Electoral Manipulation via Voter-Friendly Spending: Theory and Evidence*

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This Draft: July 2006

Abstract

We present a model of the political budget cycle in which incumbents try to influence voters by changing the *composition* of government spending, rather than overall spending or revenues. Rational voters may support an incumbent who targets them with spending before the election even though such spending may be due to opportunistic manipulation, because it may also reflect sincere preference of the incumbent for types of spending voters favor. Classifying expenditures into those which are likely targeted to voters and those that are not, we provide evidence supporting our model in data on local public finances for all Colombian municipalities. Our findings indicate both a pre-electoral increase in targeted expenditures, combined with a contraction of other types of expenditure, and a voter response to targeting.

JEL classification: D72, E62, D78

Keywords: political budget cycle, expenditure composition, elections, Colombia

*We thank Miguel Rueda for excellent research assistance, and participants at seminars at University of Maryland and Hebrew University of Jerusalem, the Vth meeting of the Political Economy Network of LACEA, and the 9th Annual Meeting of LACEA for many useful comments. All remaining errors are our own.

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1 Introduction

It is widely believed that incumbent politicians increase public spending before elections to improve the chances that they (or their party) will be re-elected. It is not obvious however why such changes would generate electoral benefits if voters are rational and forward-looking. Such voters should vote on the basis of the policies they expect each candidate will undertake after the election, rather than on outcomes in the election year. Furthermore, they should anticipate the possible incentives of the incumbent to manipulate fiscal policy before an election, and therefore not respond to such manipulation.

To reconcile fiscal expansions before elections with voter rationality, Rogoff (1990) and Rogoff and Sibert (1988) suggested that observed pre-election expenditures may serve as a signal of the incumbent's "competence" – meaning his ability to provide more public goods – which exhibits some persistence over time. In these models, a politician has better information about his own level of competence than do voters. Voters cannot observe competence directly, nor can they infer it simply from fiscal policy because they do not observe all government expenses. They thus use the part of government spending they do observe before an election to make inferences about post-electoral competence. As a result, an incumbent running for re-election has an incentive to increase spending in those items voters observe. In an alternative model of the competence approach, Shi and Svensson (2006) assume that voters' inability to perfectly monitor the budget takes the form of some voters not observing the level of deficit. The result is an incentive for incumbents to generate a fiscal expansion before the election.

However, there is a significant amount of evidence that increasing aggregate spending or deficits before an election is not an effective tool to gain votes. Peltzman (1992) shows that voters in the U.S. are less likely to support a local official who has increased overall spending before the election. Brender (2003) finds evidence that, when voters in Israel are able to effectively monitor the fiscal choices of local officials, incurring in large pre-election deficits actually *harms* an incumbent's chances of being re-elected. Brender and Drazen (2005b) find in a large panel of countries that deficits over the previous three years reduce an incumbent's re-election chances in developed countries and established democracies. Similarly, our findings below indicate that the share of votes received by the incumbent's party is decreasing in the level of the deficit in the year preceding the election. It would therefore appear that well informed voters not only are hard to "buy" through spending

increases, but also they are actually "fiscal conservatives", that is, they are averse to high overall government spending and deficits.

Politicians appear to be aware of this. Brender and Drazen (2005a) argue that empirical results on widespread election-year increases in spending or deficits (see Shi and Svensson [2006] and Persson and Tabellini [2003]) are driven by "new democracies", that is, by the first few elections in countries that have made the transition to democracy.[1] Once new democracies are removed from a larger sample, they find no statistically significant political deficit cycle among established democracies.

One is left with the question of whether there is room for electoral manipulation of the budget in established democracies, which are characterized by well informed and sophisticated voters who may be averse to deficits and high government expenditure. When voters are "fiscal conservatives", it may be politically costly for the incumbent to try to attract votes by raising total spending, and incumbents generally appear not to do so in established democracies.

We therefore suggest a different approach to the now standard "competence" argument. Voters value some types of spending more than others. Politicians differ in the value they assign to different types of spending, where these preferences are not observed by voters. By shifting the composition of spending towards the goods voters prefer, an incumbent politician will try to signal that his preferences are close to those of voters, implying he will choose high post-election spending on those same goods.[2] Political manipulation will therefore take the form of changing the *composition* of government spending, allowing its overall level (and the deficit) to remain unchanged. Voter uncertainty about the incumbent's spending priorities makes electorally-motivated increases in some types of spending an effective tool to gain votes, as voters may be unable to separate politicians into those whose spending choices are meant simply to gain votes and those whose spending preferences actually correspond to what voters want. In this setting, voters rationally respond to pre-election increases in their most preferred types of spending, as it signals politician type.[3] Hence political

[1] Similarly, Akhmedov and Zhuravskaya (2004) find an electoral expenditure cycle in regional elections in Russia after its transition to democracy, which becomes smaller with each new round of regional elections.

[2] In a related paper (Drazen and Eslava [2006]), we develop a model where expenditures can be targeted to *different* groups of voters with heterogeneous preferences, with politicians having preferences over different groups. As a result, before elections the composition of expenditures is tilted towards the goods favored by groups with greater electoral importance.

[3] Lindbeck and Weibull (1987) and Dixit and Londregan (1996) present formal models of balanced-budget targeting of voter groups, but these models assume that a politician can commit himself to a post-electoral fiscal policy. There is no voter inference problem about post-electoral utility based on pre-electoral economic magnitudes, so the question of why rational, forward-looking voters who are targeted before the election vote for the incumbent is not really answered.

budget cycles emerge even if voters are fiscal conservatives, and even if they are able to observe fiscal policy perfectly.

There are two fundamental differences between our argument and the one underlying the competence approach. First, in our model voters' imperfect information about the incumbent is about his preferences over the distribution of the budget rather than about his competence. This is not simply a semantic difference, as is made evident by the resulting second departure from the competence framework: pre-electoral manipulation of the budget in our model arises even when voters have full information about fiscal policy. This is not the case when voters need to make inferences about an incumbent's competence, since competence would be perfectly revealed with perfect information about fiscal policy. Our model of imperfect information about preferences is therefore better able to explain the existence of election-year fiscal manipulation in countries with sophisticated and well informed voters.

The strength of the political cycle in our model depends on the distribution of ideological preferences, and on the amount of information voters have about the political environment. As is probably not surprising, targeted spending increases more prior to elections the larger is the fraction of swing voters in the electorate. However, in our model voters anticipate this behavior. As a result, when a large fraction of voters is undecided, high levels of targeted spending are recognized as being politically motivated, rather than being interpreted as an effective signal of the politician's fiscal preferences. This creates a natural limit to electorally motivated increases in spending. On the other hand, the incumbent's ability to engage in this form of electoral manipulation is increased by his access to superior information about the political environment. In particular, politicians in our model may have more information than voters about the potential electoral benefits of increasing targeted expenditures (*i.e.*, how "swing" are voters). This increases their ability to obtain political support from increases in targeted expenditures, as voters are less able to determine if the targeting is politically motivated.

We present empirical evidence on these electoral composition effects, using a new data set we compiled on local government spending and local elections for all Colombian municipalities. Obviously, a classification of government expenditure into targeted and non-targeted expenditures is not readily available, or straightforward. In fact, all government expenditures (probably with the exception of interest payments on external debt) generate benefits for at least some groups in so-

ciety, even if it is only to those individuals who provide the services and goods to the government. However, we argue that some of the components of local government expenditure – in Colombia in particular, most categories of investment expenditures – are more likely than others to reflect what we call targeted expenditures than others. Consistent with our model, we find that most categories of investment spending show pre-election expansions, while many components of current spending contract. Furthermore, we investigate the effect of pre-election fiscal policy on the share of votes received by the incumbent party. We find evidence that voters reward incumbents who increase investment spending, but only to the extent that they do so without running large election-year deficits.

Our results on electoral composition effects are consistent with some previous findings. Brender (2003) finds not only that voters in Israel penalize election year deficits, but also that they reward high expenditure in development projects in the year previous to an election. Similarly, Peltzman's (1992) result that U.S. voters punish government spending holds for current (as opposed to capital) expenditures, but is weaker if investment in roads, an important component of public investment, is included in his policy variable.[4] Kneebone and McKenzie (2001) look for evidence of a political budget cycle for Canadian provinces, and find no evidence of a cycle in aggregate spending, but do find a cycle in what they call "visible expenditures", mostly investment expenditures such as construction of roads and structures. For Mexico, Gonzalez (2002) finds similarly that investment expenditure expands prior to elections, while some other categories of spending, such as current transfers, contract. Persson and Tabellini (2003) find a pre-election expansion in welfare state spending before elections in democracies with proportional electoral regimes, but no statistically significant pre-election expansion in overall spending nor deficits in these countries.

The paper is organized as follows. In section 2 we present the model and solve for the political-economic equilibrium with a budget composition cycle. In section 3 we discuss relevant empirical evidence for the case of Colombia. Section 4 contains conclusions.

[4]He interprets the "odd findings" obtained when including expenditure in roads as a result of the high lumpiness of this component. However, in light of the other evidence reviewed here, we view them as the reflection that voters in fact support the undertaking of development projects.

2 A Simple Model

We present a very simple model to demonstrate our basic results. Though it is a standard signaling model, its simplicity and tractability should make it not only easily accessible, but also a useful vehicle for both expositing rational political cycles and further investigating the composition of spending approach.

There are two periods, with an election between an incumbent and a challenger at the end of the first period. Incumbents use the composition of expenditures to attract votes. In order to derive the main results as simply as possible, we make extreme assumptions about the distribution of politician types and the distribution of voter preferences, the two key "primitives" of the problem. The political budget cycle is represented simply as the difference in fiscal choices between the pre-election period and the post-election period. Our results, however, do not depend on the simplicity of the assumptions on the distributions or the existence of only one election cycle.[5]

We assume that incumbents cannot change the overall level of spending, taxes, or deficits. Targeting voters with one type of spending thus requires reducing another type, so that the choice of fiscal policy is simply over the composition of the budget. This simplifying assumption allows us to concentrate on the budget composition effect we are suggesting. It also serves the purpose of emphasizing the differences between our model and the competence approach, as all politicians are assumed equally able to provide public goods.

The incumbent politician has preferences over the composition of the budget which may differ from those of voters. For simplicity, we assume that all voters have the same preferences over types of expenditure and receive the same amount of goods, so the heterogeneity of interests over the budget is between voters and politicians, rather than across groups of voters as in Drazen and Eslava (2006). Here, voters differ from one another only in their preferences over non-fiscal policies, termed "ideology", though our basic result of an electoral cycle in the composition of the budget would emerge even with a single representative voter who would either confirm or remove the incumbent.[6]

[5] In Drazen and Eslava (2006) we develop a more elaborate model in several dimensions, including multiple elections and less restrictive assumptions about the distributions.

[6] We include heterogeneity of voter preferences over non-fiscal policies because we also want to consider the implications of different features of the political environment, such as the fraction of the population represented by swing voters.

2.1 Voters

Voters trade off ideology over non-fiscal policy, π, and utility from targeted expenditures, g_t, in deciding whether to support a candidate. The idea of targeted expenditures is close to that in Lindbeck and Weibull (1987) or Dixit and Londregan (1996), but in a setting where expectations of future policy are key to determining how an individual votes. (See footnote 4.)

Utility of an individual depends on two factors, each of which may be influenced by government policy. First, there is the consumption of the government supplied good $g_t \geq 0$ which provides utility directly. (We abstract here from private consumption, since taxes are fixed.) Second, an individual j also cares about the distance between his most desired position π^j over non-fiscal policies (which is immutable) and the positions π^I of the current incumbent I and π^C of the challenger. We take these as fixed and known and, without loss of generality, assume $\pi^I < \pi^C$. In the post-election period, either the initial incumbent I or the challenger C may be in power, depending on the election outcome.

Single period utility of individual j in period t if politician $P \in \{I, C\}$ is in power may be written

$$U_t^j(P) = V\left(g_t^P\right) - \left(\pi^j - \pi^P\right)^2 \tag{1}$$

where $V'(\cdot) > 0$, $V''(\cdot) < 0$, and g_t^P is targeted expenditure chosen by policymaker P. A voter j is thus characterized by π^j.

Note that $V(g_t^P)$ does not depend on j, as all voters receive the same g. That is, in terms of preferences over fiscal policy all voters are homogeneous (in contrast to the model of Drazen and Eslava [2006]), allowing us to focus on the conflict of interests between voters (as a group) and politicians, rather than between voters.

An individual's only decision is whether to vote for the incumbent or the challenger, and only in an election period. We therefore focus on utility as of period 1, when the election takes place. The present expected discounted utility of individual j as of period 1 is

$$W_1^j = U_1^j(I) + \beta E_1 U_2^j(P) \tag{2}$$

where β is the discount factor, and $P \in \{I, C\}$. In the election, a voter prefers the incumbent over the challenger if he expects to receive more utility from the former in $t = 2$.

2.2 Politicians

In addition to g_t, government spending may go to K_t – a good that politicians may value but that voters do not – which for expositional simplicity we call "*desks*". One may think, for example, of politicians who value managing a large bureaucracy. However, the idea we have in mind is more general: voters may value some government services less than others for many reasons, such as voters' failure to recognize the positive externalities these services produce, or the low visibility of some types of expenditure. The characterization of K_t as total waste in the eyes of voters is simply an extreme way to capture those differences in the value assigned by voters to different goods and services provided by the government. Each period, the government thus faces a budget constraint

$$T = K_t + g_t \tag{3}$$

where T is a fixed and exogenous level of tax revenue.

The politician's objective is to maximize a weighted sum of voters' utility, a fixed value χ of being in office, the value of "desks" K_t, and the value of having its own ideology represented in office. We denote by ω_{Pt} the weight a politician P puts on voters relative to desks in period t. A politician $P's$ objective in the post-election period $t = 2$, assuming that politician Q is in office in that period, can then be written

$$\Omega_2^{P|Q} = \omega_{P2}\left[V(g_2) - \sum_{j=1}^{N}\frac{\left(\pi^j - \pi^Q\right)^2}{N}\right] + D_2^P\left[a(K_2) + \chi\right] - \left(\pi^P - \pi^Q\right)^2 \tag{4}$$

where N is the size of the voting population, which we assume to be constant, $a(K)$ is an increasing, concave function with $a(0) = 0$, and D_2^P is a dummy variable which equals 1 if P is in office (*i.e.*, if $P = Q$) and 0 otherwise. We have written this objective in per-capita terms for simplicity.

The weight ω_{Pt}, known to the politician but not observed by voters, is crucial to a voter's choice. The level of g_2 the politician would choose is, by (4), known to be a function of ω_{P2}, so that rational voters vote on the basis of their beliefs about ω_{I2} and ω_{C2}. The crucial assumptions in our argument that election-year fiscal policy may be used to gain votes are that the weight the politician puts on voters' utility is not observed by the voters (and hence must be inferred), but is correlated over time (so that fiscal policy observed before the election provides information on the politician's preferences

and hence spending allocation in the post-election period). Voters must try to infer the value of ω_{I2} from observations on g_1, that is, on expenditures before the election. For clarity of exposition, we assume the process governing the evolution of the ω_{Pt} takes the simplest possible form that satisfies the conditions discussed above. First, ω_{Pt} does not change from $t = 1$ to $t = 2$, with $\omega_{P1} = \omega_{P2} \equiv \omega_P$ for $P \in \{I, C\}$.[7] Second, for any politician P, ω_P can take on two values: $\omega_P = \{\overline{\omega}, \underline{\omega}\}$ with prior probabilities $\Pr(\omega = \overline{\omega}) = \bar{p}$ and $\Pr(\omega = \underline{\omega}) = (1 - \bar{p})$. We suppose $\overline{\omega} > \underline{\omega}$, so that a politician of type $\overline{\omega}$ cares more about targeting expenditures to people (a *people* politician), while $\omega_P = \underline{\omega}$ makes the politician more interested in bureaucracy than targeting (a *desks* politician).[8]

In the election year, the $t = 1$ incumbent chooses g_1 trying to maximize his lifetime utility. Abstracting from constant terms, we write this objective as

$$\Omega_1^I = \omega_I V\left(g_1^I\right) + a(K_1) + \beta\rho(g_1^I)\Omega_2^{I|I} + \beta\left(1 - \rho(g_1^I)\right) E_I \Omega_2^{I|C} \tag{5}$$

where β is a discount factor and where I takes the expectation of $\Omega_2^{I|C}$ as of period 1 since he does not now the challenger's type. ρ is the probability of re-election which, given that voters use g_1 to make inferences about the incumbent's preferences, is a function of g_1. We will solve for the function $\rho(\cdot)$ from voter's behavior, assuming voters are forward looking. Note that, since ideological positions of both voters and candidates are given, the argument that relates to $t = 1$ ideology is a constant with respect to the choice of g_1^I.

One solves the problem backwards, starting with the post-election period. In $t = 2$, a government P $(P = I, C)$ maximizes (4) by choice of g_2^P subject to the budget constraint (3). The solution is given by the following first-order condition

$$\omega_P V'\left(g_2^P\right) = a'\left(T - g_2^P\right) \tag{6}$$

for each P, that is, the politician equalizes his marginal utility from the two uses of expenditure.

[7] In a multiperiod model, this assumption needs to be modified so that ω_{P1} cannot be perfectly inferred from previous policy, and voters are most interested in the preferences the incumbent has just before the election. An alternative that satisfies this requirement is that ω_{Pt} follows an MA(1) process, analogous to the evolution of competence in Rogoff (1990).

[8] Coate and Morris (1995) present a model of transfers where politicians differ in their unobserved fiscal preferences, with a "good" politician putting more weight on social welfare than a "bad" politician, the latter also catering to special interests, where voters try to infer those preferences from observed fiscal choices. Their model, however, is not one of political cycles. They do not consider the implications of this inference problem for electoral manipulation (and hence political cycles), nor how possible electoral effects depend on the distribution of voters' ideology.

Concavity of $V(g)$ and $a(K)$ implies that the postelection targeted expenditures to voters are increasing in the weight the politician gives to voter welfare, so that $g_2(\overline{\omega}) > g_2(\underline{\omega})$. We will denote $g_2(\underline{\omega}) = \underline{g}$, and suppose for simplicity that $\overline{\omega} \to \infty$, so that a "*people*-type" politician always chooses the maximum level of expenditures possible, that is, $g_2(\overline{\omega}) = T > \underline{g}$. This assumption simplifies the solution but, as we discuss later, we could dispense of it and still prove that politicians are expected to engage in pre-election increases in targeted expenditures.

In the election period, the incumbent chooses g_1 to maximize his objective (5), subject to the budget constraint (3). A politician may then choose a value of g_1 different from what he would choose in the non-election period, if by doing so he can significantly increase his chances of being reelected, represented by ρ. Given our assumption that $\overline{\omega} \to \infty$, a *people* politician would provide the maximum possible g_t even in the non-election period, so he would not change his policy in the election period. A *desks* policymaker (one characterized by $\underline{\omega}$), however, has two choices. He may choose $g_1(\underline{\omega}) = \underline{g}$, his non-election period optimum, but thus reveal his type. Or, he may choose $g_1(\underline{\omega}) = T > \underline{g}$ to influence the election outcome by mimicking a *people* policymaker, whom voters prefer given that g_2 is increasing in ω.[9] He will choose high g if the current utility benefit from choosing his non-electoral preferred policy (low g) is smaller than the benefit derived from increasing his re-election chances through high targeted expenditures. More formally, the *desks*-type incumbent will choose high targeted spending in the election period if

$$\Delta\Omega + a(T - \underline{g}) < \beta \left(\rho\left(T\right) - \rho\left(\underline{g}\right)\right) \left[\Delta\Omega\overline{p} + a(T - \underline{g}) + \chi + \Delta\Pi\right] \tag{7}$$

where $\Delta\Omega$ is the current utility gain to a policy maker of $\underline{\omega}$ type of choosing his preferred level of g, that is,

$$\Delta\Omega \equiv \underline{\omega}\left[V(\underline{g}) - V(T)\right]$$

so that

$$\Delta\Omega + a(T - \underline{g}) > 0$$

and $\Delta\Pi$ is the gain to the incumbent of imposing his own ideology:

[9] Since any choice of g_1 other than T reveals a policymaker to be of type $\underline{\omega}$, in a separating equilibrium he chooses $\underline{g}$.

$$\Delta\Pi = \frac{2\underline{\omega}\left(\pi^C - \pi^I\right)\left(\frac{\pi^C+\pi^I}{2} - \sum_{j=1}^{N}\pi^j\right)}{N} + \left(\pi^I - \pi^C\right)^2 \lesseqgtr 0$$

The first term is the gain (loss) to the incumbent from the implemented ideological policy being close (far) from that of the majority of voters .This reflects the politician's concern about social welfare. The second term is the incumbent's own utility gain from implemented policy representing his preferred ideological policy rather than that of his opponent. Having policy represent the politician's preferred ideology provides a motivation for wanting to be elected in addition to the exogenous value of holding office χ or the value of implementing one's preferred fiscal policy.

Note that the benefit from choosing high g in $t = 1$, given by the right-hand side of (7), depends on both the gain in re-election probability, $\rho(T) - \rho\left(\underline{g}\right)$, and the value of being re-elected. The latter includes not only the exogenous value of being in office, but also the value of having one's preferred fiscal policy and ideology in $t = 2$ rather than the challenger's. The value of having the incumbent's preferred g rather than the challenger's is non-zero only if the challenger is of a different type. This explains the presence of $\bar{p} = \Pr(\omega_P = \overline{\omega})$ in the term involving $\Delta\Omega$ in condition (7).

The following lemma summarizes the incumbent's behavior, where a type $\underline{\omega}$ incumbent may either pool with a type $\overline{\omega}$ or separate from him:

Lemma 1: *(Incumbent's Strategy)*

In the election period, the incumbent's optimal choice of targeted expenditures $g_1(\omega_I)$ is characterized by the policy rule

$$g_1(\omega_I = \overline{\omega}) = T$$

and

$$g_1(\omega_I = \underline{\omega}) = \left\{ \begin{array}{c} T \text{ if } \Delta\Omega + a(T - \underline{g}) < \beta\left(\rho(T) - \rho\left(\underline{g}\right)\right)\left(\Delta\Omega\bar{p} + a(T - \underline{g}) + \chi + \Delta\Pi\right) \\ T \text{ with probability } q \in [0,1] \text{ if } \Delta\Omega = \beta\left(\rho(T) - \rho\left(\underline{g}\right)\right)\left(\Delta\Omega\bar{p} + \chi + \Delta\Pi\right) \\ \underline{g} \text{ otherwise} \end{array} \right\}$$

2.3 Voting behavior and election outcomes

We now consider the choice problem of voters. Let $E\left[V\left(g_2\right) \mid P, g_1\right]$ be the voter's expectation of his utility from government expenditures in $t = 2$ if politician P is elected at the end of $t = 1$, conditional on observed g_1. He votes for the incumbent if he expects to receive higher utility in $t = 2$

under the incumbent than the challenger. That is, voter j votes for the incumbent if

$$E\left[V\left(g_2\right) \mid I, g_1^I\right] - (\pi^j - \pi^I)^2 > E\left[V\left(g_2\right) \mid C\right] - (\tilde{\pi}^j - \pi^C)^2 \tag{8}$$

where π^I and π^C are known, as is $g_2(\omega)$ for $\omega = (\overline{\omega}, \underline{\omega})$. However, j has imperfect information about both ω_I and ω_C. To infer the challenger's position, he has no other information than the ex-ante distribution of ω, summarized by the prior $\Pr(\omega_C = \overline{\omega}) = \bar{p}$. On the other hand, voters can use the realization of g_1 to update their information about the incumbent's type. Using Bayes' rule and the prior $\bar{p}$, voters form a posterior on $\overline{\omega}$, denoted $\bar{p}_1$, according to

$$\bar{p}_1(g_1^I) \equiv \Pr(\omega = \overline{\omega} \mid g_1^I) = \frac{\Pr(g_1^I \mid \omega = \overline{\omega}) \Pr(\omega = \overline{\omega})}{\Pr(g_1^I)} \tag{9}$$

Equation (9) captures the rationality of voting in response to election year fiscal policy. Specifically, since voters know a *people* type politician never chooses low expenditures ($\Pr(g_1 = \underline{g} \mid \omega = \overline{\omega}) = 0$), upon observing $g_t = \underline{g}$ they assign a zero probability to the incumbent having $\omega_I = \overline{\omega}$. That is,

$$\bar{p}_1(g_1^I = \underline{g}) = 0$$

On the other hand,

$$\bar{p}_1(g_1^I = T) = \frac{\bar{p}}{\bar{p} + (1 - \bar{p})q} \tag{10}$$

where $q = \Pr(g_1 = T \mid \omega = \underline{\omega}) \leq 1$ is the probability that a *desk*-type politician will choose $g_1 = T$ in the election period. Note the obvious characteristic of Bayesian updating: $\bar{p}_1(g_1^I = T) > \bar{p}$ iff $q < 1$; if $q = 1$, then $\bar{p}_1(T) = \bar{p}$.

The nature of voters' posterior beliefs reflects an essential characteristic of the political equilibrium. A politician provides high election year expenditures favored by voters in order to convince them that he would also choose high targeted expenditures after the election. However, this signal is only effective in affecting voters' perceptions if this political incentive is not so large that any politician would provide high electoral expenditures, no matter what his post-election preferences will be. Formally, setting $g_1^I = T$ has no effect on voting if $q = 1$.

We can now rewrite the condition under which voter j prefers the incumbent over the challenger,

equation (8), as

$$(\bar{p}_1(g_1) - \bar{p}) \left[V(T) - V(\underline{g})\right] > (\pi^j - \pi^I)^2 - (\pi^j - \pi^C)^2 \tag{11}$$

where the left hand side represents the expected gain in utility from consumption if the incumbent is reelected, and the right hand side represents the expected loss in utility from ideological issues if reelection occurs.

To illustrate, we consider the following simple example of voters' ideological preferences. Voters may hold one of three ideological positions: $\pi^j = \{\hat{\pi}^I, \hat{\pi}^M = \frac{\pi^I + \pi^C}{2}, \hat{\pi}^C\}$. Voters with $\pi^j = \hat{\pi}^I$ are the incumbent's *core* voters: they are sufficiently left of center that they vote for the incumbent even if he is known to be of the *desks* type, that is, even if $\bar{p}_1 = 0$. Analogously, voters with $\pi^j = \hat{\pi}^C$ are the challenger's *core* voters: we assume they are sufficiently right of center that they vote for the challenger even if the incumbent is known to be of the *people* type.[10] In the middle are voters with $\pi^j = \hat{\pi}^M$, *swing* voters in that they are ideologically as close to one candidate as they are to the other. They therefore vote on the basis of the fiscal policy they expect to see from the candidates. They vote for the incumbent if and only if they believe he is more likely than the challenger to have high ω, that is, iff $\bar{p}_1(g_1^I) > \bar{p}$. (If $\bar{p}_1(g_1^I) = \bar{p}$, swing voters are indifferent between the two candidates, and vote to reelect the incumbent with some probability r. This will be analyzed in more detail in section 2.4, where we study the equilibrium.) The crucial point is that swing voters may be led to vote for the incumbent by high pre-election targeted expenditure, since they assign some probability to the event that targeting reflects high preference of the incumbent for targeted spending, rather than purely electoral motives.

We summarize the behavior of voters in:

Lemma 2: *(Voting Strategies)*

In an election between the incumbent and a challenger, the optimal voting strategy of an individual j is given by:

1) If $\pi^j = \hat{\pi}^I$ individual j votes for the incumbent with probability 1

2) If $\pi^j = \hat{\pi}^C$ individual j votes for the challenger with probability 1

[10] Formally, using (11), one may derive $\hat{\pi}^I < \frac{\pi^I + \pi^C}{2} - \bar{p}\left[\frac{V(T) - V(g)}{2(\pi^C - \pi^I)}\right]$ and $\hat{\pi}^C > \frac{\pi^I + \pi^C}{2} + (1 - \bar{p})\left[\frac{V(T) - V(g)}{2(\pi^C - \pi^I)}\right]$.

3) If $\pi^j = \hat{\pi}^M \equiv \frac{\pi^C + \pi^I}{2}$ *individual* j *votes for the incumbent with probability* $r(g_1)$*, where*

$$r = \begin{array}{ll} r(g_t) = 1 & \text{if } \bar{p}_1(g_1) > \bar{p} \\ r(g_t) \in [0,1] & \text{if } \bar{p}_1(g_1) = \bar{p} \\ r(g_t) = 0 & \text{if } \bar{p}_1(g_1) < \bar{p} \end{array}$$

where $\bar{p}_1(g_1)$ *is derived from Bayes' rule, so that* $\bar{p}_1(\underline{g}) = 0$*, and* $\bar{p}_1(T) = \frac{\bar{p}}{\bar{p}+(1-\bar{p})q}$.

Given the voting strategies in Lemma 2, election outcomes are easy to characterize. Let ϕ_I, ϕ_C, and ϕ_M be the fraction of voters with π^j equal to $\hat{\pi}^I$, $\hat{\pi}^C$, and $\hat{\pi}^M$, respectively. The election is decided by simple majority rule.[11] The incumbent obtains ϕ_I of the votes if $\bar{p}_1 < \bar{p}$, $\phi_I + r\phi_M$ if $\bar{p}_1 = \bar{p}$, and $\phi_I + \phi_M$ of the votes otherwise. In other words, the incumbent is re-elected if $\bar{p}_1 > \bar{p}$ or if $\bar{p}_1 = \bar{p}$ and $\phi_I + r\phi_M \geq \frac{1}{2}$. For the time being, we assume that both voters and politicians have perfect information about ϕ_I, ϕ_M, and ϕ_C. We further assume that neither group of core voters constitute an absolute majority (that is, $\phi_I < \frac{1}{2}$ and $\phi_C < \frac{1}{2}$), meaning no candidate can win the election without getting the votes of at least some swing voters, and a candidate supported by all swing voters wins the election for sure.

The assumption that no group of core voters is a majority implies that an incumbent who chooses low pre-election targeted spending will not be reelected, since voters recognize him as being of the *desks* type (so that $\rho\left(g_1^I = \underline{g}\right) = 0$). If the incumbent chooses $g_1^I = T$ and $q = 1$ (a *desks*-type incumbent chooses $g_1 = T$ with certainty), then swing voters are indifferent between the two candidates ($\bar{p}_1(g_1^I) = \bar{p}$). Then, $\rho(T) = 1$ if and only if $\phi_I + r(g_1^I)\phi_M \geq \frac{1}{2}$, that is, if indifferent voters choose the incumbent with high enough probability, and there are enough swing voters. On the other hand , if $g_1^I = T$ and $q < 1$, then $\bar{p}_1(g_1^I) > \bar{p}$, then swing voters strictly prefer the incumbent and $\rho(T) = 1$, since $\phi_I + \phi_M > \frac{1}{2}$.

2.4 Political-economic equilibrium

We can now characterize possible political-economic equilibria. The equilibrium concept is Perfect Bayesian Equilibrium. A pair of strategies (for the incumbent and voters) is an equilibrium if: 1) the voter's strategy is optimal given his beliefs and the incumbent's strategy in choosing g_1, where beliefs are formed according to Bayes' rule (that is, his strategy satisfies Lemma 2); and 2) the incumbent's choice of g_1 is optimal given voting behavior and the implied election outcomes (that

[11] We assume, without loss of generality, that a tie is resolved in favor of the incumbent.

is, it satisfies lemma 1).

Given our assumptions, the strategies of a *people*-type incumbent ($\omega = \overline{\omega}$) and of both types of core voters ($\pi^j = \hat{\pi}^I$, $\hat{\pi}^C$) are trivial. We therefore discuss only the strategies of a *desks*-type incumbent ($\omega = \underline{\omega}$) and a swing voter ($\pi^j = \pi^M$). The strategies in lemmas 1 and 2 imply that there are only three possible types of equilibria:

Pooling Equilibrium – A *desks*-type incumbent chooses $g_1 = T$ with probability $q = 1$, and swing voters vote for the incumbent with probability $r(g_1) = \overline{r} \geq \frac{1/2-\phi_I}{\phi_M}$ if $g_1 = T$ and $r(g_1) = 0$ otherwise. Note that there do not exist pooling equilibria with $r(g_1 = T) < \frac{1/2-\phi_I}{\phi_M}$, since then a *desks*-type incumbent would be better off deviating to $\Pr(g_1 = T) = 0$.

Separating Equilibrium – A *desks*-type incumbent chooses $g_1 = T$ with probability $q = 0$ and swing voters vote for the incumbent if and only if $g_t = T$.

Mixed Strategy Equilibrium – A *desks*-type incumbent chooses $g_1 = T$ with probability $q \in (0, 1)$ and swing voters vote for the incumbent if and only if $g_t = T$.

Proposition 1 describes the equilibrium outcomes depending on whether a *desks* politician gives higher value to re-election or to using part of the budget to provide desks rather than expenditure favored by voters (that is, whether $\beta(\overline{p}\Delta\Omega + \chi + \Delta\Pi)$ is greater than or less than $\Delta\Omega$, the current utility gain to a policy maker of $\underline{\omega}$ type of choosing his own policy). As above, the Proposition focuses on the case where swing voters shift the outcome of the election.

Proposition 1 *(Political-Economic Equilibrium)*
When neither type of core voter constitutes an absolute majority, there are three possible political-economic equilibria, depending on parameter values:

Case 1) If $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) > \Delta\Omega + a(T - \underline{g})$*, the optimal strategy for a desks-type incumbent* ($\omega = \underline{\omega}$) *is* $\Pr(g_1 = T) = 1$*. The optimal strategy for swing voters* ($\pi^j = \pi^M$)*is to vote for the incumbent with probability* $r(g_1) = \overline{r} \geq \frac{0.5-\phi_I}{\phi_M}$ *if* $g_1 = T$ *and* $r(g_1) = 0$ *otherwise;*

Case 2) If $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) = \Delta\Omega + a(T - \underline{g})$*, the optimal strategy for the desks-type incumbent is* $\Pr(g_1 = T) = q \in [0, 1)$*. The optimal strategy for swing voters is* $r(g_1) = 1$ *if* $g_1 = T$ *and* 0 *otherwise;*

Case 3) If $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) < \Delta\Omega + a(T - \underline{g})$*, the optimal strategy for the desks-type incumbent is* $\Pr(g_1 = T) = 0$*. The optimal strategy for swing voters is* $r(g_1) = 1$ *if* $g_1 = T$ *and* 0 *otherwise.*

Proof: Note first that all of these sets of strategies constitute equilibria, since given the voters' strategy the incumbent's satisfies Lemma 1, and given the incumbent's strategy the voters' satisfies Lemma 2. Second, to prove that in each case only the type of equilibrium described exists, note that a separating (pooling) equilibrium cannot be supported if $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) > \Delta\Omega + a(T - \underline{g})(< \Delta\Omega + a(T - \underline{g}))$ because the incumbent would deviate to $g_t(\underline{\omega}) = T$ $(g_t(\underline{\omega}) = \underline{g})$. Moreover, an equilibrium where the incumbent plays mixed strategies can only exist if he is indifferent between the two policies, which happens iff $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) = \Delta\Omega + a(T - \underline{g})$. □

Proposition 1 implies that, provided re-election is valuable enough, a political budget cycle will exist in which: 1) expenditures targeted to voters are expected to be higher in an election than a non–election period; and 2) swing voters will rationally vote for an incumbent who provides higher targeted expenditures *even though they know that such expenditures may be electorally motivated.*

Specifically, the proposition shows that if re-election is valuable enough, a *desks*-type incumbent will choose $g_1 = T$ with some positive probability in an election period, while in the post-election period, he chooses $g_2 = \underline{g}$ with certainty. This implies that the unconditional expectation of government expenditure targeted to voters is higher in the pre-election period, compared to the expected value for other periods.[12] Conversely, non-targeted expenditures are expected to be lower prior to an election than in other periods. In other words, fiscal policy exhibits cycles with the timing of the election. These cycles take the form of a change in the composition of expenditures, which shift towards targeted expenditures in election periods.

Of course, a political budget cycle of this form will only appear if the incentives to influence the election are large enough. There are two parts to this requirement. The first refers to the preferences of politicians: electoral manipulation of the budget will only arise if $\beta(\overline{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) \geq \Delta\Omega + a(T - \underline{g})$, so that the incumbent assigns a large value to being reelected. There is, however, an additional necessary condition, namely that swing voters (those whose votes depend on fiscal policy) can change the outcome of the election ($\phi_I + \phi_M \geq \frac{1}{2}$). The existence of a political budget cycle therefore depends on the political environment, in particular in the potential electoral benefit from convincing swing voters of supporting the incumbent.

What is interesting about the apparently obvious condition on the need for a large fraction of swing voters is that, given rational behavior of voters in the model, fiscal manipulation is less effective

[12] The unconditional expectation value of targeted expenditure is given by $E(g_1) = T\left[\overline{p} + (1 - \bar{p})\Pr(g_1 = T \mid \underline{\omega})\right] + \underline{g}(1 - \bar{p})\Pr(g_1 = \underline{g} \mid \underline{\omega})$ in an election period, and $E(g_2) = T\overline{p} + \underline{g}(1 - \bar{p})$ in non-election period.

to "buy" the vote of any single individual precisely in the cases where there are more swing voters. In this simplified setting, where our assumptions imply that the probability of re-election $\rho(g_1)$ is either 0 or 1, this is reflected in the fact that $\bar{p}_1(T \mid \phi_I + \phi_M < \frac{1}{2}) = 1 \geq \bar{p}_1(T \mid \phi_I + \phi_M \geq \frac{1}{2})$.

Note further that the assumption that $\overline{\omega} \to \infty$ (and the implication that a fiscal expansion in an election year reflects *mimicking* by the $\underline{\omega}$ politician, whom swing voters would not prefer if his type were known) is a convenient modeling device, rather than essential to the existence of the political cycle. Were $\overline{\omega} << \infty$, a cycle might take the form of *signaling*, in that the $\underline{\omega}$ type would choose $\underline{g}$ in both election and non-election periods, while the $\overline{\omega}$ type would choose g_1 just high enough to separate himself in an election period. If this is higher than the g_2 he would choose in a non-election period, we have the same type of cycle qualitatively. This latter strategy is the one chosen by Rogoff (1990), in a model of signaling of competence. Rogoff's approach has been criticized in that it is the more competent candidate the one who engages in fiscal manipulation. However, we think this criticism is unfair, since one could model the competence problem as one where the less competent may want to mimic the other type, implying that the less desirable candidate is the one who engages in fiscal manipulation.

2.5 Asymmetric information about the electoral environment

So far, we have assumed ϕ_I, ϕ_M, and ϕ_C are common knowledge, in that the distribution of voter types is known both to voters and politicians. This assumption is clearly not realistic, as the electoral effectiveness of providing targeted spending to voters is not known with certainty, and candidates frequently have better information about it than the public does. We now relax this assumption, and show that the existence of asymmetric information about the political environment reinforces the incentives faced by incumbent officials to affect election outcomes through changes in fiscal policy. Introducing asymmetric information about political characteristics of voters will also eliminate the unsatisfactory feature that in some of the equilibria with electorally-motivated expenditures (more exactly in the pooling equilibrium), voters are indifferent between the challenger and the incumbent who targets them with spending. This is of course a result of our simplifying assumptions, so we do not take it as a prediction of the model that voters will strictly be indifferent. However, it does open the question of how do individuals actually vote when they are "indifferent", since one would not expect them to simply toss a coin to define which candidate to support.

We now assume that candidates running for election know more than voters about the effectiveness of targeted expenditures to generate votes. In our simple setting, we can account for this type of information asymmetry by assuming that the shares of core and swing voters are only known to the politician. In particular, we assume that voters assign a probability z that $\phi_C < \frac{1}{2}$. In other words, voters assign a probability $1 - z$ that the challenger's core voters are a majority, in which case a *desks*-type incumbent would have no incentive to choose $g_1 = T$.

Voters now characterize the incumbent's behavior by

$$\Pr(g_1 = T) = \bar{p} + z(1 - \bar{p}) \Pr(g_1 | \omega = \underline{\omega}, \phi_C < \frac{1}{2})$$

since in the event the politician is of the *desks*-type (with associated prior probability $1 - \bar{p}$), he would choose $g_1 = T$ only if $\phi_C < \frac{1}{2}$, which happens with probability z. After observing fiscal policy, voters update their beliefs about the incumbent's type following Bayes' rule, as captured by equation (9). Their posterior beliefs on the probability that a policymaker who chooses high expenditures is of the high type are now:

$$\bar{p}_1(g_1 = T) \equiv \Pr(\omega = \overline{\omega} \mid g_1 = T) = \frac{\bar{p}}{\bar{p} + z(1 - \bar{p}) \Pr(g_1 \mid \omega = \underline{\omega}, \phi_C < \frac{1}{2})} \tag{12}$$

Given $z < 1$, it is now the case that $\bar{p}_1(g_1 = T) > \bar{p}$ even if $\Pr(g_1 | \omega = \underline{\omega}, \phi_C < \frac{1}{2}) = 1$. That is, the incumbent can lead swing voters to prefer him over the challenger by choosing high targeted expenditures, even if a *desks*-type politician is as likely to choose high election-year targeted expenditures as a *people*-type politicians whenever $\phi_C < \frac{1}{2}$. The reason is simply that voters do not know whether the latter holds.

The above results on the equilibria for this case can be summarized as:

Proposition 2 *(Asymmetric Information about Voter's Preferences) In equilibrium, the optimal strategy for a swing voter is to vote for the incumbent with probability* $r(g_1) = \begin{Bmatrix} 1 \text{ if } g_1 = T \\ 0 \text{ otherwise} \end{Bmatrix}$. *The optimal strategy for the desks-type incumbent is* $\Pr(g_t = T \mid \phi_C) = q(\phi_C)$. *If* $\phi_C \geq \frac{1}{2}$ *then* $q(\phi_C) = 0$. *If* $\phi_C < \frac{1}{2}$ *then* $q(\phi_C) \begin{Bmatrix} = 1 \text{ if } \beta(\bar{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) > \Delta\Omega + a(T - \underline{g}) \\ = 0 \text{ if } \beta(\bar{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) < \Delta\Omega + a(T - \underline{g}) \\ \in [0, 1) \text{ if } \beta(\bar{p}\Delta\Omega + a(T - \underline{g}) + \chi + \Delta\Pi) = \Delta\Omega + a(T - \underline{g}) \end{Bmatrix}$.

This type of imperfect information captures an additional inference problem for voters. Voters need to make inferences about whether they are being targeted with spending because the politician

prefers such expenditures or because they are very effective to get votes. The fact that they assign some probability that the latter is not true gives even more room for the politician to influence the outcome of elections by providing more targeted expenditures prior to elections.

3 Some Empirical Evidence: Local Finances in Colombia

In this section, we present empirical evidence supporting the ideas presented in section 2. The model has two basic predictions. Lemma 1 states that fiscal manipulation may take the form of changes in the composition of spending prior to elections. Our data offer a higher level of disaggregation than earlier studies, allowing a closer look at the composition issue. Moreover, the conceptual framework provided by our model facilitates a more systematic analysis of the different categories of spending, an advantage over other studies that have considered disaggregate categories of spending. Lemma 2 considers the response of voters to pre-election changes in budget composition. Hence, we present empirical evidence not only on how elections affect budget composition, but also on how vote shares respond to these changes.

3.1 The pre-election composition of government expenditure

We concentrate first on election-year changes in fiscal policy. The model indicates that, for a given level of total spending, targeted expenditures should rise preceding an election, while other types of spending should contract. We therefore try to find evidence of pre-election increases in categories of expenditure that most likely reflect targeted spending, accompanied by contractions in other categories.

3.1.1 Targeted spending and elections

The difference between targeted and non-targeted spending is hard to identify in the data. However, opportunistic targeted expenditures, often termed "pork barrel spending", are most often associated in Colombia with infrastructure development projects: construction of roads, schools, water plants. Projects of this type are highly visible and benefit specific (yet potentially large) groups of voters. Section 3.2 below provides some evidence that these spending categories are indeed favored by voters. On the other hand, some current expenditures, such as purchases of supplies and

services, payments to other government agencies, and debt service, can be presumably cut without visibly hurting large groups of voters. Hence, given the predictions of our model, we would expect pre-election increases in the share of spending devoted to those categories that capture development projects, and cuts in the shares of at least some categories of current spending. [13]

Testing these hypotheses requires data on different types of government expenditures, covering observations in both election and non-election years. We extend the data compiled in Eslava (2006) to form a panel of annual data on government accounts and electoral outcomes for all municipalities in Colombia (close to 1100 cross-sectional units) over the period 1987 to 2002.[14] A unique feature of our data compared to those used in previous studies of Political Budget Cycles is the high level of disaggregation of expenditures into different categories, allowing us to distinguish different types of spending. We describe below the basic features of the data.

We choose this "cross-district" (literally, "cross-municipality" in our data set) approach in a single country, rather than the more usual cross-country strategy for two reasons. First, the political budget cycle effects we propose are most relevant at the local level, where spending can be targeted most efficiently. Second, the cross sectional variability of institutions is much harder to control for in a multi-country setting than it is for cross sectional units within the same country. Factors such as constitutional rules, national laws, electoral and judicial systems and monetary policy are all important determinants of the existence and strength of political budget cycles. These characteristics vary far more across countries than in districts within the same country.

Though the immediate reelection of mayors is banned in Colombia, electoral manipulation of fiscal policy is regarded as a usual political practice.[15] There are two main reasons why an incumbent mayor who cannot run for reelection has incentives to manipulate fiscal policy at the end of his term of office. First, an incumbent knows that his decisions affect his party's re-election chances (or those

[13] We do not argue that this correspondence of investment types of spending with targeted spending is appropriate for every country. In fact, in our model targeted expenditures correspond to the types of spending voters prefer, and those preferences may vary across countries. For instance, Persson and Tabellini (2003, chapter 8) argue that "proportional electoral rules give politicians stronger incentives to garner votes via broad policy programs, such as welfare state programs", so that in these democracies one would identify welfare spending as electoral transfers.

[14] We do not extend the data beyond 2002 for two reasons. First, the disaggregation of spending available for 2003 and later years is not entirely consistent with the previous data, due to a change in reporting requirements. Second, the "Fiscal Responsibility Law" introduced in 2003 changed the way local finances are managed.

[15] For instance, a widely-read Colombian newspaper quotes the "Contralor General" (who is in charge of overseeing spending by both the national and local governments) as saying, "It has been shown that in election years public spending and projects are used in a populist way [... so that] citizens should be watchful in order to guarantee that public projects are chosen rationally and at the right time, rather than following other (electoral) reasons." (*La República*, April 13th 2005, original in Spanish, authors' translation)

of the incumbent's preferred candidate).[16] Second, officials usually run for election to other posts in later years, or for re-election to the same post in the future, and their actions while in office are used by voters in future elections to assess their preferences and competence.

An important consideration in the analysis of local public finances in Colombia is the effect of the decentralization process, which started several decades ago but really took off after the adoption of a new Constitution in 1991. Two consequences of that process are particularly relevant for the empirical analysis we undertake below. First, the long run behavior of local expenditures is partly determined by the laws that govern decentralization.[17] Given the importance of this effect, our empirical analysis includes a control for the advance of fiscal decentralization over our sample period (see below). Second, the process of fiscal decentralization has implied that an important share of the resources transferred from the central government to the municipalities is earmarked. Since electoral transfers can only be paid for with resources that are not earmarked, earmarking may limit the possibilities for electoral manipulation. In our view, this provides an additional reason why politicians may finance electoral transfers by reducing other types of spending, reinforcing the composition effects we highlight in this paper. It is also important to mention that our finding of electoral changes in different types of local spending shows that the rigidities mentioned above are not sufficient to tie the hands of local officials completely. In other words, resources that are not earmarked, and types of spending that local officials can control (such as current spending), provide enough leeway for politicians to provide electoral transfers.[18]

3.1.2 Estimated equations

Following much of the literature, we estimate equations in which fiscal policy variables depend on the timing of elections, as well as other controls. The basic relationship to be estimated is:

$$f_{it} = a_i + b_1 f_{it-1} + \sum_k c_k x_{k,it} + d \cdot election_{it} + \varepsilon_{it} \tag{13}$$

[16] Our findings in section 3.2.2 confirm that the fiscal choices of an incumbent affect his party's performance in the following election.

[17] For instance, the responsibility of providing health and education services has been gradually transferred from the central government to the municipalities. This has implied sustained growth of local public spending in health and education.

[18] A list of sources of funding for the different categories of spending at the local level, explaining potential sources of inflexibilities, can be found in Eslava (2006).

where f is the share of government expenditure represented by a given spending category, a_i is a municipality effect, the x are control variables, and i is an index for the municipality. The variable $election_{it}$, a political dummy which captures the timing of elections, is the central variable of our analysis. It takes the value of one in periods preceding local elections, and 0 in all other periods. We time this dummy such that the pre-election period is the year previous to the election if the election takes place in the first half of the year, and the year of the election, if the election is held in the second half. The autoregressive specification is used in the literature on political cycles as a parsimonious representation of policy choices. We include additional controls (listed in Table 3) to account for as much variability in the data as we can.

We estimate a separate regression for (the log of) each type of government expenditure. That is, each type of government expenditure is a different f. In all regressions, we are interested in d, the coefficient that captures the effect of elections. Of the 16 years in our sample, 6 are local election years, when mayors and city councils are elected. Elections occur at predetermined dates. Table 1 contains a list of elections held between 1987 and 2002.[19]

3.1.3 Data

This section presents a brief description of the data we use. In terms of dependent variables, as mentioned above, we want to estimate (13) for different components of public expenditure. We use data from the Colombian *Contraloría General*, a public agency with the task of monitoring public finances. Our data correspond to the figures in the financial report each municipality files with the *Contraloría* annually. The general structure of the expenditure accounts, as well as basic statistics, are summarized in Table 2.

Total spending is divided into three main categories: Current Spending, Investment, and Debt Service. Within the category Current Spending, "General Payments" correspond to purchases of supplies, and "Personnel" covers payments of salaries to government employees, both those under long term contracts ("Permanent Personnel") and those under short term contracts ("Temporary Personnel"). The other subcategory of Current Spending is "Current Transfers", which in the Colombian government accounts refer to benefits to retired and temporary employees, and transfers

[19] Our period of estimation begins in 1987 because mayors are elected by popular vote only since 1988. However, we have data on all variables starting in 1984. These additional observations allow us to estimate (13) in differences and use lags of the regressors as instruments (see an explanation of estimation strategy below) without losing observations.

to other levels of government. It is important to note, thus, that Current Transfers do *not* correspond to the kind of transfers to specific groups that are often central to electoral manipulation. In the investment accounts, "Urban Infrastructure" includes construction of roads, marketplaces, and other public buildings financed by the local government. Infrastructure for the provision of water, energy, and communication services, is registered under "Water, Energy, and Communications". The categories of "Education" and "Health" include both the infrastructure used in these sectors, and services paid to provide education and health. "Housing" includes investment in housing projects.

The disaggregation of investment into subcategories is only available since 1990. Moreover, we use this disaggregation only if the reported spending in the different subcategories adds up to the total reported investment. This requirement is satisfied for about 80% of the observations with disaggregate reports for investment (number of remaining observations listed in Table 2). We follow an analogous strategy for current spending, which throws away less than 0.5% of the observations that report disaggregate current spending. Morover, we do not use information for municipalities that either do not report total spending, or that report figures for current spending, investment, and debt service that do not add up to total spending (6 observations).

We estimate (13) using each of the expenditure categories mentioned in Table 2 as a dependent variable. That is, we run a separate regression for each category of spending. Besides the categories listed in Table 2, we also examine subcategories of personnel payments (temporary vs. long-term employees) and current transfers (benefits to retired employees vs. transfers to other local government agencies), although only some municipalities report these disaggregations.[20] As mentioned before, we expect to find pre-election expansions in the components closely related to development projects such as construction of water, energy, and communications infrastructure, and construction of roads. We also expect to find that the share of spending devoted to some of the current types of spending falls before elections.

For each type of expenditure, Figures 1a and 1b show mean values – in hundreds of thousands of 1998 pesos – for election and non-election years. Notice that in general current expenditure categories have lower averages in election periods that in other periods. The opposite happens for the investment categories most closely related to the construction of infrastructure. While these observations suggest pre-election effects in the direction we expect, more systematic evidence is

[20] We only use the disaggregation of current transfers until 2001, because in 2002 the codifications of the components of current transfers changed.

obtained by estimating equation (13)

Table 3 lists the different controls we use in alternative specifications (across which we compare our results as a robustness check). Our controls include per capita GDP to account for economic activity, a time trend, and some social indicators that could be used as inputs in fiscal policy decisions. The latter include population and a poverty indicator known as "Unsatisfied Basic Needs". We also use alternative financial indicators as controls, trying to account for some constraints faced by local governments. These are particularly important in later years, when the law has required that local levels of government obtain authorization from the central government to increase expenditure if they have been running deficits in previous years. We use debt, and deficit in the previous year, constructed from the *Contraloría* data.[21] We also construct, and include as an additional control, an aggregate level Fiscal Dependence Indicator.[22] This indicator is increasing in the share of revenues represented by transfers from the central government (as opposed to the local government's own fiscal effort), accounting for the growing degree of fiscal decentralization at the national level. We interact the Fiscal Dependence Indicator with the trend variable, to differentiate the trend effects related to the process of fiscal decentralization from any other trend effects. Finally, we include Incumbent Advantage, measured by the percentage share of votes received by the incumbent in the last election. We try to account in this way for the greater degrees of freedom that a popular incumbent has when choosing fiscal policy.[23]

3.1.4 Estimation strategy

Given the presence of the municipality-specific effects, a_i, we estimate (13) in differences. Since this differentiation introduces endogeneity problems, estimation is done using the one-step GMM

[21] Our debt variable is debt accumulated since 1984 until t-1, since we only have fiscal information starting in 1984.

[22] The Fiscal Dependence index used in the regressions is calculated as:

$$FD_t = \ln(f_t) - \ln\left(\sum_{t=1984}^{2002} \frac{f_t}{T}\right)$$

where T is the total number of years, and f_t is the share of total revenue represented by revenue transfers from other levels of government, for the average municipality (we use the average municipality because the decentralization effect we try to account for is a process dictated by national law).

[23] GDP per capita data are from DANE (the Colombian Bureau of Statistics); Population and the Unsatisfied Basic Needs indicator were provided by the University of Los Andes' CEDE. We constructed Deficit, Debt, and Fiscal Dependence from the *Contraloría* data. For Incumbent Advantage, we use electoral results recorded in the National Planning Department Databases for the pre-1997 elections, and official results directly provided by the Registraduría Nacional for 1997 and 2000. More details on the construction of all these controls are in Eslava (2004).

estimation procedure suggested by Arellano and Bond (1991), which has become a standard approach to estimating dynamic panel data models. For each year, we include as instruments two lags of each endogenous variable. That is, we use $f_{i,t-2}$ and $f_{i,t-3}$ to instrument for $\Delta f_{i,t-1}$, and $x_{i,t-s-1}$ and $x_{i,t-s-2}$ to instrument for the $\Delta x_{i,t-s}$ for those x assumed contemporaneously correlated with the error term.

We assume the following sequential endogeneity constraints that guarantee the validity of these instruments:

$$E(\varepsilon_{it} f_{it-s}) = 0 \text{ for all } t \text{ and for } s \geq 1$$

$$E(\varepsilon_{it} elecdum_{iv}) = 0 \text{ for all } v, t$$

$$E(\varepsilon_{it} x_{it-w}) = 0 \text{ for all } t \text{ and for } w \geq \overline{a}$$

where $\overline{a} = 0$ for incumbent advantage, the time trend, and the fiscal dependence indicator, and $\overline{a} = 1$ for all other x. That is, the electoral dummy, the time trend, incumbent advantage at the beginning of the mayor's period, and fiscal dependence, are all assumed sequentially exogenous with respect to the error term. This is so because the timing of elections is pre-determined in Colombia, and fiscal dependence is a national-level process. All other controls are allowed to be contemporaneously correlated with the error term.

3.1.5 Results

Results for the political dummy $election_{it}$ in which we are interested are presented in Table 4. In the table, each of columns (1) through (4) represents a different set of controls, as detailed in Table 3. Each row corresponds to a different regression, with the dependent variable for each regression given in the first column. For instance, the first row reports the estimate of d when the dependent variable is the share of spending represented by current expenditure. (All dependent variables are expressed in logs.) Results marked with one, two, or three stars are significant at the 10%, 5%, and 1%, respectively.

The key result is that, independently of the set of controls used, there is a systematic change in the composition of expenditures in an election year in the expected direction. We find a decrease in the shares of some current expenditures before elections, specifically transfers and payments to temporary workers. The cut in the fraction of spending dedicated to current transfers seems to be

driven by lower transfers to retirees. We also find a pre-electoral contraction of general payments, and payments of debt service,although these two results should be taken with caution as some of the specification tests cast doubt on the validity of our instruments for these dependent variables (see below). Concurrent with this contraction we find an increase of the participation of development projects in the budget at the time of elections. In particular, total investment and its subcategories of urban infrastructure, water and energy infrastructure, and housing, all show pre-election increases.[24]

These changes in spending shares are not only statistically significant, but also important in size. Using specification 4, the participation in the budget of both urban infrastructure, and water and energy infrastructure, grows by around 8%, while that of housing projects increases by almost 30%, before elections. Overall, the investment share grows by about 3%. On the current spending side, we observe a contraction of 2% in the share represented by general payments, and a decrease of around 9% of the transfers share, for an overall contraction of the share of current spending of close to 1%. The disaggregate categories of transfers to retirees and payments to temporary personnel show decreases as a fraction of total spending that reach 50% and 30%, respectively.

For most spending categories, these changes are robust to the set of controls used. An important exception is the effect on personnel spending: while with specification 4 we identify an increase of close to 1.6%, with the other specifications we find a contraction. However, the finding that the subcategory of temporary personnel falls, while payments to permanent personnel increase as a fraction of total spending, is consistent for all specifications. In terms of magnitudes, results are also largely robust. The exceptions are current transfers, for which the estimated effect falls by close to 5% with other sets of controls, and investment, which shows larger increases in specifications (1)-(3).

Our results are also robust to some changes in the specification. The electoral effects discussed above are also present if we include two lags of the dependent variable, rather than just one, in equation (13). Also, as we discuss below, most of these effects are found if we weight the regressions by total size of the budget. In this case, however, the magnitude of most effects is larger, suggesting more electoral manipulation in larger cities.

Table 4a presents other results associated with the estimation of equation (13): the number

[24]Payments to permanent workers, a current spending ategory, also appear to increase prior to elections. Eslava (2006) suggests that a pre-electoral expansion of personnel expenditures would be consistent with the widespread perception that politicians in Colombia trade government jobs in exchange for political support. However, our finding of a pre-election expansion of these payments should be taken with caution, since our tests of autocorrelation of the residual show second order autocorrelation, and this casts doubts about the consistency of our estimates for this type of spending.

of observations, the estimated coefficient for the lag of the dependent variable, and the Z-statistic for a test of second order autocorrelation of the residual of the regression. The validity of using lagged values of the dependent variable as instruments depends on the residuals of equation (13) not displaying first order autocorrelation. This, in turn, implies that the residual of the differenced equation should display first order, but not second order autocorrelation. Table 4a shows that our estimation residuals satisfy this requirement in most cases. The exceptions are the regressions of general payments and debt service, which show second order autocorrelation of the error term. We thus interpret our evidence on these two variables as simply suggestive. There is second order autocorrelation of the residual for other dependent variables, but just in one of the four specifications used.

The analysis just discussed refers to the fractions of total expenditures represented by different spending categories, because our theoretical model only makes predictions for a given level of total spending. However, we also want to examine to what extent changes in composition extend to the levels of spending in each category. Table 5 shows the result of this exercise, with each dependent variable expressed in logs of the level of spending. Table 5a presents, for each of these regressions, the number of observations, the estimated coefficient for the lag of the dependent variable, and the Z-statistic for a test of second order autocorrelation of the residual.

We find an increase in the level of spending in many investment categories, in particular urban infrastructure, water and energy infrastructure, and housing. The change is of about 10% for the two former categories, and close to 30% for housing. Investment as a whole grows between 4% and 12%, depending on the specification. On the current spending side, we find that, as was the case with shares of total spending, the levels of payments to temporary personnel and transfers to retirees fall, by close to 40% in both cases. There is no significant change in the level of general payments, while the overall personnel payments grow, driven by payments to permanent workers. There is a negative electoral change in current transfers as a whole, but it is statistically significant only for specification (4), suggesting that the changes in the subcomponents of these category, which have opposing directions, may be offsetting. In summary, our results for the most disaggregate subcategories of spending are consistent between the specifications in shares and those in levels. There are differences in the directions of effects for some of the more aggregate categories, such as Personnel and General Payments.

One problem with our estimates is that Sargan tests reject the null hypothesis of the instruments being uncorrelated with the error term for most of our estimations. However, Sargan tests and estimates obtained with such large number of overidentifying restrictions as we use are known to have poor finite sample properties (Bowsher 2002, .Wooldridge 2001).[25] We therefore examine the robustness of our results to using similar GMM estimation techniques, but with the instrument matrix suggested by Anderson and Hsiao (1982). In contrast to Arellano and Bond (1991) the instrument matrix in the Anderson-Hsiao approach does not treat each year as a separate equation, resulting in a much smaller instrument matrix. We include two lags of each endogenous variable (in levels) in this exercise.

Results of this alternative estimation are presented in columns 1 and 2 of panel I of Table 6. The table only reports results of estimating specification (4), which includes all the available controls.[26] The results from tables 4 and 5 we have been emphasizing are reproduced quite closely by this alternative estimation approach and, as we comment below, perform better in tests of exogeneity of instruments. In particular, we find that investment grows before elections, driven by spending in urban infrastructure, water and energy services, and housing projects. Payments to personnel under permanent contracts also grow. These increases occur both for the level of spending in each category and for the share in total spending. In contrast, current transfers, especially those directed to retirees, and payments to temporary personnel fall before elections. Although for most categories of spending the sizes of these effects are not far from those obtained using the Arellano-Bond approach, we tend to identify larger effects using the Anderson-Hsiao approach.[27]

We also run weighted versions of the regressions, using total spending as a weight. This gives more importance to larger municipalities, with the idea that electoral politics in small towns may be driven more by practices such as clientelism than by attempts to influence the perceptions of voters about the incumbent party. Electoral effects in the directions reported above also emerge in this case. However, the weighted results are more imprecisely estimated, and generate coeffi-

[25] The relatively large number of periods (15) and endogenous variables (up to 5) in our estimations results in an instrument matrix with more than 60 instruments in the Arellano-Bond estimation, despite the fact that we limit to two the maximum number of lags included as instruments for each year.

[26] Results using the Andreson-Hsiao approach and other sets of controls are available from the authors upon request. As is the case with the specifications reported in table 6, exogeneity tests in these alternative estimations validate the set of instruments used for most types of spending. Moreover, estimated electoral effects are also largely consistent with the results discussed above for the Arellano-Bond approach.

[27] Interestingly, Judson and Owen (1999) have found Anderson-Hsiao estimates to have smaller bias than Arellano-Bond estimates with respect to the true coefficients , although the latter are more efficient.

cients that are larger in size. Results of estimating a weighted version of equation (13), using the instrument matrix suggested by Anderson and Hsiao (1981), GMM estimation techniques, and the set of controls of specification (4), are also reported in Table 6, columns 3 and 4 of panel I.[28] For the disaggregate categories of transfers to retirees, payments to temporary personnel, investment in urban infrastructure and in water and energy infrastructure, the estimated effects more than double those obtained in the unweighted estimation (although the estimated effect on water and energy is not significant). Similarly, the estimated cut in current transfers grows to about 30%. No significant effect on payments to personnel and general payments is identified in the weighted specification.

Panel II of Table 6 reports J-statistics for a Hansen test, where the null hypothesis is that the instruments are uncorrelated with the regression error. The J-statistics are distributed chi-square, with degrees of freedom equal to the number of instruments in excess of the endogenous variables. The regressions for which we cannot reject the null hypothesis of exogenous instruments at a 5% level of significance are marked with a "@" sign. We find that the instruments are valid for several dependent variables. Among these, are the subcategories for which we have been finding consistent electoral effects in the expected directions: transfers to retired workers, current transfers (except in column 1),payments to temporary workers, urban infrastructure, water and energy, and housing infrastructure. For investment, we cannot reject the null hypothesis at the 5% in two of the four columns (and in column 3 we would not reject it at the 1% level).

In summary, we find that before elections the composition of local government expenditures changes in a systematic way. Of the total resources spent by the government, less are used to pay for some current expenditures before elections, compared to other times. The categories of current spending that show reductions that are consistent across the different specifications are current transfers, driven by transfers to retirees, and payments to temporary personnel. The freed resources are used to pay for development projects, especially in the form of infrastructure (housing, utilities, and roads and other urban infrastructure).

A key question is whether the composition changes in fiscal policy that we have documented actually favor the incumbent in the elections, a feature that is central to our approach.[29] We now

[28] Weighted estimations using the Arellano-Bond approach are not standard, apparently due to a lack of consensus about the properties of such estimations.

[29] The pre-electoral change in the composition of spending we find would also be consistent with alternative explanations. For example, an incumbent who assigns some probability to losing re-election may choose to spend on investment projects that he favors but his replacement might not. This story, however, would not explain why voters would react positively to increases in investment spending as we find they do. Moreover, our results on voters' be-

turn to empirical evidence on the link between the government's budget and election outcomes.

3.2 Voting

Our approach has two broad implications about voter response to electoral fiscal policy. First (which is actually a motivating assumption behind our theoretical framework rather than a result of it), voters dislike deficits. Second, and most importantly, different categories of spending have differential effects on voting, with the incumbent deriving the most electoral benefit from "targeted" expenditures. In this section, we address these points empirically.

3.2.1 Data

The relevant definition of "incumbent" for the Colombian case is the incumbent *party,* since officials cannot run for direct re-election. (See the discussion in section 3.1.1.)We therefore use data on the share of votes obtained by each party in local mayoral elections from 1992 to 2000 (four elections).[30]

Politics in Colombia have been traditionally dominated by two major parties, Liberal and Conservative. While some candidates, particularly in the 1990's, ran under the banner of a myriad of different parties or political movements, many of these movements can be traced back to the traditional parties, and voters in each locality are frequently aware of those ties. In that sense, elections are still mainly a contest between these two major parties, although there are also two smaller left-wing parties and some truly independent political groups.

Given these political groupings, one challenge in the data is to identify which candidates are associated with one of the major parties, in order to calculate the appropriate shares of party votes. We rely on the linkages constructed in Eslava (2006), using information from external sources to match the different movements with the traditional party division between Liberals and Conservatives. Movements that were not successfully linked to one of the main parties are considered "independents" in our analysis. We calculate the share of votes obtained by the Liberal party, for example, as the sum of the shares obtained by all the smaller organizations linked to the Liberal

havior also imply that the described pattern of spending composition is optimal from the point of view of maximizing the incumbent's share of votes. Our findings thus suggest that pre-electoral changes in spending are at least partly explained by the attempt to attract voters in a way consistent with our model.

[30] For previous elections only the share of votes obtained by the winner of the election is available, so that full party shares cannot be calculated.

party. We note that there may be some measurement error due to the difficulty in identifying some matches (in particular, some organizations linked to one of the parties may have been mistakenly assigned as independents because their origins were not successfully traced).

3.2.2 The effect of fiscal policy on vote shares

Vote shares are modeled as a function of the fiscal choices of the incumbent party in the pre-election period. We attempt to distinguish the effects of different spending categories, given that our theoretical results suggest that voters see targeted expenditures differently than the rest of spending. Following the previous discussion, we treat investment spending as targeted expenditure, and current spending as non-targeted expenditure. Following the literature on voters as fiscal conservatives as discussed in the Introduction, we also consider the possible negative effect of deficits on vote shares. We run a regression of the following form:

$$\begin{aligned} votes_{pis} = \alpha_0 + \alpha_1 votes_{pis-1} + \alpha_2 invest_{is} + \alpha_3 current_{is} + \alpha_4 deficit_{is} + \alpha_5 gr_{is} \\ + (\beta_2 invest_{is} + \beta_3 current_{is} + \beta_4 deficit_{is} + \beta_5 gr_{is}) * inc_{pis-1} + v_{isp} \end{aligned} \tag{14}$$

The time indices, s, refer to election periods, so that s is the current election and $s-1$ the previous election. $votes_{pis}$ is the share (in percentages) of votes obtained by party p in city i in the election at s. The fiscal variables correspond to the election year (as defined above); we include the log of per capita investment spending ($invest_{is}$), the log of per capita current spending ($current_{is}$), and the per capita government deficit ($deficit_{is}$). The discrete variable inc_{pis-1} takes a value of 1 if the party p is in power before the election, and 0 otherwise.[31] Average GDP growth between $s-1$ and s (gr_{is}) is also considered to control for other observables that may affect voters' perceptions about the incumbent.

We interpret the coefficients $\beta_2, \beta_3, \beta_4$ as reflecting the advantage (or disadvantage) the incumbent obtains with respect to the challenger for increasing investment, current spending or the deficit before the election. Under the assumption that the error term v_{isp} captures the part of voting behavior that the politician cannot predict, fiscal policy decisions cannot be based on those innovations, and the policy variables included in the regression should satisfy the restriction of being orthogonal

[31] The direction of the results reported below is robust to letting the dummy equal -1 if the opposing party is in power before the election.

to the error term. Assuming that there are no components of v_{isp} that affect the incumbent's fiscal choices may indeed be strong, but data restrictions make addressing these concerns a quite difficult task, beyond the scope of this paper.

Results are reported in Table 6; column (1) reports estimates of (14), while column (2) reports results of a slightly modified version that includes party/state effects.[32] Robust standard errors are reported below the point estimates. Column (3) reports results of specification (14), but the spending variable *invest* is measured as a fraction of total spending (in this case, the corresponding fraction for current spending is not included in the specification due to concerns about collinearity of the regressors).

As previous studies have found for other countries (see the Introduction), and contrary to the implicit view in much of the empirical literature on political budget cycles, the results indicate that Colombian voters penalize the incumbent party for running high deficits. Furthermore, high capital expenditures (interpreted here as targeted spending) increase the share of votes obtained by the incumbent party relative to the challenger, while current ("non-targeted") expenditure has no significant effect.[33] From column (3), for instance, a ten percent increase in the share of spending on investment gives an advantage to the incumbent party of about 1% of vote shares with respect to the challenger. A two standard deviation increase in the deficit per capita (see Table 2) decreases the share of votes to the incumbent party by close to 6% with respect to that of the other party. These results are consistent with the view that voters dislike incumbents who run high deficits, while they value specific types of expenditures. They are also consistent with the results on electoral changes in the composition of spending discussed above which show incumbents increasing targeted spending before the elections, while they try to minimize consequent increases in the overall budget.

[32] A full fixed-effects version cannot be used due to restrictions of the voting shares data: for most localities we have no more than 1 usable observation.

[33] Tests of joint significance indicate that $\alpha_2 + \beta_2$ (the "absolute" effect of investment on the share of votes received by the incumbent) is positive and statistically significant, and $\alpha_3 + \beta_3$ is not significantly different from 0. The total effect of the deficit on the vote share of the incumbent ($\alpha_4 + \beta_4$) is negative and significant in the specifications of columns 1 and 2 of Table 7. For column 3, the joint test implies that $\alpha_4 + \beta_4$ is not significant. This could reflect the fact that in specification 3 we define investment as a share of total spending, so that we are in some way controlling for total spending, which is in turn one of the variables captured by the deficit measure.

4 Conclusions

We present an approach to political budget cycles highlighting changes in the composition rather than the level of government expenditures, a view consistent with arguments that voters dislike deficits and high government spending. Citizens value government spending on some goods but not others, and rational, forward-looking voters use the levels of government-provided goods to make inferences about the incumbent's fiscal preferences. Electoral manipulation of the budget therefore takes the form of shifting spending towards those goods voters as a whole prefer in the attempt to convince voters that the incumbent shares their spending priorities. Election-year shifts in the composition of the budget improve the incumbent's chances of being re-elected, since voters assign some probability to higher spending on goods they prefer reflecting the incumbent's true preference over types of spending rather than purely electoral motives.

Both the composition of public spending and the behavior of voters in Colombian municipalities are shown to be consistent with the predictions of the model. We find that, prior to elections, some components of spending that we believe are particularly attractive to voters expand significantly. These components are infrastructure spending, including road construction and construction of power and water plants. On the other hand, interest payments, transfers to retirees, and payments to temporary workers contract in election years. We also find that voters penalize the incumbent party for running large deficits before elections, and reward it for increasing the amount of targeted spending observed before the election that we argue is attractive to voters.

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Table 1.
Dates of elections for mayor

Election	election=1 in:
March 1988	1987
March 1990	1989
March 1992	1991
October 1994	1994
October 1997	1997
October 2000	2000

Table 2. Summary statistics for different types of expenditure

Type of Expenditure	Number of obs.	Levels		Shares of total spending	
		Mean	Standard deviation	Mean	Standard deviation
Total Expenditure	13,066	63,380	675,751	1.00	-
1. Current Expenditure	13,021	21,516	198,851	0.4187	0.2017
1.1. General Payments	12,803	4,155	21,586	0.1438	0.1057
1.2. Personnel Exp.	12,869	10,240	87,817	0.2139	0.1105
1.3. Current Transfers	11,845	6,876	99,926	0.0693	0.0735
2. Investment	12,832	35,533	426,852	0.5412	0.1928
2.1. Urban Infrastructure	5,651	9,800	117,445	0.1155	0.0809
2.2. Water, Energy, and Comunications	5,923	6,423	32,653	0.1269	0.0808
2.3. Housing	5,797	2,354	17,858	0.0296	0.0387
2.4. Education	7,895	11,009	161,984	0.1380	0.0705
2.5. Health	7,551	9,316	108,681	0.1075	0.0917
3. Debt service	9,272	9,923	94,109	0.0722	0.0665
Deficit per capita	16,235	-3.35	81.01		

All measures in hundreds of thousands of pesos of 1998. Sample restricted to years from 1987 and to observations without missing values for variables included in specification 1, as listed in Table 3. Shares of Current Expenditure, Investment, and Debt Service do not add up to one due to the presence of missing values.

Table 3. List of control variables

Control	Specification 1	2	3	4
Time Trend	x	x	x	x
First lag dependent variable	x	x	x	x
Log GDP per capita	x	x	x	x
Log unsatisfied basic needs index	x	x	x	x
Log population	x	x	x	x
First lag deficit		x		x
Debt accumulated from beginning of sample to t-1			x	
Fiscal dependence index (interacted with time trend)		x	x	x
Incumbent's vote share in pevious election				x

Table 4.
Effect of elections on the composition of total expenditure (shares)

Dependent Variable: Expenditure in this category as a fraction of total spending	1	2	3	4
1. Current Expenditure	-0.025 ***	-0.020 ***	-0.020 ***	-0.008
	(0.005)	(0.005)	(0.005)	(0.007)
1.1. General Payments	-0.040 ***	-0.028 ***	-0.028 ***	-0.020 *
	(0.009)	(0.009)	(0.009)	(0.011)
1.2. Personnel Expenditure	-0.023 ***	-0.015 ***	-0.015 ***	0.016 **
	(0.006)	(0.006)	(0.006)	(0.008)
1.2.1 Personnel Permanent	0.174 ***	0.194 ***	0.193 ***	0.148 **
	0.028	0.067	0.067	0.072
1.2.2 Personnel Temporary	-0.314 ***	-0.319 ***	-0.312 ***	-0.298 ***
	0.035	0.065	0.064	0.068
1.3. Current Transfers	-0.042 ***	-0.048 ***	-0.048 ***	-0.093 ***
	(0.017)	(0.017)	(0.017)	(0.022)
1.3.1 Transfers to retired workers	-0.442 ***	-0.509 ***	-0.510 ***	-0.505 ***
	(0.062)	(0.066)	(0.066)	(0.067)
1.3.2. Other Transfers	0.118 ***	0.125 ***	0.126 ***	0.154 ***
	(0.034)	(0.034)	(0.034)	(0.044)
2. Investment	0.075 ***	0.086 ***	0.086 ***	0.024 ***
	(0.010)	(0.010)	(0.010)	(0.008)
2.1. Urban Infrastructure	0.063 ***	0.095 ***	0.094 ***	0.086 ***
	(0.024)	(0.025)	(0.025)	(0.027)
2.2. Water, Energy, and Com.	0.100 ***	0.078 ***	0.070 ***	0.072 ***
	(0.025)	(0.025)	(0.025)	(0.028)
2.3. Housing	0.209 ***	0.259 ***	0.258 ***	0.270 ***
	(0.049)	(0.052)	(0.052)	(0.056)
2.4. Education	0.029 ***	-0.022	-0.024	-0.034 *
	(0.016)	(0.016)	(0.016)	(0.018)
2.5. Health	0.062 **	-0.035	-0.036	-0.026
	(0.024)	(0.024)	(0.024)	(0.026)
3. Debt Service	-0.154 ***	-0.165 ***	-0.164 ***	-0.205 ***
	(0.022)	(0.022)	(0.022)	(0.025)

This is an Arellano Bond Estimation. Robust standard errors in parentheses
Each row corresponds to a different regression, where the dependent variable is the fraction of total expenditure represented by a given category
Each column corresponds to a different set of controls as detailed in table 3
*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 4a. Other results from regression on the effect of elections on different types of expenditure (shares)

Dependent Variable: Expenditure in this category as a fraction of total spending	1			2			3			4		
	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-stat)	Obs.
1. Current Expenditure	0.247	0.979	11055	0.252	1.019	11055	0.252	0.999	11055	0.231	1.501	7783
	(0.021)			(0.021)			(0.021)			(0.026)		
1.1. General Payments	0.236	3.640 *	10792	0.238	3.543 *	10792	0.238	3.533 *	10792	0.236	2.469 *	7606
	(0.017)			(0.017)			(0.017)			(0.022)		
1.2. Personnel Expenditure	0.295	0.534	10898	0.300	0.834	10898	0.300	0.853	10898	0.278	1.045	7659
	(0.022)			(0.022)			(0.022)			(0.026)		
1.2.1 Personnel Permanent	-0.092	1.870	1221	-0.090	2.093 *	1221	-0.084	2.482 *	1221	-0.104	2.160 *	1124
	(0.110)			(0.133)			(0.134)			(0.139)		
1.2.2 Personnel Temporary	0.178	-0.193	1190	0.162	-0.266	1190	0.166	-0.222	1190	0.171	-0.579	1095
	(0.063)			(0.066)			(0.066)			(0.069)		
1.3. Current Transfers	0.178	0.516	9589	0.180	0.657	9589	0.179	0.646	9589	0.165	0.659	6613
	(0.020)			(0.020)			(0.020)			(0.024)		
1.3.1 Transfers to retired	0.169	0.900	755	0.156	1.680	755	0.144	1.640	755	0.056	1.330	705
	(0.125)			(0.129)			(0.121)			(0.097)		
1.3.2. Other Transfers	0.067	-0.900	4782	0.052	-1.010	4782	0.054	-1.090	4782	0.058	-0.440	3305
	(0.054)			(0.052)			(0.053)			(0.046)		
2. Investment	0.280	0.677	10445	0.263	0.371	10445	0.263	0.380	10445	0.237	2.436 *	7647
	(0.017)			(0.018)			(0.018)			(0.031)		
2.1. Urban Infrastructure	0.084	-1.966 *	2832	0.084	-1.702	2832	0.079	-1.805	2832	0.083	-1.564	2616
	(0.031)			(0.031)			(0.031)			(0.031)		
2.2. Water, Energy, and Com.	0.194	0.937	2954	0.182	0.737	2954	0.165	0.334	2954	0.168	0.794	2723
	(0.031)			(0.031)			(0.034)			(0.034)		
2.3. Housing	0.122	-1.911	1961	0.125	-1.828	1961	0.122	-1.874	1961	0.126	-2.190 *	1781
	(0.034)			(0.033)			(0.033)			(0.035)		
2.4. Education	0.197	2.311 *	3746	0.159	1.800	3746	0.159	1.852	3746	0.167	2.206 *	3438
	(0.030)			(0.029)			(0.029)			(0.030)		
2.5. Health	0.205	0.697	3453	0.144	0.461	3453	0.145	0.477	3453	0.143	0.965	3163
	(0.028)			(0.028)			(0.028)			(0.030)		
3. Debt Service	0.141	2.119	5517	0.140	2.088 *	5517	0.141	2.125 *	5517	0.125	2.026 *	4494
	(0.024)			(0.024)			(0.024)			(0.027)		

This is an Arellano Bond Estimation. Robust standard errors in parentheses

Each row corresponds to a different regression, where the dependent variable is the fraction of total expenditure represented by a given category

Each column corresponds to a different set of controls as detailed in table 3

* Reject null hypothesis of no second-order autocorrelation of error term at 5%

Table 5.
Effect of elections on different types of expenditure (levels)

Dependent Variable: Expenditure in this category (log)	1	2	3	4
1. Current Expenditure	0.011 *	0.017 ***	0.018 ***	0.006
	(0.006)	(0.006)	(0.006)	(0.007)
1.1. General Payments	-0.001	0.011	0.011	0.003
	(0.010)	(0.010)	(0.010)	(0.011)
1.2. Personnel Expenditure	0.021 ***	0.029 ***	0.029 ***	0.036 ***
	(0.005)	(0.005)	(0.005)	(0.007)
1.2.1 Personnel Permanent	0.192 ***	0.144 ***	0.138 ***	0.122 ***
	(0.031)	(0.042)	(0.040)	(0.042)
1.2.2 Personnel Temporary	-0.289 ***	-0.394 ***	-0.390 ***	-0.376 ***
	(0.032)	(0.056)	(0.056)	(0.057)
1.3. Current Transfers	-0.003	-0.009	-0.009	-0.077 ***
	(0.017)	(0.017)	(0.017)	(0.023)
1.3.1 Transfers to retired workers	-0.415 ***	-0.478 ***	-0.478 ***	-0.463 ***
	(0.063)	(0.067)	(0.067)	(0.068)
1.3.2. Other Transfers	0.164 ***	0.178 ***	0.178 ***	0.186 ***
	(0.033)	(0.033)	(0.033)	(0.044)
2. Investment	0.118 ***	0.128 ***	0.128 ***	0.045 ***
	(0.012)	(0.012)	(0.012)	(0.011)
2.1. Urban Infrastructure	0.131 ***	0.135 ***	0.134 ***	0.123 ***
	(0.026)	(0.028)	(0.028)	(0.029)
2.2. Water, Energy, and Com.	0.155 ***	0.108 ***	0.103 ***	0.098 ***
	(0.028)	(0.028)	(0.028)	(0.030)
2.3. Housing	0.262 ***	0.281 ***	0.277 ***	0.291 ***
	(0.048)	(0.052)	(0.052)	(0.056)
2.4. Education	0.075 ***	0.001	-0.002	-0.012
	(0.019)	(0.019)	(0.019)	(0.020)
2.5. Health	0.114 ***	-0.001	-0.002	0.006
	(0.026)	(0.025)	(0.025)	(0.028)
3. Debt Service	-0.106 ***	-0.119 ***	-0.119 ***	-0.174 ***
	(0.022)	(0.022)	(0.022)	(0.025)

This is an Arellano Bond Estimation. Robust standard errors in parentheses
Each row corresponds to a different regression, where the dependent variable is the log of expenditure in a given category
Each column corresponds to a different set of controls as detailed in table 3
*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 5a. Other results from regression on the effect of elections on different types of expenditure (levels).

Dependent Variable: Expenditure in this category	1			2			3			4		
	AR 1	Error term: second order autocor. (Z-	Obs.	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-	Obs.
1. Current Expenditure	0.310	3.908 *	11055	0.300	3.659 *	11055	0.299	3.640 *	11055	0.210	2.853 *	7783
	(0.032)			(0.031)			(0.031)			(0.045)		
1.1. General Payments	0.323	5.713 *	10792	0.318	5.423 *	10792	0.317	5.417 *	10792	0.285	3.896 *	7606
	(0.020)			(0.020)			(0.020)			(0.025)		
1.2. Personnel Expenditure	0.307	2.385 *	10898	0.299	2.319 *	10898	0.299	2.320 *	10898	0.250	1.229	7659
	(0.038)			(0.038)			(0.038)			(0.057)		
1.2.1 Personnel Permanent	0.167	1.737	1221	0.152	1.323	1221	0.174	1.715	1221	0.075	1.502	1124
	(0.289)			(0.279)			(0.285)			(0.279)		
1.2.2 Personnel Temporary	0.191	0.077	1190	0.148	0.454	1190	0.155	0.479	1190	0.143	0.682	1095
	(0.070)			(0.069)			(0.068)			(0.070)		
1.3. Current Transfers	0.194	1.910	9589	0.196	2.090 *	9589	0.196	2.113 *	9589	0.165	1.155	6613
	(0.021)			(0.021)			(0.021)			(0.025)		
1.3.1 Transfers to retired	0.163	0.890	755	0.141	1.680	755	0.130	1.620	755	0.059	1.280	705
	(0.118)			(0.128)			(0.118)			(0.097)		
1.3.2. Other Transfers	0.055	-0.750	4782	0.032	-1.100	4782	0.033	-1.170	4782	0.034	-0.550	3305
	(0.051)			(0.050)			(0.050)			(0.037)		
2. Investment	0.313	0.364	10445	0.301	0.094	10445	0.300	0.092	10445	0.266	0.639	7647
	(0.017)			(0.017)			(0.017)			(0.026)		
2.1. Urban Infrastructure	0.033	-3.430 *	2832	0.037	-3.295 *	2832	0.034	-3.361 *	2832	0.018	-3.297 *	2616
	(0.031)			(0.031)			(0.031)			(0.032)		
2.2. Water, Energy, and Com.	0.215	0.628	2954	0.204	0.239	2954	0.195	-0.050	2954	0.192	0.256	2723
	(0.033)			(0.032)			(0.034)			(0.034)		
2.3. Housing	0.125	-2.209 *	1961	0.131	-2.098 *	1961	0.127	-2.146	1961	0.134	-2.450 *	1781
	(0.032)			(0.032)			(0.031)			(0.034)		
2.4. Education	0.283	2.400	3746	0.237	1.627	3746	0.239	1.746	3746	0.247	1.917 *	3438
	(0.033)			(0.031)			(0.031)			(0.034)		
2.5. Health	0.277	3.380	3453	0.211	3.018 *	3453	0.213	3.064 *	3453	0.205	3.087 *	3163
	(0.030)			(0.029)			(0.030)			(0.032)		
3. Debt Service	0.182	2.893	5517	0.183	2.944 *	5517	0.184	2.952 *	5517	0.163	2.621 *	4494
	(0.028)			(0.028)			(0.028)			(0.032)		

This is an Arellano Bond Estimation. Robust standard errors in parenthesis

Each row corresponds to a different regression, where the dependent variable is the log of expenditure in a given category

Each numbered group of columns corresponds to a different set of controls as detailed in table 3

* Reject null hypothesis of no second-order autocorrelation of error term at 5%

Table 6. Effect of elections on different types of expenditure (Anderson-Hsiao matrix of instruments)

Dependent Variable: Type of expenditure	Panel I: Estimated Coefficients for Election Dummy				Panel II: J-Statistic (D.F)			
	Unweighted regressions		Weighted regressions		Unweighted regressions		Weighted regressions	
	Shares	Levels	Shares	Levels	Shares	Levels	Shares	Levels
	1	2	3	4	1	2	3	4
1. Current Expenditure	-0.011 *	0.023 ***	-0.031	-0.034 *	22.778	57.777	4.270 @	7.476
	(0.007)	(0.007)	(0.022)	(0.019)	(5)	(5)	(5)	(5)
1.1. General Payments	-0.003	0.043 ***	0.031	0.026	14.487	84.434	2.039 @	1.084 @
	(0.011)	(0.011)	(0.072)	(0.053)	(5)	(5)	(5)	(5)
1.2. Personnel Expenditure	-0.001	0.040 ***	0.052 *	0.035	56.837	33.035	4.488 @	1.621 @
	(0.008)	(0.007)	(0.027)	(0.051)	(5)	(5)	(5)	(5)
1.2.1 Personnel Permanent	1.804 ***	1.476 ***	2.613 ***	2.636 ***	9.528 @	9.670 @	13.948	15.933
	(0.157)	(0.101)	(0.285)	(0.429)	(5)	(5)	(5)	(5)
1.2.2 Personnel Temporary	0.020	-0.238 ***	-1.392 **	-1.517 ***	2.885 @	61.039	7.481 @	9.330 @
	(0.112)	(0.091)	(0.627)	(0.392)	(5)	(5)	(5)	(5)
1.3. Current Transfers	-0.084 ***	-0.050 **	-0.283 ***	-0.278 ***	18.054	6.974 @	4.120 @	3.766 @
	(0.024)	(0.024)	(0.108)	(0.107)	(5)	(5)	(5)	(5)
1.3.1 Transfers to retired workers	-0.791 ***	-0.772 ***	-1.037 **	-1.169 ***	5.088 @	3.440 @	5.484 @	4.030 @
	(0.157)	(0.169)	(0.426)	(0.422)	(5)	(5)	(5)	(5)
1.3.2. Other Transfers	0.169 ***	0.205 ***	0.195	0.186	6.053 @	4.331 @	1.821 @	1.890 @
	(0.049)	(0.048)	(0.169)	(0.170)	(5)	(5)	(5)	(5)
2. Investment	0.039 ***	0.074 ***	0.074 *	0.051	8.665 @	36.180	12.911	4.989 @
	(0.007)	(0.012)	(0.038)	(0.053)	(5)	(5)	(5)	(5)
2.1.Urban Infrastructure	0.067 *	0.115 ***	0.457 **	0.489 ***	8.448 @	4.635 @	6.872 @	6.750 @
	(0.039)	(0.041)	(0.184)	(0.159)	(5)	(5)	(5)	(5)
2.2. Water, Energy, and Com.	0.121 ***	0.150 ***	0.164	0.170	5.956 @	7.883 @	7.955 @	4.177 @
	(0.032)	(0.038)	(0.218)	(0.234)	(5)	(5)	(5)	(5)
2.3. Housing	0.458 ***	0.514 ***	0.314	0.164	2.743 @	1.995 @	3.365 @	3.590 @
	(0.077)	(0.080)	(0.286)	(0.268)	(5)	(5)	(5)	(5)
2.4. Education	0.004	0.025	-0.005	-0.013	30.713	46.158	3.436 @	12.413
	(0.023)	(0.026)	(0.101)	(0.131)	(5)	(5)	(5)	(5)
2.5. Health	0.111 ***	0.120 ***	0.044	0.035	27.475	52.413	3.590 @	7.539 @
	(0.038)	(0.039)	(0.064)	(0.082)	(5)	(5)	(5)	(5)
3. Debt Service	-0.202 ***	-0.159 ***	-0.161 **	-0.207 **	17.628	31.165	5.046 @	1.630 @
	(0.028)	(0.029)	(0.075)	(0.091)	(5)	(5)	(5)	(5)

This is a GMM estimation using two lags of each endogenous variable as instruments

Each row corresponds to a different regression, where the dependent variable is a given type of expenditure

All regressions use the controls listed under Column 4 of Table 3

Robust standard errors and degrees of freedom for J-Statistics in parentheses.

*** significant at 1%, ** significant at 5%, * significant at 10%.

@' H0 in Hansen test was not rejected at 5% (H0: Instruments uncorrelated with the error term)

Table 7. Effect of fiscal performance on vote shares

Dependent Variable: Votes share to party P (percentages)	Expenditure variables in per capita terms		Investment as share of total
Regressor	1	2	3
Constant	29.158 ***	-	28.870 ***
	(2.342)		(2.111)
Votes to P in past election	0.504 ***	0.389 ***	0.524 ***
	(0.028)	(0.026)	(0.026)
Deficit	0.026	0.028	0.023
	(0.019)	(0.017)	(0.015)
Deficit * incumbent	-0.047 **	-0.049 **	-0.037 *
	(0.023)	(0.021)	(0.019)
Investment Expenditure	-3.547 **	-0.914	-4.306 *
	(1.557)	(1.123)	(2.568)
Investment Expenditure *incumbent	6.059 ***	3.367 **	9.383 ***
	(1.775)	(1.424)	(3.130)
Current Expenditure	-1.241	0.130	-
	(1.824)	(1.399)	
Current Expenditure *incumbent	1.809	-1.504	-
	(1.787)	(1.384)	
GDP Growth	140.7787 ***	73.836 **	115.813 ***
	(39.271)	(31.749)	(40.038)
GDP growth*incumbent	-94.980 **	22.006	-60.929
	(44.364)	(33.459)	(45.684)
Observations	2032	2032	2052
R-square	0.230	0.195	0.228

Notes: this table presents the results of estimating equation (14)

Robust standard errors in parentheses.

Columns 1 and 3 report Pooled OLS results, Column 2 reports OLS results with state/party effects

Incumbent is 1 if party P is in power at the time of the election, 0 otherwise

*** Significant at 1% level, ** Significant at 5% level , * significant at 10% level.