Political Business Cycles in Developed and Developing Countries

Min Shi and Jakob Svensson

7th Annual Conference
October 20-21, 2000

W. ALLEN
WALLIS
Institute of
POLITICAL
ECONOMY

UNIVERSITY OF
ROCHESTER

Conditional Political Business Cycles: Theory and Evidence*

Min Shi† and Jakob Svensson‡

September 8, 2000

Abstract

We propose a moral hazard model of electoral competition and show that the magnitude of the electoral policy cycle is conditional on the rents of remaining in power and the share of informed voters in the electorate. Based on a large new panel data set we find evidence of political business cycles in macroeconomic policy: spending increases before elections while revenues fall, leading to a larger deficit in election years. We also show that there are large systematic differences between developed and developing countries in the size and composition of the electoral policy cycle. Using two institutional indicators to proxy for the conditional variables identified by the model, we show that these institutional indicators explain a large part of the difference in policy cycles between developed and developing countries.

*We wish to thank Alberto Alesina, Steven Block, Peter Esö, George Monokroussos, Torsten Persson, Kenneth Rogoff and David Strömberg for valuable comments. Parts of this paper has previously been circulated under the title "Political Business Cycles in Developed and Developing Countries".

†Harvard University. Email:mshi@kuznets.fas.harvard.edu

‡Institute for International Economic Studies, Stockholm University. Email: jakob.svensson@iies.su.se.

1 Introduction

The relationship between political and economic cycles has received a great deal of attention in the political economics literature. However, despite that plenty of anecdotal and case-study evidence suggest that the magnitude and composition of the political cycles vary greatly across countries, there has been no robust, systematic attempt to study these variations. In fact, there is no study on political business cycles based on a large cross-section of countries. This paper attempts to close this gap by developing and testing an electoral policy cycle model on a newly assembled panel data set, covering 123 developed and developing countries over a 21-year period.

We show in the model that policy outcomes, in particular the government's budget balance, are influenced by the timing of elections. Prior to elections the government increases spending so as to enhance its chances of reelection, leading to a higher deficit in election years. In the model the incentives to boost spending are influenced by two politico-institutional features of the economy: the rents of remaining in power and the share of informed voters. The more private benefits politicians gain when in power, the higher the return of reelection, and the stronger the incentives to influence the voters' perceptions prior to the election. Likewise, the lower the share of informed voters, the more voters (ex ante) fail to distinguish pre-electoral manipulations from incumbent competency, and the higher the return from boosting spending prior to the election.

We test these prediction on a large cross-section of countries using dynamic panel data techniques. The data reveal clear evidence of political business cycles in macroeconomic policy. Spending increases before elections, while revenues fall, leading to a larger deficit in election years.

We also show that there are large systematic differences between developed and developing countries in the size and composition of the electoral policy cycle. The election induced fiscal deficit as share of GDP in an average developing country is more than twice the size of that of an average country in the developed sample.

We use two institutional measures to proxy for the conditional variables identified by the model; a risk-service index capturing to what extent formal and informal rules and institutions constrain the government from using public resources and policies for private gains, and data on voters' access to (an independent) media, and show that these institutional indicators explain a large part of the difference in policy cycles between developed and developing countries.

The most recent phase of the political business cycles literature started with Rogoff's (1990) signaling model (see also Rogoff and Sibert, 1988; and

Persson and Tabellini, 1990).[1] Rogoff's (1990) showed that by shifting spending towards easily observed consumption spending and away from government investment the incumbent can signal his competence and increase his chance of reelection.

We use a similar model. As in the signaling models the electoral cycles in our framework arise from information imperfection. However, in contrast to the models in Rogoff and Sibert (1988), Rogoff (1990), and Persson and Tabellini (1990), where the incentive for pre-electoral policy manipulation is driven by asymmetric information, resulting in strategic signaling conditional on type, it arises here from a moral hazard problem: the incumbent's ability to manipulate policy instruments that only can be observed with a lag in order to bias the voters' inference process in his favor.[2] The electorate makes the voting decision based on the expected competence of the candidates. Competence is not observable, so the voters must extract information about the incumbent's type from observed economic outcomes, in this case the production of public goods. To increase the chances of reelection the incumbent has an incentive to boost the supply of public goods prior to the election, hoping that voters would attribute a larger part of the boost to his competence. However, the voters understand the incumbent's incentives and will rationally take them into account when inferring his competence, so in equlibrium the politically induced increase in the provision of public goods has no effect on the incumbent's chances of being reelected. In our model all politicians face the same incentives, implying that the empirical prediction is not conditional on type or ability. More important, politician incentives depend on the politico-institutional environment.

Lohmann (1998) and Persson and Tabellini (2000) develop models with similar underlying features, but address different policy problem.[3] Lohmann (1998) studies the inflationary consequences of pre-electoral monetary policy expansion in a Neo-Keynesian macro-model, and Persson and Tabellini (2000) deal with cycles in wasteful spending and rent-extraction. At a conceptual level, both these studies and our model are reminiscent of Holmstrom (1982, 1999). Holmstrom shows that a manager with unknown talent will

[1]For a review of the literature see Alesina et al., 1997.

[2]Some of the implications of the signaling model of Rogoff (1990) and others seem to be at odds with both empirical and anecdotal evidence. For example, more competent politicians distort the economy, rather than the incompetent ones, and only competent politicians will be reelected (in a separating equilibrium). Also, since only competent types signal by creating a boom, the testable implications are unclear without additional information on unobservables (e.g., government's type).

[3]See Pettersson (2000) for a test of the competence model using data on Swedish municipalities.

exert higher effort so as to increase output, because output will influence the market's perceptions about the manager's ability. By increasing effort, the manager can potentially influence the learning process in his favor, although in equilibrium this will not happen.

The empirical literature on political business cycles focuses mostly on advanced industrial countries.[4] There are exceptions, but in these cases the sample is either restricted to a specific region, or a subsample of developing countries, or cycles within a specific country.[5] Moreover, existing studies typically place strong (untested) restrictions on the model to avoid using dynamic panel data estimation.[6] As a result, there is little robust, systematic evidence of political business cycles in developing countries; how these cycles compare with those observed in developed countries; and if there are systematic differences, why so?

The rest of this paper is structured as follows. The next section sets out a simple moral hazard model of electoral competition. Section 3 describes the specification. Section 4 discusses the data. The results are given in section 5. Finally, section 6 concludes.

2 A Model of Conditional Political Business Cycles

The economy is composed of a large number of citizens, each of whom derives utility from both public goods and from a private consumption good. There are two politicians (parties), denoted with superscripts a and b. The preference function of voter i is

$$U_t^i = \sum_{s=t}^{T} \beta^{s-t} \left[g_t + u(c_t) + \theta^i z_t \right] \ , \tag{1}$$

[4]There is a large empirical literature on political business cycles, dating back to Nordhaus (1975), McRae (1977), Hibbs, (1977), and Tufte (1978). Most of this literature is on U.S. data. Alesina and Roubini (1992) and Alesina et al. (1997) studies electoral cycles across OECD countries. For futher references see Alesina et al. (1997).

[5]Studies using data from developing countries include Block (1999); Magloire (1997); Khemani (1999); Kraemer (1997), Schuknecht (1996). Neither of these studies combine data from developed and developing countries, and restrict the sample to a subset of the developing world (for example African countries).

[6]Block (1999) also uses dynamic panel data techniques to estimate political business cycles in Africa.

where g_t is consumption of a government provided good (per capita) in period t, c_t is private consumption, z_t is a binary variable taking the value $-1/2$ if a is elected and $1/2$ if b is elected, and $u(c)$ is a standard concave utility function. Thus, all voters are alike in their preferences over consumption, but they differ in the parameter θ^i. If $\theta^i < 0$ voter i is biased in favor of party a (and vice versa). This bias can be interpreted as other dimension (policy or personal characteristics) on which the candidates differ. We assume that θ^i is uniformaly distributed on $\left[-\frac{1}{2}, \frac{1}{2}\right]$.

At the beginning of each period, all citizens receive an exogenous income y. Government consumption is financed with a lump-sum tax τ. Thus

$$c_t = y - \tau_t \, . \tag{2}$$

The politicians (parties) are assumed to derive utility from consumption goods in the same way as other citizens. However, as in Rogoff (1990) and others, we also assume that being in power provide the politician with additional "ego rents" of $X_t = X > 0$ per period in office. We can conceptualize these ego rents in a variety of ways, from non-monetary benefits due to the great honor of being the chief executive, to misuse of public office for private gain.[7] Thus, candidate j:s preference function is,

$$V_t^j = \sum_{s=t}^{T} \beta^{s-t} \left[g_t + u(c_t) + X_t \right] \tag{3}$$

for $j = \{a, b\}$.

Elections take place at the end of every other period. At a given period t, the incumbent determines taxes (τ_t) and borrowing (d_t).

In addition to inputs, the provision of public goods also requires administrative competency (e.g., ability to limit waste in the budget process, ability to deal with exogenous shocks) indexed by η_t^j. Public output (g_t) is then residually determined by,

$$g_t + R(d_{t+1}) = \tau_t + d_t + \eta_t^j \tag{4}$$

where $R(d)$ is a continuous cost of public borrowing function with $R(d) > d$ for all $d > 0$, $R(0) = 0$, $R'(d) > 0$ and $R''(d) > 0$.[8]

[7] Implicitly we assume that in the latter scenario, the rents per capita is negligible as the population is sufficiently large.

[8] This set-up hence presumes that the government internalizes the total cost of running a politically induced deficit (public borrowing), which includes potential effects such as higher real interest rates, and lower savings and private investment. For countries that are restricted to borrow on a small domestic market (many developing countries), the assumption that the government can borrow at an exogenous interest rate is not particularly realistic.

We assume that leadership competency follows a first-order moving average process,

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j \tag{5}$$

where each μ^j is a i.i.d. random variable with zero mean and finite variance and distribution function $F(\mu)$.

. Thus, competency is persistent, although it (may) changes over time. This seems like a plausible assumption since circumstances change over time and policymaker that was competent in some key tasks in period t need not to be competent on other tasks in period $t+s$.

The incumbent is assumed to observe the shock η_t after decisions about taxes (τ_t) and borrowing (d_t) have been made. This may appear odd at the first instance. However, given the large set of possible policy problems facing the government, the assumption simply implies that the incumbent *ex ante* is uncertain about how well he will be able to handle these issues, and thus how well he will be able to transform government revenues to public output. An alternative interpretation is that while the government knows the tax code (τ), it is uncertain about the tax revenues it will generate.

The voters' ability to assess the incumbent's policy choices differ. Specifically, a share σ of the electorate is assumed to be "informed" (has access to a free flow of information), in the sense that it observes both election year spending (g_t), taxes (τ_t), and the amount of borrowing (d_t) before casting their votes. A share $1-\sigma$ of the electorate is "uninformed" (does not have access to a free flow of information) and only observes the policy instruments that directly influence their utility, that is, g_t and τ_t. This seems like a reasonable assumption since the government can through clever accounting techniques obstruct voters' ability to assess its borrowing needs. Access to free media may help voters to overcome this problem and provide them with a good estimate of d_t, but such information requires both resources (radio, televisions, newspapers), skills to process information, and time and neither is equally distributed across the population.

2.1 Equilibrium without elections

As a reference point, we first solve the model with no elections. Thus, a randomly drawn candidate remains in power for ever. The equilibrium is easy to characterize. To simplify we let $\beta = 1$. Since the marginal utility of public consumption is constant, equal to one, and borrowing is costly, there will be no borrowing in equilibrium. Thus, $d_s = 0$ for $s = 1, 2, ...T$. Thus, given the simple production technology and quasi-linear preferences,

the problem can be broken down into a sequence of static maximization problems,

$$\max_{\{\tau_t\}} E_t \left[g_t + u(c_t) + X_t \right] \tag{6}$$

$$\text{s.t.} \qquad g_t = \tau_t + \eta_t \ , \tag{7}$$

and (2). E_t is the expectation operator conditional on information at time t. The first-order condition equates the marginal disutility of taxes with the marginal utility of spending. Solving for τ yields,

$$\tau_t = \tau^* = y - u_c^{-1}(1) \quad \forall \ t \tag{8}$$

The competency shock η will only affect spending. Realized spending is $g_s = \tau^* + \eta_s$ for $s = 1, 2, ...T$.

2.2 Political business cycles

With elections every other period the problem becomes somewhat more complex. However, given the assumption of quasi-linear preferences and the moving average process for competency, the problem can again be broken down into a sequence of simpler maximization problems - in this case a sequence of two-period problems.

Working backwards, consider first the elected (in period t) official's problem in the post-election period $t+1$. Given the process for competency, the incumbent has no incentives to hide or signal its competency in the post-election period $t+1$, since the expected outcome in the next post-election period $(t+3)$, which determines the outcome in the coming election in period $t+2$, is uncorrelated with the competency shock in period $t+1$. That is, $E_{t+1}\left[\eta_{t+3} \left| \eta_{t+1}\right.\right] = E_{t+1}\left[\eta_{t+3}\right] = 0$. Moreover, since borrowing is costly and the marginal utility of public consumption is constant, the government will run a primary surplus to pay down its debt. Thus,

$$g_{t+1} = \tau^* - R(d_t) + \eta_{t+1} \ . \tag{9}$$

In period t, an election period, the citizens will vote for the candidate that will deliver the best expected outcome in period $t+1$, conditional on their party (or candidate)-specific preferences. Assume party a is in power in period t and let d_t^* denote the solution to the incumbent's optimization problem in period t (yet to be determined). Because the electorate has

no information about the challenger's competence (and no way to make an inference), expected outcome if electing the challenger is

$$\tau^b = \tau^* \tag{10}$$

$$E_t\left[g^b_{t+1}\right] = \tau^* - E_t\left[R(d^*_t)\right] \tag{11}$$

since $E_t\left[\mu^b_t\right] = E_t\left[\mu^b_{t+1}\right] = 0$.

The expected outcome if the incumbent remains in office is

$$\tau^a = \tau^* \tag{12}$$

$$E_t\left[g^a_{t+1}\right] = \tau^* + E_t\left[\mu^a_t\right] - E_t\left[R(d^*_t)\right] \tag{13}$$

since $E_t\left[\mu^a_{t+1}\right] = 0$. Comparing (10)-(11) and (12)-(13), we see that voter i would vote for the incumbent provided that

$$E_t\left[\mu^a_t\right] - \theta^i \geq 0\ . \tag{14}$$

Thus, the incumbent's expected share of total votes is simply $\Pr(E_t\left[\mu^a_t\right] - \theta^i \geq 0) = E_t\left[\mu^a_t\right] + \frac{1}{2}$.

The electorate's ability to assess the incumbent differ across voters. A share σ of the electorate is informed in the sense that it observes both election year spending (g_t), taxes (τ_t), and the amount of borrowing (d_t) before casting their votes. By (4), these voters can thus determine the incumbent's competence prior to the election as,

$$\mu^a_t = g_t - \tau^* - d_t - \mu^a_{t-1}\ .$$

A share $1-\sigma$ of the electorate is uninformed and therefore must form an estimate about the incumbent's competence, say $\hat{\mu}^a_t$, by forming an estimate of d_t, say $\hat{d}_t$, based on the observable variables g_t and τ_t.

Combining the two types of voters' behavior we can compute the probability that the incumbent remains in power; i.e., the probability that he receives at least 50 percent of the votes, as perceived by the incumbent as

$$P_t = \Pr\left(\sigma\left[\mu^a_t + \frac{1}{2}\right] + (1-\sigma)\left[\mu^a_t - \hat{d}_t + d_t + \frac{1}{2}\right] - \frac{1}{2} \geq 0\right) = \tag{15}$$

$$= \Pr\left(\mu^a_t \leq (1-\sigma)(d_t - \hat{d}_t)\right) = F\left((1-\sigma)(d_t - \hat{d}_t)\right) \tag{16}$$

Prior to the election in the end of period t the incumbent sets τ_t and d_t to maximize expected utility. Since the incumbent cannot commit to follow a policy (budget) rule, it acts under discretion and takes $\hat{d}_t$ as given when calculating the probability of reelection. Exploiting the solution for

the optimal tax rate, the incumbent's maximization problem can be stated as,

$$\max_{d_t} E_t \left[\tau^* + d_t + u(y - \tau^*) + \eta_t^a + X_t\right] \tag{17}$$
$$+ E_t F\left((1-\sigma)(d_t - \hat{d}_t)\right)\left[\tau^* - R(d_t) + \eta_{t+1}^a + u(y-\tau^*) + X_{t+1}\right]$$
$$E_t\left[1 - F\left((1-\sigma)(d_t - \hat{d}_t)\right)\right]\left[\tau^* - R(d_t) + \eta_{t+1}^b + u(y-\tau^*)\right] \ .$$

The first-order condition of the maximization program (17) is,[9]

$$1 + (1-\sigma)E_t F'\left((1-\sigma)(d_t - \hat{d}_t)\right) X_{t+1} - R'(d_t) \leq 0 \ . \tag{18}$$

Equation (18) compares the marginal gain of higher pre-electoral spending, taking the form of higher public consumption in the election period and enhanced (ex-ante) likelihood of reelection times the value of getting reelected, with the marginal cost $R'(d)$. In equilibrium, the incumbent's optimal choice must be consistent with the voters' expectations, $d_t = \hat{d}_t$, and the first-order condition (18) becomes,

$$1 + (1-\sigma)E_t f(0) X_{t+1} - R'(d_t^*) \leq 0 \ . \tag{19}$$

Condition (19) defines the equilibrium deficit $d_t^* > 0$. Note that even though voters are rational and forward looking, the incumbent will overstimulate the economy before election so as to signal his competence and increase his chances of reelection. Note further that the chosen debt level is fully expected, and therefore in equilibrium it has no effect on the incumbent's reelection probability. Finally, competency matters. Specifically, $P_t = 1$ provided that $\mu_t^a > 0$.

From (19) it follows that the magnitude of the pre-electoral deficit is a function of two variables, X and σ; that is, $d = D(X, \sigma)$. Differentiating the first-order condition yields the following comparative statics results,

$$\frac{dD}{dX} > 0; \quad \frac{dD}{d\sigma} < 0 \tag{20}$$

The higher the rents of remaining in power, X, the stronger the incentives (the larger the expected gain) to increase spending so as to enhance the chance of reelection. As a result the incentive problem becomes more severe and the equilibrium level of pre-electoral borrowing (d) increases. A higher share of informed voters has the opposite effect since the voting decision

[9]Second-order condition is strictly negative given the assumption of $R(d)$.

for fewer voters can ex-ante be influenced by a pre-electoral spending boom. Thus, the expected gain of boosting spending falls.

Combining the first-order condition (19), the budget constraint (4), and the comparative statics results (20), yields the central results of the model: policy outcomes, particularly the government's budget balance, is influenced by the timing of elections. Prior to elections the incumbent engage in pre-electoral policy manipulations so as to increase its chances of reelection. As a result, a deficit is created. The magnitude of the deficit depends on two institutional features of the economy: the value (rents) of remaining in power and the share of informed voters in the electorate. In the period following the election, the winning government will run a primary surplus to cover for past policy actions.[10]

3 Specification

The model laid out above suggests that policy outcomes should be influenced by the timing of elections. We can state the relationship between a policy outcome $y_{i,t}$ and the electoral cycle generically as,

$$y_{i,t} = \sum_{j=1}^{k} \gamma_j y_{i,t-j} + \boldsymbol{\chi}\mathbf{w}_{i,t} + e_{i,t}\beta_e + \boldsymbol{\beta}_{me}\mathbf{m}_{i,t}e_{i,t} + \boldsymbol{\beta}_m\mathbf{m}_{i,t} + \xi_i + \varepsilon_{i,t} \quad (21)$$

for $i = 1...N$, $t = 1...T$, where $e_{i,t}$ is a binary election variable indicating if a election is taking place or not in country i at time t, $\mathbf{w}_{i,t}$ is a vector of controls, and $\mathbf{m}_{i,t}$ is a vector of conditional variables determining the incentives to engage in pre-electoral policy manipulations. This is a standard dynamic panel model in which the dependent variable is a function of lagged dependent variables, a set of other controls, the timing of elections, and an unobserved country-specific effect ξ_i. $\varepsilon_{i,t}$ is an iid error term.

Assuming that the unobserved country-specific effects are equal across countries (i.e. $\xi_i = \xi\ \forall i$); that the error term, ε, is not serially correlated; and that the explanatory variables are strictly exogenous, we can estimate (21) consistently with OLS. However, in a large panel of countries these assumptions are likely not to hold. In particular, the unobserved country-specific effects will most probably differ across countries. Allowing for country-specific effects renders the OLS estimator inconsistent since $y_{i,t-j}$ will be a function of the error term $\omega_{i,t-j} = \xi_i + \varepsilon_{i,t-j}$. The fixed effects estimator (FE) explicitly control for country-specific effects. However, even though the within

[10]Primary surplus is defined as revenue τ less government consumption g and interest on government debt (denoted $r(d)$, where $R(d) = d + r(d)$).

transformation eliminates the ξ_i:s, by construction the transformed error term $\left(\varepsilon_{i,t} - \frac{1}{T}\sum_{t=1}^{T}\varepsilon_{i,t}\right)$ is still correlated with the lagged dependent variable. The bias (which influences all variables) is a function of T, and only if $T \to \infty$ will the Within estimator of $\boldsymbol{\gamma}$ and $\boldsymbol{\beta}$ be consistent (see Nickell, 1981; and Kiviet, 1995). As an alternative, we consider the Generalized-Method-of-Moments (GMM) estimators developed for dynamic models of panel data by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). To eliminate the country-specific effects we can take first-differences of (21),

$$\Delta y_{i,t} = \sum_{j=1}^{k} \gamma_j \Delta y_{i,t-j} + \boldsymbol{\chi}\Delta \mathbf{w}_{it} + \boldsymbol{\beta}\Delta \mathbf{v}_{it} + \Delta\varepsilon_{i,t} \tag{22}$$

where $\Delta y_{i,t} = y_{i,t} - y_{i,t-1}$ and $\mathbf{v}$ is a vector of election variables. By construction, the new error term is correlated with the lagged dependent variable $\Delta y_{i,t-1}$. Arellano and Bond (1991) note that under the assumption that the error term $\varepsilon_{i,t}$ is not serially correlated, values of y lagged two periods or more are valid as instruments. Specifically, the GMM dynamic first-difference estimator uses the following linear moment conditions,

$$E\left[y_{i,t-s}\Delta\varepsilon_{i,t}\right] = 0 \quad \text{for } s \geq 2,\ t = 3, ...T \tag{23}$$

$$E\left[\mathbf{w}_{i,t-s}\Delta\varepsilon_{i,t}\right] = 0 \quad \text{for } s \geq 2,\ t = 3, ...T \tag{24}$$

We will treat the election variable (indicating year of election) as a strictly exogenous variable. There are two justifications for this assumption, one conceptual and one statistical. Conceptually, for a number of countries in the sample the election system is based on a fixed schedule, or at least the election date (year) is determined several periods in advance. Thus, the timing should be uncorrelated with current realizations of the error term, implying that the election variable could be treated as exogenous. Moreover, while strategic election date planning may take place in several countries, this effect would tend to work against us (bias the election effect towards zero). It is unlikely that a government would choose to set an election in bad economic times, that is, when tax revenues are low and the budget deficit high. On the contrary, if elections are set strategically they should be held in "good times"; that is, in periods with high growth and revenues and low deficits. Statistically, most developing countries only have a few elections during the time period, and these election years are almost impossible to

predict using lagged election dummy variables.[11] For these reasons we assume that $E[\mathbf{v}_{i,s}\omega_{i,t}] = 0$, for all s and t. It is worth noticing that in a sample of OECD countries, Alesina et al. (1997) find no support for the hypothesis of endogenous elections.

While the moment conditions above are sufficient to estimate the parameters of the model, GMM estimators obtained after first differencing have been found to have large finite sample bias and poor precision in simulation studies (see Arellano and Bover, 1995; Blundell and Bond, 1998). The motivation for this is simply that when the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences. To avoid this problem we follow Arellano and Bover (1995), and Blundell and Bond (1998), and include additional moment restrictions. The new estimator combines in a system the regression in differences with the regression in levels. The instruments for the regression in differences are those described above, while the instruments for the regression in levels are the lagged differences of the corresponding variables. These are valid instruments provided that there is no correlation between the differences of the explanatory variables and the country-specific effects (it still may be correlation between the level of the explanatory variable and ξ). The additional moment restrictions can be stated as

$$E\left[\Delta y_{i,t-s}\omega_{i,t}\right] = 0 \qquad \text{for } s = 1. \tag{25}$$

$$E\left[\Delta \mathbf{w}_{i,t-s}\omega_{i,t}\right] = 0 \qquad \text{for } s = 1. \tag{26}$$

Combining the moment conditions for the difference and level equations yields the system GMM estimator described in Arellano and Bover (1995) and Blundell and Bond (1998). Consistency of the system GMM estimator (and the GMM first-difference estimator) depends on the validity of the instruments. We consider two tests suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The first test is a Sargan test of over-identifying restrictions, where the null hypothesis is that the instruments are uncorrelated with the residuals. The second test is a serial correlation test of the error term. The moment conditions (23) rely on the assumption of no serial correlation (in levels). Thus, in the difference equation we test whether the (differenced) error term is second-order serially correlated.[12]

[11] An AR(1) election-dummy regression produces a coefficient on the lagged election variable close to zero, which is expected given the predominance of non-election years in the data. Thus, using lagged variables as instruments will yield an estimated election year dummy that is close to zero and time invariant.

[12] By construction, the differenced error term is likely to be first-order serially correlated.

Below we report the results of using all three estimators (OLS, FE, GMM). Since the system GMM estimator controls for unobserved country-specific effects as well as potential endogeneity of the explanatory variables, it is the most (only) robust of the three estimators and thus the preferred method. However, since the GMM estimator controls for endogeneity by using "internal instruments"; that is, lagged explanatory variables, we end up with a smaller set of observations when using GMM. For this reason we also report the OLS and FE results.

The political business cycles is captured by adding a dummy variable ELE taking the value 1 in election years and 0 otherwise. We also exploit an additional variable denoted PBC. Following the model, PBC, takes the value 1 in election year, -1 in the year following the election, and 0 otherwise. This variable imposes the restriction that the expansion prior to the election and contraction after the election are of the same magnitude. While this specification follows from the model (the model predicts a primary deficit d prior to the election, and a primary surplus d the following period), the second effect is sensitive to assumptions on the competency shock and preferences.[13,14] In a more general specification, the contraction might be optimally spread out over several non-election years ("consumption smoothing").

We use three fiscal measures as dependent variable (y_t), government surplus, revenues, and expenditures. In the baseline model we include two controls in the $\mathbf{x}_t$ vector, per-capita GDP and growth of per-capita GDP.

4 Data

We construct a panel data set to test the predictions of the model. Our data set includes political data on election dates, conditional controls such as income, measures of rents and share of informed voters, macroeconomic data on government surplus, revenues, expenditures, GDP and growth. Our sample has annual observations for 123 developing and developed countries (including missing values) for the period between 1975 and 1995. The sample size is restricted by election and fiscal data.

The Database on Political Institutions (DPI) from the World Bank (Beck et al., 1999) provides a wide coverage on countries' political systems and elections between 1975 and 1995. Both legislative and executive elections

[13]The primary surplus is revenues τ less government consumption g and interest on government debt $r(d)$, with $R(d) = d + r(d)$.

[14]Due to severe multicollinearity problems in the differenced equation between election and post election dummies, we cannot efficiently estimate the time profile of the election effects; that is, the exact post-election adjustment in the years following an election.

are recorded whenever available. We include legislative elections for countries with parliamentary political system, and executive elections in countries with presidential system.[15] Scheduled formal elections in communist countries are excluded. Only countries with elections during the sample period are included in the sample. Table A.1. in the appendix provides an overview of the countries in the sample and the numbers of elections that happened during the sample period.[16]

The model predicts that the size of the election induced policy cycle should depend on two institutional features of the economy: the value (rents) of remaining in power and the share of informed voters in the electorate. Obviously, neither of these variables are directly observable. Our primary proxy for X_t (rents of being in power) is the institutional indicators provided by ICRG, a private international risk service company.[17] The institutional indicators are meant to provide private investors with a measure of rent-seeking and protection of property rights, and thus is closely related to X_t in the model; that is, to what extent formal and informal rules and institutions constrain the government from using public resources and policies for private gains. ICRG provides five institutional indicators, namely "rule of law", "corruption in government", "quality of the bureaucracy", "risk of expropriation of private investment", and "risk of repudiation of contracts". We re-code each indicator to a 0-10 scale and create our rent measure by summing the five re-coded variables. A low value on *rents* indicates potentially large rents of being in power.

The proxy for the share of informed voters is created by combining data access to media, "radios per capita" from the Global Development Network Growth Database (World Bank), and information on to what extent the media is free, using the "freedom of press data" from the Freedom House. Based on the available scores from Freedom House we created a binary "freedom of broadcasting" variable taking the value 1 in year t if the country had freedom of broadcasting in year t, and 0 otherwise. The share of informed voters, *informed voters*, is the product of "radios per capita" and "freedom of broadcasting".

The macroeconomic data on fiscal variables are obtained from the *International Financial Statistics*, published by IMF. Government surplus, rev-

[15] About 20 countries have a third political system with assembly-elected president where the president is elected by the assembly but the assembly can not easily recall him. In this case, decisions on election dates are made based on where the executive powers rest (i.e. executive elections), based on information from the Political Handbook of various years.

[16] More detailed election dates are available from the authors upon request.

[17] These indicators have previously been used in the cross-country growth literature by Knack and Keefer (1995) and Svensson (1998)

enue (grants not included) and expenditures are expressed as a share of GDP. Real GDP per capita and growth of real GDP per capita is taken from the Penn World Table 5.6. Table A.2-A.4 in the appendix presents descriptive statistics for the macroeconomic variables on the whole, as well as partioned sub-samples based on income.[18]

5 Results

5.1 Main findings

Table 1 depicts the main unconditional findings with respect to the government budget surplus (deficit). In the OLS estimation, *ELE* has the expected sign but is marginally insignificant at the 10 percent confidence level. The data, however, refutes the assumption that the unobserved country-specific effects are equal across all countries [F-test reported in regression (2)], rendering the OLS estimator inconsistent. The within transformation [column (2)] eliminates the country-specific effects. The coefficient produced by the fixed effect estimator is almost identical, but with smaller standard errors. Interestingly, the coefficient on *ELE* in Regression (2) is similar to that reported in Alesina et al. (1997). They also estimate the political effects of fiscal policy using a fixed effects estimator, but confine there interest to OECD countries only.

Although the within transformation eliminates the country-specific effects, by construction the transformed error term is still correlated with the lagged dependent variable, thereby biasing all coefficients. The GMM estimator avoids this problem (under certain assumptions) by using internal instruments. The result of the GMM estimation is reported in column (3). Correcting for the potential endogeneity problem, the estimated coefficient is more than twice as large (in absolute terms) as that reported in column (2) and implies that the fiscal deficit as share of GDP will be one percent higher in election years.

Column (3) also reports the Sargan test, where the null hypothesis is that the instrumental variables are uncorrelated with the residuals, and a serial correlation test, where the null hypothesis is that the errors in the differenced equation exhibit no second-order serial correlation. The regression satisfy both specification tests. Thus, there is no evidence of first order serial

[18]The high income variable (dummy) we use is defined to be 1 if a country is in the high income category defined by IFS, and 0 otherwise. Altogether 29 countries in our sample belongs to the high income group (developed).

correlation (in levels), neither of over-identifying restrictions.

It should be noted that each regression includes a three-period lag structure ($y_{t-1}, y_{t-2}, y_{t-3}$), which is not reported, as well as two controls, real per-capita GDP and growth of per-capita income.[19] The coefficient estimates on the lagged dependent variables add up to a value less than unity in all regressions, suggesting that the budget deficit is mean-reverting. The coefficient on the one-period lagged deficit (not reported and based on the GMM estimation) suggests that roughly 70 percent of the lagged budget deficit persists to the following period.

To summarize the initial findings, after controlling for country-specific effects and potential endogeneity problems, the data suggest a strong, positive, relationship between the incidence of elections and government deficit. In election years, the fiscal deficit is on average one percent (of GDP) higher.

Columns (4)-(6) in Table 1 depict the results with PBC as regressor. While PBC captures both the pre-election manipulation and the post-election response (and impose the constraint from the model of equal magnitude in absolute values), there are drawbacks with this measure as noted above. However, the results of using PBC as regressor are similar to those reported above. The OLS and FE estimates are both highly significant and suggest that the size of the electoral cycle (defined as the change in the deficit during the election year and the post-election year) is roughly 1 percent of GDP. The GMM estimate is again larger (in absolute terms). Based on the GMM-estimation, the size of the electoral cycle is 1.4 percent of GDP.

Does the electoral budget cycle illustrated in Table 1 derive from increased spending, or reduced taxation? While the model laid out above suggests that the pre-electoral expansion is fueled by increased spending, the result is driven by simplifying assumption on preferences and policy instruments. More generally, depending on voters' valuation of private consumption versus public spending, the pre-electoral manipulations may take both forms. In fact conceptually the choice between increased spending and reduced taxes is ambiguous. As argued by Alesina et al. (1997), the choice whether to reduce taxes or increase spending in any single country may vary over time and over different elections. In addition, there is statistical explanation for why it might be difficult to find a strong effect of elections on spending and taxes. The ratios of government spending and revenues over GDP are highly persistent.[20] Thus, we do not necessarily expect to find clear patterns of elections on spending and taxation in a large panel of countries.

[19]Full results are available upon request.

[20]The AR(1) coefficient in the pooled time-series cross-country data is 0.97 for government revenues to GDP, and 0.98 for government expenditures to GDP, while (only) 0.79 for deficit.

Despite these caveats it is interesting to study if there are systematic electoral cycles in government spending and revenues. Table 2 reports on the relationship between elections and government revenue as share of GDP. There is a strong negative association between elections and revenues in the data, independent of estimation technique. The coefficient estimates suggest that the share of revenues to GDP is 0.4 percentage points lower in election years and based on the GMM estimation [column (6)], the short-run cycle in revenues is in the magnitude of 0.5 percentage points of GDP.

Table 3 displays the results for the ratio of government spending to GDP.[21] In the OLS and FE regressions the coefficients are insignificantly different from zero. This lack of significant correlation appears to be due to the statistical shortcomings of the OLS and FE estimators. In fact in the GMM estimation, ELE has a significantly positive effect on government consumption, indicating an increase in government spending as share of GDP in election years of 0.5 percentage points. Estimation with the alternative political business cycle measure, PBC, reveals a similar pattern. The coefficient in the GMM estimation suggests a short-run cycle in spending in the magnitude of 0.7 percentage points of GDP.

Thus, despite the caveats mentioned above, we find systematic election cycles in both consumption and revenues in the data that are consistent with the deficit cycles reported in Table 1. The point estimates in the GMM regressions suggest that the deficit cycle is driven both by reduction in taxes and increased spending, and that the two effects are of the same magnitude.

Summarizing, the results depicted in Table 1-3 give clear support for the notion of political business cycles in macroeconomic policy, and hence validate the general prediction of the model in section 2. Spending increases before elections while revenues fall, leading to a larger deficit in election years. The data also suggests that pre-election expansions are followed by post-election contractions, leading to a real fiscal deficit cycle of a magnitude of 1.4 percent of GDP.

5.2 Developing and Developed Countries

The results above indicates that political business cycles are not confined to OECD countries (or some other specific region or selected sample of countries), but appear to be a general pattern in countries experiencing elections. We turn next to an explicit examination of the question if there is evidence on systematic differences between developing and developed countries? Because existing empirical studies on political business cycles have analyzed either

[21] The results are similar for government consumption over GDP.

OECD-countries only, or a sub-sample of developing countries, this issue has not been addressed in the literature, nor the follow-up question - if there are systematic differences, why so?

Tables 4-6 report the result from splitting the sample into developed and developing countries. Developed countries (or more precisely high income countries) are those defined by IFS to have an income per capita above the threshold USD 9,656 in 1997. In our sample, there are 29 countries belonging to the high income group and 94 countries classified as developing (i.e., middle- and low-income).

The election induced effects on the budget balance is reported in Table 4.[22] As evident there are large differences between the two samples of countries. The pre-election induced deficit (ELE) is more than twice as large (in absolute terms) in developing countries. The coefficient on ELE suggests that in election years the deficit as share of GDP increases by 1.3 percentage points in the average developing country and roughly 0.6 percent in the average developed country. The difference in statistically significant (z-test), and is further reinforced by the pooled regression reported in column (3) (*Wald*-test).[23]

The results are even more drastic when using PBC as explanatory election variable. The pooled regression indicates that the average developing country experiences a 1.4 percentage points larger swing in the political budget cycle. In both specifications, the Wald-test strongly reject the linear restriction that the sum of the coefficients on ELE and $ELE*INC$ (PBC

[22]Only GMM results are reported. OLS and FE estimations produce qualitatively similar results (available upon request).

[23]We use two tests to examine if the election effect differ across samples. In the first test we include an interaction term of ELE and the income dummy in the benchmark regression. The coefficient on the interaction term captures the additional impact that elections in developed countries have versus that in developing countries. Note, by construction, the differenced election and interactive terms are highly collinear. This resulting multicollinearity problem masks the individual effects of the two variables (the variances of the coefficients will be incorrectly estimated, though the point estimator of the two regressors are still consistent), but does not affect their joint effect (*Wald* test). The pooled regression imposes the restrictions that coefficients on the other explanatory variables are the same for the two groups of countries (and common error variance). This need not be the case in reality, and is not the focus of the study. The second test we use allow for different effects of the controls by running the benchmark regression separately for the two subgroups. We then test the hypothesis that the coefficients on the election variables are the same. We define what is reported as the z statistic: the ratio of the difference of the coefficients and the estimated asymptotic standard error of this difference. The GMM estimators are asymptotically normally distributed (Hansen, 1982). Assuming that the coefficients on the election dummies for the two subgroups are independent, the z statistic will also be asymptotically normal.

and PBC*INC) are equal to zero, while the Sargan and serial correlation tests provide support for our identifying assumptions.

Table 5 and 6 show that not only are there systematic differences in the level of the electoral deficit cycle, the source of the deficit also differs. As depicted in Table 5, we find clear evidence of election induced cycles in revenues, both in developed and developing countries. The point estimates are very similar, suggesting that the difference in the election induced deficit cycle is not driven primarily from the revenue side. Instead, as shown in Table 6, the difference can be traced to the expenditure side. There is only weak evidence of election induced cycles in developed countries (the electoral dummies ELE and PBC enter with appropriate signs; that is, government spending relative GDP tends to increase before elections, but the coefficient estimates are small and not statistically significant). However, the data reveal that this is not the case in developing countries. The point estimates suggest an increase in spending in election years of 0.7 percentage points of GDP.

Thus, there appear to be large differences in the size and composition of the electoral business cycles between developed and developing countries. The election induced deficit is more than twice as large in developing countries compare to developed ones. In next section we investigate one possible explanation for this result.

5.3 Conditional findings: Rents and Informed voters

The results reported in Tables 4-6 suggest that there are systematic differences between developed and developing countries in size and composition of political business cycles. The question we will address next is what can explain these patterns? We will focus on explaining the difference in the size of the deficit cycle, although we will also report separately the results on spending and revenues. As noted above, conceptually the composition issue; that is, the choice between increased spending and reduced taxes, is ambiguous and depends (partly) on voters' valuation of private consumption versus public spending.

The model suggest two reasons for why the size of the election induced policy cycle might differ between developed and developing countries: differences in the value (rents) of remaining in power and the share of informed voters in the electorate. As shown in Table A.3, both these institutional features differ significantly between the two samples. In this section we attempt to test if they also can explain the systematic differences between developed and developing countries in size and composition of political business cycles.

As discussed in the data section, the proxy for X_t (rents of being in

power), denoted by *rents*, is constructed based on a set of institutional indicators meant to capture rent-seeking and protection of property rights. The variable is defined on a 0-50 scale, where a low value indicates potentially large rents of being in power.

As a proxy for the share of informed voters σ we combine data on "radios per capita" and "freedom of broadcasting" data from the Freedom House. The variable *informed voters* reports the number of radios per capita in year t, given that broadcasting is free that year, and takes the value 0 in year t if there is no freedom of broadcasting.

The empirical model we use to test the conditional findings is,

$$y_{i,t} = \sum_{j=1}^{3} \gamma_j y_{i,t-j} + \boldsymbol{\chi} \mathbf{w}_{i,t} + \beta_e e_{i,t} + \beta_{ex} e_{i,t} X_{it} + \beta_{e\sigma} e_{i,t} \sigma_{it} + \delta_x X_{it} + \delta_\sigma \sigma_{it} + \omega_{i,t} \tag{27}$$

where $\omega_{i,t} = \xi_i + \varepsilon_{i,t}$, $\mathbf{w} = [gdp, growth]$, $e_{i,t}$ is the binary election variable, and y is either government deficit, revenues, or expenditures. Thus we allow for both cross-country and within variation in institutional impact.

Table 7 presents the results with the budget balance as dependent variable. In columns (1)-(2) and (4)-(5) *rents* and *informed voters* enter separately. In both specifications both the election term and the interactive term enter highly significant and with the predicted signs. The magnitudes are also large. Regression (1) indicates that while the election induced increase in the deficit in a country with an average score on *rents* is roughly 1 percent of GDP, the effect is almost twice as large (2 percent of GDP) in a country with a one-standard deviation lower score on *rents*. While institutional features typically are persistent, and the estimated effect is consequently driven mainly by cross-country differences, a small set of countries (including Bolivia, Ghana, Malta) have experienced large improvements ($>$ one-standard deviation increase in *rents*). For the aforementioned countries, the estimated election effects suggest a reduction in the politically induced cycle over the sample period of 1.5 percent of GDP.

The estimated effect of *informed voters* is slightly smaller. Interestingly, the variable *informed voters* varies greatly in both the sample of developing and developed countries. In the latter sample, a one-standard deviation increase in *informed voters* results in a reduction in the election induced increase in the deficit of 0.4 percent of GDP.

In column (3) we include both institutional variables in the regression, noting the severe multicollinearity problem this is likely to cause (the correlation coefficient between the two interactive terms is 0.96). The mullticollinearity problem will mask the individual effect of the two variables (but

not their joint effect). Both $ELE \times rents$ and $ELE \times$ *informed voters* enter with predicted signs and the joint hypothesis that the sum of the coefficients on the election and the interaction variables are equal to zero can be soundly rejected.

A method to (partly) solve the mullticollinearity problem is to combine the two institutional proxies into an index. In Table 8 we report the findings of using such an index. The index, denoted by *sum*, is constructed by standardizing and summing the two institutional variables. As shown in columns (1)-(2) the results are supportive of the model. ELE and $ELE \times sum$ are both individually and jointly highly significant and the estimated effect is large. A one-standard deviation reduction in *sum* is associated with an increase in the politically induced cycle of almost 1.2 percent of GDP.

In columns (3)-(6) we report the results on government revenues and expenditures. Consistent with the results on spending and revenues in developed and developing countries, the coefficient estimates suggest that the effect of elections on revenues is independent of the institutional index. However, we find clear evidence that the electoral cycles in expenditures is conditional on institutions.

To sum up, the conditional findings reported above fit the prediction of the model and underlie the general idea that the size of the electoral business cycle critically depends on political and institutional features of the country. Variations in the institutional environment can in fact explain a large part of the differences between developed and developing countries, in accordance with the model.

5.4 Robustness

We ran a number of robustness tests on the results reported above. First, we tested the validity of the instruments in the GMM-specifications. As reported in the tables, we cannot reject the hypotheses of no over-identifying assumptions (Sargan test) and no higher-order correlation in the first-differenced residuals.

We also added additional controls, including term-of trade chocks. However, the additional controls had no robust significant relationship with the policy measures considered. As we lose observation by adding these additional controls we leave them out of the base specification. In a similar vein we made cyclical adjustment to the fiscal variables, following the method described in Alesina and Perotti (1995), and Alesina and Ardagna (1998) (see appendix). The election effect is stronger when using these adjusted fiscal measures (for example the coefficient in the deficit regression is roughly 30

percent larger in absolute terms), but we end up with a smaller sample size.

We also ran regressions using election dummies that allow the effect to differ depending on if the election took place early or later in the year. $ELE2$ takes the value 1 in year t if an election occurs in the last three quarters of year t, or the first quarter of year $t+1$, and 0 otherwise (and similarly for $PBC2$). The results of replacing ELE $[PBC]$ with $ELE2$ $[PBC2]$ are similar to those reported in the paper.

There are a small number of outlying observations in the deficit data. While there is no theoretical justification for deleting these observations (in fact based on the time series profile of the respective country they are not necessarily outliers), it would be of considerable concern if our results were completely driven by them. To examine this possibility we dropped all observations with absolute values larger than four standard deviations above the mean, a total of 11 observations. Reestimating the model with the outliers dropped, however, yields result very similar (coefficient estimates slightly smaller in absolute terms) to those reported above. We also dropped all country-year observations in which inflation was above 300 %. Easterly (1996) argues that inflation is all that matters for output in high inflation times. All results remain intact.

We dropped all observations for countries with weak political rights; that is, countries with a score 1 (in a 1-7 scale) in Freedom House's (1997) index on political rights. In countries in which political competition is restricted, the mechanism described above may not be present. However, it is a well established fact that even in countries where elections can be manipulated and the political opposition is severely constrained, the incumbent still need political support. Election outcomes typically are used as an indicator (by the political leadership) that the incumbent has such support. The empirical results remain intact (typically lower standard errors on the election variables) when dropping the countries with weak political rights. As shown in Table A.1., most of these countries are dropped from the sample for lack of data anyway, so only a handful countries are affected by this restriction.

Finally, a possible explanation for the conditional findings we have reported is that the two variables *rents* and *informed voters* are simply proxying for income (or some other relevant variable that is correlated with income). To control for this possibility we included GDP and $ELE \times GDP$ as additional controls in the conditional regressions reported in Table 7. The results in Table 7 remain intact. $ELE \times rents$ and $ELE \times sum$ still entered significant and with roughly unchanged coefficient estimates, while $ELE \times GDP$ entered insignificantly with a p-value above 0.7. We also tried several other variables, including measures of political polarization and fractionalization (gini coefficient, ethnic fractionalization, percentage of people

who does not speak official language at home), and measures of economic development and structural features of the economy (including illiterate rate and urbanization rate). All these variables are highly correlated with income (simple correlation around 50 percent) and could thus potentially explain the differences between developed and developing countries. However, these conditional factors seem to have no or only weak explanatory power on the size and composition of the electoral policy cycles.[24]

To conclude, the results appear robust to several possible statistical problems.

6 Discussion

This paper analyzes a large new panel data, covering 123 developed and developing countries over a 21-year period, to assess the extent of electoral policy cycles in deficit, spending and revenues across countries. We find clear support for the notion of political business cycles in macroeconomic policy. Spending increases before elections while revenues fall, leading to a larger deficit in election years. In election years, the fiscal deficit as share of GDP is 1 percent higher. This is a considerable effect given that the estimate most likely constitutes a lower bound on the effects of elections on policy. Borrowing is just one of many instrument that politicians can use to achieve better outcome (substituting his ability), but is costly and can only be observed with lag.

We also show that there are large systematic differences between developed and developing countries in the size and composition of the electoral policy cycles. In election years, the fiscal deficit as share of GDP is 1.3 percent higher in the average developing country, more than twice the effect of the average country in the developed sample.

In the paper we lay out a model to guide the empirical testing. In the model, the incentive for boosting spending prior to elections stem from a moral hazard problem: the incumbent's desire and ability to manipulate policy instruments that only can be observed with a lag so as to bias the voters' inference process in its favor.

The model identifies two reasons for why the size of the election induced policy cycle might differ between developed and developing countries. The higher the rents of remaining in power and the lower the share of informed voters, the stronger the incentives to attempt to manipulate fiscal policy

[24]Results available upon request.

prior to elections. Both these institutional features differ markedly between the sample of developed and developing countries.

We use two institutional indicators to proxy for these features and find that they explain a large part of the differences in policy cycles between developed and developing countries. We believe that these conditional findings not only fits the prediction of the model, but underlies an important area for future research, namely that the size and composition of the electoral policy cycle critically depend on political and institutional features of the country. A contribution of this paper is that we have provided some evidence of what type of political and institutional features matter, but more work along these lines are likely to be fruitful.

As in Rogoff (1990), elections in the model have both negative (excessive and costly build up of a deficit), and positive effects (mechanism to select the most competent politicians). Identifying the welfare implications of alternative electoral regimes and relate them to the institutional environment is another important research area.

References

[1] Alesina, Alberto and Ardagna, Silvia, 1998, "Fiscal Adjustments, Why They Can Be Expansionary?", Economic Policy, 488-544.

[2] Alesina, Alberto and Perotti, Roberto, 1995, "Fiscal Expansions and Adjustments in OECD Countries", Economic Policy, 207-248.

[3] Alesina, Alberto and Roubini, Nouriel, 1992, "Political Cycles in OECD Economies," Review of Economic Studies 59, 663-688.

[4] Alesina, Alberto, Roubini, Nouriel, and Cohen, Gerald, 1997, "Political Cycles and the Macroeconomy", MIT Press, Cambridge, MA.

[5] Arellano, Manuel and Bond, Stephen, 1988, "Dynamic Panel Data Estimation Using DPD - a Guide to Users," working paper series, No. 88/15, The Institute for Fiscal Studies.

[6] Arellano, Manuel and Bond, Stephen, 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," Review of Economic Studies 58, 277-297.

[7] Arellano, Manuel and Bover, Olympia, 1995, "Another Look at the Instrumental Variable Estimation of Error Components Models," Journal of Econometrics 68, 29-51.

[8] Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh, 1999, "New tools and new tests in comparative political economy: The Database of Political Institutions", mimeo, The World Bank.

[9] Blanchard, O., 1993, "Suggestion for a New Set of Fiscal Indicators", OECD Working Paper.

[10] Block, Steven, 1999, "Political Business Cycles, Democratization and Economic Reform: The Case of Africa," Tufts University, mimeo.

[11] Blundell, Richard and Bond, Stephen, 1998, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," Journal of Econometrics 87, 115-143.

[12] Deininger, Klaus and Squire, Lyn, 1996, "A New Data Set Measuring Income Inequality", World Bank Economic Review 10 (3), 565-591.

[13] Dollar, D. and J. Svensson, 2000, "What Explains the Success or Failure of Structural Adjustment Programs", Economic Journal, October.

[14] Easterly, W., "When is stabilization expansionary? Evidence from high inflation", Economic Policy 22: 67-107.

[15] Easterly, William and Levine, Ross, 1997, "Africa's Growth Tragedy: Policies and Ethnic Divisions", Quarterly Journal of Economics 112(4), 1203-1250.

[16] Freedom House, "Annual Survey of Freedom Country Scores 1972-1998", available at http://www.freedomhouse.org.

[17] Gonzalez, Maria, 1999, "On Elections, Democracy and Macroeconomic Policy -Cycles," Princeton University, mimeo.

[18] Hansen, Lars, 1982, "Large Sample Properties of Generalized Method of Moments Estimators," Econometrica 50, 1029-1054.

[19] Hibbs, Douglas, 1977, "Political Parties and Macroeconomic Policy," American Political Science Review 71, 146-187.

[20] Holmstrom, B., 1982, "Managerial Incentive Problems: A Dynamic Perspective", in "Essays in Economics and Management in Honor of Lars Wahlbeck", Swedish School of Economics, Helsinki. Reprinted as NBER Working Paper no. 6875, 1999.

[21] Khemani, Stuti, 1999, "Effect of Electoral Accountability on Economic Policy in India", The World Bank, Development Research Group, Mimeo.

[22] Kiviet, Jan, 1995, "On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models," Journal of Econometrics 68, 53-78.

[23] Kraemer, Moritz, 1997, "Electoral Budget cycles in Latin America and the Caribbean: Incidence, Causes and Political Futility", Inter-American Development Bank Working Paper, Washington, D.C.

[24] Lohmann, S., 1998, "Rationalizing the Political Business Cycle: A Workhorse Model", Economics and Politics, vol. 10(1): 1-17.

[25] Magloire, Fouda, 1997, "Political Monetary Cycles and Independence of the Central Bank in a Monetary Union: an Empirical Test for a BEAC Franc Zone Member Country", Journal of African Economies 6, 112-132.

[26] MaRae, D, 1977, "A Political Model of the Business Cycle", Journal of Political Economy 85: 239-64.

[27] Nickell, S., 1981 "Biases in Dynamic Models with Fixed Effects," Econometrica 49, 1417-1426.

[28] Nordhaus, William, 1975, "The political Business Cycles," Review of Economic Studies 42, 169-190.

[29] Persson, Torsten and Tabellini Guido, 1990, "Macroeconomic Policy, Credibility, and Politics", London: Hardwood Academy Publishers.

[30] Persson, Torsten and G. Tabellini, 2000, "Political economics: Explaining economic policy, Cambridge, MA: The MIT Press.

[31] Pettersson Lidbom, Per, 2000, "A test of the rational electoral-cycle hypothesis", in Pettersson, P. Elections, party politics and economic policy, Monograph Series No. 40, IIES, Stockholm University.

[32] Political Handbook, various years. New York: McGraw-Hill.

[33] Rogoff, Kenneth and Sibert, Anne, 1988, "Elections and Macroeconomic Policy Cycles," Review of Economic Studies 55, 1-16.

[34] Rogoff, Kenneth, 1990, "Equilibrium Political Budget Cycles," American Economic Review 80, 21-36.

[35] Roubini, Nouriel and Sachs, Jeffrey, 1989, "Political and Economic Determinants of Budget Deficits in the Industrial Democracies," European Economic Review 33, 903-938.

[36] Schuknecht, Ludger, 1996, "Political Business Cycles and Fiscal Policies in Developing Countries", Kyklos 49, 155-170.

[37] Svensson, J., 2000, "Foreign aid and rent-seeking", Journal of International Economics, 2000, Vol. 51 (2): 437-461.

[38] Svensson, J., 1999a, ""Investment, Property Rights and Political Instability: Theory and Evidence", 1998, European Economic Review, Vol. 42 (7), pp. 1317-1341.

[39] Tufte, E. 1978, "Political Control of the Economy", Princeton, Princeton University Press.

[40] World Development Indicators CD-ROM, 1975-1995.

6.1 Data Appendix

The fiscal variables are from International Financial Statistics (IFS). Government deficit (line 80 of IFS), government consumption (line 91of IFS) and government revenue excluding grand (line 81 of IFS) are denoted in local currencies. We divide these variables by GDP (also denoted in local currencies, line 99 of IFS) to get percentage of GDP.

Inflation is defined as $(cpi_t - cpi_{t-1})/cpi_{t-1}$, where the CPI refers to Consumer Price Index (line 64 of IFS).

Real GDP per capita is taken from the Penn World Table 5.6.

Real GDP growth rates are calculated using data from GDN (originally from Penn World Table 5.6).

High income dummy (INC) equals 1 for countries in which 1997 GNP per capita was $9,656 or more. This definition comes from the IFS.

The election data are from the Database on Political Institutions from the World Bank (Beck et al., 1999)

Election dummy $(ELE)_{i,t}$ equals 1 if an election happens in country i at time t, 0 otherwise. $PBC_{i,t}$ takes value 1 when $(ELE)_{i,t}$ equals 1, (-1) if $PBC_{i,t-1}$ equals 1, 0 otherwise.

$ELE2_{i,t}$ is defined as 1 if an election happens in country i during the first three quarters of year t or the first quarter of year $t+1$, 0 otherwise. $PBC2_{i,t}$ takes value 1 when $ELE2$ equals to 1, (-1) if $\text{PBC2}_{i,t-1}$ equals 1, 0 otherwise.

Ethnic fractionalization measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group. Ethnic fractionalization and the percentage of people who do not speak official language at home are from Easterly and Levine (1997).

Gini coefficients which measure the wealth distribution of economies are from Deininger and Squire (1996).

Adult illiteracy rates are the proportions of adults aged 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life. Urbanization rates are the percentages of midyear population living in areas defined as urban in each country. The data are from World Development Indicators CD-ROM.

The cyclical adjusted fiscal variables follows the procedure proposed by Blanchard (1993), and used by Alesina and Perotti (1995), and Alesina and Ardagna (1998). We regress each fiscal variable y, on lags, and the growth rate (g); $y_{i,t} = \sum_{j=1}^{3} \gamma_j y_{i,t-j} + \beta_g g_{i,t} + \varepsilon_{i,t}$. Then we derive what the value of y_i in period t would have been if the growth rate had been the same as in the previous years. That is, we calculate $y^*_{i,t} = \sum_{j=1}^{3} \hat{\gamma}_j y_{i,t-j} + \hat{\beta}_g g_{i,t-1} + \hat{\varepsilon}_{i,t}$, where $\hat{\gamma}_j$, $\hat{\beta}_g$, and $\hat{\varepsilon}_{i,t}$, are given from the first stage regression.

Rents is the sum of the five institutional indicators (re-coded to a 0-10 scale), "rule of law", "corruption in government", "quality of the bureaucracy", "risk of expropriation of private investment", and "risk of repudiation if contracts" provided by ICRG (Svensson, 1998). Index on a score from 0-50.

Informed voters is the product of "radios per capita" from the Global Development Network Growth Database (World Bank), and the binary (0,1) "freedom of broadcasting" variable from the Freedom House.

Table A.1: Number of Elections between 1975-1995, by Country.

Albania	1	Gambia,The[a]	3	Nigeria[a,b]	2
Algeria	3	Germany[a,b]	6	Norway[a,b]	5
Angola	1	Ghana[a,b]	2	Pakistan[a,b]	3
Argentina[a,b]	3	Greece[a,b]	5	Panama[a,b]	3
Australia[a,b]	6	Grenada[a]	3	PapuaNewGuinea[a,b]	4
Austria[a,b]	6	Guatemala[a,b]	4	Paraguay[a,b]	4
Bahamas,The[a,b]	4	Guinea	2	Peru[a,b]	4
Bangladesh[a,b]	3	Guinea-Bissau[a]	1	Philippines[a,b]	3
Barbados[a,b]	5	Guyana[a,b]	3	Portugal[a,b]	6
Belgium[a,b]	6	Honduras[a,b]	3	Romania[a,b]	2
Belize[a]	3	Hungary[a,b]	1	Rwanda[a]	3
Benin	3	Iceland[a,b]	5	Samoa	6
Bolivia[a,b]	4	India[a,b]	5	Senegal[a]	4
Botswana[a,b]	4	Indonesia[a,b]	4	SierraLeone[a,b]	2
Brazil[a,b]	2	Iran,IslamicRep.[a,b]	2	Singapore[a,b]	5
BurkinaFaso[a,b]	2	Ireland[a,b]	5	SlovakRepublic	2
Burundi[a,b]	2	Israel[a,b]	5	Slovenia	1
Cameroon[a]	5	Italy[a,b]	5	SolomonIslands[a,b]	4
Canada[a,b]	4	Jamaica[a,b]	5	Spain[a,b]	5
CapeVerde	2	Japan[a,b]	5	SriLanka[a,b]	3
CentralAfricanRep	2	Kazakhstan	2	St.Lucia[a]	4
Chad[a,b]	1	Kenya[a,b]	4	Sudan[a]	2
Chile[a,b]	2	Korea,Rep.[a,b]	2	Suriname[a,b]	1
Colombia[a,b]	5	Liberia[a,b]	2	Sweden[a,b]	7
Comoros[a]	3	Lithuania	1	Switzerland[a,b]	6
Congo,Dem.Rep.[a]	2	Luxembourg[a,b]	4	SyrianArabRep[a,b]	3
Congo,Rep.[a]	3	Madagascar[a]	4	Tanzania	5
CostaRica[a,b]	5	Malawi[a,b]	1	Thailand[a,b]	4
Coted'Ivoire	5	Malaysia[a,b]	5	Togo[a,b]	2
Cyprus[a,b]	3	Maldives[a,b]	4	TrinidadandTobago[a,b]	4
Denmark[a,b]	8	Mali[a,b]	3	Tunisia[a,b]	2
Djibouti[a]	2	Malta[a,b]	4	Turkey[a]	3
DominicanRep[a,b]	5	Mauritania[a]	1	Turkmenistan	2
Ecuador[a,b]	4	Mauritius[a,b]	4	Ukraine	2
Egypt,ArabRep.[a,b]	3	Mexico[a,b]	4	UnitedKingdom[a,b]	4
ElSalvador[a,b]	4	Mozambique	1	UnitedStates[a,b]	5
EquatorialGuinea	1	Nepal[a,b]	3	Uruguay[a,b]	3
Fiji[a,b]	3	Netherlands[a,b]	6	Vanuatu[a]	3
Finland[a,b]	5	NewZealand[a,b]	7	Venezuela[a,b]	4
France[a,b]	5	Nicaragua[a,b]	2	Zambia[a,b]	4
Gabon[a]	3	Niger[a]	2	Zimbabwe[a,b]	4

Superscript *a* means that the country is included in the fixed effects regression of deficit (sufficient data available)
Superscript *b* means that the country is included in the GMM regression of deficit (sufficient data available)

Table A2: Descriptive Statistics of the Macroeconomics Variables

		Mean	Std. Dev.	NOB
Government Surplus	All	-4.2	6.1	1883
	Income=1	-4.0	4.8	580
	Income=0	-4.3	6.6	1303
Government Revenue	All	23.7	11.0	1844
	Income=1	30.3	10.4	568
	Income=0	20.7	9.9	1276
Government Consumption	All	15.7	6.4	1871
	Income=1	18.7	6.0	371
	Income=0	14.9	6.2	1500

Table A3: Descriptive Statistics of the Institutional Variables

		Mean	Std. Dev.	Min	Max	NOB
Rents	All	30.56	11.94	7.33	50	1512
	Income=1	43.87	6.48	23.33	50	514
	Income=0	23.71	7.50	7.33	45.67	998
Informed voters	All	0.787	0.144	0.693	1.422	1800
	Income=1	0.913	0.170	0.693	1.422	553
	Income=0	0.731	0.083	0.693	1.110	1247
Sum	All	0.247	1.952	-2.510	6.384	1511
	Income=1	2.375	1.565	-1.127	6.384	514
	Income=0	-0.850	0.987	-2.510	3.855	997

Table A4: Correlation matrix

	Rents	Informed voters	Sum	GDP
Rents	1			
Informed voters	0.654	1		
Sum	0.902	0.917	1	
GDP	0.812	0.664	0.808	1

Table 1. Election and Government Surplus[a]

Equation	(1)[b]	(2)[c]	(3)[d]	(4)[b]	(5)[c]	(6)[d]
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Method	OLS	FE	GMM	OLS	FE	GMM
ELE	-0.414	-0.402	-1.005			
	(.257)	(.239)	(.210)			
	[.108]	[.093]	[.000]			
PBC				-0.569	-0.532	-0.701
				(.163)	(.156)	(.118)
				[.000]	[.001]	[.000]
F-test[e]		1.65			1.63	
		[.000]			[.000]	
Sargan[f]			7.86			8.63
			[.726]			[.656]
Serial corr.[g]			0.45			-0.25
			[.650]			[.803]
No. countries	104	104	85	105	105	85
No. obs.	1460	1487	1177	1487	1487	1177
Adj. R^2	.67	.60		.66	.68	

Notes: (a) Dependent variable is ratio of government surplus to GDP (DE). Full regression: $DE_{it} = \beta_1 DE_{i,t-1} + \beta_2 DE_{i,t-2} + \beta_3 DE_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_i ELE*INC_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. Heteroskedastic-consistent standard errors reported in parentheses, and p-values in brackets. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. (b) OLS-specification imposes the restriction $\eta_i = \eta \ \forall$ i. (c) Country-specific effects not reported in FE-specification. (d) Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses. The instruments used in the GMM regressions are lagged levels (two periods and more) of DE, GDP, and GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (e) F-test is an F test of the null hypothesis that all country-specific effects in the FE-specification are equal, with p-values reported in brackets. (f) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (g) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 2. Election and Government Tax Revenues[a]

Equation	(1)[b]	(2)[c]	(3)[d]	(4)[b]	(5)[c]	(6)[d]
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Method	OLS	FE	GMM	OLS	FE	GMM
ELE	-0.476	-0.474	-0.401			
	(.183)	(.167)	(.135)			
	[.009]	[.005]	[.003]			
PBC				-0.365	-0.330	-0.247
				(.106)	(.098)	(.068)
				[.001]	[.001]	[.000]
F-test[e]		2.38			2.37	
		[.000]			[.000]	
Sargan[f]			9.17			10.4
			[.606]			[.492]
Serial corr.[g]			0.22			0.82
			[.829]			[.413]
No. countries	102	102	86	102	102	86
No. obs.	1433	1433	1162	1433	1433	1162
Adj. R^2	.95	.94		.95	.94	

Notes: (a) Dependent variable is ratio of government tax revenue to GDP (RE). Full regression: $RE_{it} = \beta_1 RE_{i,t-1} + \beta_2 RE_{i,t-2} + \beta_3 RE_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. Heteroskedastic-consistent standard errors reported in parentheses, and p-values in brackets. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. (b) OLS-specification imposes the restriction $\eta_i = \eta \; \forall$ i. (c) Country-specific effects not reported in FE-specification. (d) Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses. The instruments used in the GMM regressions are lagged levels (two periods and more) of RE, GDP, GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (e) F-test is an F test of the null hypothesis that all country-specific effects in the FE-specification are equal, with p-values reported in brackets. (f) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (g) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 3. Election and Government Spending[a]

Equation	(1)[b]	(2)[c]	(3)[d]	(4)[b]	(5)[c]	(6)[d]
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Method	OLS	FE	GMM	OLS	FE	GMM
ELE	-0.019	-0.025	0.454			
	(.262)	(.256)	(.249)			
	[.943]	[.922]	[.068]			
PBC				0.208	0.179	0.333
				(.177)	(.167)	(.152)
				[.242]	[.283]	[.028]
F-test[e]		2.48			2.48	
		[.000]			[.000]	
Sargan[f]			10.01			9.57
			[.530]			[.570]
Serial corr.[g]			0.428			0.74
			[.668]			[.459]
No. countries	102	102	84	102	102	84
No. obs.	1443	1443	1161	1443	1443	1161
Adj. R^2	.90	.90		.90	.90	

Notes: (a) Dependent variable is ratio of government spending to GDP (EX). Full regression: $EX_{it} = \beta_1 EX_{i,t-1} + \beta_2 EX_{i,t-2} + \beta_3 EX_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_i ELE*INC_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. Heteroskedastic-consistent standard errors reported in parentheses, and p-values in brackets. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. (b) OLS-specification imposes the restriction $\eta_i = \eta \ \forall$ i. (c) Country-specific effects not reported in FE-specification. (d) Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses. The instruments used in the GMM regressions are lagged levels (two periods and more) for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (e) F-test is an F test of the null hypothesis that all country-specific effects in the FE-specification are equal, with p-values reported in brackets. (f) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (g) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 4. Election and Government Surplus in Developed and Developing Countries[a]

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Sample	Developed	Developing	Pooled	Developed	Developing	Pooled
Method	GMM	GMM	GMM	GMM	GMM	GMM
ELE	-0.625	-1.318	-1.257			
	(.188)	(.307)	(.295)			
	[.001]	[.000]	[.000]			
PBC				-0.359	-0.954	-1.030
				(.074)	(.192)	(.188)
				[.000]	[.000]	[.000]
ELE*INC			0.826			
			(.400)			
			[.039]			
PBC*INC						0.686
						(.253)
						[.007]
z-test[b]		1.93			2.89	
		[.03]			[.00]	
Wald[c]			20.93			38.07
			[.000]			[.000]
Sargan[d]	16.7	6.60	13.1	12.7	6.52	9.09
	[.116]	[.830]	[.365]	[.311]	[.837]	[.696]
Serial corr.[e]	-0.20	-0.42	-0.48	-0.12	-0.25	-0.03
	[.844]	[.674]	[.628]	[.901]	[.799]	[.979]
No. countries	27	58	85	27	58	85
No. obs.	406	771	1177	406	771	1177

Notes: (a) Dependent variable is ratio of government surplus to GDP (DE). Full regression: $DE_{it} = \beta_1 DE_{i,t-1} + \beta_2 DE_{i,t-2} + \beta_3 DE_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_i ELE*INC_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses, and p-values in brackets. The instruments used in the GMM regressions are lagged levels (two periods and more) of DE, GDP, and GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (b) z-test is a test of the hypothesis that the coefficients on ELE (and PBC) in the two samples (developing and developed countries) are equal, distributed as N(0,1) under the null of equal coefficients, with p-values reported in brackets. (c) Wald is a test of the linear restriction that the sum of the coefficients on ELE and ELE*INC (PBC and PBC*INC) are equal to zero, asymptotically distributed as χ^2 under the null that the linear restriction holds, with p-values reported in brackets. (d) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (e) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 5. Election and Government Tax Revenue in Developed and Developing Countries[a]

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Sample	Developed	Developing	Pooled	Developed	Developing	Pooled
Method	GMM	GMM	GMM	GMM	GMM	GMM
ELE	-0.396	-0.398	-0.326			
	(.123)	(.183)	(.209)			
	[.001]	[.029]	[.119]			
PBC				-0.208	-0.255	-0.208
				(.077)	(.099)	(.093)
				[.007]	[.010]	[.025]
ELE*INC			-0.165			
			(.278)			
			[.554]			
PBC*INC						0.094
						(.127)
						[.459]
z-test[b]		0.01			0.37	
		[.50]			[.36]	
Wald[c]			10.05			15.66
			[.005]			[.000]
Sargan[d]	14.0	9.43	9.16	13.55	10.05	10.54
	[.233]	[.583]	[.689]	[.259]	[.526]	[.569]
Serial cor.[e]	0.68	0.69	0.25	0.63	0.33	0.76
	[.495]	[.490]	[.803]	[.531]	[.739]	[.445]
No. countries	26	60	86	26	60	86
No. obs.	393	769	1162	393	769	1162

Notes: (a) Dependent variable is ratio of government tax revenue to GDP (RE). Full regression: $RE_{it} = \beta_1 RE_{i,t-1} + \beta_2 RE_{i,t-2} + \beta_3 RE_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_i ELE*INC_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses, and p-values in brackets. The instruments used in the GMM regressions are lagged levels (two periods and more) of DE, GDP, and GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (b) z-test is a test of the hypothesis that the coefficients on ELE (and PBC) in the two samples (developing and developed countries) are equal, distributed as N(0,1) under the null of equal coefficients, with p-values reported in brackets. (c) Wald is a test of the linear restriction that the sum of the coefficients on ELE and ELE*INC (PBC and PBC*INC) are equal to zero, asymptotically distributed as χ^2 under the null that the linear restriction holds, with p-values reported in brackets. (d) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (e) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 6. Election and Government Spending in Developed and Developing Countries[a]

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Sample	Developed	Developing	Pooled	Developed	Developing	Pooled
Method	GMM	GMM	GMM	GMM	GMM	GMM
ELE	0.062	0.657	0.662			
	(.231)	(.338)	(.363)			
	[.788]	[.052]	[.068]			
PBC				0.087	0.518	0.587
				(.123)	(.236)	(.246)
				[.477]	[.028]	[.017]
ELE∗INC			-0.477			
			(.432)			
			[.268]			
PBC∗INC						-0.469
						(.260)
						[.072]
z-test[b]		1.45			1.62	
		[.07]			[.05]	
Wald[c]			3.49			6.21
			[.175]			[.045]
Sargan[d]	11.46	6.57	14.43	10.93	8.12	9.10
	[.406]	[.833]	[.274]	[.449]	[.702]	[.695]
Serial cor.[e]	-0.56	0.44	0.28	-0.53	0.69	0.84
	[.575]	[.660]	[.776]	[.597]	[.491]	[.402]
No. countries	27	57	84	27	57	84
No. obs.	410	751	1161	410	751	1161

Notes: (a) Dependent variable is ratio of government expenditures to GDP (EX). Full regression: $EX_{it} = \beta_1 EX_{i,t-1} + \beta_2 EX_{i,t-2} + \beta_3 EX_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_i ELE*INC_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses, and p-values in brackets. The instruments used in the GMM regressions are lagged levels (two periods and more) for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (b) z-test is a test of the hypothesis that the coefficients on ELE (and PBC) in the two samples (developing and developed countries) are equal, distributed as N(0,1) under the null of equal coefficients, with p-values reported in brackets. (c) Wald is a test of the linear restriction that the sum of the coefficients on ELE and ELE*INC (PBC and PBC*INC) are equal to zero, asymptotically distributed as χ^2 under the null that the linear restriction holds, with p-values reported in brackets. (d) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (e) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 7. Election and Government Surplus conditional on rents of being in power and share of informed voters[a]

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Method	GMM	GMM	GMM	GMM	GMM	GMM
ELE	-2.950	-2.642	-3.387			
	(.707)	(1.120)	(1.063)			
	[.000]	[.018]	[.001]			
PBC				-1.897	-1.971	-1.725
				(.449)	(.671)	(.631)
				[.000]	[.003]	[.006]
ELE∗rents	0.060		0.039			
	(0.018)		(.022)			
	[.001]		[.084]			
ELE∗informed voters		2.248	1.314			
		(1.201)	(1.457)			
		[.061]	[.367]			
PBC*rents				0.039		0.041
				(.011)		(.015)
				[.001]		[.008]
PBC∗informed voters					1.598	-0.268
					(.702)	(.924)
					[.023]	[.772]
Wald[b]	22.68	13.67	23.85	22.79	27.06	25.88
	[.000]	[.001]	[.000]	[.000]	[.000]	[.000]
Sargan[c]	17.65	20.83	20.53	13.13	6.91	14.40
	[.171]	[.076]	[.152]	[.438]	[.906]	[.495]
Serial corr.[d]	-0.08	0.09	-0.38	0.03	-0.18	0.21
	[.936]	[.928]	[.703]	[.975]	[.859]	[.834]
No. countries	73	84	73	73	84	73
No. obs.	995	1153	994	995	1153	994

Notes: (a) Dependent variable is ratio of government surplus to GDP (DE). Full regression: $DE_{it} = \beta_1 DE_{i,t-1} + \beta_2 DE_{i,t-2} + \beta_3 DE_{i,t-3} + \gamma_t GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_{er} ELE*RENTS_{i,t} + \gamma_{ei} ELE*INFORMED_{i,t} + \gamma_r RENTS_{i,t} + \gamma_i INFORMED_{i,t} + \eta_i + \varepsilon_{i,t}$ not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses, and p-values in brackets. The instruments used in the GMM regressions are lagged levels (two periods and more) of DE, GDP, and GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (b) Wald is a test of the linear restriction that the sum of the coefficients on the election and interaction variables are equal to zero, asymptotically distributed as χ^2 under the null that the linear restriction holds, with p-values reported in brackets. (c) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (d) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.

Table 8. Conditional Political Business Cycles[a]

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Time	1975-95	1975-95	1975-95	1975-95	1975-95	1975-95
Dep. Variable	DE	DE	RE	RE	EX	EX
Method	GMM	GMM	GMM	GMM	GMM	GMM
ELE	-1.270	-0.797	-0.427		0.499	
	(.257)	(.133)	(.163)		(.181)	
	[.000]	[.000]	[.009]		[.006]	
PBC				-0.226		0.591
				(.094)		(.191)
				[.016]		[.002]
ELE∗SUM	0.265		-0.027		-0.310	
	(.091)		(.068)		(.120)	
	[.004]		[.695]		[.010]	
PBC∗SUM		0.290		-0.025		-0.223
		(.087)		(.037)		(.073)
		[.001]		[.501]		[.002]
Wald[b]	26.14	37.97	10.77	10.30	8.24	10.42
	[.000]	[.000]	[.005]	[.006]	[.016]	[.005]
Sargan[c]	19.39	13.52	11.98	11.52	16.38	16.36
	[.112]	[.409]	[.529]	[.567]	[.229]	[.230]
Serial corr.[d]	0.275	0.541	0.731	0.782	0.061	0.118
	[.784]	[.588]	[.465]	[.434]	[.951]	[.906]
No. countries	73	73	74	74	73	73
No. obs.	994	994	981	981	977	977

Notes: (a) Dependent variable is ratio of government surplus to GDP (DE) in columns (1)-(2); ratio of government revenues to GDP (RE) in columns (3)-(4); ratio of government expenditures to GDP (EX) in columns (5)-(6). Full regression: $Y_{it} = \beta_1 Y_{i,t-1} + \beta_2 Y_{i,t-2} + \beta_3 Y_{i,t-3} + \gamma_l GDP_{i,t} + \gamma_g GROWTH_{i,t} + \gamma_e ELE_{i,t} + \gamma_{es} ELE*SUM_{i,t} + \gamma_s SUM_{i,t} + \eta_i + \varepsilon_{i,t}$, where Y=[DE RE EX] is not reported. The coefficient estimates on the lagged dependent variables add up to a value less than unity. The coefficients on ELE and PBC are multiplied by 100, thus indicating the percentage-point change in government surplus to GDP. Asymptotic standard errors, asymptotically robust to heteroskedasticity, are reported in parentheses, and p-values in brackets. The instruments used in the GMM regressions are lagged levels (two periods and more) of DE, GDP, and GROWTH for the differenced equation, and lagged difference (one period) for the level equation. The election dummy is treated as strictly exogenous. (b) Wald is a test of the linear restriction that the sum of the coefficients on ELE and ELE*SUM (PBC and PBC*SUM) are equal to zero, asymptotically distributed as χ^2 under the null that the linear restriction holds, with p-values reported in brackets. (c) Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instrument validity, with p-values reported in brackets. (d) Serial corr. is a test for second-order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation, with p-values reported in brackets.