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**PARTY ALIGNMENT AND POLITICAL BUDGET  
CYCLES: THE ARGENTINE PROVINCES**

**Daniel Lema y Jorge M. Streb**

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# Party alignment and political budget cycles: the Argentine provinces

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The links between subnational political budget cycles (PBCs) and the national government in federal countries have seldom been studied. We study the behavior of the budget balance, public expenditures, and revenues in Argentine provinces during the 1985–2001 period. We find that in election years public expenditures increase, but revenues also do — a result exactly contrary to the predictions of rational opportunistic models of aggregate PBCs — and the budget deficit does not increase significantly. Since the increase in provincial revenues is due to larger federal transfers, we incorporate the influence of party alignment between governors and president. Public expenditures in election years increase in aligned provinces because of larger federal transfers, without affecting the budget deficit; in contrast, the budget deficit tends to increase in unaligned provinces. The federal government thus plays a key role in subnational PBCs, with an electoral cycle in the allocation of federal transfers.

*JEL classification codes:* D72, E62

*Key words:* political budget cycles, federal countries, discretionary transfers, tactical allocation, party alignment, distributive politics

## I. Introduction

The federal organization of Argentina leads to the fiscal autonomy of provinces from the federal government. This opens the door to political budget cycles (PBCs) at the provincial level. At the same time, it creates incentives for the president to intervene and support aligned districts. Hence, we empirically address two main questions. First, are fiscal manipulations present in Argentine provinces during executive

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<sup>\*</sup> This paper is based on “Conditional political budget cycles in Argentine provinces”, chapter 2 of Daniel Lema’s doctoral dissertation, *Three essays on economic and political institutions*, Buenos Aires, Universidad del CEMA, February 2006. That study also explores the composition effect of PBCs, looking at the behavior of current expenditure relative to total public expenditure.

election periods? Second, are there any systematic differences in provinces politically aligned with the federal incumbent?

To answer these questions, we analyze the evidence of aggregate electoral cycles in the fiscal balance, expenditures and revenues in twenty-two Argentine provinces during the 1985–2001 period using econometric methods for panel data. We then develop a stylized model of these empirical findings, where PBCs within federal countries are affected by the discretionary allocation of national funds to aligned districts. This links the literature on electoral cycles in fiscal policy with the literature on tactical allocation.

The only other studies that we are aware of that look at electoral cycles in tactical allocation, besides ours, are Cecilia Rumi's (2008) study of discretionary transfers by the national government to Argentine provinces over the 1984-2003 period, and Kang's (2010) study of national transfers and subsidies to municipalities in South Korea from 1989 to 2008. Rumi (2008) distinguishes between in-kind and cash transfers from the national government to the provinces; the first are easily traceable to the national government, the second are not. In non-election periods, political affiliation does not affect total discretionary transfers, but it affects their composition: affiliated provinces receive more cash and less in-kind transfers. In presidential election years, however, the federal government allocates more total transfers to politically affiliated provinces in the form of cash transfers.

Our study focuses on subnational PBCs, so we only consider cash revenues, both automatic and discretionary, that are transferred by the federal government and form part of provincial budgets. Since these are not easily traceable to the national government, we expect the federal incumbent to favor aligned districts in gubernatorial election years.

The paper is structured as follows. The next section presents the literature most related to this study. Section III describes the data set, the empirical specification, and the econometric techniques employed. Section IV reports the empirical results. Section V develops a model to capture the main empirical patterns. Section VI concludes.

## **II. Background literature**

This paper is related to the literature on electoral cycles in economic policy and to the literature on tactical allocation of

In the pioneering work by William Nordhaus (1975) on electoral cycles, opportunistic incumbents act to maximize their chances of reelection using expansionary monetary policy to stimulate output before elections, in what are known as “political business cycles”. Since the model is based on adaptive expectations, voters can be systematically deceived, a behavior that has been criticized as myopic or irrational.

Kenneth Rogoff and Anne Sibert (1988) demonstrate, however, that if voters are rational, but there is asymmetric information on budget decisions and the politician’s competence, electoral cycles are still present. Their focus is on fiscal rather than monetary policy, with “political budget cycles” (PBCs) that signal the competency of the incumbent. Following Lohmann’s (1998) approach to electoral cycles in monetary policy, extended by Shi and Svensson (2006) to electoral cycles in fiscal policy, the signaling problem produced by the incumbent’s private information about its own competence can be ignored. What remains is the core problem, the credibility problem

of economic policy when there is asymmetric information on policy decisions. Credibility problems become particularly acute at the time of elections.

Plenty of empirical studies detect PBCs at the national level using cross-country panels (e.g., Torsten Persson and Guido Tabellini 2003, Adi Brender and Allan Drazen 2005, Min Shi and Jakob Svensson 2006, Streb, Lema, and Gustavo Torrens 2009). Our study focuses instead on PBCs at the subnational level, and how they are affected by the institutional framework. In this regard, there is a nice study by Shanna Rose (2006) on U.S. states. She finds PBCs when the incumbent can issue debt (whether or not balanced budget rules are in place), while no PBCs arise in states where no debt is allowed, or a voter referendum must approve them first. Our focus is instead on how the discretion of the federal government affects subnational PBCs.<sup>1</sup>

The theoretical literature on tactical allocation has debated whether an incumbent will target loyal or swing districts for federal transfers. Gary Cox and Matthew McCubbins (1986) espouse the first view, Assar Lindbeck and Jorgen Weibull (1987), the second, while Avinash Dixit and John Londregan (1996) combine both. Since their models are framed in terms of campaign proposals of competing parties, commitment is required for these promises to be relevant after elections. This ignores the time-consistency problems of economic policy. Wiji Arulampalam, Sugato Dasgupta, Amrita Dhillon, and Bhaskar Dutta (2009) instead consider an incumbent with discretionary power to assign transfers, in a setup with two levels of government (center and state). Voters, however, are not forward-looking. Woo Kang (2010) considers a similar setup, but adds forward-looking voters, asymmetric information on budget decisions, and differences in the competence of incumbents, as in Shi and

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<sup>1</sup> Meloni (2001) analyzes how the change in current expenditure correlates with the votes obtained by the governing party in Argentina provinces. This study does not focus on political budget cycles, but rather on voting. Medina and Lema (2004) analyze political budget cycles in Argentine provinces, but they do not consider the influence of the political alignment of provincial governors with the president.

Svensson (2006). The result is that the incumbent favors loyal districts in non-election years and swing districts in election years, leading to a political budget cycle in the composition of national government spending. Hence, the issues of tactical allocation become intertwined with PBCs because of the credibility problems of fiscal policy in election years. Our formal model builds on this insight.

In the empirical literature, swing districts are typically identified by a dummy variable for close elections (e.g., a difference of 5% or less between the percentage of votes of the winner and the runner-up), or by the vote margin between the two top contenders. Loyal districts, in turn, are typically identified as those that supported the national incumbent's party. The empirical literature on tactical allocation has mixed findings. For example, Valentino Larcinese, Leonzio Rizzo, and Cecilia Testa (2006), in their study of federal outlays for the forty-eight U.S. continental states from 1982 to 2000, find that states whose governor, or whose majority delegation in the House, belong to the same party of the president are rewarded with more federal budget allocations. However, they do not control for the interaction of alignment and swing states.<sup>2</sup> Christopher Berry, Barry Burden, and William Howell (2010), in their study of U.S. federal spending from 1984 to 2007 at the district and county levels, find that districts and counties whose legislators belong to the president's party, as well as those that are swing, receive more federal outlays, while the interaction term of being both swing and aligned is not significant. The aim of these studies is to show the importance of the U.S. president, vis-à-vis Congress, in the distribution of federal spending. Hence, these studies do not distinguish between election and non-election periods. Arulampalam et al. (2009), in their study of central government transfers in India to fourteen states from 1974 to 1996, find that states that are aligned and swing

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<sup>2</sup> In another regression, they find that states that heavily supported the incumbent president in past presidential elections are rewarded, but swing states are not, whether this is measured by the vote margin or by the number of times voters swung their support from one party to another.

receive more transfers than either unaligned or non-swing states.<sup>3</sup> Again, transfers in election and non-election years are not distinguished.

### **III. Empirical approach**

#### **A. Data**

We construct a panel data set to test the existence of electoral cycles in provincial fiscal variables. Our data set includes data on provincial government budget balance, spending and revenues, political data on provincial executive election dates and political party in power, per capita Gross Geographic Product (GGP) and GGP growth. Our database has annual observations for 22 provinces for the period between 1985 and 2001, averaging four provincial executive elections.

Two provinces were excluded from the original sample. First, the City of Buenos Aires is excluded from the analysis since it was only in the year 1996 that the elections for Chief of Government (equivalent to governor) were held. Up to that moment, there was a City Mayor who was directly appointed by the national executive power. Second, the Province of Corrientes is the other exception, because it had to undergo two federal interventions during the 90s. The first one, in 1991, was due to disagreement between the provincial electors; and the one in 1999 was due to serious social disturbances. Both provinces were excluded from the database to perform the econometric estimation.

The source of the fiscal data is the Ministry of Economy (Dirección Nacional de Coordinación Fiscal con las Provincias, Secretaría de Hacienda del Ministerio de

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<sup>3</sup> Given that India is a parliamentary country with coalition governments, Arumlampalam et al. (2009) consider state governments that have one party in common with the central government as aligned states.

Economía y Producción de la Nación). Geographic Gross Product (GGP) estimates were taken from Mirabella (2002), who estimate the provincial GGP using residential electricity consumption.

The electoral budget cycle is analyzed through the variables fiscal balance, total expenditure, total provincial revenue, revenue from provincial taxes and revenue from the federal government.<sup>4</sup> The period of analysis ranges from 1985 to 2001. Table 1 presents the variables used for the estimates and Table 2 presents descriptive statistics of the dependent fiscal variables.

< please see Table 1 and Table 2>

## B. Econometric model

The theoretical and empirical literature on political budget cycles suggests that the timing of elections should influence fiscal outcomes. The relationship between a fiscal variable,  $y_{it}$ , and the electoral cycle can be stated as follows:

$$y_{it} = \alpha + \sum_{j=1}^k \beta_j y_{i,t-j} + \sum_{j=1}^m \gamma_j x_{jit} + \delta_1 e + \eta_i + \varepsilon_{it} \quad (1)$$

for  $i = 1..N$ ,  $t = 1..T$ ,  $j = 1..k$ , where  $e$  is a binary election variable indicating if an election took place in province  $i$  during the year  $t$ ;  $x$  is a vector of control variables that in our estimations include per capita Geographic Gross Product (GGP) and the growth rate of the Geographic Gross Product (GROWTH).

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<sup>4</sup>Provincial revenues from federal revenue sharing ("coparticipation federal") plus special (discretionary) transfers from federal government ("Aportes del Tesoro Nacional" – ATN).

This specification represents a standard dynamic panel, where the dependent variable is a function of its own lagged levels, of set of controls ( $x_j$ ), of the time when elections take place and of a specific effect per province ( $\eta_i$ ). The term  $\varepsilon_{it}$  is a random error assumed to be independently and identically distributed.

Assuming that the unobserved province-specific effects are identical across provinces, that the error term is not serially correlated, and that the explanatory variables are strictly exogenous then it is possible to estimate this relation consistently through OLS. However, these assumptions may not hold in the panel, particularly the assumption of equality of the unobservable effects per province. This being so, then OLS estimates are inconsistent since the lagged dependent variable is correlated to the error term  $w_{i,t} = \eta_i + \varepsilon_{it}$ .

It is possible to control the specific effects using the panel data Fixed Effects (FE) estimator. However, the transformed error term will still be correlated with the lagged dependent variable. The bias will depend on T (the length of the panel); and provided T tends to infinite, the FE estimator of the coefficients will be consistent.

Considering these problems, the Generalized Method of Moments (GMM) designed for dynamic models by Arellano and Bond (1991) is performed in the estimations. The Arellano-Bond strategy consists in the differentiation of the equations to eliminate the specific effects and solve the inconsistency using the lagged values of the dependent variable as instruments. Assuming the error term is not serially correlated, the dependent variable lagged two periods or more constitute valid instruments for the new dependent variable in differences. Likewise, the same can be said for the control variables.

It will be assumed in our particular case, that the vector from variables  $x_{jit}$  is slightly exogenous or predetermined; that is to say, it is not correlated with future

realizations of the error term. The elections variable will be considered strictly exogenous.

Estimates are performed using three methods: OLS, Fixed Effects and GMM Arellano-Bond for dynamic panel data. The GMM method seems to be preferable due to the characteristics previously mentioned. Nevertheless, since it makes use of the lagged values of the variables as instruments, the set of observations available is smaller. For this reason and for comparative purposes, results from the three methods are reported.

The political cycle is modeled including the binary variable ELE that assumes value 1 in election years, and 0 in the rest of the years. Additionally, we also run the non-restricted regressions with the election dummy ELE and the post election dummy ELE+1.

Our analysis includes five fiscal outcomes as dependent variables to test the electoral manipulation, its origins and consequences:

- Ratio of provincial budget balance to GGP (DEF)
- Ratio of total public expenditure to GGP (TE)
- Total provincial revenue relative to GGP (TR)
- Revenue from provincial taxes relative to GGP (PTR)
- Provincial revenues from federal revenue sharing, plus transfers from federal government relative to GGP (FR).

Two basic controls will be included in the regressions: the

- Per capita geographic gross product (GGP)
- GGP Growth rate (GROWTH).

## **IV. Empirical results**

The idea that political budget cycles (PBCs) can be found at a sub-national level is rooted in the federal organization of Argentina (Argentine Constitution, sections 5, 121, 122 and 123). However, together with provincial autonomy, the relations with the federal government turn out to be crucial.

### **A. Unconditional budget cycles**

This section presents the empirical analysis of electoral cycles in fiscal variables, focusing on the provincial budget surplus, expenditures and revenues. We first present the unconditional results of elections over the fiscal variables. We then look at the conditional results, controlling for the alignment between the provincial and federal executives.

#### **Budget balance**

Table 3 shows the main unconditional results with respect to the provincial budget balance (deficit); that is equation (1) including the election dummy ELE and using as controls the GGP and the growth of GGP per capita.<sup>5</sup>

**<please see Table 3>**

In the columns 1 to 3, with the three different estimation methods, ELE has the expected negative sign, although is not statistically significant in any case. For GMM

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<sup>5</sup> Full econometric estimation results presented in the Data Appendix.

estimation the Sargan test is reported, where the null hypothesis is that the instrumental variables are uncorrelated with the residuals. In addition, the serial correlation test is presented, where the null hypothesis is the absence of second order serial correlation in the first-difference residuals. Estimates satisfy both tests (no rejection of null hypothesis).

As Persson and Tabellini (2002) remark, there may also be post-electoral effects, so we check if they are present. We also test whether the restriction that the coefficient estimate of ELE is equal to the coefficient estimate of minus ELE in  $t+1$ , is rejected by the data. This test imposes the restriction that the pre-electoral increase in deficit is equivalent in magnitude to the posterior contraction. Estimate results are presented in columns (4), (5) and (6) of Table 3. The electoral dummy ELE is non-significant and the post electoral dummy ELE+1 is positive and significant. In all estimates, the F test soundly rejects the restriction that the post-electoral contraction in the budget surplus as a percentage of GGP is of the same size as the pre-electoral expansion. We can interpret the results as follows: a) there is no evidence of surplus falling in election periods, and b) the restriction that surplus falls below its trend, and then jumps above it, is not supported by the data.

### **Total public expenditures**

Tables 4 shows the effects of the electoral cycle over total public expenditure in the provinces, measured as a proportion of GGP. In the OLS and GMM regressions, the coefficients are positive and significant for ELE, with a value indicating that the expenditure over GGP increases approximately one percentage point during the year of elections.

**<please see Table 4>**

However, once we control for post-electoral effects, only reductions in expenditure in the post election years are sometimes significant. Since the F tests do not reject the null hypothesis of equality between ELE and -ELE+1, the results with a variable PBC, taking value 1 during the election year, -1 in the following year and 0 in the remaining ones, are also presented in Table 5. This variable, which imposes the restriction that the pre-electoral increase in spending is equivalent in magnitude to the posterior contraction, is highly significant.

**<please see Table 5>**

#### **Revenues: total, federal and provincial**

To track the possible changes in fiscal revenues around elections Tables 6, 7, and 8 present the estimates considering as dependent variables total provincial revenue (TR) and its components: revenue from federal sources (FR), that includes federal tax sharing and other federal transfers (mostly discretionary) and revenue from provincial taxes (PTR).

**<please see Tables 6, 7, and 8>**

Tables 6 and 7 show the results with total revenue (TR) and federal revenue (FR) as dependant variables. The electoral years are related to a significant tendency of

revenues to go up, explained by the increase in federal revenue, and is important to note that federal revenue is 90% of total provincial revenues. The most significant effect is the revenue increase in election years, and the discretionary transfers from the federal government could explain that. The federal tax sharing is mostly determined by fixed coefficients and cannot be easily manipulated.

Results in Table 8 show non-significant manipulations in provincial taxes; in all regressions revenue from this source is not sensitive to the election dummy variable. This seems reasonable, because in most provinces local taxes are a very small part of total revenues. Changes (reductions) in this variable may have a non relevant effect over the voter's perceptions about competency of the incumbent, reducing his incentives to engage in electoral manipulations over provincial taxes.

## **B. Conditional findings: political alignment between provincial and federal executives**

The results reported in the previous section suggest that there are some systematic increase in expenditures and federal revenues in electoral years, but no electoral or cyclical effects were detected over the budget balance. Decisions over spending are clearly taken at provincial level, but the federal revenues are not a decision variable for the provincial executive. If this is so, how can the provincial executive manipulate at the same time expenditures and federal revenues? What can explain this pattern?

In this section, we will focus on explaining these facts, looking for differences in the behavior of incumbents conditioning for the political alignment between the provincial and federal executive. Our conjecture is that when both executives are members of the same political party (political alignment), the more probable the

federal executive increases the discretionary transfers to the province, allowing the provincial executive to increase spending without significant effects over the budget balance.

When both executives (provincial and federal) are not aligned, and with an aligned candidate running for the provincial election, the federal government is not interested in increasing the discretionary transfers to the incumbent. On the contrary, probably the federal government can reduce the transfers, rendering spending manipulations more difficult to the provincial executive and inducing budget deficits.

We thus look at the sensitivity of the previous results when conditioned to political alignment between provincial and federal executives. The conditional election variables `ELE_UNAL`, `ELE_AL` are now included in the regressions to estimate the differential effect of political alignment.

### **Budget balance**

Table 9 presents the results with the budget balance as the dependent variable.

**<please see Table 9>**

In columns 1 to 3 the coefficients estimates for the conditional election variable are presented. The coefficients associated to the unaligned provinces are all negative and significant at 10% in OLS and GMM regressions and marginally significant (11%) in FE. The election year has no significant effect over fiscal balance in aligned provinces. The regression results indicates that while the election increases the deficit

between 0.8 to 1.0 percentage points in unaligned provinces, the election effect is not relevant in aligned provinces.

## **Expenditures**

Table 10 shows the effects of the conditional electoral variables over total public expenditure.

**<please see Table 10>**

Results in columns 1 to 3 show that in electoral years, when the province is politically aligned with federal government, spending rises significantly. Depending on estimation method, the increasing in spending ranges between 0.8 to 1.4 percentage points of GGP. For unaligned provinces the estimates are non-significant in all regressions.

## **Revenues: total, federal and provincial**

Tables 11, 12, and 13 present the conditional estimates considering as dependent variables the total provincial revenue (TR), revenue from federal source (FR) and revenue from provincial taxes (PTR).

**<please see Tables 11, 12, and 13 >**

There is a strong positive relationship between elections in aligned provinces and federal revenues in the data, independent of the estimation technique. In politically aligned provinces, a positive and significant effect over revenues is present in electoral years, explained by the increase in discretionary federal revenues. The magnitude of the effect is important, from 0.8 to 1.6 percentage points of GGP of increase in federal revenues depending on the estimation technique. By contrast, for the conditional election dummy in unaligned provinces, the estimated coefficients are non significant in all cases.

To sum up, the findings reported above fit the conjectures about the behavior of federal and provincial governments considering the political alignment. If the provincial executive is aligned with the federal government, the discretionary transfers from this source are bigger in electoral years, and the provincial incumbent is able to increase the total expenditures proportionally, without increasing the fiscal deficit. Our empirical results show that discretionary transfers from the federal governments allows the provincial incumbent to increase the spending in 0.8 – 1.4 percentage points of GGP.

On the other side, if the provincial executive is unaligned, the federal transfers remain approximately constant. With constant revenues from provincial taxes, if the incumbent increases the spending he also increases the fiscal deficit, but in this case he is constrained by the borrowing alternatives.

## **V. A theoretical formalization**

We now describe a stylized political economy model that builds on the Shi and Svensson (2006) model of PBCs as caused by credibility problems. The idea was first

proposed by Lohmann (1998) for electoral cycles in monetary policy, putting the Barro and Gordon (1983) time-consistency problems of monetary policy in the context of political business cycles. Our contribution is to embed elections in each district (provinces, in our case) in a broader national setting, where there is a federal government that can make transfers which are conditional on the political affiliation of each district. This links political budget cycles to tactical allocation of federal funds.

Ivan Ferreira and Mauricio Bugarin (2008), motivated by the pattern of federal and state transfers to municipalities in Brazil between 1999 and 2004, develop a model where PBCs in municipal governments are affected by exogenous transfers from higher levels of government that are partisan-motivated. We explicitly model how these discretionary transfers follow an electoral cycle and impact on subnational PBCs.

## **A. Theoretical setup**

### **Voters**

In each district  $i$ , where  $i = 1, 2, \dots, I$  are provinces, personal consumption  $c_i$  equals personal income  $y_i$  minus tax payments  $p_i$  in every period  $t$ . Personal income is constant over time ( $y_{it} = y_i$ ):

$$c_{it} = y_i - p_{it}. \tag{1}$$

As in Shi and Svensson (2006), the utility  $u_i$  from the consumption of the public and private goods is quasi-linear in the public good  $g_i$ . Additionally, each individual

$h$  in province  $i$  differs in an idiosyncratic political shock  $\sigma_{ih}$  that is identically and independently distributed over time. This additive shock captures the relative preferences for the opposition party in relation to the incumbent party, and is assumed to be uniformly distributed around zero. Hence, the median voter  $m$  in province  $i$  is not affected by the political shock, since the individual  $h$  such that  $\sigma_{iht} = 0$  in election period  $t$  is the median.

$$u_{iht} = g_{it} + \alpha \ln(c_{it}) + \sigma_{iht}. \quad (2)$$

A voter's expected utility is given by the discounted sum

$$U_{iht} = \mathbf{E}_t[\sum_{j=t}^{\infty} \beta^{j-t} u_{iht}]. \quad (3)$$

### **District governments**

In each district, the incumbent government has the following budget constraint in per-capita terms. Every period, government expenditures  $\gamma_i$  equal tax revenues  $\pi_i$  plus public debt  $d_i$  and federal transfers  $\phi_i$ , net of the repayment of principal and interest  $(1 + r(d_i))d_i$  on the debt of the previous period. The interest rate  $r(d_i)$  increases at an increasing rate with debt:  $r' > 0, r'' > 0$ .

$$\gamma_{it} = \pi_{it} + d_{it} + \phi_{it} - (1 + r(d_{it-1}))d_{it-1}. \quad (4)$$

As in Streb and Torrens (2012), we distinguish between the budget process and the public goods production function. Expenditure  $\gamma_i$  plus a competence shock  $\theta_t$  determines the provision of public goods  $g_i$ . Hence, more competent governments can provide more public goods and services with a given budget.

$$g_{it} = \gamma_{it} + \theta_{it}. \quad (5)$$

As in Rogoff and Sibert (1988), competence is a moving average process of order 1 which depends on independent and identically distributed shocks  $\varepsilon$ . For simplicity, we assume these shocks  $\varepsilon$  are uniformly distributed around zero.

$$\theta_{it} = \theta + \varepsilon_{it} + \varepsilon_{it-1}. \quad (6)$$

Tax revenues  $\pi_i$  equal the tax payments  $p_i$  that citizens make, so they are not affected by the competence of the provincial incumbent. Most provincial revenues in Argentina come from automatic and discretionary transfers from the federal government, so local tax efficiency is not a central issue in voter evaluations (cf. Jones, Meloni, and Tommasi as well as Gervasoni).

$$\pi_{it} = p_{it}. \quad (7)$$

Let the per-period utility  $v_i$  of the provincial incumbent equal that of a regular citizen, plus an extra term which equals  $k_i > 0$  if in office (the indicator function  $I_0 = 1$ ), zero if not ( $I_0 = 0$ ). This introduces an electoral bias in the model:

$$v_{it} = g_{it} + \alpha \ln(c_{it}) + I_{Ot}k_{it}. \quad (8)$$

The expected utility of the provincial incumbent is given by:

$$V_{it} = \mathbf{E}_t[\sum_{j=t}^{\infty} \beta^{j-t} v_{it}]. \quad (9)$$

As in Shi and Svensson (2006), debt is not socially optimal since the extra utility from current public goods is smaller than the required sacrifice of future public goods.

$$1 \leq \beta(1 + r(0)). \quad (10)$$

### **Federal government**

We take the identity of the federal incumbent as given, to abstract from presidential elections. We also assume that citizens vote along party lines in the election for provincial governor and for provincial representatives to the national congress. This gives the federal incumbent a stake in provincial elections.

The federal government uses its resources to fund federal transfers  $\phi_i$  to the  $I$  provinces. Transfers may be automatic or discretionary. In the case of discretionary transfers, the key issue is whether a district is aligned or not.: if aligned,  $I_{A_i} = 1$ , else this indicator function equals 0. In the case of aligned districts, the per-period utility  $v$  of the federal incumbent depends positively on a constant factor  $\omega_i$  which reflects the share of representatives in the national congress (if no districts are overrepresented, they equal the share of the district's population in the total). Here we take the party coalition as a given. However, following Riker's (1962) idea of a minimum winning

coalition, one can expect the weights to taper off quickly to zero once the national incumbent has built a majority. We also assume that the cost of transfers increases with their square, to reflect the feature that the incumbent distributes the transfers among all the aligned districts.

$$v_t = \sum_{i=1}^I \omega_i I_{A_{it}} \phi_{it} - \sum_{i=1}^I \phi_{it}^2. \quad (11)$$

The expected utility of the federal incumbent is given by:

$$V_t = \mathbf{E}_t[\sum_{j=t}^{\infty} \beta^{j-t} v_t]. \quad (12)$$

## B. Equilibrium with automatic federal transfers

We will first consider as a benchmark case the equilibrium when federal transfers  $f_i$  are exogenously given. In this case, each district election only depends on local issues, so the behavior is very similar to standard models of PBCs under credibility problems.

The timing each period is as follows. As in Lohmann (1998), the incumbent makes policy decisions before observing its current competence shock, so vote is probabilistic from its point of view. After  $\gamma_i$ ,  $\pi_i$ , and  $d_i$  are defined in the provincial budget, the competence shock  $\varepsilon_i$  occurs. Voters then observe taxes  $p_i$ , federal transfers  $\phi_i$ , and the production of public goods  $g_i$ , but not current government debt  $d_i$  nor current expenditure  $\gamma_i$ , and use that information to make inferences about the politician's capacity. There are elections every other period.

## Non-election period

In a non-election period  $t + 1$ , the budget decisions do not affect electoral prospects next period, so as in Rogoff and Sibert (1988) the intertemporal problem reduces to maximizing current utility. From equation (8), the incumbent's problem is thus to maximize

$$\text{Max } \mathbf{E}_{t+1}[v_{it+1}] = \mathbf{E}_{t+1}[g_{it+1} + \alpha \ln(c_{it+1}) + k_i] \quad (13)$$

with respect to  $\gamma_{it+1}$ ,  $\pi_{it+1}$ , and  $d_{it+1}$ , subject to restrictions (1), (4), (5), and (7).

Replacing in (13), the problem becomes a function of  $\gamma_{it+1}$  since optimal debt  $d_{it+1}^*$  is zero by assumption (10).

$$\text{Max } \mathbf{E}_{t+1}[(\gamma_{it+1} + \theta_{it+1}) + \alpha \ln(y_i - (\gamma_{it+1} - \phi_{it+1} + (1 + r(d_t))d_t) + k_i)]. \quad (14)$$

The first-order condition for a maximum is

$$\mathbf{E}_{t+1}\left[1 + \alpha \frac{1}{y_i - (\gamma_{it+1} - \phi_{it+1} + (1 + r(d_t))d_t)}(-1)\right] = 0, \quad (15)$$

and the second-order condition is satisfied (the second-order derivative is negative).

Solving the first-order condition (15), optimal fiscal policy is given by:

$$\gamma_{it+1}^* = y_i - \alpha + \phi_{it+1} - (1 + r(d_t))d_t, \quad (16)$$

$$\pi_{it+1}^* = y_i - \alpha. \quad (17)$$

The actual provision of public goods  $g_{it+1}$  will be increasing in competence  $\theta_{it+1}$ , something that is determined once the competence shock materializes.

### **Election period**

In an election period  $t$ , the median voter  $m$  must decide whether to vote for the incumbent party or for the opposition party. The median prefers the incumbent if the utility expected in the future, given the estimated competence shock  $\hat{\varepsilon}_{it}$  of the incumbent, is larger than the unconditional expected utility with the opposition party:

$$\mathbf{E}_t[g_{it+1} + \alpha \ln(c_{it+1}) \mid \hat{\varepsilon}_{it}] > \mathbf{E}_t[g_{it+1} + \alpha \ln(c_{it+1})] \quad (18)$$

Using (16) and (17), the median voter prefers the incumbent if

$$\mathbf{E}_t[\theta_{it+1} \mid \hat{\varepsilon}_{it}] \geq \mathbf{E}_t[\theta_{it+1}] \Leftrightarrow \hat{\varepsilon}_{it} \geq 0. \quad (19)$$

The probability of reelection is thus given by

$$\mu_{it} = \Pr(\hat{\varepsilon}_{it} \geq 0) = \Pr(g_{it} - \hat{\gamma}_{it} - \theta - \varepsilon_{it-1} \geq 0) = \Pr(\varepsilon_{it} \geq \hat{\gamma}_{it} - \gamma_{it}). \quad (20)$$

The distribution of  $\varepsilon_{it}$  is uniform, with density  $D_i$  over the interval  $[-\frac{1}{2D_i}, \frac{1}{2D_i}]$ , so this expression takes the following simple form:

$$\mu_{it} = D_i \left[ \frac{1}{2D_i} - (\hat{\gamma}_{it} - \gamma_{it}) \right] = \frac{1}{2} + D_i(\gamma_{it} - \hat{\gamma}_{it}). \quad (21)$$

The incumbent's problem of maximizing its expected utility can be reduced to

$$\text{Max } \mathbf{E}_t [v_{it} + \beta v_{it+1} + \beta^2 v_{it+2}], \quad (22)$$

since fiscal policy decisions in period  $t$  affect citizen welfare in periods  $t$  and  $t + 1$ , as well as the probability that the incumbent is reelected in  $t$  and thus continues in office in periods  $t + 1$  and  $t + 2$ . This problem is equivalent to

$$\begin{aligned} \text{Max } \mathbf{E}_t [g_{it} + \alpha \ln(c_{it}) + \beta(g_{it+1} + \alpha \ln(c_{it+1})) + (\beta I_{Ot+1} + \beta^2 I_{Ot+2}) k_i] \\ = \mathbf{E}_t [g_{it} + \alpha \ln(c_{it}) + \beta(g_{it+1} + \alpha \ln(c_{it+1}))] + \mu_{it}(\beta + \beta^2) k_i, \end{aligned} \quad (23)$$

since the expected value of indicator function  $I_O$  is the probability of being reelected. This maximum problem is subject to restrictions (1), (4), (5), and (7), as well as the optimal fiscal responses (17) and (18) after elections, and function (21). Replacing in (23), this problem can be expressed as a function of  $\pi_{it}$ , and  $d_{it}$ :

$$\begin{aligned} \text{Max } \mathbf{E}_t [(\theta_{it} + \pi_{it} + d_{it} + \phi_{it}) + \alpha \ln(y - \pi_{it})] \\ + \beta \mathbf{E}_t [(\theta_{it+1} + y - \alpha + \phi_{it} - (1 + r(d_{it}))d_{it}) + \alpha \ln(\alpha)] \\ + \left( \frac{1}{2} + D_i(d_{it} - \hat{d}_{it}) \right) (\beta + \beta^2) k_i. \end{aligned} \quad (24)$$

Because there is no electoral incentive to manipulate taxes, the first-order condition with respect to  $\pi_{it}$  leads to the same result as (17), namely  $\pi_{it}^* = y_i - \alpha$ . Hence, this maximum problem becomes a function of  $d_{it}$ , and the first-order condition is

$$\mathbf{E}_t[1 - \beta(1 + r(d_{it}) + r'(d_{it})d_{it})] + D_i(\beta + \beta^2) k_i = 0. \quad (25)$$

The second-order condition for  $d_{it}^*$  is satisfied because  $r' > 0, r'' > 0$ .

The main result of this subsection is that more the probability of reelection depends on fiscal policy — i.e., the larger the density  $D_i$  —, the larger the optimal debt  $d_{it}^*$ . Hence, PBCs are larger in more competitive districts where voters respond more to fiscal performance. Given the informational asymmetries of voters regarding the politician's fiscal policy decisions, there is an incentive for the incumbent to resort to debt in order to increase expenditure and the provision of public goods, to give the impression of being more capable. Though this behavior does not increase, in equilibrium, reelection chances, it does introduce an electoral bias in expenditure and the budget deficit.

### **C. Equilibrium with discretionary federal transfers**

We now consider the case of discretionary transfers, which is the key innovation of our setup. In this, we build on the ideas in Ferreira and Bugarin (2008) and Kang (2010). This setup leads us to establish a series of simple propositions.

#### **Non-election period**

The factor  $\omega_i$  measures the political stakes at play in each district. Since only aligned districts support the federal incumbent, only these are taken into consideration in non-election period  $t + 1$  when distributing discretionary transfers. This leads to reward loyal or core voters.

*Proposition 1. In non-election periods, the federal incumbent will only distribute discretionary transfers among aligned districts.*

Proof. In a non-election period  $t + 1$ , the federal incumbent will maximize objective function (11). The first-order condition for aligned districts is

$$\omega_i - 2\phi_{it} = 0, \tag{26}$$

where the second order condition is satisfied. This implies that  $\phi_{it+1}^* = \omega_i/2$ . As to unaligned districts, there is a corner solution with  $\phi_{it+1}^* = 0$ , since there is no benefit of distributing transfers to those districts, only costs ■

The rest of the analysis of a non-election period is as in the previous subsection, with the amendment that aligned districts will be able to provide more public goods thanks to the discretionary federal transfers.

### **Election period**

In an election period  $t$  the median voter  $m$  must decide whether to vote for the incumbent party or for the opposition party. There will be discretionary transfers from the federal government to aligned districts in periods  $t + 1$  and  $t + 2$ . The median

must take into account the future transfers to the current incumbent  $\phi_t^{inc}$  in comparison to those of the opposition party  $\phi_t^{opp}$ . The voter prefers the current incumbent if

$$\begin{aligned} & \mathbf{E}_t [g_{it+1} + \alpha \ln(c_{it+1}) + \beta I_{A_{it}} \phi_{it+1}^{inc} + \beta^2 I_{A_{it}} \phi_{it+2}^{inc} \mid \varepsilon_{it}] \\ & \geq \mathbf{E}_t [g_{it+1} + \alpha \ln(c_{it+1}) + \beta (1 - I_{A_{it}}) \phi_{it+1}^{opp} + \beta^2 (1 - I_{A_{it}}) \phi_{it+2}^{opp}], \end{aligned} \quad (27)$$

i.e., if

$$\varepsilon_{it} \geq \mathbf{E}_t [(1 - I_{A_{it}})(\phi_{it+1}^{opp} + \beta \phi_{it+2}^{opp}) - I_{A_{it}}(\phi_{it+1}^{inc} + \beta \phi_{it+2}^{inc})]. \quad (28)$$

The probability of reelection of the incumbent is

$$\mu_{it} = \Pr(\varepsilon_{it} \geq \hat{\gamma}_{it} - \gamma_{it} + \mathbf{E}_t [(1 - I_{A_{it}})(\phi_{it+1}^{opp} + \beta \phi_{it+2}^{opp}) - I_{A_{it}}(\phi_{it+1}^{inc} + \beta \phi_{it+2}^{inc})]). \quad (29)$$

Since the distribution of  $\varepsilon_{it}$  is uniform,

$$\mu_{it} = \frac{1}{2} + D_i(\gamma_{it} - \hat{\gamma}_{it} + \mathbf{E}_t [I_{A_{it}}(\phi_{it+1}^{inc} + \beta \phi_{it+2}^{inc}) - (1 - I_{A_{it}})(\phi_{it+1}^{opp} + \beta \phi_{it+2}^{opp})]) \quad (30)$$

The federal government will want to distribute transfers  $\phi_{it}$  so as to

$$\text{Max } \mathbf{E}_t [v_t + \beta v_{t+1} + \beta^2 v_{t+2}], \quad (31)$$

which is equivalent to

$$\begin{aligned} \text{Max } & \sum_{i=1}^I (\omega_i I_{A_{it}} \phi_{it} - \phi_{it}^2) + \beta \mathbf{E}_t [\sum_{i=1}^I (\omega_i I_{A_{it+1}} \phi_{it+1} - \phi_{it+1}^2)] \\ & + \beta^2 \mathbf{E}_t (\sum_{i=1}^I (\omega_i I_{A_{it+2}} \phi_{it+2} - \phi_{it+2}^2)). \end{aligned} \quad (32)$$

In election periods, the federal incumbent can only use federal transfers to help prop up the reputation of competence of its candidates in districts where they are the incumbents. As to future transfers to aligned districts, in  $t + 1$  they are determined by (26), while in  $t + 2$  they will equal transfers in  $t$ , since the federal incumbent only takes into account district conditions, which are stationary. Hence, the expected values of federal transfers in periods  $t + 1$  and  $t + 2$  equals the probability that the incumbent in an aligned incumbent is reelected, times the expected transfers in that period:  $\mathbf{E}_t [I_{A_{it+1}} \phi_{it+1}] = \mu_{it} \phi_{it+1}^{inc}$  and  $\mathbf{E}_t [I_{A_{it+2}} \phi_{it+2}] = \mu_{it} \phi_{it+2}^{inc}$ .

*Proposition 2. In election periods, the federal incumbent will distribute extra discretionary transfers among aligned districts.*

Proof. The first order condition for aligned districts is

$$\omega_i - 2\phi_{it} + \omega_i (\beta \mathbf{E}_t [\phi_{it+1}^{inc}] + \beta^2 \mathbf{E}_t [\phi_{it+1}^{inc}]) D_i = 0, \quad (33)$$

where we use the fact that  $\gamma_{it} = \pi_{it} + d_{it} + \phi_{it}$  and  $\hat{\gamma}_{it} = \pi_{it} + \hat{d}_{it} + \hat{\phi}_{it}$ . The second order condition is satisfied. Taking into account that  $\phi_{it+1}^{inc}$  is given by (26), and that  $\phi_{it+2}^{inc} = \phi_{it}^{inc}$  in equilibrium, we can solve for  $\phi_{it}$ :

$$\phi_{it}^* = \frac{\omega_i(1+\beta(\omega_i/2)D_i)}{2-\omega_i\beta^2D_i}. \quad (34)$$

For an interior solution, the condition  $2/(\omega_i\beta^2) > D_i$  must be satisfied. Unaligned districts, on the other hand, receive nothing because there is no electoral benefit for the federal incumbent, only a cost ■

This result is related to Kang (2010), where there is an electoral cycle in the composition of government spending, since in election years the federal incumbent allocates all transfers to swing districts, while in non-election years transfers go to loyal districts. The difference is that here there is an aggregate electoral cycle in the federal budget, since discretionary transfers rise in election periods. Furthermore, these transfers are only targeted to districts where the incumbent party is in office, since we consider cash transfers that go directly to the provincial budget.

We now consider how the competitiveness of elections affects PBCs, taking into account the marginal effect of fiscal manipulation on the probability of reelection.

*Proposition 3. In electoral years, incumbents in more competitive districts incur more public debt.*

*Proof.* If federal transfers do not lead to a corner solution where the probability of reelection in (30) is 1 for an aligned incumbent — or 0 for an unaligned incumbent, the first-order condition (25) for district incumbents remains unaltered. Hence, in districts where density  $D_i$  is larger, optimal debt  $d_{it}^*$  is larger. Note that if there is a corner solution and debt does not affect the probability of reelection, the district incumbent has no incentive to engage in PBCs ■

*Proposition 4. In electoral periods, an incumbent will increase spending more if it is aligned with the federal incumbent.*

Proof. In electoral periods, a district government will only receive extra discretionary transfers  $\phi_{it}^* > 0$ , as specified in (34), if it is aligned with the federal government; otherwise it get nothing. Since  $\gamma_{it} = \pi_{it} + d_{it} + \phi_{it}$ , an aligned incumbent will be able to spend more in election years ■

Hence, aligned incumbents have more ability to increase expenditure in election periods without need of resorting to distortionary debt (here we are assuming that the cost of credit is the same for all district governments, but that of course is not the case). If provincial governments are restricted in their access to cheap credit, as happens in Argentina, then the main channel for PBCs may instead be the transfers from the federal government.

*Proposition 5. Discretionary transfers tilt the district elections in favor of the incumbents aligned with the federal incumbent.*

Proof. Even when  $\hat{\gamma}_{it} = \gamma_{it}$  in equilibrium, and discretionary transfers from the federal government are correctly anticipated, federal transfers affect election results. This is not because of current transfers, but rather because of future transfers to those districts aligned with the federal government. This leads to a larger probability that incumbents in aligned districts will be reelected, since  $\mu_{it} = \frac{1}{2} + D_i \mathbf{E}_t \left[ (\phi_{it+1}^{inc} + \beta \phi_{it+2}^{inc}) \right]$ . On the other hand, the probability of reelection will be less then 1/2 in those districts not aligned with the federal government ■

Ferreira and Bugarin (2007) already pointed out how partisan transfers change the incentive of voters, so the selection motive based on choosing the most competent incumbent becomes less important. However, given our assumption of an uniform distribution, this will not affect the magnitude of PBCs, except if there is a corner solution where the incumbent wins or loses for sure.

## **VI. Conclusions**

This paper presents empirical evidence of systematic effects in fiscal balance, public expenditures and revenues in Argentine provinces as a function of elections and political alignment. Our findings are partially consistent with the predictions of the theoretical literature on rational opportunist political cycles: there are fiscal policy manipulations of spending during elections, and there is a strengthening of the policies after elections. However, revenue increases in election years.

Hence, we look at the influence of the federal incumbent on provincial PBCs. The data reveal that there are important systematic differences between provinces in the size of the electoral manipulations, depending on the political alignment with the federal executive. Specifically, the political alignment between provincial and federal executives implies more discretionary transfer of federal revenues<sup>6</sup> and increases the election induced provincial spending without increasing the fiscal deficit. Politically unaligned provinces are constrained by constant federal transfers and fiscal deficits are more frequent in election years.

Our conditional findings are formalized with a theoretical model of opportunistic rational behavior at the district level, combined with the partisan behavior of the

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<sup>6</sup> A similar result is reported in the Rumi (2008) study on cash transfers, but for presidential election years.

federal incumbent. This formalizes the feature that the institutional and political features are important issues to explain the electoral motivated policy cycles. This links the literature on PBCs to the literature on the tactical allocation of federal funds.

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## Appendix

**Table 1. Definition of variables**

**Dependent Variables (fiscal variables).** (All values expressed in constant 1993 Argentine Pesos deflated by the combined prices index -wholesale-consumer- from INDEC)

DEF<sub>it</sub>: Fiscal Balance [Deficit (-) Surplus (+)] divided by provincial GGP in province i year t  
Source: MECON

TE<sub>it</sub>: Total Public Expenditure divided by GGP from province i  
in year t. Source: own elaboration based on Ministry of Economy (MECON)

CE<sub>it</sub>: Current Expenditure divided by public total expenditure in province i in year t. Source: MECON

TR<sub>it</sub>: Total Provincial Revenue divided by GGP in the province i in year t (includes revenue from provincial taxes, federal revenue sharing –“coparcipación federal”- and other federal transfers –“aportes del tesoro”- Source: MECON

PTR<sub>it</sub>: Revenue from Provincial Taxes divided by provincial GGP in province i in year t.  
Source: MECON

FR<sub>it</sub>: Provincial revenues from federal revenue sharing ("coparticipation federal") plus transfers from federal government divided by provincial GGP in province i in year t.  
Source: MECON

### Control Variables

GGP<sub>it</sub>: Natural log of per capita Geographic Gross Product of province i during year t  
Source: Mirabella (2002) and National Institute of Statistics and Census (INDEC)

GROWTH<sub>it</sub>: GGP Growth rate in the province i between the year t and the t-1  
Source: Mirabella (2002).

### Election Variables

ELE<sub>it</sub>: Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and 0 otherwise.

Source: own elaboration based on “Guia Electoral”.

PBC<sub>it</sub>: Political Budget Cycle dummy. Variable assuming value 1 if ELE<sub>it</sub> is equal to 1; -1 if ELE<sub>it-1</sub> is equal to 1 and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

ELE+1<sub>it</sub>: Post Election dummy. Binary variable that assumes value 1 if ELE<sub>it-1</sub> is equal to 1 and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

ELE\_UNAL<sub>it</sub>: Conditional Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and the provincial and federal executive governments were unaligned (different political party), and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

ELE\_AL<sub>it</sub>: Conditional Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and the provincial and federal executive governments were aligned (same political party), and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

PBC\_UNAL<sub>it</sub>: Conditional Political Budget dummy. Binary variable that assumes value 1 if ELE\_UNAL<sub>it</sub> is equal to 1; -1 if ELE\_UNAL<sub>it-1</sub> is equal to 1 and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

PBC\_AL<sub>it</sub>: Conditional Political Budget dummy. Binary variable that assumes value 1 if ELE\_AL<sub>it</sub> is equal to 1; -1 if ELE\_AL<sub>it-1</sub> is equal to 1 and 0 otherwise. Source: own elaboration based on “Guia Electoral”.

**Table 2. Fiscal variables: descriptive statistics**

	Mean	Std. Dev.	Min.	Max.	No. Obs
DEF	-0.022	0.031	-0.155	0.058	374
TE	0.237	0.123	0.052	0.812	374
CE	0.807	0.091	0.445	0.952	374
TR	0.215	0.113	0.046	0.825	374
PTR	0.028	0.014	0.004	0.121	374
FR	0.186	0.110	0.024	0.704	374

**Table 3. Elections and Fiscal Balance**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	-0.0037 (-1.17)	-0.0031 (-0.91)	-0.0030 (-0.97)	0.0020 (0.60)	0.0023 (0.66)	0.0016 (0.50)
ELE+1				0.0140 (3.98)***	0.0135 (4.07)***	0.0141 (4.34)***
F-test <sup>a</sup>		2.07			2.11	
p-value		0.0045			0.0036	
F-test: <i>ELE = -ELE+1</i>				8.27	7.71	8.78
p-value				0.0043	0.0059	0.0030
Sargan test <sup>b</sup>			283.73			277.02
p-value			0.9994			0.9998
Serial Corr <sup>c</sup>			-0.04			1.25
p-value			0.9677			0.2131
No.obs.	308	304	302	308	308	308
No. provinces	22	22	22	22	22	22
R <sup>2</sup> (adj.)	0.36			0.40		

Notes: Dependent variable DEF is ratio of government surplus to Geographic Gross Product (PBG).  
Estimated Regressions:

$$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$$

$$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 4. Elections and Total Expenditure**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM
ELE	0.0115 (2.50)**	0.0057 (1.50)	0.0100 (2.34)***
F-test <sup>a</sup>		11.30	
p-value		0.0000	
Sargan test <sup>b</sup>			254.35
p-value			1.0000
Serial Corr. <sup>c</sup>			1.00
p-value			0.3166
No. obs.	308	308	308
No. provinces	22	22	22
R <sup>2</sup> (adj.)	0.90		

Notes: Dependent variable TE is the ratio of total provincial expenditure to Geographic Gross Product (PBG).

Estimated Regressions:

$$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 5. Elections and Total Expenditure**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE	0.0086 (1.63)	0.0026 (0.64)	0.0074 (1.59)			
ELE+1	-0.0078 (-1.44)	-0.0087 (-2.26)**	-0.0073 (-1.61)			
PBC				0.0082 (3.15)***	0.0057 (2.55)**	0.0074 (2.83)***
F-test: <i>ELE = -ELE+1</i>	0.01	0.88	0.00			
p-value	0.9271	0.3484	0.9961			
F-test <sup>a</sup>		11.51			11.47	
p-value		0.0000			0.0000	
Sargan test <sup>b</sup>			249.74			250.02
p-value			1.0000			1.0000
Serial Corr. <sup>c</sup>			1.42			1.41
p-value			0.1568			0.1600
No. obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R <sup>2</sup> (adj.)	0.90			0.90		

Notes: Dependent variable TE is the ratio of total provincial expenditure to Geographic Gross Product (PBG).

Estimated Regressions:

$$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$$

$$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 6. Elections and Total Revenue**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0111 (2.62)*	0.0051 (1.59)	0.0095 (2.44)**	0.0138 (2.91)***	0.0070 (2.08)**	0.0125 (3.05)***
ELE+1				0.0075 (1.44)	0.0055 (1.75)*	0.0085 (2.07)**
F-test <sup>a</sup>		17.19			17.18	
p-value		0.0000			0.0000	
F-test: <i>ELE = -ELE+1</i>				6..30	5.59	9.76
p-value				0.0126	00187	0.0018
Sargan test <sup>b</sup>			270.19			274.97
p-value			0.9999			0.9999
Serial Corr <sup>c</sup>			1.25			1.00
p-value			0.2096			0.3194
No.obs.	308	308	308	305	305	302
No. provinces	22	22	22	22	22	22
R <sup>2</sup> (adj.)	0.89			0.89		

Notes: Dependent variable TR is the ratio of current expenditure to total provincial expenditure.

Estimated Regressions:

$$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$$

$$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 7. Elections and Revenue from Federal Government<sup>7</sup>**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0114 (2.89)***	0.0053 (1.74)*	0.0097 (2.73)***	0.0138 (3.25)***	0.0073 (2.28)**	0.0124 (3.33)***
ELE+1				0.0071 (1.54)*	0.0057 (1.92)*	0.0078 (2.09)**
F-test <sup>a</sup>		15.51			15.55	
p-value		0.0000			0.0000	
F-test: <i>ELE = -ELE+1</i>				8.03	6.69	10.92
p-value				0.0049	0.0102	0.0456
Sargan test <sup>b</sup>			254.86			258.52
p-value			1.0000			1.0000
Serial Corr <sup>c</sup>			1.49			1.30
p-value			0.1355			0.1944
No.obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R <sup>2</sup> (adj.)	0.90			0.91		

Notes: Dependent variable FR is the ratio of federal revenues to Gross Geographic Product (PBG).

Estimated Regressions:

$$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \eta_i + \varepsilon_{FR}$$

$$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

<sup>7</sup>Provincial revenues from revenue sharing ("coparticipation") plus (discretionary) transfers from federal government (i.e. "Aportes del Tesoro Nacional" – ATN).

**Table 8. Elections and Revenue from Provincial Taxes**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0002 (0.23)	0.0002 (0.22)	0.0002 (0.23)	0.0005 (0.66)	0.0004 (0.56)	0.0005 (0.66)
ELE+1				0.0009 (1.10)	0.0008 (1.12)	0.0011 (1.51)
F-test <sup>a</sup>		3.30			3.28	
p-value		0.0000			0.0000	
F-test: <i>ELE = -ELE+1</i>				1.30	1.049	1.78
p-value				0.2559	0.3083	0.1823
Sargan test <sup>b</sup>			338.55			344.69
p-value			0.8362			0.7708
Serial Corr <sup>c</sup>			0.26			-0.13
p-value			0.7969			0.8958
No.obs.	308	308	308	304	304	302
No. provinces	22	22	22	22	22	22
R <sup>2</sup> (adj.)	0.84			0.84		

Notes: Dependent variable PTR is the ratio of provincial revenues to Geographic Gross Product (PBG).  
Estimated Regressions:

$$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$$

$$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 9. Elections and Fiscal Balance conditional on alignment of provincial and federal government**

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM
ELE_UNAL	-0.0106 (-1.93)*	-0.0091 (-1.61)	-0.0084 (-1.80)*
ELE_AL	-0.0003 (-0.09)	-0.0002 (-0.04)	0.0003 (0.09)
F-test <sup>a</sup>		2.03	
p-value		0.0056	
Sargan test <sup>b</sup>			283.40
p-value			0.9994
Serial Corr <sup>c</sup>			-0.19
p-value			0.8472
No. obs.	308	304	302
No. provinces	22	22	22
R <sup>2</sup> (adj.)	0.37		

Notes: Dependent variable DEF is ratio of government surplus to Geographic Gross Product (PBG).

Estimated Regressions:

$$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE\_UNAL_{it} + \gamma_4 ELE\_AL_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as  $N(0,1)$  under the null of no serial correlation.

**Table 10. Elections and Total Expenditure conditional on alignment of provincial and federal government**

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS.	GMM
ELE_UNAL	0.0062 (0.70)	0.0005 (0.07)	0.0015 (0.28)
ELE_AL	0.0140 (3.05)***	0.0082 (1.81)*	0.0101 (2.59)***
F-test <sup>a</sup>		11.29	
p-value		0.0000	
Sargan test <sup>b</sup>			354.41
p-value			0.5287
Serial Corr <sup>c</sup>			-0.61
p-value			0.5406
No. obs.	308	308	286
No. provinces	22	22	22
R <sup>2</sup> (adj.)	0.90		

Notes: Dependent variable TE is ratio of total provincial expenditure to Geographic Gross Product (PBG).

Estimated Regressions:

$$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE\_UNAL_{it} + \gamma_4 ELE\_AL_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

**Table 11. Elections and Total Revenue conditional on alignment of provincial and federal government**

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS.	GMM
ELE_UNAL	0.0005 (0.08)	-0.0067 (-1.25)	-0.0061 (-1.20)
ELE_AL	0.0162 (3.37)***	0.0108 (-2.85)***	0.0090 (2.57)*
F-test <sup>a</sup>		17.60	
p-value		0.0000	
Sargan test <sup>b</sup>			364.10
p-value			0.3863
Serial Corr <sup>c</sup>			-0.75
p-value			0.4523
No. obs.	308	308	286
No. provinces	22	22	22
R <sup>2</sup> (adj.)	0.89		

Notes: Dependent variable TR is the ratio of current expenditure to total provincial expenditure.

Estimated Regressions:

$$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE\_UNAL_{it} + \gamma_4 ELE\_AL_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ , t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as  $N(0,1)$  under the null of no serial correlation.

**Table 12. Elections and Revenue from Federal Government<sup>8</sup> conditional on alignment of provincial and federal government**

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS.	GMM
ELE_UNAL	0.0007 (0.11)	-0.0066 (-1.30)	-0.0064 (-1.35)
ELE_AL	0.0166 (3.66)***	0.0110 (3.07)***	0.0082 (2.49)**
F-test <sup>a</sup>		15.94	
p-value		0.0000	
Sargan test <sup>b</sup>			346.63
p-value			0.6431
Serial Corr <sup>c</sup>			-0.36
p-value			0.7156
No. obs.	308	308	286
No. provinces	22	22	22
R <sup>2</sup> (adj.)	0.91		

Notes: Dependent variable FR is the ratio of federal revenues to Gross Geographic Product (PBG).

Estimated Regressions:

$$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE\_UNAL_{it} + \gamma_4 ELE\_AL_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as  $N(0,1)$  under the null of no serial correlation.

<sup>8</sup>Provincial revenues from revenue sharing ("coparticipation") plus special (discretionary) transfers from federal government.

**Table 13. Elections and Revenue from Provincial Taxes conditional on alignment of provincial and federal government**

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS.	GMM
ELE_UNAL	0.0003 (0.29)	0.0001 (0.13)	0.0008 (0.82)
ELE_AL	0.0001 (0.14)	0.0001 (0.19)	-0.0002 (-0.34)
F-test <sup>a</sup>		3.29	
p-value		0.0000	
Sargan test <sup>b</sup>			337.35
p-value			0.8475
Serial Corr <sup>c</sup>			0.33
p-value			0.7379
N° obs.	308	308	308
N° provinces	22	22	22
R <sup>2</sup> (adj.)	0.84		

Notes: Dependent variable PTR is the ratio of provincial revenues to Geographic Gross Product (PBG). Estimated Regressions:

$$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + \gamma_3 ELE\_UNAL_{it} + \gamma_4 ELE\_AL_{it} + \eta_i + \varepsilon_{it}$$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction  $\eta_i = \eta \forall i$ . t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a  $\chi^2$  under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as  $N(0,1)$  under the null of no serial correlation.