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Sergio Béjar and Bumba Mukherjee

Abstract

What accounts for the substantial variation in the temporal volatility of economic growth rates in democratic regimes? We claim that institutional differences between the majoritarian and proportional representation (PR) electoral systems explain why growth volatility is high in some democracies, but not others. Specifically, we suggest that unlike PR democracies, the pronounced career concerns of policymakers in majoritarian systems give them incentives to use their discretionary spending power to alter government spending levels sharply, which generates higher spending volatility in these countries. As a result, policymakers in majoritarian systems cannot credibly commit themselves to stabilizing spending levels. This causes uncertainty among economic actors about future spending levels and leads to unstable investment patterns that generate a higher volatility of growth rates in majoritarian democracies. Results from statistical models provide robust statistical support for our theoretical predictions.

Keywords

comparative political economy, electoral systems, growth volatility, time-series cross-section analysis

A growing body of research suggests that economic development requires *stable* economic growth (Easterly et al., 2000; Rodrik, 1999). Recent studies, in fact, find that greater temporal fluctuation (volatility) in growth rates within countries diminishes average growth, deters investment, and exacerbates unemployment (Ramey and Ramey, 1995; Sachs, 2002). The pernicious consequences of volatile growth rates (that is, high growth volatility) are particularly visible in Africa. Indeed, some economists have shown that high growth volatility in Africa reduces economic output on average by a staggering 10 percent in African countries, which generates sharp spikes in unemployment and civil wars (Becker and Mauro, 2006; Hausmann et al., 2005). The adverse impact of unstable economic growth is not restricted to developing countries. Rather, research reveals that growth volatility reduces consumption and causes unemployment in advanced societies such as the USA and Britain (Butler et al., 1994; Wolfers, 2003).

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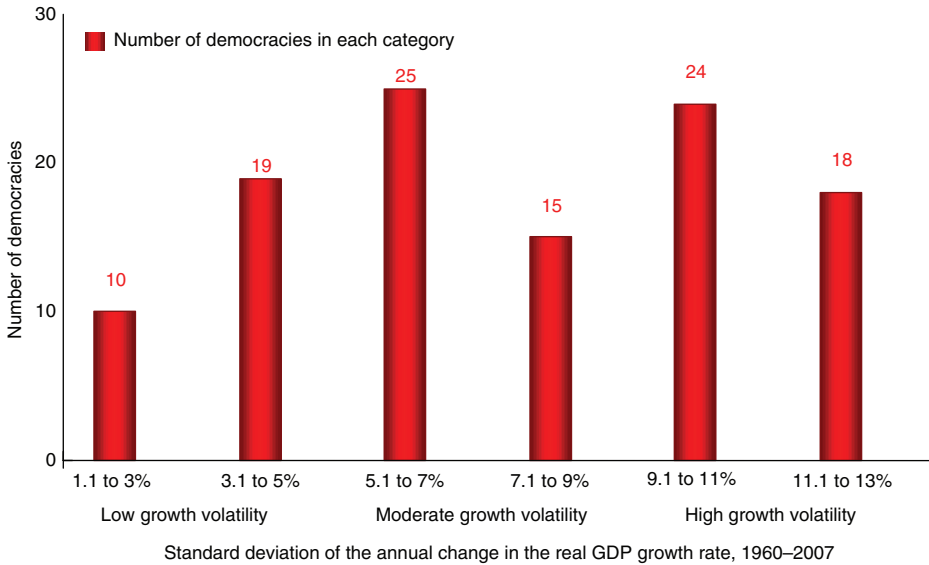


Figure 1. Growth Volatility in 111 Democracies, 1960–2007

Given the high costs of volatile growth rates, it is not surprising that research on the determinants of growth volatility has proliferated in recent years. Economists have invested substantial effort toward understanding how terms-of-trade shocks affect growth volatility (Denizer et al., 2002; Rodrik, 1999). Political scientists, however, not only focus on comparing growth rates between democracies and autocracies,¹ but also suggest that the volatility of growth in democracies is substantially lower than in autocracies (Quinn and Woolley, 2001; Rodrik, 1999).

Existing studies on democracy and stability (or lack thereof) of economic growth are insightful, but tend to paint the link between democracy and growth volatility with a broad brush. This is because, in reality, there is substantial variation in the volatility of growth rates within democracies. The bar graph shown in Figure 1, which is derived from our data of 111 democracies during the 1960–2007 time period, reveals that growth volatility (operationalized as the standard deviation of the *annual change* in real GDP growth rates) is as high as 9–13 percent in several democracies, but as low as 1–5 percent in other democratic regimes. Thus, growth volatility in many democracies is significantly higher than in others. Our data also show that among OECD democracies growth volatility within Australia and Canada is two and a half times higher than in Germany. Likewise, in the developing world, the temporal fluctuation in the growth rate from year to year in the Philippines (a democracy since 1986) is four times higher than in Chile (a democracy since 1990). In contrast to Chile's economic and political stability, higher growth volatility in the Philippines has led to poor living standards and political instability in the country (Kahl, 2006).

Figure 1 and the examples mentioned above lead to a substantively interesting question that has not been systematically analyzed earlier, but is examined here: What accounts for the substantial variation in the volatility of growth rates (that is, growth volatility) within democracies? Building on the literature on electoral systems and the composition of fiscal policies,² we suggest below that institutional differences across electoral systems, particularly between the majoritarian and proportional representation (PR) systems, can help explain why growth volatility is high in some

democracies, but not others. Specifically, we claim that unlike PR democracies, the majoritarian system has the effect of increasing the temporal volatility of central government spending and that this engenders higher growth volatility in majoritarian states. We develop two arguments to justify this claim. First, we suggest that the frequent formation of single-party majority governments in majoritarian countries provides incumbents with significant discretionary power to alter the level of central government spending sharply. We then claim that the *pronounced* career concerns of incumbents in majoritarian systems give them incentives to use their discretionary spending power and that this generates higher government spending volatility in these countries.

Second, following from the aforementioned argument, we theorize that higher spending volatility makes it impossible for incumbents in majoritarian systems to commit themselves credibly to the stabilizing of public spending levels. This causes uncertainty about the stability of future spending levels among domestic actors in majoritarian systems and leads to volatile investment patterns that generate higher growth volatility in these countries. In contrast, we suggest that leaders in PR systems are more politically constrained and lack the opportunity to alter spending levels sharply. This induces them to maintain stability in government spending levels, which helps to prevent higher growth volatility in PR systems. The results from several statistical models applied to a dataset of 111 democracies for the period 1960–2007 provide robust statistical support for our theoretical predictions.

A key implication of our study (discussed in the Conclusion) is that contrary to extant claims (McGann, 2006; Norris, 1997), majoritarian democracies do *not* necessarily promote economic stability. Our analysis also suggests that governments in majoritarian states need to design institutions such as highly independent central banks that may help to reduce government spending and growth volatility. This article proceeds as follows. We begin by developing our theory that explains why majoritarian systems increase the volatility of central government spending and growth. We then present the data, the variables, and the empirical results. We conclude by discussing the implications of our findings and provide avenues for future research.

I. Theoretical framework

Building on existing studies that explore how electoral systems influence the *composition* of central government spending (see Milesi-Ferretti et al., 2002; Persson and Tabellini, 2003), we suggest below that, in contrast to PR democracies, two key features of the majoritarian system increase central government spending volatility, which is defined here as the temporal (year-to-year) variation in central government spending as a percentage of GDP. As discussed below, the first feature provides discretionary power to incumbents in majoritarian systems to alter public spending levels drastically, while the second feature gives them incentives to use this discretionary spending power to adopt pro-cyclical fiscal policies. This generates higher government spending volatility and consequently more growth volatility.

The first key feature of majoritarian systems (supported by our data, which are described later) is that single-party majority governments form frequently in majoritarian democracies.³ Coalition governments are, however, the norm in PR systems (Lijphart, 1994; Powell, 2000). As Norris (1997: 308) states:

The classic argument for majoritarian systems is that they tend to produce stable and responsible single party (majority) governments ... In contrast, PR is closely associated with coalition cabinets.

Proponents of the majoritarian system claim that the frequent formation of single-party majority governments leads to accountable incumbents (Norris, 1997), which promotes 'lower variability in government expenditure in majoritarian countries' (McGann, 2006: 191). Although plausible, this claim overlooks the fact that leaders of single-party majority governments in majoritarian states face lesser constraints within the ruling party when implementing public spending policies (Crepaz, 1996; Schmidt, 2002). As a result, they have more discretionary power to implement substantial changes in the level of central government spending.

We suggest that the greater discretionary power of incumbents in majoritarian systems to change spending policies provides maneuvering room to alter the degree of central government expenditure during their tenures in order to meet certain objectives. For instance, it may induce incumbents in majoritarian democracies to increase 'pork-barrel' expenditures sharply and therefore central government spending during election years so as to increase their prospects of winning elections. However, in nonelection years (when the pressures to win an election are substantially reduced) discretionary power to change the extent of government spending allows policymakers in majoritarian systems to focus on deficit reduction by drastically curtailing central government spending. Thus, the greater discretionary spending power of majoritarian incumbents, which results from the formation of single-party majority governments, generates public expenditure 'peaks' (during election years) and 'troughs' (in nonelection years) which imply more temporal variance in central government spending.

While the frequent formation of single-party majority governments provides discretionary spending power for incumbents, their incentives to use this discretionary spending power stems from the pronounced career concerns that result from the second key feature of majoritarian democracies: small electoral districts. Specifically, majoritarian systems are, on average, characterized by small (that is, single-member) electoral districts (Crepaz, 1996; Powell, 2000). According to Persson and Tabellini (2003), electoral competition in small districts *and* the frequent formation of single-party majority governments in majoritarian systems encourage the general electorate nationwide (that is, the electorate at the national level) to focus on the abilities of the incumbent. This magnifies the 'career concerns' of incumbents in majoritarian systems, which gives them electoral incentives to use their discretionary spending power to adopt pro-cyclical fiscal policies at the *aggregate* (that is, central government) level, as doing so maximizes their vote share (Lizzeri and Persico, 2001).⁴ Tests conducted by Persson and Tabellini on a pooled dataset of 60 democracies show that majoritarian systems generate pro-cyclical fiscal policies as

majoritarian elections ... induce more pronounced cycles in *aggregate* fiscal policy compared to proportional elections. This is in line with the idea that electoral accountability and incentives to perform are stronger under plurality rule. (2003: 11)

Persson and Tabellini's finding (2003) that majoritarian systems generate pronounced pro-cyclical fiscal policies is important. This is because economists have shown empirically that pro-cyclical fiscal policies engender fiscal instability which has a powerful positive effect on the temporal variability of central government spending (Talvi and Vegh, 2000). Since majoritarian systems generate pro-cyclical fiscal policies that positively influence government spending volatility, we can thus plausibly infer that the volatility of central government spending is likely to be high in majoritarian states.

The politics of government spending under the single-party majority Tory government in Britain (a majoritarian democracy) between 1984 and 1996 supports our causal arguments. For instance,

Gamble and Walkland (1984) show that 'the rituals of the two party adversary system' and the intense scrutiny of incumbents in Britain by the public magnifies the career concerns of British incumbents. John and Ward (2001: 308), in turn, point out that the career concerns of Tory leaders encouraged them to use their discretionary power as policymakers of a single-party majority government to increase public expenditure during the 1987 and 1992 election years to maximize the party's chances of electoral success. But after the 1987 and 1992 elections, the conservative ruling party used its political leverage to reduce central government spending in Britain to balance the budget. The fluctuation in spending policies by the Tory administration generated significant government spending volatility (John and Ward, 2001). Our data also reveal that on average the standard deviation in the annual change of central government spending as a percentage of GDP in Britain between 1960 and 2007 is 3.5 percent, which is more than *three times higher* than a PR democracy such as Germany, where coalition governments form frequently.⁵ The British example thus supports the arguments that we proposed earlier.

In contrast to greater spending volatility in majoritarian democracies, we suggest that a key feature of PR democracies that leads to substantially lower temporal variance (more stability) in central government expenditure is the frequent formation of coalition governments in these countries. Because the PR system allows parties to win legislative seats with a smaller percentage of the vote, it leads to the formation of multiparty coalition governments and more partisan diversity within governing coalitions (Powell, 2000). This has two effects. First, the presence of multiple political parties and partisan diversity within governing coalitions make it more difficult for policymakers in these coalitions to reach agreement across partisan lines. This constrains political leaders in coalition governments (that form often in PR countries) from implementing drastic changes to central government spending. Further, the formation of multiparty coalitions in PR systems engenders policymaking gridlock in such coalitions, which curtails the ability of policymakers in PR countries to adopt pro-cyclical fiscal policies that generate spending volatility. This is in contrast to incumbents in majoritarian systems, who (as mentioned above) have greater opportunity to adopt pro-cyclical fiscal policies. Hence, the constraints that result from the frequent formation of multiparty coalitions in PR states ensure that policymakers in PR countries, unlike their counterparts in majoritarian systems, have neither the discretionary power nor the opportunity to alter spending levels sharply. Consequently, large discretionary changes in government spending levels are less likely to occur in PR countries. This leads to lower volatility in central government expenditure in PR states.

Second, multiparty coalition government, which occurs often in PR systems, leads to diffused policymaking authority in PR democracies (Huber et al., 1993). The diffusion of policymaking authority necessitates compromise and bargaining between those actors who together share control over the reins of power in governing coalitions (Lijphart, 1994). Because of the need for compromise, policymakers in coalition governments cannot substantially increase government spending as this may alienate coalition partners that dislike high spending. They also cannot drastically reduce spending as this may provoke parties that favor higher government spending to defect from the coalition. Rather, they have to adopt a stable (neither very high nor low) level of central government expenditure to satisfy different partisan parties within the coalition (Bawn and Rosenbluth, 2006). This leads to lower variability in central government spending in PR countries.

Examples from PR democracies such as Austria in the developed world and Chile in the developing world (since 1990) support our claims. In Austria and Chile, multiparty coalition governments with diffuse policymaking authority form frequently. As suggested by scholars, the presence of multiple parties within governing coalitions in Austria and Chile has made changes to central

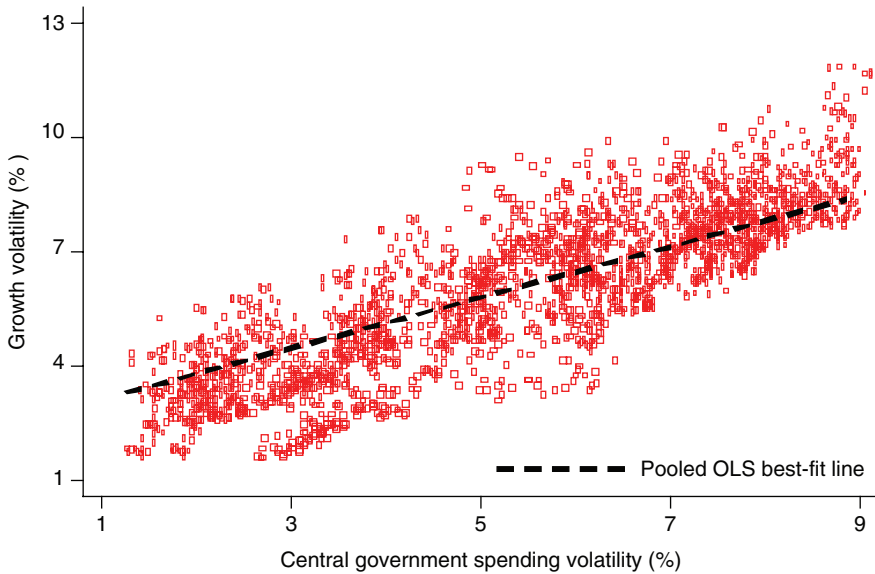


Figure 2. Relationship between Central Government Spending Volatility and Growth Volatility

Notes: Country-year scatter plot of the standard deviation in the annual change in real GDP growth against the standard deviation in the annual change of central government spending (as a percentage of GDP), 1960–2007.

government spending gradual, owing to the reasons delineated above.⁶ Hence, not surprisingly, our data indicate that the standard deviation in the annual change of central government spending (as a percentage of GDP) is merely 1.0 percent in Austria and 1.8 percent in Chile. Put together, then, the preceding discussion suggests that, in contrast to PR systems, majoritarian systems will generate higher government spending volatility. This leads to the following hypothesis:

Hypothesis 1. The majoritarian electoral system has a positive effect on the volatility of central government spending.

Building on Hypothesis 1, we suggest below that the higher volatility of central government spending in majoritarian systems increases the temporal (year-to-year) variance in growth rates (that is, growth volatility) because of two reasons. First, according to Lane (2003), higher temporal volatility of central government spending exacerbates supply shocks in the economy and that engenders higher growth volatility. Lane's insight (2003) has been confirmed in empirical studies by economists (see Klomp and Haan, 2009; Ramey and Ramey, 1995). It is also corroborated by the slope of the pooled OLS best-fit line in Figure 2 (derived from our data), which shows that higher volatility of central government spending (as a percentage of GDP) positively influences growth volatility. Because we suggested earlier that central government spending volatility is likely to be high in majoritarian states, we thus plausibly infer from Lane's insight (2003) and Figure 2 that greater volatility of central government spending in majoritarian systems increases growth volatility in these countries.

Second, policymakers in majoritarian systems will find it difficult to commit themselves credibly to the stabilization of government spending levels since they have the discretionary spending power to alter spending levels sharply (as emphasized earlier). Hence, when economic actors

observe spending volatility in majoritarian systems, they may anticipate that such volatility will *persist* and they will thus be uncertain *ex ante* about future trends in spending levels. Indeed, the lack of credibility of the policymakers' commitment to stabilizing spending levels in majoritarian states will induce economic actors to believe that policymakers may not exert the necessary effort to curtail spending volatility. Uncertainty about future spending levels in majoritarian systems will increase the volatility of private investment by economic actors. This, in turn, will lead to higher growth volatility in majoritarian democracies.

Evidence from a majoritarian democracy such as Britain, for example, shows that successive governments have failed to instill predictability of spending policies plus confidence among economic actors, and that this has generated higher growth volatility (Gamble and Walkland, 1984: 25). In fact, our data not only indicate high government spending volatility in Britain (mentioned earlier), but also show that the standard deviation in the annual change of the growth rate is a fairly high 3.9 percent, which is three times higher than growth volatility in a PR democracy such as Germany. The standard deviation in the year-to-year change of the growth rate in majoritarian countries in the developing world such as the Philippines and Zambia, where spending volatility is substantial, is as high as 6.3 percent (the Philippines) and 9.0 percent (Zambia).

In contrast to majoritarian democracies, we argue that leaders in PR systems have incentives to maintain stability in the level of government spending and that this prevents higher growth volatility. To see why, recall that multiparty coalition governments form frequently in PR democracies. As discussed earlier, multiparty coalitions curtail the discretionary spending power of policymakers in PR systems and reduce their ability to alter spending levels sharply (unlike their counterparts in majoritarian systems). These characteristics, in turn, have two consequences.

First, note that economic actors observe that leaders in PR systems (1) lack the discretionary power radically to alter spending levels and (2) have political incentives to stabilize spending levels owing to the reasons delineated above. As a result, spending volatility in PR systems will be viewed by economic actors as a temporary phenomenon and will therefore *not* lead to volatile investment patterns by these actors. Second, the incentives for government leaders in PR democracies to maintain stability in government spending levels will increase predictability in future public spending patterns. Greater predictability regarding future trends in government spending will engender stable investment patterns by economic actors in PR systems and make these countries less susceptible to volatile capital flows. This will also help to prevent growth volatility in PR democracies. A cursory examination shows that the frequent formation of coalition governments in PR democracies such as Austria and Israel encourages the policymakers of governing coalitions in these two countries to maintain stable spending levels (Berridge, 2004; Mueller, 2003). Consequently, growth volatility has been as low as 1.0 percent in Austria and 1.4 percent in Israel. In short, the discussion that immediately follows Hypothesis 1 leads to a second hypothesis:

Hypothesis 2. Volatility of central government spending in majoritarian democracies has a positive effect on the volatility of economic growth.

2. Sample, dependent variable(s), and statistical methodology

We compile a time-series, cross-sectional (TSCS) sample of 111 democracies from 1960 to 2007 to test Hypotheses 1 and 2, since they focus on *democracies*. The democracies in our sample satisfy the criteria for democracies suggested by Przeworski et al. (2000): (1) the chief executive and legislature must be directly elected; (2) there must be more than one party in the legislature; and (3) incumbents must allow a lawful alternation of office if defeated in elections. Table 1 lists the 111

Table I. List of Countries

Country	Country	Country
Albania ^b	Ghana ^a	Nigeria ^a
Antigua ^a	Greece ^b	Norway ^b
Argentina ^b	Grenada ^a	Pakistan ^a
Australia ^a	Guatemala ^b	Panama ^a
Austria ^b	Guinea Bissau ^b	Papua New Guinea ^a
Armenia ^a	Haiti ^a	Peru ^b
Bahamas ^a	Honduras ^b	Philippines ^a
Bangladesh ^a	Hungary ^a	Poland ^b
Barbados ^a	Iceland ^b	Portugal ^b
Belgium ^b	India ^a	Romania ^b
Benin ^b	Indonesia ^b	Russia ^a
Bolivia ^b	Ireland ^b	Solomon Islands ^a
Brazil ^b	Israel ^b	Sri Lanka ^b
Belize ^a	Italy ^b	St Kitts ^a
Bulgaria ^b	Jamaica ^a	St Lucia ^a
Burundi ^b	Japan ^a	St Vincent ^a
Canada ^a	Kenya ^a	Sao Tome Principe ^b
Cape Verde ^b	Kiribati ^a	Sierra Leone ^a
Central Africa ^a	South Korea ^a	Slovakia ^b
Chile ^b	Lesotho ^b	Slovenia ^b
Colombia ^b	Latvia ^b	South Africa ^b
Comoros ^a	Lithuania ^a	Spain ^b
Congo ^a	Luxembourg ^b	Sudan ^a
Costa Rica ^b	Macedonia ^a	Suriname ^b
Cote d'Ivoire ^a	Malawi ^a	Sweden ^b
Croatia ^b	Mali ^a	Switzerland ^b
Cyprus ^b	Malta ^b	Thailand ^b
Czech Republic ^b	Mauritius ^a	Trinidad and Tobago ^a
Denmark ^b	Mexico ^b	Turkey ^b
Dominica ^a	Mongolia ^a	Uganda ^a
Dominican Republic ^b	Moldova ^b	Ukraine ^a
Ecuador ^b	Namibia ^b	United Kingdom ^a
El Salvador ^b	Nepal ^a	United States ^a
Estonia ^b	Netherlands ^b	Uruguay ^b
Finland ^b	New Zealand ^a	Vanuatu ^a
France ^a	Nicaragua ^b	Venezuela ^b
Germany ^b	Niger ^a	Zambia ^a

Notes: ^a majoritarian (or MMM) system. ^b PR (or MMP) system.

countries (24 advanced OECD states plus 87 non-OECD states) that were observed as democracies in any year or years in the period 1960–2007. Our sample is comprehensive as it includes all democracies observed during the period 1960–2007 for which data to operationalize the dependent and independent variables are available. We will first describe how we operationalized the dependent variable in Hypothesis 2, that is, growth volatility, which is defined as the temporal (year-to-year) variation in the real GDP growth rate in countries.

Extant studies use either the inter-quartile range of growth across countries or a cross-sectional measure of the standard deviation of growth rates to operationalize growth volatility (see Denizer et al., 2002; Rodrik, 1999). Since these two measures only account for growth volatility *across*

countries, but *not over time* within countries, they are inadequate for operationalizing the temporal variance in the growth rate in countries, which is the dependent variable in Hypothesis 2. The estimates from cross-sectional measures of growth volatility are also susceptible to bias as these measures *underestimate* the time-series variance in growth rates and are sensitive to potential outliers (Mobarak, 2005).

To avoid the aforementioned limitations and ensure that our results are not driven by a single measure of growth volatility, we consider three measures of growth volatility to test Hypothesis 2. The first measure of growth volatility that we employ is the absolute value of the annual change in the real GDP growth rate between years $t - 1$ and t . This measure is defined as

$$Abs(\Delta growth) = |g_{it} - g_{it-1}| \quad (1)$$

where g_{it} denotes the real GDP growth rate for country i at t and g_{it-1} denotes the real GDP growth rate at $t - 1$. We employ $Abs(\Delta growth)$ as our main measure of growth volatility since it accurately operationalizes the extent to which the real GDP growth rate varies from year to year in each country. Yet, to be cautious, we use additional measures of growth volatility. Specifically, our second measure is the *conditional variance* of the annual change in the real GDP growth rate for each country, which is operationalized in two steps. First, for each country in Table 1, we estimated the Generalized Autoregressive Conditional Heteroskedastic (GARCH) model (Engle, 2001), which includes the conditional mean ($y_{i,t}$) and conditional variance ($\sigma_{i,t}^2$) equations for the growth rate per country-year. After estimating the GARCH model, for every country in our data we derived the conditional variance of the annual change in the real GDP growth rate ($\hat{\sigma}_{i,t}^2$); this measure is denoted as *growth - GARCH*. Higher values of $Abs(\Delta growth)$ and *growth - GARCH* represent wider fluctuations in the growth rate from year to year and thus greater growth volatility in countries.

For the third measure, we follow Klomp and Haan (2009) and operationalize *growth volatility* as the standard deviation of the annual change in the real GDP growth rate ($\sigma_{y,t}$). This measure is operationalized by using *annual observations* of the real GDP growth rate calculated over a five-year rolling window for each country and is defined as

$$\sigma_{y,t} = \frac{1}{|\bar{y}_{i,T}|} \sqrt{\frac{\sum (y_{i,t} - \bar{y}_{i,T})^2}{n-1}} \quad (2)$$

where $y_{i,t}$ is the real GDP growth rate in country i at time t , $\bar{y}_{i,T}$ is the average real GDP growth rate in a five-year rolling window in country i measured over period T , and n is the number of observations in period T . Our results remain robust if we use a three-, four-, or six-year rolling window to operationalize the *growth volatility* measure in Equation (2). Larger values for *growth volatility* represent wider fluctuations from year to year and thus greater temporal volatility of growth rates in countries.

The three growth volatility measures described above directly operationalize the dependent variable in Hypothesis 2 and enhance our ability to isolate the effect of those factors that vary over time on growth volatility. This helps us to test Hypothesis 2 closely. We will now describe the operationalization of the dependent variable in Hypothesis 1, that is, the volatility of central government spending, which is defined as the year-to-year variation in central government spending (as a percentage of GDP) within countries. We cannot use a cross-sectional measure of spending

volatility since it does not capture the *temporal* variance in central government spending within countries. We thus operationalize the dependent variable in Hypothesis 1 as the absolute value of the annual change of central government spending as a percentage of GDP between years t and $t - 1$. This is defined as $Abs(\Delta spending) = |s_{it} - s_{it-1}|$, where s_{it} denotes the level of central government spending as a percentage of GDP in country i at t , while s_{it-1} is the level of central government spending (as a percentage of GDP) at $t - 1$. In order to test robustness, we operationalize the absolute value of the annual change in central government expenditure as a percentage of total government spending between t and $t - 1$ for each country. This alternative measure is denoted as $Abs(\Delta expenditure)$.

The $Abs(\Delta spending)$ and $Abs(\Delta expenditure)$ measures allow us to test Hypothesis 1 closely because higher values of each of these two measures capture larger fluctuations in government spending from year to year and thus higher spending volatility. The results remain robust when we use the standard deviation of the annual change in central government spending as a percentage of GDP (or as a percentage of total government spending) as an alternative measure for the dependent variable in Hypothesis 1. Hence, to save space, we do not report the estimates from this alternative measure. The data used to operationalize the growth and spending volatility measures mentioned above are from *Penn World Tables* (2008), International Monetary Fund (2008), and World Bank (2008a).

Since we use a TSCS dataset and continuous measures for the dependent variable, we test our hypotheses by estimating TSCS regression models with panel-corrected standard errors (PCSEs) that are adjusted to correct for heteroskedasticity and contemporaneous correlation. We add the lag of the relevant dependent variable in the empirical models to correct for serial correlation.

2.1 Independent and control variables

The independent variable required to test Hypothesis 1 is a dummy variable for countries with a majoritarian electoral system. The dummy, *majoritarian*, is coded as 1 for countries with a majoritarian electoral system and is coded 0 otherwise. Following Powell (2000) and Lijphart (1994), countries with a majoritarian system in our sample include states that use plurality rule, absolute and qualified majority requirements, the limited vote, the alternative vote, the single nontransferable vote, and a form of the modified Borda count. We also code *majoritarian* as 1 for states in the data with mixed-member majoritarian (MMM) systems since 'MMM systems closely resemble pure (majoritarian) single-member district electoral systems' (Shugart and Wattenberg, 2001; Thames and Edwards, 2006). The data for *majoritarian* are from Golder (2005) and World Bank (2008b). Some 52 out of the 111 democracies in the data have a majoritarian system, while 59 have a PR system. From Hypothesis 1, we expect that the *majoritarian* variable will positively influence spending volatility.

We include several controls that may influence spending volatility. We first include *GDP per capita* since governments in high-income countries have a greater ability to dampen the volatility of central government spending (Fatás and Mihov, 2003). We control for *trade openness* (measured as exports plus imports divided by the state's GDP), as Rodrik (1999) claims that more trade openness leads to greater spending volatility. We add *urbanization* (operationalized as the proportion of the urban population to the total population for each country-year) because more urbanization leads to discretionary spending that engenders higher spending volatility (Fatás and Mihov, 2003). We include *terms-of-trade (tot) shock* and *inflation volatility* as these factors may also engender higher spending volatility (Rodrik, 1999). We incorporate the *age dependency ratio*, which is

operationalized as the ratio of the population that is younger than 14 and older than 65 years to the population between 14 and 65 years of age, since it may negatively influence growth volatility (Fatás and Mihov, 2003).

With respect to political controls, we include the dummy *election*, which is coded as 1 when elections for the national lower chamber of the legislature are held in a country. We also incorporate the dummy *presidential* (coded as 1 for countries with a presidential system). We include these two political variables as Persson and Tabellini (2003) suggest that elections and presidential systems may encourage incumbents to change spending policies. Governments that survive for a longer time period in office may have incentives to stabilize public spending. We thus control for *government duration*, which is operationalized as the length of tenure in office in months for each government in our sample. We implement Hurlin and Venet's Granger causality test for panel data (2003) to assess the potentially endogenous relationship between the *government duration* control variable and each of our two measures of spending volatility mentioned above. F-statistics from the Hurlin and Venet (2003) test indicate that *government duration* is not endogenous to the two measures of spending volatility that serve as the dependent variable for Hypothesis 1. To investigate if cabinet changes influence spending volatility, we use a *cabinet changes* variable which measures for each country the number of times in a year that a new premier is named or 50 percent of cabinet posts are occupied by new ministers. To check whether wars influence spending volatility, we control for the dummy *war* (coded as 1 when a country is involved in an armed conflict against another state).

We operationalize the independent variable in Hypothesis 2 (that is, central government spending volatility in majoritarian democracies) in two steps. First, we identify countries in our sample with a majoritarian electoral system based on the criteria described earlier; these countries are coded as *majoritarian* democracies. Second, after identifying *majoritarian* states in the sample, we calculate the absolute value of the annual change in central government spending as a percentage of GDP between t and $t - 1$ for each majoritarian democracy in the data. This measure, labeled *spend volatility-majoritarian*, provides the independent variable that operationalizes the year-to-year variance (that is, volatility) of central government spending in majoritarian democracies.

For robustness testing, we compute the absolute value of the annual change in central government expenditure as a percentage of total government spending between t and $t - 1$ for each majoritarian democracy. This measure is denoted as *exp volatility-majoritarian* and is used as an alternative measure of the independent variable to test Hypothesis 2. Note that our independent variable *spend volatility-majoritarian* (and *exp volatility-majoritarian*) captures the year-to-year variance in government spending in majoritarian countries by operationalizing the absolute value of the annual change in central government spending as a percentage of GDP (or percentage of total spending) between t and $t - 1$ for these countries. As a result, the *temporal structure* of our independent variable closely fits the operationalization of the temporal structure of our main measure of the dependent variable in Hypothesis 2, that is, growth volatility (or $Abs(\Delta growth)$), which computes the absolute value of the annual change in the real GDP growth rate between years $t - 1$ and t . This helps us to test Hypothesis 2 in the sample as directly as possible.

Apart from the independent variables, we control for *trade openness*, *terms-of-trade (tot) shock*, *log inflation*, and *GDP per capita*, since greater trade openness and higher inflation increases growth volatility, while higher GDP per capita reduces it (Rodrik, 1999). We also add *private credit*, measured as private credit issued by banks and other financial institutions as a percentage of GDP, since it increases money supply which then affects growth volatility (Mobarak, 2005). We control for the *age dependency ratio* because a higher age dependency ratio reduces growth

volatility (Mobarak, 2005). Following Henisz (2004), we add *secondary enrollment*, measured as the percentage of the population with secondary education. Following Rodrik (1999), we control for ethno-linguistic fractionalization (*elf*). We add the Cukierman et al. (2002) 0–1 index of central bank independence (*cbi*) since Quinn and Woolley (2001) claim that independent central banks decrease growth volatility. We include the dummy *presidential* as Fatás and Mihov (2003) suggest that presidential democracies induce higher growth volatility. We include the dummy *war* since external wars may increase growth volatility. We control for the effective number of legislative parties (*enlp*) as more legislative parties cause gridlock that may reduce growth volatility. Governments that survive in office for a longer time period may have incentives to dampen growth volatility; however, a higher frequency of cabinet changes may generate uncertainty and consequently higher growth volatility. We include *government duration* and *cabinet changes*, which were described earlier. F-statistics from the Hurlin and Venet (2003) test reveal that *government duration* is not endogenous to the measures of growth volatility employed here. Finally, we include a linear *time trend* in the specifications where *growth volatility* is the dependent variable and in the models where *spending* (or *expenditure*) volatility is the dependent variable.

3. Empirical results

We first report the estimates from testing Hypothesis 1 and then discuss the results from testing Hypothesis 2. In Table 2, Models 1 and 2 report the results from the specification in which the dependent variable is *Abs(Δ spending)* (Model 1) and *Abs(Δ expenditure)* (Model 2), respectively. The estimate of the *majoritarian* variable is positive and significant at the 1 percent level in Models 1 and 2. We checked whether the results mentioned above hold when the specification in Models 1 and 2 are each estimated separately for the OECD and non-OECD samples. The impact of *majoritarian* on each measure of spending volatility used here remains positive and highly significant when the specification is estimated separately for the OECD and non-OECD samples (which are not reported, to save space). Thus Hypothesis 1, which posits that the majoritarian system has a positive impact on spending volatility, finds statistical support in the full OECD and non-OECD samples.

We derive the substantive effect of *majoritarian* on the year-to-year variance in central government spending (as a percentage of GDP), that is, *Abs(Δ spending)*, in two steps. First, from the estimates in Model 1, we find that increasing *majoritarian* from 0 to 1 (since *majoritarian* is a dummy variable) while holding other variables in the model at their respective mean, increases the year-to-year variance in central government spending (as a percentage of GDP) by 7.3 percent, which is substantial. Figure 3, which is derived from Model 1, confirms this substantive effect since it shows that when we move from a PR to a majoritarian system *Abs(Δ spending)* increases by 7.3 percent; this effect is also statistically significant at the 95 percent confidence level.

Second, examples from our data illustrate the substantive effects reported above. For instance, the temporal variance in government spending between t and $t - 1$ (as a percentage of GDP) between 1960 and 2007 in an advanced majoritarian democracy such as Canada (where single-party majority governments form often) is, on average, 5.6 percent. However, it is merely 1.1 percent in an advanced PR democracy such as Austria (where coalition governments form frequently). Within the non-OECD sample, the year-to-year variance in government spending (as a percentage of GDP) in Thailand (a majoritarian democracy during 1983–90 and 1992–2006) is not only on average as high as 8 percent, but is also statistically four times higher than the mean spending volatility of 2 percent in Costa Rica (a PR democracy). These examples also provide some support for Hypothesis 1.

Table 2. Main Results

	DV: government spending volatility			DV: growth volatility		
	Abs(Δ Spending) Model 1	Abs(Δ expenditure) Model 2	Abs(Δ growth) Model 3	growth – GARCH Model 4	Abs(Δ growth) Model 5	growth – GARCH Model 6
Lag Abs(Δ Spending)	.815*** (.049)	.833*** (.057)	.602*** (.093)			
Lag Abs(Δ expenditure)				.729*** (.134)	.603*** (.093)	.728*** (.135)
Lag growth – GARCH				–.041*** (.010)	–.035*** (.009)	–.041*** (.011)
GDP per capita	–.012*** (.003)	–.015*** (.004)	–.035*** (.008)	–.439 (.530)	–.482 (.326)	–.445 (.530)
Age dependency ratio	–.685*** (2.35)	–5.77*** (2.22)	–.453 (.319)			
Inflation volatility	.098 (.099)	.091 (.126)				
Urbanization	.051 (.060)	.047 (.039)				
Spend volatility-majoritarian				2.19*** (.034)		
Log inflation				.397*** (.089)	.456*** (.092)	.374*** (.095)
Majoritarian	1.88*** (.510)	1.61*** (.431)	.049** (.025)	.030** (.014)	.069*** (.012)	.056*** (.010)
Trade openness	.034*** (.009)	.055*** (.012)	.069*** (.012)	.055*** (.009)	.181*** (.047)	.378*** (.192)
Terms-of-trade shock	.058*** (.010)	.065*** (.006)	.185*** (.046)	.393** (.199)	.091 (.085)	.083 (.077)
Spend volatility-PR				–.382*** (.057)	–.304*** (.062)	–.380*** (.056)
Cbi			–.301*** (.065)		–.031 (.040)	–.044 (.056)
PR	2.06 (1.84)	1.95 (2.12)	.633 (.482)	.174 (.263)	.633 (.482)	.174 (.263)
Private credit			.020*** (.004)	.048 (.065)	.020*** (.005)	.047 (.065)
Election	.179 (.165)	.087 (.090)				
Secondary enrollment			.007 (.011)	.010 (.025)	.006 (.010)	.009 (.024)
Government duration	–.743 (2.40)	–.799 (1.92)	–.309 (.286)	–.521 (.503)	–.312 (.284)	–.530 (.509)
Cabinet changes	.045** (.021)	.034* (.019)	.039*** (.005)	.051*** (.012)	.037*** (.005)	.052*** (.014)
Elf			.361 (.298)	.537 (.588)	.395 (.303)	.532 (.579)
Enlp			–.066 (.092)	–.073 (.067)	–.066 (.092)	–.073 (.067)
War	.080 (.077)	.075 (.069)	.411 (.359)	.109 (.086)	.419 (.362)	.114 (.087)
Time trend	.069** (.033)	.080** (.024)	1.83* (1.02)	.94* (.52)	1.85* (1.01)	.95* (.49)
Constant	5.27*** (1.93)	4.14*** (2.35)	2.50 (3.17)	.783 (.931)	1.94 (2.23)	.592 (.608)
Adjusted R ²	.56	.51	.30	.33	.30	.33
N	3296	3187	2968	2924	2847	2812

Notes: *** 1 percent, ** 5 percent, * 10 percent significance levels. PCSEs reported in parentheses are corrected for heteroskedasticity and contemporaneous correlation.

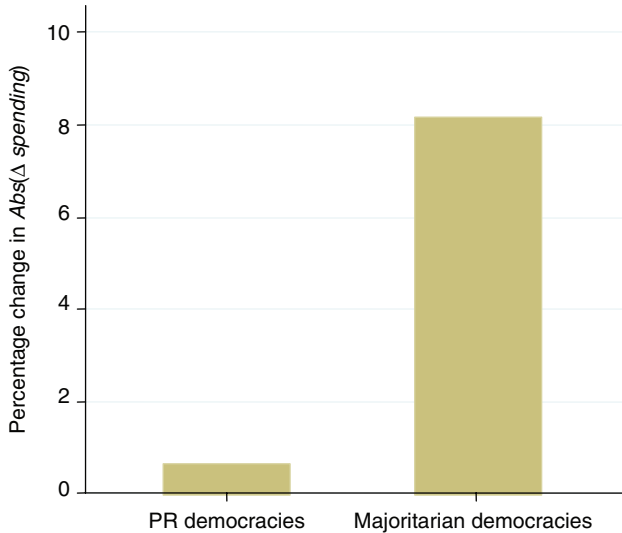


Figure 3. Estimated Central Government Spending Volatility in PR and Majoritarian Democracies

We obtained mixed results for the control variables in Models 1 and 2 where spending volatility was the dependent variable. For example, *election*, *war*, *inflation volatility*, and *urbanization* are insignificant in each model. In contrast, *GDP per capita* and the *age dependency ratio* are consistently negative and significant. *Trade openness* and *economic shock* are positive and significant in Models 1 and 2. However, *government duration* is negative, but insignificant. *Cabinet changes* is positive, but weakly significant, while *presidential* is insignificant in the models.

We now turn to the evaluation of Hypothesis 2, where the dependent variable is growth volatility. To this end, Models 3 and 4 in Table 2 report the results obtained from testing Hypothesis 2 for two measures of growth volatility: *Abs(Δ growth)* (Model 3) and *growth – GARCH* (Model 4). The estimated coefficient of the *spend volatility-majoritarian* independent variable is positive and statistically significant at the 1 percent level in Models 3 and 4. The impact of *spend volatility-majoritarian* on the aforementioned measures of growth volatility is also positive and highly significant when the model is estimated separately for the OECD and non-OECD samples (which are not reported, to save space). These results corroborate Hypothesis 2, which predicts that the volatility of government spending in majoritarian democracies has a positive effect on growth volatility.

Before reporting the substantive impact of *spend volatility-majoritarian* on growth volatility, we will statistically assess how spending volatility in PR democracies influences the year-to-year variance in growth rates. To do so, we estimated some models in which we replaced *spend volatility-majoritarian* with the independent variable *spend volatility-PR*. The *spend volatility-PR* variable operationalizes the volatility of central government spending as a percentage of GDP in PR democracies in the sample.⁷ Models 5 and 6 in Table 2 report the impact of *spend volatility-PR* on the two growth volatility measures: *Abs(Δ growth)* (Model 5) and *growth – GARCH* (Model 6). The effect of *spend volatility-PR* on each measure of growth volatility mentioned above is statistically insignificant and extremely weak in Models 5 and 6 (as shown below). It is also statistically insignificant in models that are estimated separately for the OECD and non-OECD samples. These results are in sharp contrast to the positive and statistically significant effect of *spend volatility-majoritarian* on

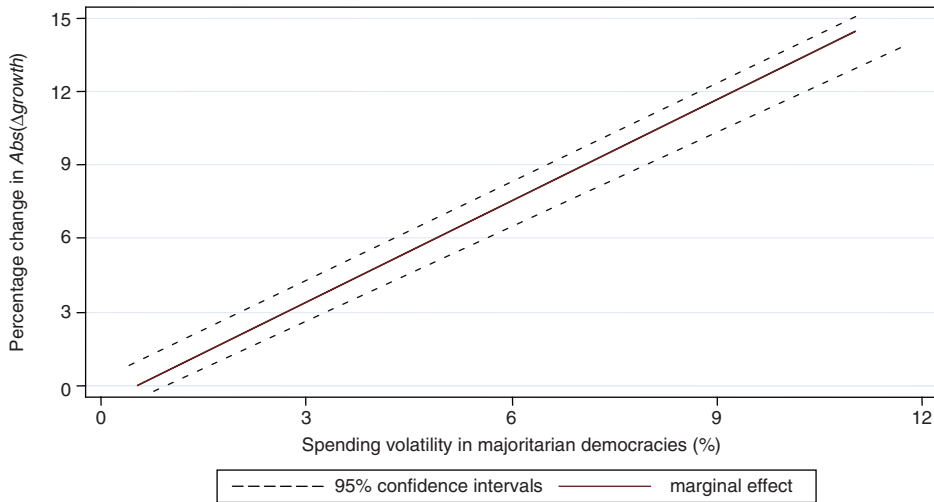


Figure 4. Marginal Effect of Spending Volatility on Growth Volatility in Majoritarian Systems

growth volatility. It also indicates, as suggested in the theoretical section, that spending volatility in PR democracies does not significantly (in the statistical sense) lead to higher growth volatility.

We use the results from Models 3–6 to derive and compare the substantive effect of government spending volatility on growth volatility in majoritarian systems and PR systems. We do so in three steps. First, we check how increasing volatility of government spending in majoritarian democracies in Model 3 (see Table 2) affects our main measure of growth volatility which operationalizes the year-to-year variance in real GDP growth rates ($Abs(\Delta growth)$). Specifically, when we increase *spend volatility-majoritarian* by one standard deviation above its mean in Model 3, while holding other variables in the model at their mean, we find that the year-to-year variance in growth rates increases by a substantial 6.7 percent. Figure 4, which is derived from Model 3, reveals that this substantive effect is statistically significant at the 95 percent confidence level. Hence, there exists statistical and substantive support for Hypothesis 2.

Second, we analyze more explicitly whether the substantive effect of spending volatility on growth volatility differs between majoritarian and PR democracies. We do so as follows. We first examine from Model 4 how increasing spending volatility in majoritarian systems by 1–5 percent above its mean influences the conditional variance of the annual change in real GDP growth rates, which constitutes our third measure of growth volatility ($growth - GARCH$). We then repeat this analysis by examining from Model 6 how increasing spending volatility in PR systems by 1 percent, 3 percent, 5 percent, and 7 percent above its mean influences the conditional variance of the annual change in real GDP growth rates. The results from this exercise are illustrated in Figure 5. This figure shows that when spending volatility increases from 1 percent to 5 percent above its mean in majoritarian systems, the variance of the annual change in growth rates increases dramatically by 10.2 percent. By contrast, Figure 5 also shows that when spending volatility increases from 1 percent to 5 percent above its mean in PR systems, the variance of the annual change in growth rates is largely flat and does *not* increase. This latter result is further confirmed by Model 5, where we find that the marginal effect of a one standard deviation increase in *spend volatility-PR* above its mean on the year-to-year variance in the real GDP growth rate ($Abs(\Delta growth)$), when

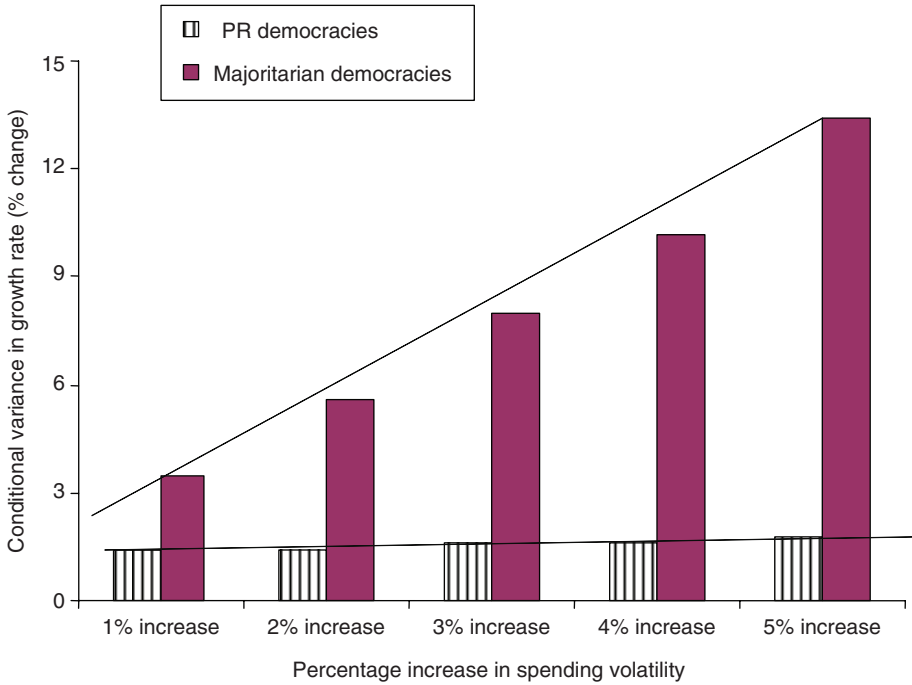


Figure 5. Effect of Majoritarian and PR Democracies on Growth Volatility for Different Spending Volatility Levels

other variables in the model are held at their mean, is just 0.2 percent and statistically insignificant. Hence, this marginal effect and Figure 5 show that the institutional context matters, as higher spending volatility has a positive and statistically significant effect on growth volatility in majoritarian democracies, but *not* in PR democracies.

Third, examining some examples of majoritarian and PR democracies provides a more intuitive understanding of the magnitude of the substantive effects described above. For instance, as shown in the first graph of Figure 6, when spending volatility increases by one standard deviation in Britain (a majoritarian democracy), the year-to-year variance in the growth rate statistically (at the 5 percent level) increases by a substantial 4.4 percent. However, the effect of a one standard deviation increase in spending volatility on the temporal variance in growth rates in Germany (a PR democracy) is a mere 0.2 percent and statistically insignificant. Similarly, the second graph in Figure 6 shows that among the non-OECD countries, a one standard deviation in spending volatility statistically (at the 5 percent level) increases growth volatility by 6.7 percent in the case of the Philippines (a majoritarian democracy), but has a negligible and statistically insignificant effect on growth volatility in Costa Rica (a PR democracy).

Unlike the strong statistical support for Hypothesis 2, economic controls such as the *age dependency ratio* and *secondary enrollment* are each insignificant in Models 3–6. *Log inflation* and *private credit* are each positive and significant, while *GDP per capita* and *cbi* are negative and significant in these models. *Economic shock* and *trade openness* are also positive and statistically significant in these models. *Elf*, *enlp*, *war*, and *presidential* are, however, statistically insignificant in the models.

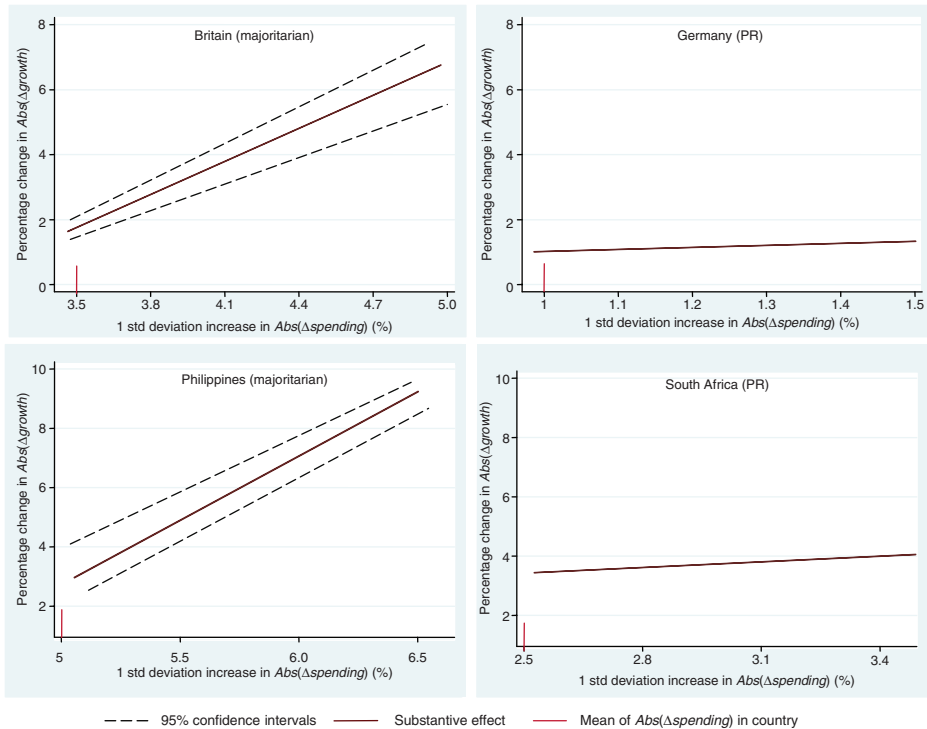


Figure 6. Spending and Growth Volatility in some Majoritarian and PR Democracies

Government duration is negative, but consistently insignificant in the models. The effect of *cabinet changes* on growth volatility is positive, but weakly significant at the 10 percent level in Models 3–6.

4. Robustness tests and diagnostic checks

We conducted a battery of robustness tests. First, we added three more controls to Models 1 and 2 in Table 2, where *spending volatility* (or expenditure volatility) is the dependent variable: *log population*, the dummy *oil* (coded as 1 if oil makes up more than 50 percent of a country's exports), and *productivity shock* (measured as the standard deviation of total factor production and computed for each country using the Solow model). We find, but do not report, that *majoritarian* has a positive and highly significant effect on *spending* and *expenditure volatility* in the augmented models for the full, OECD and non-OECD samples. Following Mobarak (2005), we add the following controls to the relevant models in Table 2, where the dependent variable is growth volatility: *log population*, *black-market premium*, *oil*, and the proportional contribution of the *service sector to GDP*. Note that *spend volatility-majoritarian* has a positive and statistically significant effect on each growth volatility measure in the expanded models for the full OECD and non-OECD samples (which are not reported, because of space constraints).

Second, we find that the results that support our two hypotheses remain robust when the models are estimated with fixed and random effects.⁸ Third, the effect of *spend volatility-majoritarian* on

Table 3. Robustness Test Results for Growth Volatility

	Growth volatility Model 7	Abs(Δ growth) Model 8	System-GMM model Abs(Δ growth) Model 9
Lag dv	.686*** (.125)	.349*** (.082)	.112*** (.022)
GDP per capita	-.041*** (.008)	-.015*** (.002)	-.006*** (.002)
Trade openness	.035*** (.009)	.058*** (.012)	.039*** (.008)
Spend volatility-majoritarian	.194*** (.023)		.169*** (.033)
Exp volatility-majoritarian		.176*** (.033)	
Presidential	.326 (.310)	.450 (.393)	.351 (.490)
Majoritarian	.033** (.017)	.029** (.014)	.026** (.012)
Elf	.417 (.355)	.463 (.357)	.142 (.109)
Enlp	-.039 (.030)	-.048 (.066)	-.052 (.050)
Cabinet changes	.056** (.029)	.059** (.024)	.044** (.020)
Government duration	-.453 (.481)	-.389 (.321)	-.263 (.225)
Cbi	-.265*** (.072)	-.179*** (.063)	-.223*** (.095)
Log inflation	.658*** (.101)	.524*** (.112)	.182*** (.027)
Private credit	.036*** (.007)	.012*** (.002)	.025*** (.007)
Secondary enroll	.003 (.002)	.002 (.004)	.000 (.000)
Age dependency ratio	-.822 (.890)	-1.93 (1.74)	-1.188 (.186)
War	.309 (.283)	.098 (.107)	.037 (.096)
Terms-of-trade shock	.274*** (.043)	.421*** (.055)	.320*** (.064)
Time trend	1.73* (.75)	.92** (.045)	.074** (.031)
Constant	2.34 (3.55)	1.51 (1.63)	1.52*** (.295)
Adjusted R ²	.32	.35	.23
N	2455	2791	2912

Notes: *** 1 percent, ** 5 percent, * 10 percent significance levels. PCSEs reported in parentheses are corrected for heteroskedasticity and contemporaneous correlation.

our third measure of growth volatility (labeled as *growth volatility*) remains positive and significant at the 1 percent level (see Model 7 in Table 3); this further indicates the robustness of our main result. We also found (but do not report, in order to save space) that *spend volatility-majoritarian* has a positive and highly significant effect on *growth volatility* in the OECD and non-OECD samples.

Fourth, in Model 8, we assess if the results for growth volatility remain robust when we replace *spend volatility-majoritarian* with the alternative measure for the independent variable in Hypothesis 2, that is, with *exp volatility-majoritarian*. The effect of *exp volatility-majoritarian* on *Abs(Δ growth)* is positive and highly significant in Model 8. We find (but do not report, owing to space constraints) that *exp volatility-majoritarian* has a positive and highly significant effect on not just *Abs(Δ growth)*, but also *growth - GARCH* and *growth volatility*, while *exp volatility-PR* has a positive, but statistically insignificant effect on all three. Fifth, our results remain robust when we use a sample of democratic country-years in which countries are defined as democracies if their Polity score (coded on a scale running from -10 to +10) is greater than or equal to +6 in a given year.

Sixth, F-statistics from the Hurlin and Venet (2003) Granger causality test indicate that the independent variable *spend volatility-majoritarian* (and *exp volatility-majoritarian*) is *not* endogenous to our measures of growth volatility (the dependent variable in Hypothesis 2). Yet, we address the possibility of endogeneity between the independent and dependent variables in Hypothesis 2 by estimating the effect of spending volatility on growth volatility in majoritarian

democracies via the system-Generalized Method of Moments (GMM). This approach corrects for endogeneity by using moment conditions to derive a set of valid instruments for our potentially endogenous explanatory variables (Blundell and Bond, 1998). The system-GMM model shows that the positive influence of *spend volatility-majoritarian* on growth volatility is highly significant (see Model 9). The positive effect of *exp volatility-majoritarian* on growth volatility is also significant, while the impact of spending volatility on growth volatility in PR systems is statistically *insignificant* in the system-GMM models. Our results thus hold when we correct for potential endogeneity problems.

Seventh, selection bias may be a problem since nonrandom factors that lead to the adoption of majoritarian electoral rules may influence growth volatility. We address this potential problem by estimating Heckman selection models in which the *majoritarian* dummy is the dependent variable in the selection equation, while growth volatility is the dependent variable in the outcome equation.⁹ Results from the Heckman model's outcome equation (which are not reported, to save space) confirm that *spend volatility-majoritarian* (and *exp volatility-majoritarian*) have a positive and highly significant effect on each growth volatility measure. Diagnostic tests reveal that none of the models suffers from severe multi-collinearity, serial correlation, or omitted variable bias, and that the residuals are normally distributed.

5. Conclusion

We suggest here that unlike PR systems, in majoritarian democracies the pronounced career concerns of incumbents give them incentives to use their discretionary spending power, which leads to higher central government spending volatility in these countries. This causes uncertainty about the stability of future spending levels among domestic actors and engenders volatile investment patterns that generate higher growth volatility in majoritarian systems. Results from several statistical models provide robust statistical support for our hypotheses.

This article has three important implications. First, some scholars have suggested that the majoritarian system leads to stable fiscal policies (for example, McGann, 2006). But this article shows that the formation of single-party majority governments in majoritarian countries leads to a higher volatility of central government spending and growth rates in such systems. Our results thus indicate that scholars should be more cautious before inferring that majoritarian systems promote economic stability. Second, our main findings suggest that the prospects for future economic development in relatively poor majoritarian democracies (such as Haiti, the Philippines, and Ukraine) are low. This is because economists have shown that higher growth volatility lowers average growth and increases poverty (Easterly et al., 2000; Ramey and Ramey, 1995). Developing countries with majoritarian electoral systems may thus gain from adopting PR electoral rules to stabilize spending policies and reduce growth volatility.

Third, given that independent central banks enhance policy credibility and reduce volatile growth rates (Quinn and Woolley, 2001), policymakers in majoritarian democracies can reduce growth volatility by designing more independent central banks. They may also benefit from adopting fiscal policy targets that may prevent severe oscillation in the degree of public spending and thus stabilize growth rates.

This article could be extended in two directions. First, extending the temporal domain of our sample to the years before 1960 would enhance the empirical generalizability of our findings. Second, it may be worthwhile to study the impact of electoral rules on the volatility of government spending and growth rates in specific regions such as Africa, Asia, Eastern Europe, and Latin America. We hope to extend our project along the lines suggested above.

Acknowledgment

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Notes

1. Unlike Sloan and Tedin (1987), Knack and Keefer (1995) found that democracy positively influences growth. Przeworski et al. (2000) found that growth does not differ *statistically* between democracies and autocracies.
2. See Milesi-Ferretti et al. (2002) and Persson and Tabellini (2003). These studies do *not* focus on how electoral rules affect the volatility of government spending and growth.
3. Our data from 111 democracies show that 65.8 percent of elections under majoritarian systems produced single-party majority governments (with 22.7 percent producing multiparty coalitions), while only 14.3 percent of elections under PR systems produced single-party majority governments (with 73.0 percent producing multiparty coalitions).
4. Weingast et al. (1981) claim that majoritarian incumbents adopt pro-cyclical fiscal policies and extract resources from the central government budget to provide ‘pork’ to districts. This leads to an increase in central government expenditure at the *aggregate* level even when directed toward districts.
5. Among developing states, for example, government spending volatility is on average 5.1 percent in the Philippines (a majoritarian democracy since 1986) and 8.0 percent in Pakistan (a majoritarian democracy during 1988–99).
6. For Austria, see Mueller (2003); for Chile, see Munck and Bosworth (1998).
7. We first identify the PR democracies in our data. These include countries that use the PR electoral rule, as classified by Powell (2000), and countries with a mixed-member proportional (MMP) system, since Thames and Edwards (2006) claim that ‘MMP systems ... resemble pure PR systems.’ We then calculate the absolute value of the annual change in central government spending as a percentage of GDP between t and $t - 1$ for *each* PR democracy in the data, which leads to our measure of *spend volatility-PR*.
8. The results from these models are available on request.
9. In line with Boix (1999), the following variables are included in the Heckman model’s selection equation, where *majoritarian* is the dependent variable: *GDP per capita*, *elf*, *religious fractionalization*, *trade openness*, *log population*, and *British colony*.

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