^M, g_t^R)$  is optimal. Similarly, for R,  $-(g_t^R - g_t)^2 + br_{C,t}^\lambda + \delta(-(g_{t+1}^R - g_{t+1})^2 + br_{C,t+1}^\lambda) > -(\hat{g}_t^R - g_t)^2 + br_{C,t}^\lambda + \delta(-(\hat{g}_{t+1}^R - g_{t+1})^2 + br_{C,t+1}^\lambda)$  and  $-(g_t^R - g_t)^2 + br_{C,t}^\lambda + \delta(-(g_{t+1}^R - g_{t+1})^2 + br_{C,t+1}^\lambda) > -(\tilde{g}_t^R - g_t)^2 + br_{C,t}^\lambda + \delta(-(\tilde{g}_{t+1}^R - g_{t+1})^2 + br_{C,t+1}^\lambda)$   $\forall \delta \in (0,1)$  which follows from the optimality of  $g_t^R$  in  $p_t^*(g_t^M, g_t^R)$ . Thus the incumbent parties in the coalition government have no incentives to deviate from  $p_t^*(g_t^M, g_t^R)$ , as claimed **QED**.

**Proof of Proposition 1:** First, note that  $p_t^*(g_t)$  is continuous and monotonic in  $\delta \in (0,1)$ . From the

solution  $p_t^*(g_t) = \frac{(1-\delta)(2br_{C,t}^\lambda) + \delta(1+br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta g'_{t+1}(\gamma_{t+1})}$ , one can observe that as the discount factor

of parties in the coalition government decreases (i.e.  $\lim \delta \rightarrow 0$ ), the level of spending  $p_t^*(g_t)$  increases

since  $\lim_{\delta \rightarrow 0} \frac{(1-\delta)(2br_{C,t}^\lambda) + \delta(1+br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta g'_{t+1}(\gamma_{t+1})} > 0$ .  $p_t^*(g_t)$  monotonically increases for lower  $\delta$ .

Suppose  $\delta'' < \delta'$  where  $\delta' \in (0,1)$  and  $\delta'' \in (0,1)$ . Then  $\frac{(1-\delta'')(2br_{C,t}^\lambda) + \delta''(1+br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta'' g'_{t+1}(\gamma_{t+1})} > \frac{(1-\delta')(2br_{C,t}^\lambda) + \delta'(1+br_{C,t+1}^\lambda)g_t(\gamma_t)}{\delta' g'_{t+1}(\gamma_{t+1})}$ ; hence  $p_t^*(g_t)$  monotonically increases if  $\delta$  decreases. **QED**

**Proof of Claim**  $\partial p_t^*(g_t)/\partial r_{C,t}^\lambda > 0$ : Observe that  $b'r_{C,t}^\lambda > 0$  and  $b''r_{C,t}^\lambda < 0$ , as assumed in the text.

Using the quotient rule and some algebra, we obtain the following after collecting terms,

$$\frac{\partial p_t^*(g_t)}{\partial r_{C,t}^\lambda} = \frac{\delta g'(\gamma_{t+1}) \left\{ \overbrace{[2(1-\delta)b'r_{C,t}^\lambda]}^+ + \overbrace{[\delta[g'(\gamma_{t+1})(1+br_{C,t+1}^\lambda)](b'r_{C,t+1}^\lambda)]}^+ \right\}}{\underbrace{(\delta g'(\gamma_{t+1}))}_+} > 0. \text{ Since the numerator}$$

and denominator of the aforementioned expression is positive  $\partial p_t^*(g_t)/\partial r_{C,t}^\lambda > 0$ , as claimed.

**Proof of Claim**  $r_{C,t}^\lambda$  strictly increases when  $\lim \delta \rightarrow 0$ : Defining  $r_{C,t}^\lambda$  as an implicit function of the equilibrium solution  $p_t^*(g_t)$  in equation (4) and collecting terms, we obtain after some algebra,

$$\frac{[(2b-2\delta b + \delta g_t(\gamma_t)) + \delta g_t(\gamma_t)]}{\delta g'_{t+1}(\gamma_{t+1})} = \frac{p_t^*(g_t)}{r_{C,t}^\lambda}. \text{ Dividing the above expression by } p_t^*(g_t) \text{ yields}$$

$$\frac{[(2b-2\delta b + \delta g_t(\gamma_t)) + \delta g_t(\gamma_t)]}{p_t^*(g_t)\delta g'_{t+1}(\gamma_{t+1})} = \frac{1}{r_{C,t}^\lambda}. \text{ Multiplying the l.h.s of the aforementioned expression by}$$

$\delta g'_{t+1}(\gamma_{t+1})$  and taking the inverse of both sides to define  $r_{C,t}^\lambda$  as an implicit function of  $p_t^*(g_t)$  we get  $\frac{p_t^*(g_t)}{[(2b - 2\delta b + \delta g_t(\gamma_t))]} = r_{C,t}^\lambda$ . Letting  $\lim \delta \rightarrow 0$  in this expression shows that  $r_{C,t}^\lambda > 0$ , as claimed.

**Proof of Claim**  $p_t^{S*}(g_t)$  does not increase  $\forall \delta_s \in (0,1)$ : From the Bellman equation of the single party's dynamic programming problem, we obtain  $p_t^{S*}(g_t) = \frac{\delta_s(1 - \delta_s)(br_{s,t+1}^\lambda)}{\delta_s(g_{t+1}(\beta_{t+1})) + (1 - \delta_s)(br_{s,t}^\lambda + g_t(\beta_t))}$ . Observe that  $p_t^{S*}(g_t) \rightarrow 0$  for  $\lim \delta_s \rightarrow 0$  and  $\lim \delta_s \rightarrow 1$ . Since  $p_t^{S*}(g_t) \rightarrow 0$  at the upper and lower bound of  $\delta_s$ ,  $p_t^{S*}(g_t) \rightarrow 0$  in the interior of  $\delta_s \in (0,1)$ .

**Table 1:** List of Countries in Sample

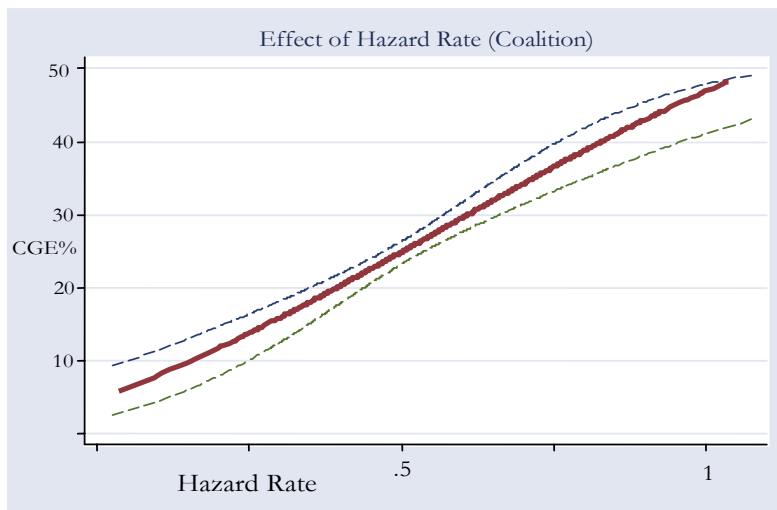
Country	Year	OECD	Country	Year	OECD
Argentina	1975	No	Israel	1975-2000	No
Argentina	1983-2000	No	Italy	1975-2000	Yes
Australia	1975-2000	Yes	Jamaica	1975-2000	No
Austria	1975-2000	Yes	Japan	1975-2000	Yes
Bahamas	1975-2000	No	Lithuania	1992-2000	No
Bangladesh	1991-2000	No	Luxemburg	1980-2000	Yes
Barbados	1975-2000	No	Malta	1992-2000	No
Belgium	1975-2000	Yes	Mauritius	1990-2000	No
Bolivia	1982-2000	No	Nepal	1991-2000	No
Brazil	1979-2000	No	Nigeria	1999-2000	No
Bulgaria	1992-2000	No	Netherlands	1975-2000	Yes
Canada	1975-2000	Yes	N. Zealand	1975-2000	Yes
Chile	1990-2000	No	Norway	1975-2000	Yes
Colombia	1975-2000	No	papua N. guinea	1975-2000	No
Costa Rica	1975-2000	No	Peru	1980-1989	No
Czech Republic	1992-2000	Yes	Philippines	1990-2000	No
Denmark	1975-2000	Yes	Poland	1992-2000	Yes
Ecuador	1979-2000	No	Portugal	1990-2000	Yes
El Salvador	1984-2000	No	Romania	1992-2000	No
Estonia	1992-2000	No	South Africa	1985-1989	No
Finland	1975-2000	Yes	South Korea	1996-2000	Yes
France	1975-2000	Yes	Slovenia	1991-2000	No
Germany	1975-2000	Yes	Spain	1979-2000	Yes
Greece	1975-2000	Yes	Sri Lanka	1975-2000	No
Grenada	1975-1978	No	Sweden	1975-2000	Yes
Grenada	1984-2000	No	Switzerland	1983-2000	Yes
Guyana	1992-2000	No	Taiwan	1992-2000	No
Hungary	1992-2000	Yes	Thailand	1975-2000	No
Iceland	1975-2000	Yes	Trinidad	1975-2000	No
India	1975-2000	No	UK (Britain)	1975-2000	Yes
Ireland	1975-2000	Yes	Uruguay	1985-2000	No
			United States	1975-2000	Yes
			Zambia	1991-2000	No

**Table 2:** Central Government Expenditure as % of GDP and Duration in office

	Global	Global Sample	OECD Sample	Non-OECD Sample
<b>Electoral System</b>				
Majoritarian	19.85% (7.25)			
Proportional Representation	22.91% (8.59)			
Difference-of-means test: Majoritarian Vs. PR	3.06 p=.71			
<b>Government Type</b>				
Coalition Government	32.18% (10.66)	24 months	28 months	21 months
Single Party Government	17.24% (6.05)	38 months	40 months	37 months
Difference-of-means test: Coalition Vs. Single Party	14.94*** P=.00	14 months*** (p=.00)	12 months*** (p=.00)	16 months*** (p=.00)
<b>Democracy Type</b>				
Presidential Democracy	17.38% (6.74)			
Parliamentary Democracy	22.17% (5.29)			
Difference-of-means test: Presidential vs. Parliamentary	4.79 P=.72			

\*Simple Averages; standard deviations in parenthesis.

**Figure 1:** Marginal Effect of Hazard Rate(Coalition) on Central Govt. Expenditure as % of GDP



**Table 3: Main Results**

LDV Models With Fixed Effects							
							PR-dummy included
	Global sample	Global sample	Global sample	Global Sample	OECD sample	non-OECD sample	Global Sample
	1	2	3	4	5	6	7
Lag of DV	.1512*** (.0279)	.1473*** (.0259)	.1280*** (.0217)	.1768*** (.0493)	.1926*** (.0584)	.1386*** (.0579)	.1879*** (.0592)
Hazard rate (Coalition)	.3118*** (.1622)	.3371*** (.0989)	.3992*** (.1288)		.4017*** (.1580)	.3754*** (.1321)	.3191*** (.1041)
Ln(GDP per capita)	-.1771** (.0679)	-.1228** (.0582)	-.1185** (.0621)	-.1632*** (.0653)	-.1223** (.0584)	-.1163** (.0549)	-.1356*** (.0588)
Trade Openness	-.0177 (.0167)	-.0106 (.0158)	-.0108 (.0215)	-.0121 (.0157)	-.0206 (.0265)	-.0145 (.0534)	-.0131 (.0140)
Log Population	.1989*** (.0284)	.1421*** (.0145)	.1134*** (.0297)	.1225*** (.0261)	.1743*** (.0224)	.1136*** (.0430)	.1592*** (.0226)
CBI	.1823 (.2524)	.1925 (.2468)	.1264 (.2159)	.1208 (.2631)	.1312 (.2514)	.1973 (.2452)	.1935 (.1808)
Hazard rate (Single Party)	.1226 (.6030)	.1271 (.5641)		.1478 (.5824)	.1982 (.6114)	.1591 (.4466)	.1312 (.4851)
Majoritarian	.1770 (.1264)	.1226 (.1260)	.1342 (.1623)	.1709 (.1512)	.1281 (.1334)	.1119 (.1256)	
Coalition govt.	.1288 (.2247)			.1219 (.2343)	.1440 (.2265)	.1295 (.2190)	.1825 (.2277)
PR							.1355 (.3882)
ENLP	.0296 (.0243)	.0301 (.0252)	.0372 (.0299)	.0290 (.0248)	.0288 (.0236)	.0145 (.0334)	.0170 (.0264)
Partisanship	-.0106 (.0158)	-.0118 (.0219)	-.0172 (.0257)	-.0142 (.0231)	-.0146 (.0265)	-.0136 (.0430)	-.0170 (.0264)
Gov. polarization	.1549 (.3820)	.1961 (.3775)	.1536 (.4122)	.1255 (.3921)	.1079 (.3324)	.1973 (.2450)	.1476 (.4614)
Parliamentary	.1170 (.3551)	.1283 (.3598)	.1208 (.2615)	.1321 (.3108)	.1019 (.2247)	.0995 (.2192)	.1241 (.1597)
Minority Govt.	.0179 (.1642)	.0131 (.1845)	.0179 (.1605)	.0119 (.1253)	.0171 (.1451)	.0153 (.0240)	.0128 (.0212)
Veto Players	.0102 (.0288)	.0197 (.0201)	.0194 (.0204)	.0115 (.0309)	.0379 (.0443)	.0172 (.0257)	.0115 (.0212)
Constant	.2335*** (.0744)	.2598*** (.0711)	.2672*** (.0715)	.2148*** (.0742)	.2922** (.0759)	.1997*** (.0821)	.1805*** (.0734)
Adjusted R <sup>2</sup>	.5626	.5210	.5388	.5883	.5361	.5971	.5718
cook-weisberg	2.03	2.21	1.97	2.11	2.01	1.98	1.78
Normality	1.01	.94	.89	.91	.97	.99	0.99
N	1192	1192	1192	1192	503	689	1192

**Notes:** \*\*\*,\*\* and \* denotes significance at the 1%, 5% and 10% level respectively. PCSE's in parentheses.

**Table 4:** Results from Robustness Tests

LDV-Models With Random Effects					Prais-Winsten Models with Fixed Effects			LDV-FE <sup>a</sup>
	With PR Dummy							
	Global Sample	Global Sample	OECD sample	Non-oecd sample	Global sample	OECD sample	Non-oecd Sample	Global sample
	8	9	10	11	12	13	14	15
Lag of DV	.1746*** (.0446)	.1541*** (.0397)	.1608*** (.0413)	.1357*** (.0390)				.1264*** (.0405)
Hazard rate (Coalition)	.4182*** (.0902)	.3786*** (.0612)	.3371*** (.0681)	.3065*** (.0732)	.3166*** (.0710)	.3855** (.0778)	.3132*** (.0811)	.2967*** (.0748)
Ln(GDP per capita)	-.1271** (.0181)	-.1452*** (.0173)	-.1669*** (.0175)	-.1321*** (.0184)	-.1216** (.0121)	-.1323** (.0146)	-.1211*** (.0149)	-.1329*** (.0128)
Trade openness	-.0197 (.0255)	-.0215 (.0141)	-.0106 (.0547)	-.0170 (.0364)	-.0192 (.0323)	-.0206 (.0265)	-.0150 (.0333)	-.0275 (.0259)
Log population	.1971*** (.0317)	.1344*** (.0326)	.1512*** (.0219)	.1805*** (.0342)	.1439*** (.0246)	.1743*** (.0424)	.1180*** (.0331)	.1234*** (.0354)
CBI	.1565 (.1168)	.1917 (.1815)	.1282 (.1824)	.1083 (.1516)	.1967 (.1438)	.2312 (.1514)	.1119 (.1312)	.1277 (.1049)
Hazard rate (Single party)	.1176 (.2526)	.1722 (.2223)	.1916 (.2518)	.1890 (.4238)	.1527 (.2055)	.1617 (.2791)	.1792 (.1140)	.1651 (.1098)
Coalition govt.	.1252 (.2177)	.1381 (.2544)	.1640 (.2571)	.1149 (.1517)	.1428 (.2188)	.1707 (.2215)	.1361 (.1904)	.1244 (.1837)
ENLP	.0406 (.0265)	.0360 (.0299)	.0399 (.0324)	.0178 (.0255)	.0296 (.0237)	.0311 (.0246)	.0123 (.0230)	.0207 (.0315)
Partisanship	-.0406 (.0265)	-.0229 (.0186)	-.0194 (.0198)	-.0176 (.0160)	-.0128 (.0254)	-.0155 (.0360)	-.0136 (.0151)	-.0021 (.0119)
Majoritarian		.1337 (.3890)	.1295 (.3759)	.1637 (.2433)	.1752 (.3176)	.1617 (.3991)	.1210 (.2637)	.1533 (.2085)
Parliamentary	.1711 (.1531)	.1086 (.1741)	.1372 (.1825)	.1830 (.1913)	.1478 (.1865)	.1506 (.1878)	.1823 (.1858)	.1259 (.1717)
gov.polarization	.1637 (.4331)	.1687 (.4247)	.1812 (.4252)	.1307 (.4607)	.1126 (.3174)	.1038 (.3613)	.1332 (.4836)	.1281 (.1744)
PR	.1806 (.3878)							
Veto Players	.0194 (2.247)	.0165 (.0232)	.0138 (.0175)	.0183 (.0255)	.0289 (.0483)	.0307 (.0619)	.0198 (.0271)	.0081 (.0067)
Minority govt.	.0110 (.0463)	.0125 (.0287)	.0180 (.0354)	.0132 (.0238)	.0211 (.0257)	.0258 (.0244)	.0206 (.0237)	.0219 (.0226)
Constant	.1215*** (.0631)	.1720*** (.0753)	.1918*** (.0627)	.1773*** (.0625)	.1542*** (.0412)	.2061*** (.0596)	.1155*** (.0392)	.2123*** (.0527)
Adjusted R <sup>2</sup>	.5419	.5188	.5978	.5254	.5122	.5329	.5163	.5163
Rho					.6955	.6724	.7144	
cook-weisberg	1.87	1.90	1.83	2.04	2.01	1.96	1.98	1.98
Normality	1.01	0.97	1.02	1.11	0.99	0.94	0.99	0.99
N	1192	1192	503	689	1190	502	688	1192

**Notes:** \*\*\*,\*\* and \* denotes significance at the 1%, 5% and 10% level respectively. PCSE's in parentheses.

<sup>a</sup>The dependent variable in this model is the change in central government expenditure as % of GDP.

## References

- Achen, Christopher. 2000. "Why Lagged Dependent Variables Can Suppress the Power of Other Independent Variables." Unpublished Manuscript.
- Alesina, Alberto and G. Tabellini. 1990. "Voting on the Budget Deficit." *American Economic Review*, 80(1): 37-49.
- Alesina, A., Sulezler, N. Roubini, and P. Swagel. 1996. "Political Instability and Economic Growth." *Journal of Economic Growth*, Vol. 1, 189-211.
- Austen-Smith, David. 2000. "Redistributing Income under Proportional Representation." *Journal of Political Economy*, 108(6): 1235-1269.
- Bawn, K., and F. Rosenbluth. 2006. "Short versus Long Coalitions: Electoral Accountability and the Size of the Public Sector." *American Journal of Political Science*, 50(2): 251-65.
- Beck, N. and J. Katz. 1995. "What to Do (and Not to Do) with Time Series-Cross Sectional Data." *American Political Science Review* 89(3): 634-47.
- Beck, N., J. Katz, and R. Tucker. 1998. "Taking Time Seriously: Time-Series-Cross-Section Analysis with a Binary Dependent Variable." *American Journal of Political Science*, 42(4): 1260-88.
- Beck, T., G. Clarke, A. Groff, P. Keefer, and Patrick Walsh. 2002. "New Tools in Comparative Political Economy: The Database of Political Institutions." *World Bank Economic Review*, 15(1): 165-76.
- Chatterjee, Samprit, B. Price, and Ali S. Hadi. 1999. *Regression Analysis By Example*. Wiley Series in Probability and Statistics. New York: John Wiley and Sons.
- Cheibub, J. A., and Fernando Limongi. 2002. "Democratic Institutions and regime Survival: Parliamentary and Presidential Democracies Reconsidered." *Annual Review of Political Science*, 151-179.
- Cheibub, J.A., Przeworski, A., and Sebastian Saiegh. 2004. "Government Coalitions and Legislative Success Under Presidentialism and Parliamentarism." *British Journal of Political Science*, 34(3): 565-587.
- Cukierman, Alex, G. Miller, and B. Neyapti. 2002. "Central Bank Reform, Liberalization and Inflation in Transition Economies—an International Perspective." *Journal of Monetary Economics*, 49(2): 237-264.
- Cusack, Thomas R. 1997. "Partisan Politics and Public Finance: Changes in Public Spending in Industrialized Democracies, 1995-1989." *Public Choice* 91: 371-395
- Delury, George. 1999. *World Encyclopedia of Political Systems and Parties*. Third Edition.
- Franseze, Robert J. 1999. "Partially Independent Central Banks, Politically Responsible Governments, and Inflation," *American Journal of Political Science*, 43(3): 681-706.
- Franzese, Robert J. 2002. *Macroeconomic Policies of Developed Democracies*. Cambridge: Cambridge University Press.
- Franzese, Robert J. 2004. "Fiscal Policy with Multiple Policymakers: Veto Actors and Deadlock; Collective Action and Common Pools; Delegation, Bargaining, and Compromise. *Veto Actor Analysis*, H. Magara editor.

- Garrett, G., and D. Mitchell. 2001. "Globalization, Government Spending and Taxation in the OECD." *European Journal of Political Research*, 39(1): 145-77.
- Garrett, G. and Peter Lange. 1991. "Political Responses to Interdependence: What's 'Left' for the Left?" *International Organization* 45, 538-564.
- Hallerberg, M. and J. von Hagen. 1999. "Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the European Union." In J. Poterba and J. von Hagen, *Fiscal Institutions and Fiscal Performance*. University of Chicago Press.
- Hicks, A. and D. Swank. 1992. "Politics, Institutions, and Welfare Spending in Industrialized Democracies, 1960-82." *American Political Science Review*, 86(3): 658-74.
- International Monetary Fund. 2004. *Government Finance Statistics* (CD- ROM).
- Keesings' Record of World Events. 2005. *Keesings' Worldwide Online*. <http://www.keesings.com/>
- King, G., J. Alt, N. Burns, and Michael Laver. 1990. "A Unified Model of Cabinet Dissolution in Parliamentary Democracies." *American Journal of Political Science*, 3(3): 846-871.
- Kontopolous Y., and R. Perotti. 1999. "Government Fragmentation and Fiscal Policy Outcomes: Evidence from the OECD Countries." In *Fiscal Institutions and Fiscal Performance*. J. Poterba and J. von Hagen, eds. Chicago, Ill.: University of Chicago Press, pp. 81-102.
- Laakso, M., and R. Taagepera. 1979. "Effective Number of Parties: A Measure with Application to West Europe." *Comparative Political Studies*, 12(1): 3-27.
- Linz, Juan. 1994. "Presidential or parliamentary democracy: Does it make a difference?" In Juan J. Linz & Arturo Valenzuela (Eds.). *The failure of presidential democracy*, (pp. 3-87). Baltimore: Johns Hopkins University Press.
- Maeda, K., and Misa Nishikawa. 2006. "Duration of Party Control in Parliamentary and Presidential Governments: A Study of 65 Democracies, 1950-1998." *Comparative Political Studies*, 39(3): 352-74.
- Milesi-Ferretti, G., Perotti, R., and Rostagno, Massimo. 2002. "Electoral Systems and the Composition of Government Spending." *Quarterly Journal of Economics*, 117(2): 609-57.
- Mukherjee, Bumba. 2003. "Political Parties and the Size of Government in Multiparty Legislatures." *Comparative Political Studies*, 36(3): 699-728.
- Penn World Tables. Version 6.1. "[http://pwt.econ.upenn.edu/php\\_site/pwt\\_index.php](http://pwt.econ.upenn.edu/php_site/pwt_index.php)"
- Persson, T., and G. Tabellini. 2003. *Economic Effects of Constitutions*. Cambridge, MA: MIT Press.
- Persson, T., and G. Tabellini. 2004. "Constitutional Rules and Economic Performance Outcomes." *American Economic Review*, 94(1): 25-46.
- Persson, T., G. Roland, and G. Tabellini. 1997. "Separation of Powers and Political Accountability." *Quarterly Journal of Economics*, 112(4): 1163-202.
- Persson, T., G. Roland, and G. Tabellini. 2005. "Electoral Rules and Government Spending in Parliamentary Democracies." Working Paper, Department of Economics, UCLA.

- Przeworski, A., A. Cheibub, F. Limongi, Alvarez, M. 2000. *Democracy and Development*. New York: Cambridge University Press.
- Rodrik, D. 1997. *Has Globalization Gone Too Far?* Washington, D.C.: Institute for International Economics.
- Roubini, N., and J. Sachs. 1989. "Political and Economic Determinants of Budget Deficits in the Industrial Democracies." *European Economic Review*, 33(5): 903-938.
- Scartascini, C. and M. Crain. 2002. "The Size and Composition of Government Spending in Multi Party Systems." George Mason University, Department of Economics Ms.
- Smith, Alastair. 2003. "Election Timing in Majoritarian Parliamentary Systems". *British Journal of Political Science*, 33, 379-418.
- Tavits, Margit. 2004. "The Size of Government in Majoritarian and Consensus Democracies." *Comparative Political Studies*, 37(3): 340-359.
- Thames, Frank C. & Martin S. Edwards. 2006. "Differentiating Mixed-Member Electoral Systems: Mixed-Member Majoritarian and Mixed-Member Proportional Systems and Government Expenditures," *Comparative Political Studies*, 39(7): 905-927.
- Tsebellis, G., and E.C.C. Chang. 2005. "Veto Players and the Structure of Budgets in Advanced Industrialized Countries." *European Journal of Political Research*, 44(2): 295-326.
- Velasco, Andres. 1999. "A Model of Endogenous Fiscal Deficits and Delayed Fiscal Reforms." In *Fiscal Institutions and Fiscal Performance*. J. Poterba and J. von Hagen, eds. Chicago, Ill.: University of Chicago Press, pp. 37-57.
- Warwick, Paul. 1994. *Government Survival in Parliamentary Regimes*. Cambridge and New York: Cambridge University Press.
- Woldendorp, J., Keman, H., and Ian Budge. 2000. *Party Government in 48 Democracies, 1945-1998*. Boston, MA. Kluwer Academic Publishers.
- World Bank. 2003. *World Development Indicators*. (CD-Rom)