# Reassessing the fiscal consequences of polarization and fragmentation in the legislature

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## Abstract

While the relationship between the size of the government budget and the levels of fragmentation and polarization in Congress has been previously studied, the two political variables have been considered in isolation. However, fragmentation should matter for public spending only to the extent that the degree of polarization is high enough that a larger number of parties does imply greater tensions in the legislature. We examine the joint impact of polarization and fragmentation, allowing for interdependence between them. We find that the effect of fragmentation on government spending is increasing in polarization and significantly different from zero only when there is some degree of polarization. We also find that polarization has a positive effect on public spending, but only when the effective number of parties is large enough. Above that threshold, the effect of polarization is increasing in the number of parties. Our findings indicate that ignoring the possible interaction between the effects of polarization and fragmentation may imply misled conclusions about each of these effects.

# 1. Introduction

Political fragmentation has been put forward as a determinant of economic (and other) policy decisions, in different contexts. The arguments frequently have to do with the idea that in more fragmented political systems the government finds greater difficulties to have its initiatives approved by the legislator. However, the effects of political fragmentation on the government's ability to enact policies are likely not independent of how polarized the political system is. To give an example, if several parties have influence or veto power over the government's initiatives, but there is a high degree of political cohesion, it is unlikely those parties will exercise their powers to block government initiatives. The argument has been formalized in Nupia (2007).

Focusing on the specific context of decisions on the size of public expenditure, this paper aims at providing empirical evidence to substantiate the claim that the effects of political fragmentation and political polarization are likely to depend on one another. Several theoretical contributions link either the degree of political fragmentation or the degree of political polarization to the size of government spending. Following a standard argument of common property, fragmentation is expected to increase spending, as greater fragmentation is associated with a larger number of interests fighting over a pool of common government revenues (Weingast et al., 1981; Velasco, 2000). Another strand of the literature suggests that polarization should also lead to higher spending, because more polarization increases the distance between the incumbent's fiscal preferences and that of his possible replacements. An incumbent facing more polarization will thus be more inclined to overspend to make sure his preferred projects are undertaken (Alesina and Tabellini, 1990). Finally, more polarization and fragmentation may create difficulties to have fiscal adjustment initiatives approved (Spolaore, 2004; Alesina and Drazen, 1991).

The proposed polarization-spending and fragmentation-spending relationships have been taken to the data by different studies, always separately. Several studies find that government spending is increasing in political fragmentation, captured by the number of parties in the legislature (Mukherjee, 2003; Stein et al., 1998). Others find that political systems where fiscal decision-making presumably exhibits more fragmentation, such as parliamentary systems, also lead to higher spending (Persson and Tabellini, 1999; Crain and Scartascini, 2002). Greater polarization has been shown to lead to higher spending in an experimental study (Sutter, 2003).

Here, we examine the impact of both polarization and fragmentation on the level of spending. Besides studying the two effects jointly, we allow for interdependence between them. As stated above, the hypothesis is that fragmentation should matter for public spending only to the extent that political polarization is high enough that a larger number of parties does imply greater tensions in the legislature. Following the literature, we measure political fragmentation using the effective number of parties in the legislature, and use an index of polarization measuring the ideological distance between the main parties in the legislature. We find that the effect of fragmentation on government spending is increasing

in polarization and significantly different from zero only when there is some degree of polarization.[2] We also find that polarization has a positive effect on public spending, but only when the effective number of parties is large enough. Above that threshold, the effect of polarization is increasing in the number of parties. Our findings indicate that ignoring the possible interaction between the effects of polarization and fragmentation may imply misled conclusions about each of these effects.

## 2. Relevant literature

### 2.1. Government spending vs. political polarization and fragmentation

Several theoretical contributions have implications that link either the degree of political fragmentation or the degree of political polarization to the size of government spending. We review those contributions in this section

A first relevant strand of this literature follows Weingast et al.'s (1981) paper on pork barrel spending. The basic argument in their paper is that when geographically concentrated interests are represented in the legislature, and projects with local impact are funded from a common pool of resources, the size of the budget is larger than optimal. Moreover, the size of this inefficiency is increasing in the number of interests represented in the legislature. More in general, the fact that a pool of common resources is used to finance public projects with concentrated benefits leads to a common property problem that implies overspending. Such overspending is increasing in the number of different interests with an influence over the choice of the government budget, often related to political fragmentation. For instance, if the legislature participates in the design or approval of the government budget, the number of parties present in Congress is expected to have a positive impact on the size of the budget.

Based on this general argument, Velasco (2000) develops a model relating the dynamics of fiscal deficits to the degree of fragmentation of the political system. The results show that in this dynamic context the common pool problem leads again to transfers that are higher than optimal, and are also increasing in the number of parties with a saying in the choice of the government's budget.[3]

The same type of argument has been put forward by Velasco (1998) to explain delays in adopting necessary fiscal adjustment. Common pool problems impede the adoption of spending cuts until the tax-related distortions arising from the growing debt are sufficiently large to make the parties involved in budget choices fully internalize the cost of the projects that benefit them. Since the common pool problem is increasing in the number of parties participating in the budget choice, so is the delay to adjust.

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[2] As described in detail below, although the effect of fragmentation is statistically significant when polarization is zero, its size is negligible.
[3] Other implications of political fragmentation in this context are excessive long-run public debt and the presence of deficits at times when intertemporal smoothing does not suggest the need for running them.

Other models of delayed fiscal adjustment similarly tie the extent of fiscal problems to either the degree of political fragmentation or polarization, although due to a different set of reasons. Alesina and Drazen (1991) and Spolaore (2004) present models where a "war of attrition" between different groups implies necessary fiscal adjustment is delayed until one of the groups agrees to bear that cost of the reform. Spolaore shows that greater fragmentation, defined as a larger number of players with veto power, leads to greater delays in adjustment, as agreement between more parties is more difficult to reach. On the other hand, Alesina and Drazen show that greater polarization also leads to larger delays, as more polarization implies that the costs of fiscal reform are more disproportionately distributed across groups.[4]

Political polarization has also been tied to the size of the government budget. Alesina and Tabellini (1990), present a model where incumbent politicians strategically raise spending and run deficits to tie the hands of their successors. The argument is based on the presence of heterogeneous preferences across politicians on the composition of government spending. If an incumbent politician is faced with a high risk of being replaced by someone from a different party, she may increase spending in her preferred goods. Since the cost of the resulting deficit will likely be paid by her successor, and thus fall disproportionately on the goods preferred by that successor, the long run pattern of government spending will be tilted toward the incumbent's preferred items. Greater polarization increases the incumbent's incentives to rise spending, as it implies a greater distance between her preferences those of her challengers.

## 2.2. Inter-related effects of polarization and fragmentation

The basic hypothesis we examine is that the effects of political fragmentation on policy decisions depend on how polarized the political system is. In the specific context of fiscal decisions, the common property problem mentioned above arises when different interests fight for a common pool of resources; if there is a large number of parties, but all represent the same interest, then the common pool problem should either not arise or be minor. Part of this idea is captured in Nupia's (2007) model of decisions in a legislature.

Nupia's model studies the governing party's preferences for different types of legislatures. In the model, legislatures differ along two dimensions: number of parties represented, and level of polarization. The author first shows that, between two legislatures with the same number of parties, the governing party prefers to negotiate in that with the smallest level of ideological polarization. On the other hand, between two legislatures with the same level of

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[4] Drazen (2000) warns that the results of both war of attrition and common property models must be taken with caution, given the inherent simplicity of these models. In particular, Drazen argues that the effects of fragmentation may not be monotonical; in the presence of a government coalition, for instance, an increase in the number of parties will affect incentives to form sub coalitions within the coalition, and may end up strengthening the power of the government to enact a reform.

ideological polarization, the governing party prefers to negotiate in that with the smallest number of parties. These effects, however, are not independent. When faced with two legislatures in which ideological polarization is low (zero), the governing party is indifferent between these two legislatures, regardless of the number of parties in each of them.

In this model, parties bargain on two issues: A public policy (ideological decision) and a distributive policy (private goods). Assuming that public policy bargaining is on the size of public expenditure, the results stated above can be applied to our case of interest. Other things equal, public spending is expected to be larger in either legislatures with high level of polarization or legislatures with a large number of parties. However, if the level of polarization is low, the effect of number of parties on spending is expected to be zero.

## 3. Baseline empirical model and data

Our aim is to estimate the effect of legislative polarization and fragmentation (effective number of parties) on government spending. In order to do so, we use a panel of data consisting of annual observations for a set of countries for the period 1996-2003. The sample includes 91 both developed and developing countries.

We seek to test the following hypotheses: (1) Government spending increases as ideological polarization in the legislature increases; (2) government spending increases as legislative fragmentation increases; (3) if the level of ideological polarization is low (zero), there is not effect of fragmentation on government spending; (4) the effect of fragmentation on government spending increases as the level of polarization increases, and; (5) the effect of polarization on government spending increases as the number of parties increases. Given these questions, our baseline econometric model has the following form:

$$g_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 F_{it} + \beta_3 P_{it} * F_{it} + \gamma' X_{it} + u_{it} \qquad (1)$$

where $g_{it}$ is the central government expenditure as a proportion of GDP in county $i$ at time $t$, $P_{it}$ is the level of ideological polarization in the legislature, $F_{it}$ is the level of fragmentation (effective number of parties) in the legislature, $X_{it}$ is a vector of control variables and $u_{it}$ is a random error term. Equation 1 not only includes linear effects of both polarization and fragmentation on $g_{it}$ but also an interacted effect of these two variables. The inclusion of this interaction allows us to study the extent to which the effects of the two variables of interest depend on one another.

The Effective Number of Parties is a measure proposed by Laakso and Taagepera (1979), to calculate the relevant number of parties present in a legislature. It corresponds to the reciprocal of the sum of squared shares of seats in congress, calculated over all parties present (see the Appendix for more details). It takes values above one, where one represents legislatures in which a single party holds all the seats. We calculate the Effective number of

parties using information from the Database of Political Institutions produced by the World Bank. Meanwhile, our measure of Polarization corresponds to that proposed by Keefer and Stasavage (2003). It measures the ideological distance, in a left-center-right scale, between the chief executive's party and the largest parties in the legislature. The variable takes integer values between zero and two, where zero indicates the lowest possible degree of polarization, and two represents maximum polarization (i.e. at least one of these main parties is on the left of the scale and another is on the right). Our vector of control variables includes standard variables used in previous studies (Stein et al., 1998): GDP growth, and index of openness, lagged debt and dependent population. The Appendix contains a complete description of these variables and the corresponding sources.

Table 1 shows descriptive statistics and correlations for the variables of interest, i.e. government expenditure, legislative fragmentation and polarization. It also presents statistics for two other political variables that will be included later in the analysis: and accountability index and an election year dummy.

The average effective number of parties in the sample is 6,5. This variable exhibits a high dispersion (standard deviation of 19,1). The level of ideological polarization is in general low; for an important number of observations there is no polarization in the legislature (58% of the observations). However, an important proportion of observations exhibit high and middle levels of polarization. It is important to highlight that for a few observations (3% of the sample) the effective number of party in the legislature is 1, and consequently our measure of polarization takes a value of 0. This fact will be taken into account in our econometric analysis later on.

It is worth to notice that the correlation coefficient between fragmentation and polarization is below 0.1. Thus, the two variables indeed measure different characteristics of legislatures, and these need not be correlated in a consistent manner. On the other hand, the correlation between government expenditure and all the political variables is positive.

## 4. Results: fragmentation and polarization vs. government spending.

The results reported in this and the following sections are obtained through OLS regressions. The measures of polarization and fragmentation exhibit little variability over time, leaving no room for us to exploit fixed effect estimations.[5] However, in order to minimize biases in the estimations, later on we will introduce regional effects in the analysis.

Table 2 displays results from different OLS estimations of equation 1 (robust standard errors included in parentheses), where some of the columns restrict the set of variables of interest included in the estimation. In particular, column 1 only takes into consideration the linear effect of polarization, while column 2 looks solely at the effect of fragmentation. As

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[5] The R-squared measures from running polarization and fragmentation against country fixed effects are above 0.8.

predicted by the theory reviewed above, results show that both variables affect government spending positively.

Column 3 of Table 2 includes both linear affects at the same time. Relaxing the constraints imposed in columns 1 and 2 affects neither the magnitude nor the statistical significance of the parameters of interest. Results suggest that fragmentation has a stronger effect than polarization on government spending. While an increment of one standard deviation in the effective number of parties increases government spending in 2.2 percentage points of GDP, the corresponding effect of a similar one standard-deviation increase of polarization (which is close to polarization going up one unit) is 1.

Column 4 in Table 2 reports results for the unrestricted estimation of equation 1. Notice that the three parameters of interest (i.e. the linear effect of both polarization and fragmentation and their interaction) are statistically significant in the model. The results for the two variables of interest are also shown in Figure 1 (the discontinuous lines represent 95% confidence intervals). The first panel of this figure shows the effect of fragmentation for the different possible values of the polarization index, while the second panel represents the effect of polarization for different effective numbers of parties.[6]

Focusing on the first panel of Figure 1, the effect of fragmentation on government spending is always positive, i.e. more fragmentation implies larger government expenditure. It is also the case that the magnitude of the effect increases as the level of polarization increases. Moreover, the effect of fragmentation on government spending in the absence of polarization, although statistically significant, is close to zero. In particular, when polarization takes the value of zero, any new party in the legislature generates an increment of government spending in 0.11 percentage points as a proportion of GDP, very small compared to both the mean and standard deviation of spending. The effect of polarization is ten times larger and twenty times larger for the middle and high level of polarization. Thus, although statistically we reject our hypothesis that the effect of fragmentation on government expenditure is zero when there is not polarization, the effect is not economically significant. Results also support the hypothesis that the effect of fragmentation on legislative outcomes is not independent of the level of ideological polarization.

Moving to the effect of polarization (second panel of Figure 1), we find that this effect increases as the effective number of parties in the legislature increases. However, for some levels of fragmentation the effect of polarization on government spending is zero. More precisely, if the effective number of parties is between 2 and 4, the hypothesis that the effect of polarization on government expenditure is zero cannot be rejected. Only when the effective number of parties is larger or equal to 4 polarization has a positive effect on government expenditure.

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[6] The scale of the effective number of parties in Panel b is restricted to values above 1. This is because when the effective number of parties is 1, by construction the level of polarization cannot be different from zero (that is, for these cases looking at the effect of a change in polarization does not make sense).

From the baseline model estimation we conclude that the effect of fragmentation on government expenditure is not independent from the level of ideological polarization. The same is true for the effect of polarization. As theory predicts, both effects are positive for most relevant cases. However, when the level of any of the two variables of interest is small enough, the effect of the other on government spending is zero or close to it.

## 4. Robustness

In this section, we conduct a series of robustness tests on our baseline model. Section 4.1. examines the effect on our results of including additional political variables potentially related to our measures of fragmentation and polarization. Section 4.2. adds regional fixed effects and electoral competition effects to our estimations. Finally, section 4.3. examines the effect of expanding the sample along different dimensions.

### 4.1. Controlling for other political effects

The literature on the political economy of fiscal policy has suggested that other political dimensions may influence fiscal outcomes. One strand of that literature argues that fiscal choices may be influenced by the political cycle (Rogoff, 1990; Drazen and Eslava, 2006). Another suggests that government deficits may be smaller when governments are more accountable; this is so either because voters are fiscal conservatives, as some studies have found (Alesina et al., 1998; Brender and Drazen, 2005; Drazen and Eslava, 2005; Peltzman, 1992), or because voters try to monitor potentially corrupt governments (Alt and Lassen, 2006). Although some of the arguments do not directly refer to spending, but to the deficit, we consider the possibility that not controlling for how accountable the government is and for the electoral cycle may be affecting our results. Accountability and transparency may be related to our variables of interest to the extent that an effective legislature is instrumental in making the government accountable. In turn, the effectiveness of Congress may be related to how fragmented and polarized the legislature is. To this extent, not controlling for accountability may introduce an omitted variable bias in our estimations. On the other hand, while it is not clear that the electoral cycle should be correlated with our variables of interest, we control for this dimension to make sure that we capture as much variability as is possible regarding the political environment.

In order to control for the political effects mentioned above, we include in our estimations a dummy variable for election years and the *Voice and Accountability* index constructed by Kauffman and Mastuzzi (2005). Notice from Table 1 that our measure of accountability does show non-negligible correlations with our variables of interest, while the same does not hold for the election year dummy.

Results of the expanded estimation are reported in Table 3. Columns 1 to 3 restrict the interaction between fragmentation and polarization to be zero, and include the additional political controls one by one and then jointly. Columns 4 through 6 similarly include the additional political controls, while also including the interaction between polarization and

fragmentation. With respect to our variables of interest, notice that the inclusion of the Accountability measure renders the effect of polarization insignificant in Columns 1 and 3. However, when the effect of polarization is allowed to depend on the level of fragmentation, we find that after the inclusion of the additional political controls both polarization and fragmentation have effects that are similar to our baseline case, both in magnitude and in significance (Columns 3-6 and Figure 2). This finding highlights once again the importance of allowing the effects of fragmentation and polarization to depend on one another. The main conclusion is that the results from our baseline model (including the polarization-fragmentation interaction) are robust to the inclusion of the additional political controls.

While we are not directly interested here on the effects of the electoral cycle and the level of accountability, we briefly discuss our results on these dimensions. First, we find that spending decreases during election years. This finding is consistent with the literature on voters' fiscal conservatism, cited above.[7] However, the effect of the electoral dummy is not robust to some of the changes introduced below. On the other hand, the effect of our accountability measure has a sign that is opposite to that expected (and is significant). This may reflect the fact that, besides the effects discussed above, greater legislative effectiveness (one of the conditions of greater accountability) may also imply more provision of public goods.

## 4.2. Including regional effects and electoral competition

Our second set of robustness exercises addresses an issue mentioned above: our inability to take advantage of fixed effects estimations due to the low variability of fragmentation and polarization over time. Thus, invariant country characteristics might create biases in the parameters. We also include in this section additional controls to capture the possibility of very limited electoral competition in some of the countries. Some of the channels that may explain the influence of fragmentation and polarization on government spending may be affected by the level of political competition (for instance, the strategic manipulation of spending suggested by Alesina and Tabellini, 1999, would only arise in the presence of competitive elections). In order to consider these two issues, we include both regional effects and dummies for low levels of electoral competition (the Appendix explains these variables in detail).

Table 4 reports the estimated parameters. Notice that for some specifications the election year dummy effect is no longer significant. The results for the variables of interest are similar to those obtained in Table 3. When there is no interaction between polarization and fragmentation, the inclusion of the regional and electoral competition effects eliminates the

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[7] Conventional wisdom is that government spending should rise during election times. However, the theory on political budget cycles is consistent with no increases on the overall budget (as opposed to some specific types of spending), and may be made consistent with cuts in spending when voters are fiscal conservatives. Empirical studies on the possible existence of political budget cycles have found no evidence of electoral manipulation, except when focusing on new democracies and developing countries. See Eslava (2006) for a summary of this literature.

statistical significance of polarization, but does not generate important changes in the parameter of fragmentation. On the other hand, when the interaction between polarization and fragmentation is included, results for the variables of interest are similar to those found in our baseline estimation both in direction and statistical significance (Figure 3). Notice in particular that we continue to find negligible effects of fragmentation when polarization is zero, and a similar negligible effect of polarization for effective numbers of parties below four. However, notice also that the magnitude of these effects is dampened by the inclusion of the region dummies and electoral competition dummies (Figure 3 vs. Figure 1). The effect of polarization is now close to half its size in the baseline specification. A similar change can be seen in the estimated effect of fragmentation. We conclude that, although the magnitude of the effects of interest is reduced, the main conclusions obtained from the baseline model are still supported by the data.

## 4.3. Expanding the sample

Our last robustness check expands the sample in two dimensions: the expanded sample covers the 1975-2004 period and 104 countries. We do not use this sample as our baseline because the information on additional political controls is not available for this extended sample. Comparing the two samples, we find that in the extended one, the averages and standard deviations of the variables of interest are slightly smaller now. The mean value of the effective number of parties goes from 6.47 to 6.05, while the mean of our polarization measure goes from 0.74 to 0.62 respectively. Similarly, the standard deviations of the two variables go from 19.16 to 19 and from 0.91 to 0.88, respectively. The opposite happens with the government expenditure as a proportion of GDP, for which the mean value goes from 27.1 to 28.9, and standard deviation from 8.98 to 11.8.

Table 5 reports the estimations for the expanded sample. Estimations in columns 1 to 4 are analogous to those in the same columns of Table 2. Column 5, meanwhile, includes regional effects and the dummy variables for electoral competition. Consider the model in which the interaction between fragmentation and polarization is restricted to be zero. Comparing the parameters in Table 5 with those in Table 2, we find that de effect of polarization on government spending is larger in the expanded sample. The opposite happens with the effect of fragmentation. However, both effects are still positive and statistically significant.

In the model that includes the polarization-fragmentation interaction, we reach the same conclusions obtained with the constrained sample regarding our variables of interest. This may be most easily observed in Figure 4, which shows the effects of fragmentation and polarization using the estimated coefficients from Column 5 of Table 5. Thus, we conclude that our baseline model, which includes the interacted effect for polarization and fragmentation, is robust to the change of the sample considered in this section.

In summary, the effects of fragmentation and polarization estimated using our baseline specification exhibit a high degree of robustness. As theory predicts, the effect of both variables on government spending is positive. However, these effects are not independent

from one another. In particular, the effect of fragmentation on public spending increases as the level of polarization increases and vise- versa. Moreover, when the level on any of these two variables is small enough, the effect of the other on government spending is negligible.

**5. Conclusions and future work.**

We have examined the joint and interacted effects of polarization and fragmentation on the size of the government budget. We find that, as theory predicts, the two variables have positive effects on government spending for most relevant scenarios. However, these effects are not independent from one another. In particular, in the absence of polarization, a marginal change in the level of fragmentation of the legislature does not affect the size of the budget in a significant manner. Similarly, polarization only has a significant effect on spending when the effective number of parties in the legislature is high enough (above four). Moreover, the effect of each of these variables is increasing in the level of the other.

In future versions of this paper we plan to address possible non-linearities in the effects of polarization and fragmentation. For instance, as mentioned in Footnote 4, Drazen (2000) warns that greater fragmentation may end up facilitating a fiscal adjustment in the context of a large government coalition. Under the assumption that coalitions are more likely to arise under low levels of ideological polarization, this hypothesis would suggest a possibly different pattern for the effect of fragmentation at very low levels of polarization, relative to other regions of the polarization scale.

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**Table 1**
**Descriptive Statistics**

| Panel A: Baseline Sample - (1996 - 2003) | Obs | Mean | St. Dev. | Min | Max | |
|---|---|---|---|---|---|---|
| Effective Number of Parties (ENP) | 446 | 6.467 | 19.159 | 1 | 150 | |
| Voice and Accountability | 446 | 0.603 | 0.232 | 0.133 | 1 | |
| Central Government Expenditure (% of GDP) | 446 | 27.138 | 8.978 | 8.773 | 49.665 | |
| | | | | **Freq. 0** | **Freq. 1** | **Freq. 2** |
| Polarization | 446 | 0.735 | 0.913 | 260 | 44 | 142 |
| Election Year Dummy | 446 | 0.114 | 0.319 | 395 | 51 | - |

| Panel B: Correlation Coefficients, Obs: 446 | ENP | Polarization | Voice and Accountability | Election Year Dummy | Central Government Expenditure |
|---|---|---|---|---|---|
| Effective Number of Parties (ENP) | 1 | | | | |
| Polarization | -0.098 | 1 | | | |
| Voice and Accountability | -0.262 | 0.520 | 1 | | |
| Election Year Dummy | -0.040 | 0.073 | -0.042 | 1 | |
| Central Government Expenditure | 0.168 | 0.174 | 0.367 | -0.133 | 1 |

**Table 2**

**Effect of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**

**Baseline Model**

**Dependent Variable: Central Government Expenditure (as % of GDP), 1996 - 2003**

| | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
| Polarization | 0.981 | | | | 1.007 | | -2.983 | |
| | (0.474) | * | | | (0.462) | * | (0.965) | ** |
| ENP | | | 0.117 | | 0.117 | | 0.113 | |
| | | | (0.014) | ** | (0.014) | ** | (0.014) | ** |
| Polarization*ENP | | | | | | | 0.973 | |
| | | | | | | | (0.211) | ** |
| GDP Growth | -0.142 | | -0.241 | | -0.231 | | -0.235 | |
| | (0.130) | | (0.136) | | (0.133) | | (0.130) | |
| Openness | 0.088 | | 0.075 | | 0.078 | | 0.075 | |
| | (0.010) | ** | (0.010) | ** | (0.010) | ** | (0.010) | ** |
| Lagged Debt (% of GDP) | 0.045 | | 0.054 | | 0.055 | | 0.054 | |
| | (0.011) | ** | (0.011) | ** | (0.011) | ** | (0.010) | ** |
| Dependent Population | -0.410 | | -0.572 | | -0.510 | | -0.496 | |
| | (0.073) | ** | (0.069) | ** | (0.075) | ** | (0.072) | ** |
| Constant | 33.581 | | 40.636 | | 37.140 | | 36.942 | |
| | (3.213) | ** | (2.819) | ** | (3.230) | ** | (3.120) | ** |
| Observations | 446 | | 446 | | 446 | | 446 | |
| R-squared | 0.29 | | 0.33 | | 0.34 | | 0.37 | |

Robust standard errors in parentheses, * significant at 5%; ** significant at 1%.

Estimation method: OLS with robust standard errors.

Controls include: GDP growth rate, exports plus imports as percentage of GDP (Openness), Initial level of debt as percentage of GDP, and population under 15 and over 64 years of age as a percentage of total population.

**Table 3**
**Effect of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**
**Controlling for Accountability and Election Cycles**
**Dependent Variable: Central Government Expenditure (as % of GDP), 1996 - 2003**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Polarization | 0.350 | 1.112 | 0.460 | -4.064 | -2.957 | -4.025 |
| | (0.488) | (0.461) * | (0.487) | (0.911) ** | (0.973) ** | (0.921) ** |
| ENP | 0.132 | 0.115 | 0.130 | 0.130 | 0.110 | 0.127 |
| | (0.015) ** | (0.014) ** | (0.015) ** | (0.014) ** | (0.014) ** | (0.014) ** |
| Polarization*ENP | | | | 1.057 | 0.995 | 1.076 |
| | | | | (0.197) ** | (0.212) ** | (0.198) ** |
| Voice & Accountability | 8.968 | | 8.819 | 10.089 | | 9.947 |
| | (2.582) ** | | (2.563) ** | (2.470) ** | | (2.453) ** |
| Election Year Dummy | | -2.475 | -2.358 | | -2.688 | -2.574 |
| | | (1.163) * | (1.137) * | | (1.118) * | (1.088) * |
| GDP Growth | -0.211 | -0.229 | -0.210 | -0.213 | -0.233 | -0.212 |
| | (0.130) | (0.132) | (0.129) | (0.126) | (0.129) | (0.125) |
| Openness | 0.071 | 0.078 | 0.070 | 0.066 | 0.075 | 0.066 |
| | (0.010) ** | (0.010) ** | (0.010) ** | (0.010) ** | (0.010) ** | (0.010) ** |
| Lagged Debt (% of GDP) | 0.055 | 0.055 | 0.055 | 0.053 | 0.054 | 0.053 |
| | (0.011) ** | (0.011) ** | (0.011) ** | (0.010) ** | (0.010) ** | (0.010) ** |
| Dependent Population | -0.328 | -0.492 | -0.314 | -0.290 | -0.477 | -0.274 |
| | (0.093) ** | (0.075) ** | (0.092) ** | (0.089) ** | (0.073) ** | (0.088) ** |
| Constant | 25.562 | 36.716 | 25.351 | 23.900 | 36.477 | 23.639 |
| | (4.836) ** | (3.232) ** | (4.787) ** | (4.588) ** | (3.113) ** | (4.538) ** |
| Observations | 446 | 446 | 446 | 446 | 446 | 446 |
| R-squared | 0.36 | 0.35 | 0.37 | 0.40 | 0.38 | 0.41 |

Robust standard errors in parentheses, * significant at 5%; ** significant at 1%.

Estimation method: OLS with robust standard errors.

Controls include: GDP growth rate, exports plus imports as percentage of GDP (Openness), Initial level of debt as percentage of GDP, and population under 15 and over 64 years of age as a percentage of total population.

**Table 4**
**Effect of Effective Number of Parties (ENP) and Polarization on Government Expenditure**
**Controlling for Regional Effects and Legislative Electoral Competition**
**Dependent Variable: Central Government Expenditure (as % of GDP), 1996 - 2003**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Polarization | 0.206 | | 0.470 | | 0.294 | | -2.071 | | -4.199 | | -2.213 | |
| | (0.389) | | (0.484) | | (0.388) | | (0.681) | ** | (0.900) | ** | (0.672) | ** |
| ENP | 0.159 | | 0.095 | | 0.093 | | 0.155 | | 0.076 | | 0.083 | |
| | (0.016) | ** | (0.020) | ** | (0.029) | ** | (0.015) | ** | (0.021) | ** | (0.030) | ** |
| Polarization*ENP | | | | | | | 0.554 | | 1.122 | | 0.612 | |
| | | | | | | | (0.142) | ** | (0.196) | ** | (0.141) | ** |
| Voice & Accountability | 16.547 | | 10.667 | | 17.359 | | 16.625 | | 11.884 | | 17.511 | |
| | (2.144) | ** | (2.640) | ** | (2.140) | ** | (2.131) | ** | (2.517) | ** | (2.124) | ** |
| Election Year Dummy | -1.441 | | -2.166 | | -1.630 | | -1.518 | | -2.434 | | -1.735 | |
| | (0.801) | | (1.134) | | (0.800) | * | (0.796) | | (1.082) | * | (0.797) | * |
| GDP Growth | -0.429 | | -0.272 | | -0.451 | | -0.426 | | -0.277 | | -0.450 | |
| | (0.108) | ** | (0.131) | * | (0.108) | ** | (0.106) | ** | (0.127) | * | (0.105) | ** |
| Openness | 0.057 | | 0.065 | | 0.047 | | 0.054 | | 0.059 | | 0.043 | |
| | (0.009) | ** | (0.011) | ** | (0.010) | ** | (0.009) | ** | (0.011) | ** | (0.010) | ** |
| Lagged Debt (% of GDP) | 0.042 | | 0.058 | | 0.044 | | 0.041 | | 0.057 | | 0.044 | |
| | (0.007) | ** | (0.011) | ** | (0.007) | ** | (0.006) | ** | (0.010) | ** | (0.006) | ** |
| Dependent Population | 0.041 | | -0.368 | | 0.031 | | 0.038 | | -0.335 | | 0.022 | |
| | (0.083) | | (0.103) | ** | (0.090) | | (0.082) | | (0.099) | ** | (0.088) | |
| Constant | 0.392 | | 26.443 | | 1.038 | | 0.790 | | 25.116 | | 1.743 | |
| | (4.013) | | (5.236) | ** | (4.253) | | (3.978) | | (4.968) | ** | (4.205) | |
| Regional Effects | Yes | | No | | Yes | | Yes | | No | | Yes | |
| Electoral Competition Dummies | No | | Yes | | Yes | | No | | Yes | | Yes | |
| Observations | 446 | | 446 | | 446 | | 446 | | 446 | | 446 | |
| R-squared | 0.65 | | 0.40 | | 0.67 | | 0.66 | | 0.44 | | 0.68 | |

Robust standard errors in parentheses, * significant at 5%; ** significant at 1%.

Estimation method: OLS with robust standard errors.

Controls include: GDP growth rate, exports plus imports as percentage of GDP (Openness), Initial level of debt as percentage of GDP, and population under 15 and over 64 years of age as a percentage of total population, regional effects and electoral competition dummies.

**Table 5**

**Effect of Effective Number of Parties (ENP) and Polarization on Government Expenditure**

**Expanded Sample**

**Dependent Variable: Central Government Expenditure (as % of GDP), 1975 – 2004**

| | 1 | | 2 | | 3 | | 4 | | 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Polarization | 2.236 | | | | 2.232 | | 0.241 | | -0.684 | |
| | (0.341) | ** | | | (0.339) | ** | (0.751) | | (0.603) | |
| ENP | | | 0.064 | | 0.064 | | 0.062 | | 0.067 | |
| | | | (0.013) | ** | (0.013) | ** | (0.013) | ** | (0.014) | ** |
| Polarization*ENP | | | | | | | 0.495 | | 0.411 | |
| | | | | | | | (0.161) | ** | (0.133) | ** |
| GDP Growth | -0.256 | | -0.278 | | -0.280 | | -0.282 | | -0.287 | |
| | (0.086) | ** | (0.087) | ** | (0.086) | ** | (0.086) | ** | (0.091) | ** |
| Openness | 0.089 | | 0.082 | | 0.086 | | 0.084 | | 0.084 | |
| | (0.008) | ** | (0.008) | ** | (0.008) | ** | (0.008) | ** | (0.008) | ** |
| Lagged Debt (% of GDP) | 0.081 | | 0.084 | | 0.083 | | 0.082 | | 0.077 | |
| | (0.010) | ** | (0.010) | ** | (0.010) | ** | (0.010) | ** | (0.009) | ** |
| Dependent Population | -0.425 | | -0.607 | | -0.468 | | -0.463 | | -0.080 | |
| | (0.052) | ** | (0.046) | ** | (0.053) | ** | (0.052) | ** | (0.063) | |
| Constant | 33.905 | | 42.502 | | 35.362 | | 35.349 | | 17.349 | |
| | (2.281) | ** | (1.915) | ** | (2.267) | ** | (2.253) | ** | (2.439) | ** |
| Regional Effects | No | | No | | No | | No | | Yes | |
| Electoral Competition Dummies | No | | No | | No | | No | | Yes | |
| Observations | 1331 | | 1331 | | 1331 | | 1331 | | 1331 | |
| R-squared | 0.43 | | 0.41 | | 0.44 | | 0.44 | | 0.59 | |

Robust standard errors in parentheses, * significant at 5%; ** significant at 1%.

Estimation method: OLS with robust standard errors.

Controls include: GDP growth rate, exports plus imports as percentage of GDP (Openness), Initial level of debt as percentage of GDP, and population under 15 and over 64 years of age as a percentage of total population, regional effects and electoral competition dummies.

**Figure 1**

**Effects of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**

**Baseline Model (Table 2, column 4)**



Effect of the Effective Number of Parties on Government Expenditure
as Polarization Changes
Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)



Effect of Polarization on Government Expenditure as the Effective
Number of Parties Changes
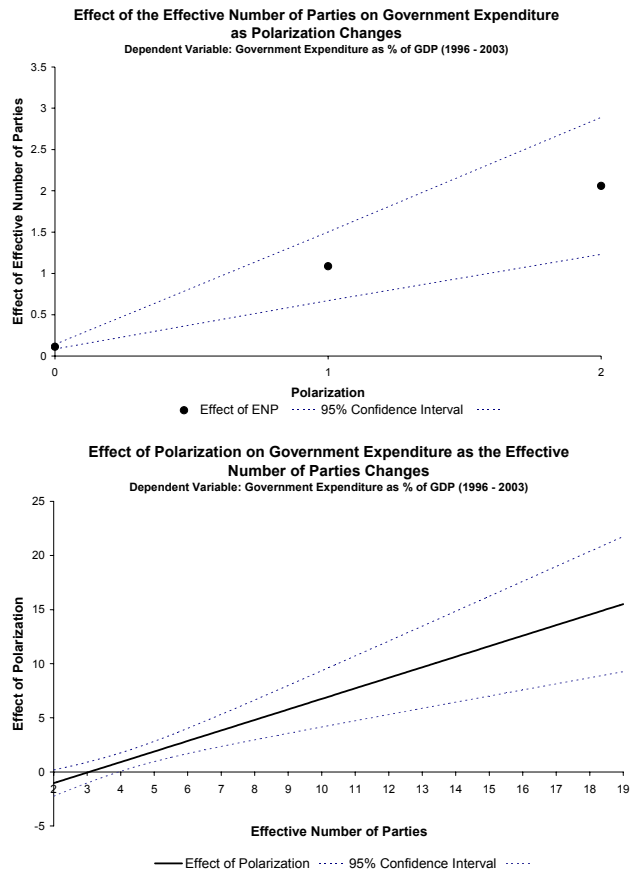Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)

**Figure 2**
**Effects of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**
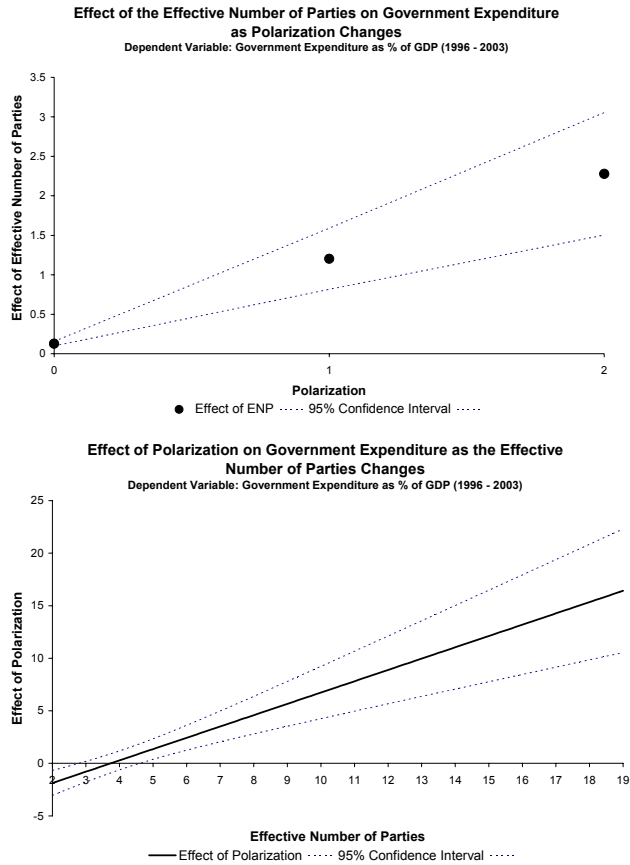**Controlling for Accountability and Election Cycles (Table 3, column 6)**



Effect of the Effective Number of Parties on Government Expenditure
as Polarization Changes
Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)



Effect of Polarization on Government Expenditure as the Effective
Number of Parties Changes
Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)

**Figure 3**
**Effects of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**
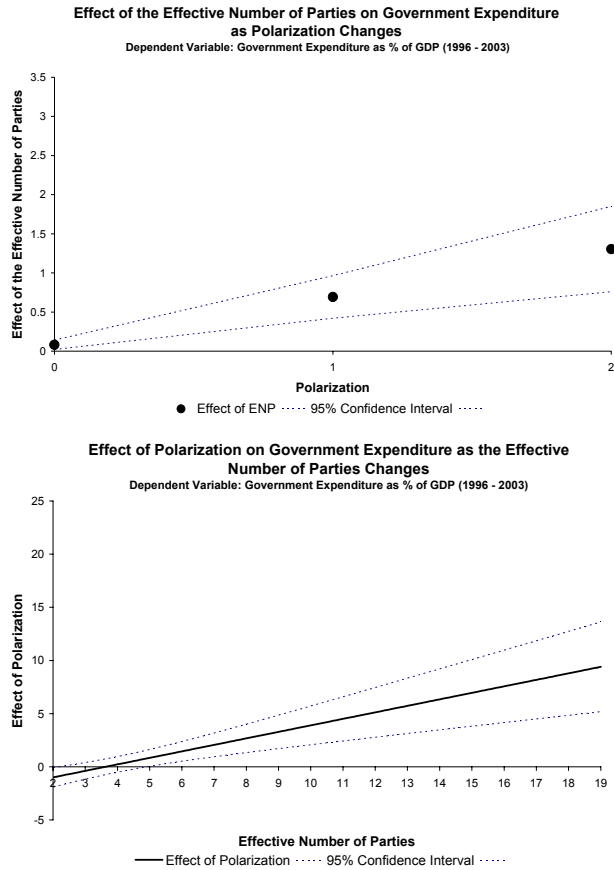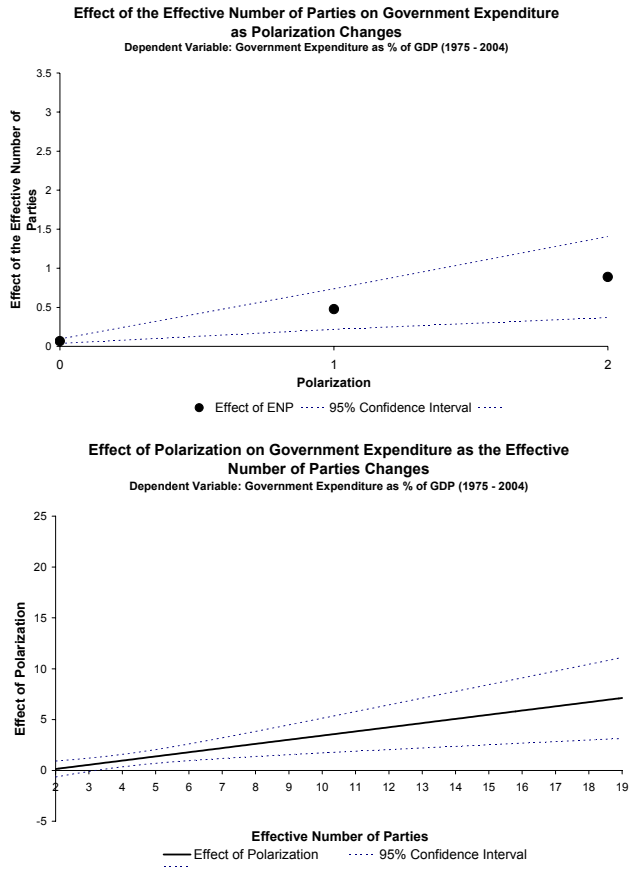**Controlling for Regional Effects and Legislative Electoral Competition (Table 4, column 6)**



Effect of the Effective Number of Parties on Government Expenditure
as Polarization Changes
Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)



Effect of Polarization on Government Expenditure as the Effective
Number of Parties Changes
Dependent Variable: Government Expenditure as % of GDP (1996 - 2003)

**Figure 4**

**Effects of the Effective Number of Parties (ENP) and Polarization on Government Expenditure**

**Expanded Sample (Table 5, column 5)**

**Effect of the Effective Number of Parties on Government Expenditure as Polarization Changes**

Dependent Variable: Government Expenditure as % of GDP (1975 - 2004)



**Effect of Polarization on Government Expenditure as the Effective Number of Parties Changes**

Dependent Variable: Government Expenditure as % of GDP (1975 - 2004)

**Data Appendix**

This appendix lists the variables used in this study, their definitions and the sources from which we took them.

**Government Expenditure**
Central Government Expenditure as percentage of GDP.
Source: Inter American Development Bank taken from World Economic Outlook (IFS).

**Effective Number of Parties (ENP)**

$$\text{ENP} = \sum_{i=1}^{n} \frac{1}{p_i^2}$$

Where $p_i$ is the share of seats won by the ith party in the legislative elections and n is the actual number of parties in the legislature. This variable was originally proposed by Laakso and Taagepera (1979).

Source: authors' calculations based on the data in the Database of Political Institutions (DPI2004), World Bank. BECK, Thorsten George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh (2001). "New tools in comparative political economy: The Database of Political Institutions". *World Bank Economic Review,* Vol. 15, N.1, (September) pp. 165-176. LAAKSO, Markku. and Rein Taagepera, (1979). "Effective number of parties: a measure with application to West Europe". *Comparative Political Studies* 12, pp. 3–27.

**Polarization**
Maximum distance between the executive's party and the four main parties in the legislature, where each of these parties is classified in the left-center-right political ideology scale. The distance between left (or right) and center is one, and the distance between the left and the right is two. Polarization thus takes integer values between zero and two. Polarization is zero if elections are not competitive (in the case of legislative elections, as measured by the Legislative Index of Electoral Competition, explained below), or if the chief executive's party has an absolute majority in the legislature.

Source: KEEFER Philip and David Stasavage (2003). "The Limits of Delegation: Veto Players, Central Bank Independence and the Credibility of Monetary Policy." *American Political Science Review* (August). Database of Political Institutions (DPI2004), World Bank.

**Voice & Accountability**
Measure of political and civil rights rescaled to [0, 1], where a value of zero indicates the lowest level of accountability and one the highest. Some of its components are: Accountability of public officials, freedom of press, effectiveness of national parliament as a law making and oversight institution, institutional permanence, budget transparency, media sustainability index, among others.

Source: Governance Indicators IV (2005) database, World Bank. KAUFFMAN, Daniel, Kraay, Aart and Mastruzzi, Massimo, "Governance Matters IV: Governance Indicators for 1996-2004". *World Bank Policy Research Working Paper Series No. 3630,* (May).

**Election Year Dummy**
Dummy that indicates the year of executive elections.

Source: authors' calculations based on the data in the Database of Political Institutions (DPI2004), World Bank. BECK, Thorsten George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh (2001). "New tools in comparative political economy: The Database of Political Institutions". *World Bank Economic Review,* Vol. 15, N.1, (September) pp. 165-176.

**Legislative Electoral Competition**
Integer values between one and seven, where countries awarded a value of seven are the ones with the most competitive elections. In total, there are ten categories and subcategories, listed below. Our estimations in Table 4 include five dummies that represent the five lowest levels of competition in the scale listed below:
1. No legislature
2. Unelected legislature
3. Elected legislature, only one candidate
3.5 It is not clear whether there is competition among elected legislators in a single-party system.
4. One party, multiple candidates
5. Multiple parties are legal but only one won seats
5.5 It is unclear whether multiple parties ran and only one won or if multiple parties ran and won more than 75 percent of the seats
6. Multiple parties did win seats but the largest party received more then 75 percent of the seats
6.5 Multiple parties won seats but it is unclear how many seats were won by the largest party
7. The largest party got less than 75 percent of the seats in the legislature

Source: authors' calculations based on the data in the Database of Political Institutions (DPI2004), World Bank. BECK, Thorsten George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh (2001). "New tools in comparative political economy: The Database of Political Institutions". *World Bank Economic Review,* Vol. 15, N.1, (September) pp. 165-176.

**Regional Effects**
Countries in the sample are grouped in the following regions:
1. Sub-Saharan Africa
2. Western Europe
3. Central America and Caribbean
4. South America
5. Eastern Europe and Central Asia
6. Middle East and North Africa
7. Eastern Asia and Pacific
8. South Asia
9. Canada, United States and Mexico (this is the one excluded from the estimations).

**GDP Growth**
Annual percentage GDP real growth rate.
Source: World Development Indicators, World Bank.

**Openness**
Exports and imports as percentage of GDP.
Source: World Development Indicators, World Bank.

**Lagged Debt**
Central Government Debt as percentage of GDP, with a one period lag.
Source: Jaimovich and Panizza (2006) database.

**Dependent Population**
Population under 15 and over 64 years of age as percentage of total population.
Source: World Development Indicators, World Bank.