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

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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.

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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 policy choices 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 immediately infer it 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 (2008) find in a large panel of countries that deficits either in the election year or over the term 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 (2005) argue that in studies which find widespread election-year increases in spending or deficits (see Shi and Svensson [2006] and Persson and Tabellini [2003]) the results are driven by "new democracies", that is, by the first few elections in countries that have made the transition to democracy. Once new democracies are removed from a larger sample, there is no statistically significant political deficit cycle among established democracies.[1]

One is left with the question of whether there is room for electoral manipulation of the budget in countries 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 and developed countries.

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] Other researchers have found political deficit cycles in specific developed countries and established democracies. As long as one believes that in some democracies voters punish incumbents who run deficits (as we in fact find for Colombia), there is a strong case for investigating the possibility of influencing voters via changes in the composition of the budget.

[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

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 composition of the budget rather than about his competence, that is, about the size of total expenditures. 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

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.

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 society, 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 some components of current spending contract. Furthermore, we investigate the effect of pre-election fiscal policy on the incumbent party's chances of being re-elected. 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] Khemani (2004) finds that Indian states spend more on public investment before scheduled elections that in other times, while they contract current spending, leaving the overall balance unchanged. 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 describing 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. "Incumbent" and "challenger" can refer to an individual or a party.

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 with 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 or party. 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 3.)

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 $Q \in \{I, C\}$ is in power may be written

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

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

Note that $V(g_t^Q)$ 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

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

where β is the discount factor, and $Q \in \{I, C\}$. 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 in period t is a weighted sum of voters' utility (that is, in per capita terms, $\frac{1}{N}\sum_j U_t^j(Q)$, where N is the constant population size), 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_P the weight a politician P puts on voters relative to desks, where for simplicity we assume that this is constant over time.[7] A politician $P's$ single-period objective at t when politician Q is in office in that period is

$$H_t^{P|Q} = \omega_P \left[V\left(g_t^Q\right) - \sum_{j=1}^{N} \frac{\left(\pi^j - \pi^Q\right)^2}{N} \right] + D_t^P \left[a(K_t^P) + \chi\right] - \left(\pi^P - \pi^Q\right)^2 \tag{4}$$

where $a(K)$ is an increasing, concave function with $a(0) = 0$, and D_t^P is a dummy variable which equals 1 if P is in office (*i.e.*, if $P = Q$) and 0 otherwise.[8] Note that the politician gets no utility

[7] In a multiperiod model, this assumption needs to be modified so that ω_{Pt} in an election year cannot be perfectly inferred from previous policy (see the discussion at the beginning of section 2.3 below), and voters are most interested in the preferences the incumbent has just before the election. For example, one could assume, analogous to the evolution of competence in Rogoff (1990), that ω_{Pt} follows an MA(1) process.

[8] Including the term $-\sum_{j=1}^{N} \frac{\left(\pi^j - \pi^Q\right)^2}{N}$ in the terms in brackets in (4) reflects the fact that concern for voter welfare includes ideological loss that each voter suffers when π^Q differs from her own preferred π^j. An alternative specification would consider only voter welfare from the public good g_t. Given that politician ideology is fixed, this change has no qualitative effect on the results, although it changes the value given to re-election. We prefer the specification in 4, as it grants that electoral manipulation arises even with benevolent politicians that give weight to all aspects of voters' utility.

from desks if he is not in office.

The weight ω_P, 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 known, by (4) at $t = 2$, to be a function of ω_P, so that rational voters vote on the basis of their beliefs about ω_I and ω_C. 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_I from observations on g_1, that is, on expenditures before the election. For simplicity of exposition, we assume that 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).[9]

In the election year, the $t = 1$ incumbent chooses g_1 trying to maximize his lifetime utility, which may be written

$$\Omega^I\left(g_1^I; \omega_I\right) = \omega_I H_1^{I|I} + \beta\rho(g_1^I)H_2^{I|I} + \beta\left(1 - \rho(g_1^I)\right) E_I H_2^{I|C} \tag{5}$$

where β is a discount factor and where I takes the expectation of $H_2^{I|C}$ as of period 1 since he does not know 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 $H_2^{I|I}$ in (4) by choice of g_2^P subject to the budget constraint (3). The solution is given by the following first-order condition

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

[9] 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.

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

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 we assume 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 the results do not depend on assuming that a "people-type" politician puts no weight on desks. As we discuss below, as long as $\overline{\omega} > \underline{\omega}$, one can show that politicians are expected to engage in pre-election increases in targeted expenditures.[10]

In the election period, the incumbent chooses g_1 to maximize the 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.[11] 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 with probability 1 if

$$\Omega^I\left(g_1^I = \underline{g}; \omega_I\right) < \Omega^I\left(g_1^I = T; \omega_I\right)$$

which may be written

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

where ΔH is the current-period utility gain to a policy maker of $\underline{\omega}$ type of choosing his preferred

[10] As is standard in signaling models, a type at one extreme (here the type with the highest ω) always "plays his own type", that is, does not choose higher g in an election than a non-election year. With more than two types, all but the highest ω would distort their election year expenditures.

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

level of g, that is,

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

and $\Delta\Pi$ is the gain to the incumbent of policy π reflecting his preferred ideology. (Since $\underline{\omega}V(\underline{g}) + a(T-\underline{g}) > \underline{\omega}V(T) + a(0)$, $\Delta H > 0$.)

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. $\Delta\Pi$ may be written

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

The first term in this equation 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 and could be either positive or negative. The second term is the incumbent's own utility gain from having the implemented policy representing his preferred ideological policy rather than that of his opponent.

The left-hand side of (7), ΔH, is the utility gain in period 1 to a type $\underline{\omega}$ policymaker of choosing $\underline{g}$ instead of T. The term in brackets on the right-hand side is the gain to the incumbent of his being in office in period 2 rather than the challenger. It consists of three terms: the single period gain ΔH from having his preferred fiscal policy, multiplied by the probability $\bar{p}$ that the challenger will choose a different policy; the exogenous value χ of holding office; and, the value to the incumbent of his preferred ideology, that is, $\Delta\Pi$. This is multiplied by the increased probability of re-election, $\rho(T) - \rho\left(\underline{g}\right)$, associated with choosing T in period 1 rather than $\underline{g}$, all discounted by β.

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

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

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

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

where π^I and π^C are known, as is $g_2\left(\omega\right)$ 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 $\bar{p}_1(T) = \bar{p}$.[12]

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.[13] 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.

[12] With repeated elections, one would need to assume that ω evolves over time (as discussed in footnote 7 above) so that previous elections do not reveal type and political budget cycles are a recurrent phenomenon.

[13] 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 $\hat{\pi}^C > \frac{\pi^I + \pi^C}{2} + (1 - \bar{p})\left[\frac{V(T) - V(g)}{2(\pi^C - \pi^I)}\right]$.

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

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.[14] 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 $\phi_I + \phi_M > \frac{1}{2}$.

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

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 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 $\beta(\overline{p}\Delta H + \chi + \Delta\Pi)$ is greater than or less than ΔH, 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 decide 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 $\beta(\overline{p}\Delta H + \chi + \Delta\Pi) > \Delta H$*, 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 $\beta(\overline{p}\Delta H + \chi + \Delta\Pi) = \Delta H$*, 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 $\beta(\overline{p}\Delta H + \chi + \Delta\Pi) < \Delta H$*, 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 equilibrium cannot be supported if $\beta(\overline{p}\Delta H+\chi+\Delta\Pi) > \Delta H$ because the incumbent would deviate to $g_1(\underline{\omega}) = T$. Similarly, a pooling equilibrium cannot be supported if $\beta(\overline{p}\Delta H + \chi + \Delta\Pi) < \Delta H$ because the incumbent would deviate to $g_1(\underline{\omega}) = \underline{g}$. Moreover, an equilibrium where the incumbent plays mixed strategies can only exist if he is indifferent between the two policies, which happens iff $\beta(\overline{p}\Delta H + \chi + \Delta\Pi) = \Delta H$. □

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.[15] 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 $\beta(\overline{p}\Delta H+\chi+\Delta\Pi) \geq \Delta H$, so that the incumbent assigns a large value to being reelected. There is, however, an additional necessary

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

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 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 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* $q(\phi_C) \begin{Bmatrix} = 1 \text{ if } \beta(\bar{p}\Delta H + \chi + \Delta\Pi) > \Delta H \\ = 0 \text{ if } \beta(\bar{p}\Delta H + \chi + \Delta\Pi) < \Delta H \\ \in [0,1) \text{ if } \beta(\bar{p}\Delta H + \chi + \Delta\Pi) = \Delta H \end{Bmatrix}$.

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, using data for Colombia. 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 increase before 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 in Colombia

The difference between targeted and non-targeted spending is in general difficult to identify in data. However, in Colombia opportunistic targeted expenditures, often termed "pork barrel spending", are most often associated 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, and payments to other government agencies, 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.[16]

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.[17] A unique feature of our data compared to those used in most 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

[16] We do not argue that this correspondence of investment 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.

[17] 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.

vary far more across countries than in districts within the same country.

Though the immediate re-election of mayors is not allowed in Colombia, electoral manipulation of fiscal policy is regarded as a usual political practice.[18] 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 of the incumbent's preferred candidate).[19] 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.

Another concern when using data on Colombian municipalities to study political budget cycles is whether mayors have the ability (in addition to the incentive) to manipulate spending choices. In the last few decades, and especially since the adoption of a new Constitution in 1991, Colombia has experienced a process of decentralization of public expenditures. As part of this process, the responsibility of providing health and education, as well as other services, has been gradually transferred from the central government to the municipalities. These expenditures are partly funded with resources collected by the Central Government and transferred to local governments. Since a significant share of these resources is earmarked, and electoral transfers can only be paid for with resources that are not earmarked, the possibilities for electoral manipulation may be limited. The are several reasons why we believe this argument does not invalidate the use of Colombian data in our empirical work. First, in our view revenue earmarking 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. Second, 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.[20] Moreover, our estimation controlS for the process of spending decentralization

[18] For instance, a widely-read Colombian newspaper quotes the "Controller General" (who is in charge of overseeing spending by both the national and local governments) as saying, "It has been proven 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)

[19] Our findings in section 3.2 confirm that the fiscal choices of an incumbent affect his party's performance in the following election.

[20] A list of sources of funding for the different categories of spending at the local level can be found in a Web Appendix, available through Drazen's webpage at www.econ.umd.edu/~drazen/. The list explains potential sources of inflexibilities.

described above.

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:

$$f_{it} = a_i + b_1 f_{it-1} + \sum_k c_k x_{k,it} + \sum_l c_l y_{l,t} + d \cdot election_t + \varepsilon_{it} \tag{13}$$

where f is a given spending category, a_i is a municipality effect, the x are control variables, i is an index for the municipality, and t represents years. The variable $election_t$, 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 below) to account for as much variability in the data as we can; some of these controls (the $x_{k,it}$) vary at the municipality level, others (the $y_{l,t}$) vary only over time.

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. Six elections took place between 1987 and 2002: March 1988, March 1990, March 1992, October 1994, October 1997, and October 2000.[21]

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 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

[21] 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.

$x_{i,t-s-2}$ to instrument for the $\Delta x_{i,t-s}$ for those x assumed contemporaneously correlated with the error term.

We assume the following regressors are sequentially exogenous with respect to the error term: the electoral dummy, the aggregate level controls $y_{l,t}$, and incumbent advantage at the beginning of the mayor's period (see below). All other controls are allowed to be contemporaneously correlated with the error term. Note that the timing of elections is pre-determined in Colombia, and our aggregate controls should not be affected by local spending.

3.1.3 Data

This section presents a 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 1. All of our expenditure variables are expressed in hundreds of thousands of 1998 pesos, where the CPI has been used as deflator.

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 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 1). We follow an analogous strategy for current spending, which throws away less than 0.5% of the observations that report disaggregate current spending. Moreover, 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 1 as the dependent variable. That is, we run a separate regression for each category of spending. Besides the categories listed in Table 1, 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.[22] 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. We do not report results of estimating equation (13) using "Debt Service" as the dependent variable, as payments of interest on debt are generally considered out of the control of the incumbent. For each type of expenditure, Table 1 shows unconditional mean values – in hundreds of thousands of 1998 pesos – for election and non-election years.

Our controls include, first, variables that vary across municipalities as well as over time ($x_{k,it}$ in equation (13)). Among these, we consider population and per capita GDP of the state in which the municipality is located, both in logs. We also include lagged deficit, trying to account for financial 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. Finally, we include Incumbent Advantage, measured by the percentage share of votes received by the incumbent in the last election. In this way we try to account for the greater degrees of freedom that a popular incumbent has when choosing fiscal policy.[23]

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

[23] State GDP per capita data are from DANE (the Colombian Bureau of Statistics); Population was provided by the University of Los Andes' CEDE. We constructed Deficit, Debt, and Fiscal Dependence from the Contraloría data.

We also have a set of aggregate level controls, which vary only over time ($y_{l,t}$ in equation (13)). These are log aggregate GDP, interest rates, a time trend, and an aggregate level Fiscal Dependence indicator. The Fiscal Dependence index 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.[24] We also 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.

3.1.4 Results

Results for the political dummy $election_{it}$ in which we are interested are presented in Table 2.[25] In the table, each row corresponds to a different regression, with the dependent variable for each regression listed in the first column. For example, the first row reports the estimate of d when the dependent variable is current expenditure. (All dependent variables are expressed in logs.) Results marked with one and two asterisks are significant at the 10% and 5% levels, respectively. Besides the controls listed above, the estimation reported in Column 1 also controls for total expenditure, so the coefficient for the political dummy reported in this column can be interpreted as the election year effect on the share of spending in a given category. Table 2a presents other results associated with the estimation of equation (13): 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 of the regression.

The key result in Column 1 is that 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

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.

[24] 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).

[25] Results for all of the covariates for regressions reported in Tables 2-3, as well as robustness tests including two lags of the dependent variable in the specification, are available through Drazen's webpage at www.econ.umd.edu/~drazen/.

in the fraction of spending dedicated to current transfers seems to be driven by lower transfers to retirees. 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 health, water and energy infrastructure, and housing all show pre-election increases.[26]

These changes in spending shares are not only statistically significant, but significant in magnitude as well. Before elections the budget share of water and energy infrastructure grows by 5% (or 0.05 log points), that of housing projects increases by almost 20%, and investment in health grows by 7%. Overall, the investment share grows by about 2%. On the current spending side of the budget, we observe a contraction of around 10% of the transfers share. The disaggregated categories of transfers to retirees and payments to temporary personnel show decreases as a fraction of total spending of 40% and 19%, respectively.[27]

Column 2 of Table 2 shows results of estimating (13) without controlling for total spending, showing to what extent changes in composition extend to the *levels* of spending in each category. We find an increase in the level of spending in many investment categories, in particular urban infrastructure, water and energy infrastructure, health, and housing. The change is between 6% and 10% for the former three categories, and close to 20% for housing. Investment as a whole grows about 7%. On the current spending side, we find that, as was the case with shares of total spending, the levels of payments to temporary personnel, current transfers, and transfers to retirees fall, by close to 20%, 10% and 40%, respectively. These results are in general consistent with those obtained in the specifications that control for total spending.

One potential problem with all of the estimates reported above is that Sargan tests reject the null hypothesis of the instruments being uncorrelated with the error term for most of our estimations, and some of the residuals display second order autocorrelation. A finding such as this may cast doubt on the validity of the instruments. However, Sargan tests and estimates obtained with such large number of overidentifying restrictions as we use are known to have poor finite sample properties

[26] Payments to permanent workers, a current spending category, 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.

[27] These results are robust to controlling for lagged debt rather than deficit, and for a poverty indicator ("Unsatisfied Basic Needs). The latter attempts to measure social problems potentially addressed through government spending. Our results are also largely robust to including two lags of the dependent variable, rather than just one, in equation (13). All of those results can be found in the Web Appendix mentioned above.

(Bowsher 2002, Wooldridge 2001).[28] 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 3. The electoral effects we discussed above based on Table 2 are reproduced by this alternative estimation approach. For these variables, the regressions using the Anderson-Hsiao approach to instrumenting perform better in tests of exogeneity of instruments than the Arellano-Bond regressions.[29] We find that investment grows before elections, driven by spending in water and energy infrastructure, health and housing projects (although the effect on water and energy spending is not statistically significant.) 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. The magnitudes of the significant effects are in general similar to those reported in Table 2; the subcategories of investment are an exception, showing larger effects using the Anderson-Hsiao matrix of instruments.[30]

Panel II of Table 3 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, those for which we cannot reject it at the 1% level are marked with a "‡". 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

[28] 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.

[29] The validity of our results on electoral effects is confirmed not only by the estimation reported in Table 3, but also by estimations using the Arellano-Bond approach and alternative sets of controls. With several sets of such controls we find the same electoral effects, while not rejecting the validity of the Arellano-Bond instrument matrix (results available in the Web Appendix referenced above). We keep the reported set of controls as our baseline specification because it is the most complete one. It is worth mentioning that the validity of our instruments is rejected consistently (that is, for most sets of controls and in Table 3) for permanent personnel. We thus interpret our results on this variable as simply suggestive.

[30] 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.

expected directions: transfers to retired workers, current transfers, payments to temporary workers, water and energy, housing infrastructure, and health. For investment as a whole, we can reject the null hypothesis, so the instruments cannot be considered valid.

In summary, we find that before elections the composition of local government expenditures changes in a systematic way. Of total government expenditure, less is on 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.[31] We now turn to empirical evidence on the link between the government's budget and election outcomes.

3.2 The effect of fiscal policy on vote shares

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

[31] 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 (see below). Moreover, our results on voters' behavior 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.

elections).[32]

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 could be traced back to the traditional parties, and voters in each locality were frequently aware of those ties. In that sense, over our estimation period elections were mainly a contest between these two major parties, although there are also two smaller left-wing parties and some truly independent political groups. To identify which candidates are associated with one of the major parties, we rely on the linkages constructed in Eslava (2006), using information from external sources to match the smaller parties with the traditional party division between Liberals and Conservatives.[33]

3.2.2 Estimation and results

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

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

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 (Liberal or Conservative) 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 party p is in power before the election, and 0 otherwise. Average GDP

[32] 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.

[33] The list of party correspondences can be found in the Web Appendix mentioned above.

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 to the error term. We make that assumption here.

Results are reported in Table 4; column (1) reports estimates of (14), while column (2) reports results of a slightly modified version that includes party/state effects.[34] 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). Robust standard errors are reported below the point estimates.

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.[35] 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 (standard deviation of close to 80) 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 captured by investment. They

[34] A full fixed-effects version is not estimated due to restrictions of the voting shares data: for many localities we have no more than 1 usable observation. Some results discussed below, however, control for a fixed effect related to how swing voters are in the municipality.

[35] 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.

are also consistent with the results on electoral changes in the composition of spending discussed above which suggest incumbents increase targeted spending before the elections, while they try to minimize consequent increases in the overall budget.

Although the assumption that fiscal choices are orthogonal to v_{isp} in equation (14) may seem strong, the precise potential sources of correlation between the fiscal variables and the expected share of votes that we can think of would not imply biases in our conclusions (although some of them could be associated with biases in the sizes of the coefficients). One possibility is that some parties have members that are better managers, and that those parties both deliver more spending and obtain more votes. However, we control for the share of votes in the past election in equation (14), which implies that v_{isp} should not reflect factors that make the share of votes of party p in municipality i systematically higher or lower. Another potential reason why the fiscal choices made by the incumbent may be correlated with v_{isp} arises if there are factors that we do not control for that affect his expectations of his party's share of votes in the following election, and if those factors influence his fiscal decisions. In particular, suppose that the incumbent's party looks weak for the following election. Our model would suggest that the incumbent could change the composition of spending to improve his party's chances of re-election, increasing investment and reducing current expenditure. In this case the estimated coefficient for the interaction of investment and the incumbent dummy would be biased downwards, while the coefficient for the interaction with current spending would be biased upwards. These biases would strengthen our conclusions, since we actually estimate a positive coefficient for investment under the incumbent party, and an insignificant coefficient for current spending by the incumbent party.

3.2.3 Swing versus non-swing municipalities

The model discussed in section 2 also implies that fiscal choices should have electoral consequences primarily in swing municipalities. We take that implication to the data by looking at how our results on voting behavior differ across municipalities according to how "safe" they appear to be for one of the main parties.

We divide our sample of municipalities into two groups according to how "tilted" the vote totals are toward one of the parties, each group containing approximately half of the municipalities. We define the more "non-swing" municipalities as being those where one of the two main parties

won at least three out of four elections recorded in our data (or at least 65% of the elections, for municipalities for which we have less than four observations). The threshold of 65% of election is chosen so that approximately 50% of municipalities are classified into each group. We then create the dummy variable *swing*, with a value of one if the above criterion is not satisfied and a value of zero otherwise. Note that our definition does not really separate municipalities into swing and non-swing, but into those that are more and less swing. Note also that our swing dummy does not vary over time.

The obvious estimation strategy involves interacting each of the coefficients of regression model (14) with one of our swing dummies. This strategy, however, results in a very large number of coefficients to be estimated, making successful identification unlikely. We thus chose to estimate the following simplified model, where we only use observations on incumbent parties:

$$\begin{aligned} votes_{Pis} &= \alpha_0 + \alpha_1 votes_{Pis-1} + \alpha_2 invest_{is} + \alpha_3 current_{is} + \alpha_4 deficit_{is} + \alpha_5 gr_{is} \\ &\quad + (\alpha_{0s} + \alpha_{2s} invest_{is} + \alpha_{3s} current_{is} + \alpha_{4s} deficit_{is}) * swing_i + v_{isp} \end{aligned} \tag{15}$$

Here, P is the incumbent party (we consider only observations where one of the two main parties is incumbent; most of our observations satisfy this condition). Note that we interact each of the fiscal-related terms in this equation with our swing dummy. We expect to find that the effects of fiscal choices are more significant in the more swing municipalities.

Results are reported in Table 5. Column (1) shows estimated coefficients for the basic model, where all municipalities are treated equally, independent of their level of commitment to one party. These results confirm the findings reported in column (1) of Table 4: the share of votes the incumbent party receives is negatively affected by deficits, positively affected by public investment, and not affected by current spending. Column (2) shows results of estimating the model interacted with the swing dummy. These results indicate that, consistent with our theoretical model, the effects of deficits and public investment are stronger in the more swing municipalities. In fact, we only find significant effects for the municipalities that we identify as being more swing.[36] The estimated effect of current spending on voting, on the other hand, is not consistent with our priors: we find a

[36] These results are robust to using an alternative definition of swingness, where "non-swing" municipalities are those where one of the main parties received more than 50% of the votes in each of the elections recorded in our data. They are also robust to limiting our sample to municipalities for which we have information on at least three elections. These alternative sets of results are included in the Web Appendix mentioned above.

significant and negative effect for swing municipalities, and a positive effect for the others. While we have no good intuition for this result, it should be noted that it is not a robust finding: the probit model discussed below shows no effect of current spending on voting in either group of municipalities, and this is also the case if we estimate equation (15) using a different criterion, based on the fraction of votes won by each party, to identify swing municipalities.

The empirical model in equation (15) can also be modified to estimate the effect of fiscal choices on the probability that the incumbent wins the election. To do this, we estimate (15) through a probit estimation, where the dependent variable is one if the incumbent party won the election and zero otherwise. Table 6 reports marginal effects obtained from this estimation. Column (1) estimates the modified model for all municipalities, while columns (2) and (3) restrict the sample to swing and non-swing municipalities, respectively, using the swing dummy described above.[37] We find that the probability that the incumbent wins in one of the more swing municipalities depends positively on past public investment, and negatively on the deficit, while current spending has no effect. We find no effect of fiscal variables on the probability of reelection in non-swing municipalities; this lack of effect for non-swing municipalities also dominates the results for the overall sample (column 1). Results of the probit estimation are thus also consistent with the effects we find on vote shares, and consistent with our theoretical model.

It is worth noting that measuring the level of "swingness" of a given municipality is conceivably problematic. In our theoretical model swing voters are those whose votes are decided by "ideology", where the latter is meant to capture factors other than fiscal policy. Identifying swing districts through election outcomes has thus the shortcoming that such outcomes incorporate the effects past fiscal policy may have had. Our swing dummy may be identifying as swing precisely those districts where fiscal choices made voters consistently support the incumbent, rather than districts where voters are "ideologically" committed to one party. If this is the case, the result that variables affect votes only in swing districts is tautological. Even if so, however, there is no reason to expect ex ante that, as we find, the signs of the effects of different fiscal variables coincide with our predictions. We thus see our results as in fact supporting the theoretical model.

[37] We estimate the model separately for swing and non-swing municipalities, rather than pooling all observations and including interactions with the swing dummies. We do this to avoid the difficulties involved in calculating marginal effects in discrete models with interactions (Ai and Norton, 2003).

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. Summary statistics for different types of expenditure

Type of Expenditure	Number of obs.		Levels		Shares of total spending	
	Election Years	Non-election Years	Election Years	Non-election Years	Election Years	Non-election Years
			Mean (St. Dev.)		Mean (St. Dev.)	
Total Expenditure	5,248	7,818	53,767	69,833	1.00	1.00
			(588,560)	(728,415)		
1. Current Expenditure	5,224	7,797	18,702	23,401	0.458	0.393
			(178,126)	(211,594)	(0.216)	(0.187)
1.1. General Payments	5,148	7,655	3,899	4,328	0.158	0.134
			(22,112)	(21,224)	(0.115)	(0.097)
1.2. Personnel Exp.	5,184	7,685	9,271	10,893	0.228	0.204
			(81,279)	(91,965)	(0.118)	(0.104)
1.3. Current Transfers	4,764	7,081	5,560	7,761	0.081	0.062
			(82,690)	(110,010)	(0.085)	(0.063)
2. Investment	5,111	7,721	30,129	39,111	0.515	0.558
			(371,871)	(459,632)	(0.202)	(0.184)
2.1. Urban Infrastructure	2,049	3,602	10,314	9,507	0.119	0.113
			(110,567)	(121,197)	(0.080)	(0.081)
2.2. Water, Energy, and Comunications	2,155	3,768	7,116	6,026	0.135	0.122
			(34,612)	(31,475)	(0.087)	(0.077)
2.3. Housing	2,106	3,691	2,382	2,339	0.033	0.028
			(15,228)	(19,200)	(0.040)	(0.038)
2.4. Education	2,840	5,055	10,538	11,274	0.138	0.138
			(158,566)	(163,888)	(0.070)	(0.071)
2.5. Health	2,702	4,849	8,416	9,818	0.100	0.111
			(102,810)	(111,826)	(0.083)	(0.096)
3. Debt service	3,431	5,841	8,883	10,533	0.065	0.076
			(82,371)	(100,368)	(0.059)	(0.070)
Deficit per capita	6,305	9,930	-4.22	-2.79		
			(29.034)	(100.966)		

Standard errors in parentheses

All measures in hundreds of thousands of pesos of 1998. Sample restricted to years from 1987 to 2002.

Shares of Current Expenditure, Investment, and Debt Service do not add up to one due to the presence of missing values.

Table 2. Effect of elections on the composition of total expenditure

Dependent Variable: Expenditure in this category	1 Controlling for total spending		2 Not controlling for total spending	
1. Current Expenditure	-0.003		0.016	**
	(0.006)		(0.007)	
1.1. General Payments	-0.018		0.019	*
	(0.011)		(0.011)	
1.2. Personnel Expenditure	0.030	**	0.045	**
	(0.009)		(0.007)	
1.2.1 Personnel Permanent	1.947	**	1.698	**
	(0.096)		(0.096)	
1.2.2 Personnel Temporary	-0.193	**	-0.224	**
	(0.060)		(0.061)	
1.3. Current Transfers	-0.099	**	-0.090	**
	(0.025)		(0.025)	
1.3.1 Transfers to retired workers	-0.434	**	-0.424	**
	(0.073)		(0.076)	
1.3.2. Other Transfers	0.130	**	0.147	
	(0.047)		(0.048)	
2. Investment	0.018	**	0.067	**
	(0.007)		(0.011)	
2.1. Urban Infrastructure	0.024		0.072	**
	(0.026)		(0.028)	
2.2. Water, Energy, and Com.	0.050	*	0.088	**
	(0.027)		(0.031)	
2.3. Housing	0.181	**	0.217	**
	(0.059)		(0.060)	
2.4. Education	-0.009		0.016	
	(0.018)		(0.020)	
2.5. Health	0.073	**	0.096	**
	(0.030)		(0.031)	

The table presents results of estimating equation (13) through an Arellano-Bond estimation.
Each row corresponds to a different regression, where the dependent variable is the log of expenditure in a given category. Robust standard errors in parentheses.
Results in Column 1 control for total spending, results in Column 2 do not.
** significant at least at 5%, * significant at 10%.

Table 2a. Other results from regression on the effect of elections on different types of expenditure

Dependent Variable: Expenditure in this category	1 Controlling for total spending			2 Not controlling for total spending		
	AR 1	Error term: second order autocor. (Z-stat)	Obs.	AR 1	Error term: second order autocor. (Z-	Obs.
1. Current Expenditure	0.108	1.202	7783	0.134	2.070 *	7783
	(0.037)			(0.044)		
1.1. General Payments	0.165	1.268	7606	0.195	2.913 *	7606
	(0.021)			(0.025)		
1.2. Personnel Expenditure	0.249	0.950	7659	0.285	1.875	7659
	(0.061)			(0.060)		
1.2.1 Personnel Permanent	0.009	-2.392 *	1124	-0.244	-2.243 *	1124
	(0.118)			(0.258)		
1.2.2 Personnel Temporary	0.160	-1.034	1095	0.206	-0.503	1095
	(0.075)			(0.077)		
1.3. Current Transfers	0.159	0.637	6613	0.171	0.885	6613
	(0.026)			(0.026)		
1.3.1 Transfers to retired	0.174	1.541	705	0.227	1.419	705
	(0.102)			(0.109)		
1.3.2. Other Transfers	-0.043	-1.054	3305	0.034	-0.474	3305
	(0.092)			(0.034)		
2. Investment	0.104	2.162 *	7647	0.198	0.854	7647
	(0.019)			(0.028)		
2.1. Urban Infrastructure	0.051	-0.929	2616	0.013	-2.080 *	2616
	(0.031)			(0.035)		
2.2. Water, Energy, and Com.	0.129	0.826	2723	0.167	0.586	2723
	(0.031)			(0.037)		
2.3. Housing	0.084	-2.121 *	1781	0.112	-2.508 *	1781
	(0.036)			(0.038)		
2.4. Education	0.081	0.943	3438	0.137	0.242	3438
	(0.029)			(0.036)		
2.5. Health	0.093	1.035	3163	0.120	2.010 *	3163
	(0.028)			(0.030)		

The table presents results of estimating equation (13) through an Arellano-Bond estimation.

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

Robust standard errors in parentheses. Results in Column 1 control for total spending, results in Column 2 do not.

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

Table 3. 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)			
	Controlling for total spending 1		Not controlling for total spending 2		Controlling for total spending 1		Not controlling for total spending 2	
1. Current Expenditure	0.000		0.022	**	20.532		47.258	
	(0.006)		(0.007)		(5)		(4)	
1.1. General Payments	-0.008		0.038	**	26.722		74.439	
	(0.011)		(0.011)		(5)		(4)	
1.2. Personnel Expenditure	0.039	**	0.044	**	57.445		42.848	
	(0.007)		(0.007)		(5)		(4)	
1.2.1 Personnel Permanent	3.509	*	2.975	*	12.843	‡	11.291	‡
	(1.993)		(1.629)		(5)		(4)	
1.2.2 Personnel Temporary	-1.057	**	-1.475	**	4.932	†	5.411	†
	(0.219)		(0.128)		(5)		(4)	
1.3. Current Transfers	-0.110	**	-0.079	**	14.182	‡	4.780	†
	(0.025)		(0.025)		(5)		(4)	
1.3.1 Transfers to retired workers	-0.298	*	-0.315	**	6.231	†	3.949	†
	(0.164)		(0.154)		(5)		(4)	
1.3.2. Other Transfers	0.127	**	0.155	**	3.870	†	2.907	†
	(0.051)		(0.052)		(5)		(4)	
2. Investment	0.018	**	0.075	**	57.675		49.487	
	(0.007)		(0.011)		(5)		(4)	
2.1.Urban Infrastructure	-0.022		-0.028		18.786		10.397	‡
	(0.049)		(0.057)		(5)		(4)	
2.2. Water, Energy, and Com.	0.052		0.046		9.553	†	11.415	‡
	(0.040)		(0.052)		(5)		(4)	
2.3. Housing	0.358	**	0.400	**	2.818	†	1.878	†
	(0.094)		(0.094)		(5)		(4)	
2.4. Education	0.002		0.020		21.223		38.182	
	(0.030)		(0.037)		(5)		(4)	
2.5. Health	0.167	**	0.164	**	7.335	†	18.405	
	(0.045)		(0.053)		(5)		(4)	

The table presents results of estimating equation (13) through GMM 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.

Results in columns labeled 1 control for total spending, results in columns labeled 2 do not.

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

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

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

‡' H0 in Hansen test was not rejected at 1% (H0: Instruments uncorrelated with the error term).

Table 4. Effect of fiscal performance on vote shares for the two main parties

Dependent Variable: Votes share to party P (%)	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	

The table presents 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 5% level , * significant at 10% level.

Table 5. Incumbent party's vote share as a function of fiscal outcomes. Swing vs.non-swing municipalities.

Dependent Variable: Vote share to incumbent party P (%)	1		2		
			Individual effects		Joint Effects [p-value]
Votes to P in past election	0.685	**	0.498	**	
	(0.034)		(0.035)		
Swing			-29.850	**	
			(2.196)		
Deficit	-0.022	*	-0.011		-0.0533**
	(0.013)		(0.009)		[0.0098]
Deficit*Swing			-0.042	*	
			(0.023)		
Investment Expenditure (per capita, pc)	2.642	**	-0.662		9.237**
	(0.937)		(1.010)		[0.0000]
Investment Expenditure (pc)*Swing			9.899	**	
			(1.868)		
Current Expenditure (per capita, pc)	-0.599		2.965	**	-3.488**
	(1.080)		(1.408)		[0.0038]
Current Expenditure (pc)*Swing			-6.453	**	
			(1.834)		
GDP Growth	55.750	**	53.940	**	
	(23.920)		(20.310)		
Constant	12.900	**	41.410	**	
	(3.173)		(3.577)		
Observations	1369		1369		
R-squared	0.227		0.397		

The table presents results of estimating equation (15) using Pooled OLS. Robust standard errors in parentheses.
Swing: The municipality is non-swing if one of the two parties won more than 65% of the elections observed in the data for the particular municipality.

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

Table 6. Probability of incumbent winning the election as a function of fiscal outcomes. Swing versus non-swing municipalities.

Dependent Variable: 1 if the incumbent party was re-elected, 0 otherwise	All Municipalities		Swing Municipalities		Non-Swing Municipalities	
	1		2		3	
Votes to P in past election	0.0077	***	0.0059	***	0.0022	***
	(0.0007)		(0.0010)		(0.0007)	
Deficit (per capita)	-0.0002		-0.0009	**	0.0000	
	(0.0002)		(0.0005)		(0.0001)	
Investment Expenditure (per capita)	0.0255		0.0953	***	-0.0122	
	(0.0175)		(0.0318)		(0.0185)	
Current Expenditure (per capita)	-0.0139		-0.0495		0.0277	
	(0.0234)		(0.0340)		(0.0244)	
GDP Growth	0.1150		-1.3301	*	1.2036	**
	(0.4520)		(0.7072)		(0.4274)	
Observations	1462		652		809	

The table presents marginal effects from a probit model on the probability of the incumbent being reelected. Standard errors in parentheses.

Swing: The municipality is non-swing if one of the two parties won more than 65% of the elections observed in the data for the particular municipality.

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