Expenditure Visibility and Voter Memory:

A compositional approach to the political budget cycle in Indian States, 1959 - 2012

by

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Abstract

In this paper we argue that the search for opportunism in government budgets is weakened by the absence of a strong reason for why such expenditures should be restricted solely to the period leading into the next election. Here we argue that the need to fulfill a set of election platform promises in combination with the characteristic that some budget items better attract the attention of voters (with deteriorating memories) will lead to a predictable reallocation of budgetary spending across the life of a government. Our test for a predictable pattern rather than a specific period of election motivated spending uses capital expenditures as our example of more politically visible budgetary items and a data set of 14 Indian states over 54 years (1959/60 – 2012/13). The results of the hypotheses that capital expenditures as a ratio of both total government expenditure and government consumption alone should rise across the entire governing interval are found to be consistent with this hypothesis and provide a fit with the data that is marginally better than more traditional models that use either all pre-election periods or only the pre-election year of scheduled elections to test for opportunism. The absence of a similar interval effect on aggregate state expenditures and on the net budgetary position suggests that evidence of political interaction with the budget is more likely to be found in its composition rather than in its overall level or in the size of its surplus or deficit.

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> *Economists are increasingly coming to understand…how the performance of a market economy depends upon, among other things, the stock of knowledge possessed by participants concerning such items as product prices and wage rates. Analogously, it would seem reasonable that the performance of the public economy would depend upon the stock of knowledge possessed by voters. (Richard Wagner, 1976)*

I. Introduction

While differences in information costs have been used by writers such as Wagner to motivate concepts like fiscal illusion and the political business cycle, in this paper we use knowledge differences across voters to produce a different type of election cycle. In our case incumbent politicians use differences in the degree of visibility across different types of government outputs together with voters' less than perfect memory to change the timing of expenditures over the governing cycle to maximize support. In doing so we do not argue that this incentive to win electoral support based on information differences necessarily produces excessive government size or a budget cycle that is biased towards deficits (although that could easily happen), but rather that a predictable pattern of spending will arise over the term of the governing cycle that results in an election cycle within the government's overall budget.

The idea that an incumbent political party will seek to manipulate policy to achieve electoral advantage is so intuitive that the presumption of a political business cycle seems entirely natural. Yet despite this, theoretical and empirical support has been hard to come by, at least at the aggregate level. On the conceptual side, many have questioned the assumption underlying the original Nordhaus (1975) article that voters have myopic expectations, noting that under rational expectations the ability to predictably fool voters disappears. A rational for a political budget cycle has been re-established, but now based on signalling rather than opportunism (Rogoff and Sibert, 1988). On the empirical side, evidence consistent with the use of opportunism either in the form of economic outcomes or underlying fiscal policies has also been hard to find (McCallum, 1978). The consensus view, as summarized in Drazen (2001), is that evidence of a link between aggregate spending and fiscal deficits with the election cycle is broadly lacking. Shi and Svensson (2006) note however that when developing economies are separated from all other economies evidence consistent with a political budget cycle does emerge. This finding is also present in the work of Brender and Drazen (2005) who attribute the cycle to information obstacles in newer democracies that lack electoral experience and/or quality institutions to monitor government performance.

In the case of India's state governments, the particular focus of our inquiry, the lack of electoral experience and/or a shortage of electoral awareness and political involvement has not been a concern.[1] Perhaps for this reason, evidence for the existence of a political business cycle has been particularly lacking. While arguing that many dimensions of political influence do matter for the choice of government policies, neither Khemani (2004, p. 128) nor Dash and Raja (2013, p.305-6) find any evidence suggesting that aggregate state expenditures or budget deficits have increased in the year of an election. Similarly, Chaudhuri and Dasgupta (2006) find "contrary to the predictions of Rogoff and Sibert (1988), there is no election year increase in public spending" (p.650). At the federal level, Sen and Vaidya (1996) find no evidence of an election cycle in output or consumer price index (CPI), a measure of inflation, but do find that some budget items and the overall budget deficit do respond to elections.

[1] See Khemani (2004) for evidence of widespread voter registration and participation in Indian state elections.

The difficulty of finding an election cycle at the level of aggregate expenditure has led to the search for evidence of opportunism or targeted interest group spending within the subcomponents of aggregate spending, particularly those items that are highly visible such as road or other forms of infrastructure construction. Khemani (2004) highlights the case of road construction in Indian states and finds evidence that small manipulations in investment and taxation do take place to benefit narrow interest groups. Kneebone and McKenzie (2001) and Gonzales (2002) find a similar electoral pattern of response in infrastructure and construction spending in Canada and Mexico, respectively. Even within the subcategory of capital construction differences can be found. In Columbia, Drazen and Eslava (2010) find specific budget items like water and energy infrastructure and housing projects provide evidence of pre-election spending increases. Alternatively, Potrakfe (2010) finds evidence of electoral response in the visibility of health expenditures. Klomp and de Haan (2013) find electoral response in agricultural support, while Besley and Burgess (2002) in their study of government responsiveness in the Indian states find that it is flood relief, rather than agricultural support, that is particularly responsive to elections. Again for the Indian states, Chaudhuri and Dasgupta (2006) find that a number of specific budget items such as capital account education expenditures are as much as fifteen percent higher in scheduled election years.

While examples such as these have established empirically the feature that certain components of the government budget can exhibit an election cycle, our contribution to this literature is to focus specifically on the question of why budget expenditures designed either to manipulate voters or target specific interest groups take place at the end of the governing cycle rather than being spread more uniformly throughout the governing interval. To answer this question we use the feature that some budget items are inherently more visible to voters and then follow Tanzi and Davoodi (1997), Schuknecht (2000), and Keefer and Knack (2002) in focusing on capital expenditures as the budget item with greater voter visibility and/or better targeting potential. However attracting better voter attention and/or having greater targeting potential does not explain why spending on these items must be concentrated at election time. That is, a road to my door should win my vote whether it is delivered at the beginning or the end of a governing cycle. Hence to explain why spending later in the term has more electoral impact, we assume that voters' memories for specifics deteriorate over time, perhaps captured best in the expression "what have you done for me lately?" These two features then combine to explain how a cycle can arise in the composition of the government's budget rather than its aggregate size (see also Herzog and Haslanger (2014)). In essence the story that we model below takes the following form. Each political party offers to the electorate a program of policies and outputs designed to win support from the median voter. By comparing alternative party platforms and, for the incumbent, comparing realizations to previous promises, voters elect a particular party. Even though the winning party wishing re-election is constrained by the promises made in the previous election campaign, the party is still free to alter the timing of its delivery to achieve maximum political advantage. This we argue produces a cycle whereby politically visible (capital) expenditures are raised towards the end of the electoral cycle relative to the beginning. Although we place less emphasis on it, similar reasoning could be used to explain the existence of a deficit cycle in which the early years of a governing term are devoted to accumulating surpluses that can be spent with greater electoral impact in the period leading into the next election.[2]

[2] Should voters be particularly sensitive to the existence of deficits and accumulating debt, deficits could be run early in the governing tenure to allow credit for pre-election surpluses while still achieving overall spending promises (see, for example, Pelzman (1992)).

The paper proceeds with a formalization of this reasoning. In Section II we present a model of an election cycle in capital expenditure that allows for the possibility that the budget cycle could become a business cycle. The emphasis is on the factors needed to produce a cycle in the composition of government spending. Section III discusses the data and variables used in the paper. This is followed by an empirical section that tests the prediction of a cycle in the capital component of Indian state budgets over the 1959 and 2012 time period. The analysis uses an error correction process across fourteen states to find the pattern of capital spending an established characteristic of the long run. The same model is then used to assess whether an election cycle can be found either in aggregate state expenditures or in the pattern of changes in state budget surpluses and deficits. The final section presents our conclusions.

II. A Political Budget Cycle Model of the Composition of Government Spending

We begin by building a model where changes in government spending can have real effects as the foundation of a political budget cycle. Using c(t), m(t), y(t), g_1(t), g_2(t) and p(t) to represent household consumption, the money supply, two types of government spending, real output, and the price level all at time t, we posit a Lucas-type of private production economy with a government sector that sets the levels of two types of government spending. Here the central bank is assumed to be independent and sets the money supply separate from fiscal considerations. Such an economy can be described as one where:

$$c^d(t) = \alpha + \theta\big(m(t) - p(t)\big) + u(t), \tag{1}$$

$$y^s(t) - g_1(t) - g_2(t) = c^s(t) = y_F + \beta\big(p(t) - p^e(t)\big) - g_1(t) - g_2(t) + v(t), \tag{2}$$

$$m(t) = m_0 + w(t). \tag{3}$$

In the above system, $u(t)$, $v(t)$, and $w(t)$ are random uncorrelated shocks affecting, respectively, household demand, aggregate supply and the money supply with $u(t) \sim N(0, \sigma_u^2)$, $v(t) \sim N(0, \sigma_v^2)$, $w(t) \sim N(0, \sigma_w^2)$. y_F is full employment output, m_0 is the initial money supply and $1 > \alpha, \beta > 0$.

Imposing market clearing and solving for the equilibrium price, we find

$$p(t) = \frac{1}{\theta+\beta}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t) + \beta p^e(t)] + \frac{u(t)+\theta w(t)-v(t)}{\theta+\beta}. \tag{4}$$

From (4) it can be seen that increases in m_0, $g_1(t)$, $g_2(t)$ and $p^e(t)$ all lead to an increase in the price level. As is well know, if expectations are formed rationally in such an economy, then the ability to influence the price level does not translate into the ability to manipulate the economy.[3] That is,

$$p(t) - p^e(t) = \frac{u(t)+\theta w(t)-v(t)}{\theta+\beta}, \tag{5}$$

such that $y^s(t) = v(t) + \frac{\beta u(t)+\beta\theta w(t)-\beta v(t)}{\theta+\beta} = \frac{\beta u(t)+\beta\theta w(t)+\theta v(t)}{\theta+\beta}$. (6)

That is under rational expectations, $p(t) = p^e(t)$ and policy--changes in m_0, $g_1(t)$, and $g_2(t)$-- are ineffective ways of changing $y(t)$.[4] Monetary policy is neutral and changes in $g_1(t)$ and $g_2(t)$ are

[3] Here rational expectations is defined as, $p^e(t) = E_t(p(t)|I(t))$, where the information set, I(t), includes knowledge of all exogenous and past variable values and the form but not the size of all current shocks.

ineffective as ways of changing $y(t)$ and hence $c(t) - c_F$, but do produce equivalent changes in both $c(t)$ and c_F. It follows that under rational expectations where current shocks are unrecognized in the current period, the economy will vary randomly about y_F but will exhibit neither a political business nor political budget cycle.

To allow policy instruments to have a real effect in the sense of producing a divergence between $y(t)$ and y_F, we assume that households have adaptive expectations. Households learn but learn slowly. Under adaptive expectations, the economy can now be described as (1) through (4) plus

$$p^e(t) = \gamma p(t) + (1-\gamma)\, p^e(t-1)), \qquad 1 > \gamma > 0. \tag{7}$$

Substituting (7) into (4), and then substituting the result back into (5) yields[5]

$$p(t) - p^e(t) = \frac{1-\gamma}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)]$$
$$- \frac{\theta\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\, p^e(t-1)) + \frac{(1-\gamma)[u(t)+\theta w(t)-v(t)]}{\theta+\beta(1-\gamma)}. \tag{8}$$

From this it follows that,

$$y(t) = y_F + \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] - \frac{\beta\theta(1-\gamma)}{\theta+\beta(1-\gamma)}p^e(t-1)$$
$$+ \frac{(1-\gamma)\big[u(t)+\theta w(t)\big] + \big((\beta-1)(1-\gamma)+\theta\big)v(t)\big]}{\theta+\beta(1-\gamma)},$$

$$\text{or} \quad y(t) - y_F = \lambda_0[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] - \lambda_1 p^e(t-1) + \varepsilon(t) \tag{9}$$

where $1 > \lambda_0, \lambda_1 > 0$ and $\varepsilon(t)$ is white noise.[6]

It follows that $y^s(t) - y_F$ can now be influenced by policy. An increase in either type of government spending will result in aggregate output rises relative to its long run equilibrium value. That is,

$$\frac{dy(t)}{dg_i(t)} = \lambda_0 = \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)} > 0, \text{ for i = 1,2.} \tag{10}$$

Whether the increase in g_i is permanent or transitory, contemporaneous output increases and then slowly converges back to y_F. The time path of c(t) is slightly more complicated. A permanent increase in g_i results in an immediate fall in $c(t)$ (but less than the increase in g_i) followed by a further slow fall to its permanently lower level. In the interim, $c(t+j) - c_F(t) - \Delta g_i$ is higher than it will be once the expected and actual price level comes together at the permanently higher level. A single period (transitory) change in g_i produces a similar effect in the short run, a jump in the price level and a fall in contemporaneous consumption. However through time, $y(t), p(t), p^e(t)$ and $c(t)$ all return to their

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[4] In this case $c(t)$ will vary randomly with $y(t)$ about $c_F \equiv y_F - g_1 - g_2$.

[5] In the absence of shocks the system will converge to an equilibrium where $p(t) = p^e(t) = p^e(t-1)$. From (8) this implies $p(t) = p^e(t) = \frac{[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)]}{\theta}$. From (9) and (10) it can also be seen that as γ approaches 1 policy becomes ineffective in influencing aggregate output.

[6] Where $\lambda_1 < 1$ is needed for stability.

previous level with the length of the time path depending on how quickly the expected price adjusts to the ongoing changes in the price level.[7]

Thus far there is no distinction in the effect generated by the two types of government spending. Both $g_1(t)$, now considered to be government consumption, and $g_2(t)$, capital expenditures, are produced at constant cost (the loss of unit of c(t)) and both have the same transitory and permanent effect on the aggregate output supplied and household consumption. From the perspective of the governing party facing election, however, the two types of spending may generate different levels of voter support and the two types of spending may differ in their recognition/visibility by voters at the time of the election. The first of these will be used to explain the equilibrium composition of aggregate government spending while the second will be used to explain the timing of their provision over the governing cycle. To focus on the implications for policy we set all the shocks equal to zero and abstract from the randomness affecting the model.

To model the behaviour of the governing party over the election cycle, we begin by assuming that the party is interested in maximizing voter support over a governing cycle whose length is T periods. The level of support the party receives each period depends upon the levels of $g_1(t)$ and $g_2(t)$ it provides along with the level of household consumption that can be undertaken after household taxes are paid. To focus on the level and composition of government spending, we avoid the complications that arise under deficit financing and assume that the government can run neither a deficit nor a surplus. This implies that the government also determines household consumption. That is, $c(t) \equiv y(t) - \tau(t) = y(t) - g_1(t) - g_2(t)$, where $\tau(t)$represents aggregate tax collections. To discuss this problem analytically, we assume that the support that the governing party wishes to maximize over the governing interval of T periods is, V(t), takes the following specific form,

$$\max V(g_1(t), g_2(t)) = \sum_0^T V\big(c(t), g_1(t), g_2(t)\big) = \sum_0^T [a\, lnc(t) + b\, lng_1(t) + d\, lng_2(t)]$$

$$= \textstyle\sum_0^T (a[ln\,(y(t) - g_1(t) - g_2(t))] + b\, lng_1(t) + d\, lng_2(t)),$$

subject to

$$y(t) = y_F + \tfrac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] - \tfrac{\beta\theta(1-\gamma)}{\theta+\beta(1-\gamma)} p^e(t-1) + \varepsilon(t), \quad t = 0 \ldots . T$$

where $p^e(t) = \tfrac{\gamma}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] + \tfrac{(1-\gamma)(\theta+\beta)}{\theta+\beta(1-\gamma)} p^e(t-1)$

and where $p^e(-1) = \tfrac{\alpha - y_F + \theta m_0 + g_1(-1) + g_2(-1)}{\theta}$ and $p^e(T)$ is free. (11)

Setting this up as a Lagrangian

$$\mathcal{L}\big(g_1(t), g_2(t)\big) = \sum_0^T (a[\ln(y(t) - g_1(t) - g_2(t))] + b\, lng_1(t) + d\, lng_2(t))$$

$$+\varphi(t)\Big[y(t) - y_F - \tfrac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] + \tfrac{\beta\theta(1-\gamma)}{\theta+\beta(1-\gamma)} p^e(t-1)\Big] \quad (12)$$

[7] From (10) it can be seen that the size of the short run effect is increasing in the weight given to past prices, $1-\gamma$, and the relative importance of the real versus nominal shocks, β.

where the first order conditions for an internal optimum are:

$$\frac{\partial \mathcal{L}(t)}{\partial g_1(t)} = \frac{-a}{c(t)} + \frac{b}{g_1(t)} - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\varphi(t) = 0 \qquad t = 0,..T, \qquad (13)$$

$$\frac{\partial \mathcal{L}(t)}{\partial g_2(t)} = \frac{-a}{c(t)} + \frac{d}{g_2(t)} - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\varphi(t) = 0 \qquad t = 0,..T, \qquad (14)$$

$$\frac{\partial \mathcal{L}(t)}{\partial \varphi(t)} = y(t) - y_F - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\{[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] + \theta p^e(t-1)\} = 0. \qquad (15)$$

From (13) and (14) it can be seen that $\frac{b}{g_1(t)} = \frac{d}{g_2(t)}$ or $\frac{g_2(t)}{g_1(t)} = \frac{d}{b}$. That is, the optimal long run strategy for the incumbent governing party is to provide the two types of government spending in fixed proportions depending on their relative weight in generating electoral support. From the form of (13) and (14) it is also apparent that expansions and contractions in government size ($g_1(t) + g_2(t)$) will take place though proportional expansions/contractions of the two components.

Equation (15) can now be written as

$$y(t) - y_F = \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\{[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] - \theta p^e(t-1)\},$$

where from footnote (5) it can be seen that convergence to equilibrium price implies $y(t) = y_F$. However a transitory increase in either $g_1(t)$ or $g_2(t)$, with $p^e(t-1)$ predetermined, means that $y(t) - y_F$ becomes positive. Given that the governing party starts from a position of equilibrium, any transitory increase in government services will be larger than the fall in household consumption and this in turn implies that voter support can be increased.[8] The conditioning comment is that the timing of such an increase must be varied over the governing interval so as not to become predictable to voters and incorporated into their expectation of a price change at that time in the election cycle. To the extent that pre-election spending becomes predictable, opportunism along these lines becomes ineffective.

At present we have motivated opportunism but have nothing in the analysis to suggest a repeating cycle of government expenditure in the period leading into an election nor anything to suggest what type of government spending would be used for opportunism. However it is often argued that voters tend to forget past government contributions, so that what has been done in the past will generate less electoral support than what is done in the period immediately before an election. In addition, some types of government expenditure may be inherently more visible to voters than others and hence deteriorate less quickly in voters' memories. As argued in the introduction, capital expenditures on items such as infrastructure are often argued to much more visible to voters than equivalent amounts of government consumption.

Our final step is then to add these dimensions to the model by having government spending increase over time in terms of its effectiveness in generating electoral support at the rate, $r_i, i = 1, 2$, where the rate at which consumption expenditures grow in effectiveness, r_1, is slower than that of capital

[8] Note that a permanent change in government spending would distort the community's output composition away from the optimal proportion (too much government, too much of one type of government spending and too little private consumption). This would lower voter support relative to a potential competitor who promised to leave the optimal proportions unaltered.

expenditure, r_2. This implies that across time the voting effectiveness of both types of government expenditure will increase, with the effectiveness of g_2 increasing relative to g_1.

$$\mathcal{L}\big(g_1(t), g_2(t)\big) = \sum_0^T (a[\ln(y(t) - g_1(t) - g_2(t))] + b(1+r_1)^t lng_1(t) + d(1+r_2)^t lng_2(t))$$

$$+\varphi(t)\left[y(t) - y_F - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] + \frac{\beta\theta(1-\gamma)}{\theta+\beta(1-\gamma)}p^e(t-1)\right]. \quad (16)$$

where the first order conditions for an internal optimum are now :

$$\frac{\partial\mathcal{L}(t)}{\partial g_1(t)} = \frac{-a}{c(t)} + \frac{b(1+r_1)^t}{g_1(t)} - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\varphi(t) = 0 \qquad t = 0,..T, \quad (17)$$

$$\frac{\partial\mathcal{L}(t)}{\partial g_2(t)} = \frac{-a}{c(t)} + \frac{d(1+r_2)^t}{g_2(t)} - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\varphi(t) = 0 \qquad t = 0,..T, \quad (18)$$

$$\frac{\partial\mathcal{L}(t)}{\partial\varphi(t)} = y(t) - y_F - \frac{\beta(1-\gamma)}{\theta+\beta(1-\gamma)}\{[\alpha - y_F + \theta m_0 + g_1(t) + g_2(t)] - \theta p^e(t-1)\} = 0. \quad (19)$$

From (17) and (18) it can be seen that $\frac{b(1+r_1)^t}{g_1(t)} = \frac{d(1+r_2)^t}{g_2(t)}$ or $\frac{g_2(t)}{g_1(t)} = \frac{d(1+r_2)^t}{b(1+r_1)^t}$. That is, the optimal spending proportions by government will change over the governing cycle with the proportion of capital expenditures in the budget rising relative to consumption the closer it gets to the upcoming election. Stated alternatively, the greater the recognition given to capital expenditures means that for equivalent increases in g_1 and g_2, g_2 will generate a greater rise in voter support later in the governing cycle and hence be used relative to g_1 as the upcoming election approaches. The ratio of capital expenditures in the government budget should rise over the course of the governing cycle. Whether or not aggregate government spending generally will rise over the governing cycle then depends upon two conditions: whether or not government spending increases in its ability to generate electoral support faster than does private consumption;[9] and the weight attached to past prices in the expectations formed by producers. As long as there is some inertia arising from the weighting of the past in the formation of expectations, there can be opportunism and hence some element of a political business cycle. Even without this, however, the differential political visibility of capital expenditures as a reminder of the current government's contribution to the economy will produce a political budget cycle in ratio of government capital to consumption expenditures.

III. Data and variables

To test these hypotheses we use a dataset that covers 14 major Indian states and is spread over 54 years (1959-60 to 2012-13).[10] The 14 states comprise more than 90 percent of both India's population and

[9] Here we have assumed that increases in private consumption (through reduced taxes) do not grow in their electoral effectiveness over time (otherwise the ratio of private consumption to government spending would be higher at the beginning of the governing period than at the end and the state governments would be running surpluses prior to the election). Alt and Lassen (2006) use differences in the degree of fiscal transparency in this way to explain variations in fiscal balance across countries.

[10] The selected states are Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. Overdependence on the central transfers hampers the fiscal autonomy of the small and/or special category states. Therefore such states are ignored from the analysis. Among the selected states, Gujarat was carved out from Bombay state in 1960 and

domestic product for the period of our study. The sources of our data and methods used to construct the variables are set out in the Data appendix. State-specific summary statistics are provided in appendix Table A1.

Because we argue that capital expenditures are relatively more visible in comparison to other revenue expenditures in the budget, the ratio of capital to other state expenditures becomes our primary dependent variable. The importance of capital expenditures in the state budget is measured in two different ways: (1) *the share of capital expenditure in noninterest total government expenditure*, and (2) *the ratio of capital to current state expenditures*. Then to compare our hypothesis to the alternative hypothesis that capital expenditures generate a political budget cycle in levels, we examine how a change in the share of capital expenditures affects the aggregate expenditure size of state governments and its budgetary balance. For that, the ratios *of noninterest total government expenditure* and *state fiscal deficits or surpluses to state gross domestic product (SGDP*) are used.[11] Columns (1) – (4) in Table A1 present state-specific means and standard deviations of all four fiscal measures over the sample period of our study. These figures document the enormous variation in all four fiscal measures that takes place across the major Indian states.

Our set of explanatory variables can be divided into two categories: variables of interest and control variables. The variables of interest are constructed to capture the timing of state expenditures over the governing cycle. In this regard political budget cycle (PBC) theories predict that fiscal instruments will be manipulated by incumbent governments to create a favorable environment for re-election. Since economic outcomes are expected to affect election outcomes, policy expenditures must be manipulated prior to the election. To capture this a dummy variable is often used and for our purposes, *election year*, is constructed as taking the value 1 in the year before the election and 0 for all other years. In India, as in other Westminster parliamentary systems, while an election mandate is given for a maximum period not all governments can complete the full (five year) term. Coalition governments in particular struggle to maintain required support in the state assembly and, when a government falls prematurely, fresh mid-term elections are held. Because the occurrence of a mid-term election is typically unpredictable, incumbent governments will then find it difficult to plan and implement opportunistic policies. This reasoning led Khemani (2004) to search for evidence of the PBC at the state level in India by testing the hypothesis that it was the inclusion of mid-term elections in the *election year* variable that explained the lack of evidence of a PBC. That is, by considering only *scheduled elections*, a variable taking the value 1 for the year before a scheduled election and 0 for other years, the data would better identify opportunism because the time of the election is exogenously set allowing governments the predictable interval needed to implement opportunistic spending. In contrast to the timing predicted by these PBC hypotheses, our model predicts that the share of visible state expenditures, i.e. capital expenditures, will increase over the entire governing interval rather than simply in the period immediately before the upcoming election. This also implies that the unexpected loss of parliamentary confidence mid-term or the unexpected opportunity 'to surf' (go to the polls early to take advantage of favourable circumstance) should not change the compositional pattern of spending established up to that point. Even if spending

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Haryana from Punjab in 1966. Data for these two states is available from the year of their creation and that leaves us with an unbalanced panel dataset.

[11] Fiscal deficit in India is defined as excess of total budget expenditure over total revenue receipts excluding borrowings. A large deficit would mean a large amount of borrowing. A negative (positive) number means fiscal deficit (surplus).

could be increased somewhat at the last minute, this would not overcome the prediction that visible spending should be higher in the later years of the governing term. To test whether the predicted growth in capital spending takes place over the life of a parliamentary government we use the number of years since the last election, *elapse*, as the appropriate metric. A positive coefficient on *elapse* would provide evidence consistent with the targeting of capital projects with greater political visibility across the life of a government.[12]

The set of control variables consists of six economic and political regressors: *per capita SGDP* in constant prices (2004-05 rupees), *the contribution of agriculture to SGDP*, state revenue receipts left after meeting committed expenditures (called *fiscal space*), *political alignment*, years when states were governed by the same party as that elected for the center, the years when the *congress* party was in power at the state level, and the years when each state was governed by a *regional* party. Reasoning for their inclusion begins with Wagner's law, the hypothesis that state spending will vary directly with the scale and complexity of state output. The effect of state income on capital expenditures is more complicated. Here long run steady state analysis implies that consumption will rise relative to saving and investment as wealth is accumulated and states develop. To control for different levels of development across states we use each state's real per capita income. Second, although the contribution of agricultural related activities to gross domestic product (GDP) has fallen in recent times, agriculture's contribution to SGDP is still significant (see column 6, Table A1) and varies widely across Indian states. In addition its inverse, activities more associated with industrialism and urbanization, would be expected to elicit greater capital infrastructural support from state governments and be more visible to voters. Third, fiscal rules as they relate to the ability to spend and/or tax are often a significant influence on state policies (Nerlich and Reuter, 2015). At the state level in India, Chakraborty and Dash (2013) have shown that it is development expenditures that are cut strategically to meet budget deficit targets set under an imposed fiscal rule.[13] Because non-development spending includes such budget items as interest payment, administrative services, and pension payments that are essentially committed, it falls on capital items within development spending as the flexible component in the budget that must adjust to projected deficits. To measure the extent of this pressure on capital spending we have constructed variable, *fiscal space*, defined as the share of revenue receipts left after meeting 'required' non-development expenditures. With greater *fiscal space* higher levels of capital expenditure, a larger sized government and smaller fiscal deficits are expected. Fourth, Arulampalam et al. (2009) have shown that when the governing parties at the central and state level in India are closely aligned, the aligned states typically receive higher discretionary transfers from the center. Such transfers are usually project-based, capital intensive and conditional in nature. Thus *political alignment*, a dummy variable taking the value 1 when the two governing parties are politically aligned and 0 otherwise, is expected to be associated with higher share of capital in state expenditures. Partisanship is another important variable that has been shown to have a strong influence on the composition of government budgets (Potrafke, 2016). In the case of India, the Indian National Congress party, known more simply as the Congress party, is an ideologically center-left national political party that dominated particularly the early elections at the

[12] Note that evidence that *elapse* is significant is not inconsistent with Khemani's hypothesis. Rather by using the ratio in early as well as late governing years, the test permits the emergence of evidence of opportunism even when targeted spending in the pre-election period is not significantly different from an average of all earlier years.

[13] Development expenditure constitutes the aggregate spending on social and economic services. Spending on items such as health, education, infrastructure, agriculture, and industry, rural development, roads and transport are parts of it.

center and in many of the states. For example, Congress formed the government in 54 percent of the fiscal years in our sample period and their presence would be expected to have had a distinctive impact on the way fiscal policies are chosen. A dummy variable *congress* is used to differentiate between the years ruled by the Congress party and other parties, defined as 1 if the Congress party has ruled, 0 otherwise. Finally, a number of distinctive regional political parties emerged as challengers to Congress party dominance at the state level in the 1970s and 1980s such that by the end of our time period many of the major Indian states had been governed by state-specific regional parties for considerable periods. Because such parties succeed in part through their emphasis on state relative to national interests, the policies adopted under these governments might be expected to differ systematically from the policy set of their national-oriented rivals.[14] To control for the impact of regional parties on the composition of state budgets we introduced a variable, *regional*, that takes the value 1 in years when a regional party was in power in the state, 0 otherwise.

IV. Empirical specification and results

Our theoretical model highlights the following testable hypotheses. First, capital expenditures as the most politically visible category of state budgets should rise over the course of the governing period, peaking in the year leading into the next election. This hypothesis is tested in comparison with the two PBC timing hypotheses discussed earlier. Second, without state budgets in total responding to the election cycle, government consumption expenditures with less immediate voter visibility should be larger in the early years of governing tenure and then fall as the next election approaches. Hence complementary to the first prediction, the ratio of capital to consumption in the state budget should rise over the governing period and be more sensitive to governing duration than the share of capital in the total state budget. Third, while our analysis does not presume that the spending items as a group have greater voter visibility than do taxes, we test for that possibility. First we test the hypothesis that there is a cycle in the timing of deficits and surpluses over the governing interval (with surpluses early and deficits later and no aggregate spending cycle). We also test for the presence of a traditional spending cycle by seeing whether total state expenditures as a proportion of SGDP rise over the governing cycle.

Empirical specification

As the summary statistics in Table A1 suggest, there has been substantial variation in all the variables both over time and across states. In such cases standard panel models, such as pooled OLS, fixed effects and random effects panel models are often used to study the relation between the variables of interest. However a major drawback of these models is that they capture only static relationships and are unable to incorporate the dynamic nature of interrelated variables. To handle processes that evolve over time and the time series issues raised by such combinations of variables, the extensions of the autoregressive distributed lag approach to panel analysis (hereafter panel ARDL) proposed by Pesaran et al. (1997, 1999) have proven to be particularly useful. In its most general form, the error-correction form of the autoregressive distributed lag ARDL (p, q) model, where p is the lag of the dependent variable and q is the lag of the independent variables, can be written as:

$$\Delta Y_{i,t} = \sum_{j=1}^{p-1} \gamma_j^i \, \Delta Y_{i,t-1} + \sum_{j=0}^{q-1} \delta_j^i \, \Delta X_{i,t-1} + \varphi^i \left[Y_{i,t-1} - \left\{ \beta_0^i + \beta_1^i X_{i,t-1} \right\} \right] + \epsilon_{i,t}, \qquad (20)$$

[14] See Dash and Raja (2013) for a more detailed testing of the effects of political ideology and partisanship on the level and composition of state expenditures.

where *Y* is a fiscal policy outcome, *X* represents a set of explanatory variables including the set of election timing and control variables, γ and δ are the short-run coefficients related to fiscal outcome and its determinants, β's are the long-run coefficients, φ is the speed of adjustment to the long-run equilibrium, ϵ is a time-varying disturbance, and the subscripts i and t represent state and time, respectively. The term in square brackets is the long-run regression equation, which is derived from:

$$Y_{i,t} = \beta_0^i + \beta_1^i X_{i,t} + \mu_{i,t}, \qquad \text{where } \mu_{i,t} \sim I(0). \tag{21}$$

Unlike traditional cointegration approach, where long-run relationship between variables can exist only if all variables are of the same order of integration, Pesaran and Shin (1999) show that the panel ARDL model can be used with variables of different order of integration. This allows for the simultaneous existence of cointegration (a long run equilibrium relationship) among the I(1) variables, an equilibrating process of convergence to the long run in response to random shocks and a short run process of change among the I(0) variables about the long run equilibrium time path. Given that our variable set combines political variables that are primarily stationary I(0) in nature (do not trend) with economic variables that can be either stationary I(0) or nonstationary I(1), panel ARDL estimation suits our purposes well.[15]

Another important advantage of using panel ARDL model is that no formal test is required to check for cointegration among the variables of concern. Only the error-correction term in (20) is required to be negative and not lower than -2 to confirm cointegration among variables. However for completeness we begin the modeling of our dynamic process by asking whether an error correction process is appropriate for our panel and hence ask if there is any evidence that the nonstationary I(1) economic variables in our model are cointegrated. To answer this we use the Westerlund (2007) error correction model panel cointegration test that tests the null hypothesis of no cointegration by assessing whether the error-correction term in a conditional panel error-correction model is equal to zero. Table A3 in the data appendix presents these results for both the ratio of capital to total government expenditures and the ratio of capital to current expenditures. The results allow us to reject the hypothesis of no cointegration and proceed by comparing alternative versions of the panel error correction model.

The general model in equation (20) can be estimated in three alternative forms. At one extreme, we have the dynamic fixed effects (DFE) estimator, an error-correction form of the static fixed-effects model. This version allows the intercept to vary across the states but restricts all other parameters and error variances to be the same. At the other extreme, the mean group (MG) model by proposed Pesaran and Smith (1995) estimates separate equations for each state and then calculates the unweighted mean of all estimates. It allows all coefficients to vary both in the long-run and short-run. The intermediate alternative is the pooled mean group (PMG) estimator developed by Pesaran et al. (1999). It allows the intercepts, short-run coefficients and error variances to differ across the states, but requires the long-run coefficients to be equal. After estimating all three versions, a Hausman test can be used to indicate the more appropriate model for our analysis.[16]

[15] We use the first generation test of the panel unit root of Fisher-type (Choi, 2001), and the second generation test of the panel unit root of Pesaran (2007) to confirm that the orders of integration of all our variables are either I(0) or I(1). The individual results are presented in the data appendix as Table A2.

[16] Stata-based *xtpmg* routine developed by Blackburne and Frank (2007) is used to estimate all three models (MG, PMG, and DFE).

The PMG estimator by assuming that the long run elasticities are the same across states will yield more efficient estimates than the MG estimator if that restriction is true, but inconsistent estimates if the slope coefficients are not equal. A significant Hausman statistic of MG versus PMG will reject the assumption of long-run slope homogeneity and imply that the MG model is superior to the PMG. The DFE model further restricts the coefficients of the model by requiring the short run coefficients and the speed of adjustment to be equal (as well as the long run). However doing so introduces a simultaneous equation bias if endogeneity arises between the error term and the lagged dependent variable. A significant Hausman statistics of MG versus DFE suggests that the simultaneous equation bias is serious and implies the MG model is preferred to the DFE model.

Empirical Results

Our emphasis on the governing term and its duration rather than simply the pre-election period allows our hypothesis to be distinguished from that of Khemani (2004) who tests for the Indian states a similar hypothesis over the shorter 1960 – 1992 time period. Khemani's insight as to why evidence of a PBC was missing for India was the recognition that India's parliamentary system of government requires the governing coalition to "maintaining the confidence" of parliament where the inability to do so means that governing durations are often shorter than the legislated maximum and somewhat unpredictable in length. This in turn means that because opportunistic spending needs to be implemented not later than the election itself, evidence of opportunism would likely be absent in cases of unexpected mid-term elections and hence present only for those elections that arose at the scheduled end of the governing period.

We then begin the presentation of our empirical work in Table 1 by using a fixed effects panel regression to re-examine Khemani's scheduled election hypothesis in relation to capital expenditures over the longer 1959 to 2012 time period now available.[17] Columns (1) and (2) confirm Khemani's finding that when all pre-election years are included as a test of opportunism, the data are not consistent and that by excluding mid-term elections (to consider only scheduled elections) evidence consistent with opportunism hypothesis. Note however that in our results the prediction that scheduled elections will be positively related to capital's expenditure share of the state budget is confirmed only if the lowest conventional level of significance is used to establish the confidence interval (10 per cent). Thus while the data does not contradict the hypothesis, the evidence in its favour is not strong (at least for capital expenditures).

-- Table 1 about here --

Under our visibility hypothesis, the ratio of capital expenditure should rise throughout the governing duration such that *elapse* should be related positively to the two capital spending ratios. In columns 3 and 4 of Table 1 the results of these tests are presented. Both ratios, the ratio of capital to total government expenditure and the ratio of capital to consumption expenditures, are found to be positively related to elapse as expected, with coefficient estimates significantly different from zero at the five percent significance level. Also as expected, the ratio of capital to state consumption spending is found to be somewhat more responsive and marginally more significant. In relative terms, then, the hypothesis that opportunism produces a predictable time pattern of increasing politically visible capital expenditures over the life of an established government (rather than a single outburst of capital

[17] See Khemani (2004, Table 5c, p.143).

expenditure in the year before the next election) is found to be consistent with the data for Indian states.

It is interesting to note that the effects produced by our control variables are virtually identical across all model specifications and serve to document relationships that are of interest in their own right. For example, the results indicate that both capital spending ratios fall with rising state per capita incomes, rise as the share of agriculture in state output falls over time, and rise with the degree of discretionary flexibility in state budgets (as represented by fiscal space). Similarly, the public choice predictions that opportunism through visible capital expenditure will increase as state and central governments become more politically aligned and that the spending partisanship of the center-left Congress party (increasing consumption relative to investment spending) are both found to be consistent with the data. In the case of regional parties, however, a partisan effect in the capital ratios is only suggested rather than confirmed by the data. While the estimated coefficient is consistently negative across all four columns, none of the coefficients are significantly different from zero even at the 10 percent significance level.

While the estimations of Table 1 are insightful, the fixed effects procedure used assumes the existence a static equilibrium rather than a dynamic process of adjustment among a set of variables that evolve through time. Because the long run is embedded in data that can include a potential convergence process together with likely responses to purely short run influences, we are interested in methods that can separate these effects from the long-run process describing the ratio of capital expenditures in state budgets over time and particularly over the election cycle. For this reason we turn to the results of using panel ARDL estimation as outlined above. Before beginning we note that one notable feature of the results in Table 1 is that each of the proposed equations explain much more of the variation within each state over time than across states at any point in time. This suggests that heterogeneity issues may be important in estimating a single dynamic model of adjustment so that methods that impose equality among different coefficients may result in serious bias. With this in mind we present in Tables 2 and 3 the three alternative versions of a dynamic error correction model: the MG, PMG, and DFE models.

-- Tables 2 and 3 about here --

As would be expected, the two sets of three ARDL models describing the evolution of the two shares of capital expense over time are quite similar in the sign and size of their estimated coefficients. Within each table, all three models present a similar looking long run about which transitory shocks and variations in the model's covariates produce a short run process of adjustment and convergence back to the long run equilibrium path. In all cases the error correction term is negative and significantly different from zero, indicating cointegration among the I(1) variables reinforcing the equilibrium nature of the indicated long run path.[18] A set of Hausman tests, however, suggests that the different homogeneity assumptions of the PMG and DFE approaches will introduce sufficient bias in the estimates to make the coefficients of the MG model the more appropriate form of the underlying relationship. This is true for both sets of estimates.

In terms of our variable of interest, the significant positive coefficient estimate of *elapse* in column (1) of Table 2 indicates that the data is consistent with the predicted cycle of increased capital spending in state expenditures through successive years of governing. In this sense the capital spending cycle forms

[18] Note that the estimated error correction terms are both large in absolute size indicating relatively rapid convergence of departures in the capital ratios to their equilibrium long run path.

an important part of the long run. The magnitude of the coefficient suggests that, everything else remaining the same, the share of capital expenditure increases by 2.8 percent each year leading into the next election. Our complementary prediction, that capital spending will grow relative to state consumption spending as the next election approaches is also confirmed by the data. The coefficient estimate on *elapse* in column (1) of Table 3 implies that as the next election gets closer, capital spending will increase each year by 3.7 percent relative to consumption spending. For both hypotheses the use of error correction modeling to separate short run adjustment from the longer run equilibrium time path has resulted in an increase in estimated size and significance of the underlying long run relationship between the capital spending ratios and governing duration. The coefficient estimates in our preferred ARDL models are now significantly different from zero at 1 percent.

The separation of the short run and convergence process from the long run has made no difference to the interpretation of the role played by some of our control variables. The coefficient estimates on state per capita income, the share of agriculture in state GDP and fiscal space the ARDL coefficient estimates are now only marginally larger in absolute size than in the earlier static fixed effect case of Table 1. Hence the share of capital expenditure in total noninterest state spending declines as real per capita incomes rise, consistent with convergence to a longer run stationary state in the state capital to output ratio. In practice it's a well-documented feature of India's public finances that the share of capital in the state budgets has shrunk over the years, particularly since the early 1980s. This is often attributed to stagnant state revenues combined with increasing pressure on consumption expenditure coming from rising salaries, subsidies and interest payments to crowd out capital expenditure (Rao, 2002; McCarten, 2003). Capital expenditure is largely financed by debt issues and with the introduction in the early 2000s of a fiscal rule that imposes a ceiling on the size of fiscal deficit at the state level, capital spending has been further constrained. Particularly strong has been the decline in public investment in the agriculture sector. Rising consumption subsidies for fertilizers, irrigation, electricity, credit and other agricultural inputs have arisen at the expense of public infrastructural investment in agriculture (Jha, 2007). Finally, as discussed earlier, a diminishing amount of fiscal space is consistent with the reduction in the availability of state resources for the capital expenditure accounts.

On the other hand the separation of the long run from the short run convergence process has changed somewhat the relative importance of the political variables. The earlier finding that Congress party control is associated with lower capital spending is now seen to be less reliable as a partisan hypothesis while regional parties are now indicated as addressing public investments concerns at the state level better than their national counterparts. Finally, political alignment is still associated with a higher share of capital in state expenditures, but its coefficient is now insignificantly different from zero.

The findings of Table 2 and 3 complement the recent literature that predicts that electoral cycles will appear within the subcomponents of aggregate spending rather than in its level. Our contribution is to note that such evidence may be spread across the life of the incumbent government rather than concentrated solely at its end. However while our capital spending model does not require an aggregate spending cycle, its logic would generate an election cycle in aggregate spending and/or state budget surpluses and deficits if spending items in the budget were more politically visible than their financing through taxes (as in fiscal illusion). For this reason we extend our analysis to examine these possibilities.

To search for the presence of an electoral cycle in aggregate fiscal policy across Indian states, we estimated the three ARDL models for two aggregate fiscal measures: noninterest total state spending

and fiscal surpluses both as a percentage of SGDP. The results are presented in the two columns of Table 4 where the ARDL results reported are only for the more appropriate model selected by the Hausman test. The results suggest that both of these aggregate fiscal variables are explained primarily by our control variables. Aggregate spending in column (1) is consistent with Wagner's Law and with the presence of *fiscal space* leading to an increase in overall as well as capital expenditure. The *fiscal surplus* is shown to be responsive to the business cycle (reductions in per capita income met by rising deficits) and with agricultures share of state output. In terms of partisan effects, it appears that the Congress party is a more conservative budget manager, spending somewhat less and running larger surpluses (smaller deficits) than their political rivals. However, there is no systematic effect indicated for *elapse* on either aggregate fiscal policy measure, with *elapse* making no significant contribution to aggregate spending and taking a sign that is more consistent with rising budget surpluses over the life of a government than producing expansionary deficits. The data then fail to support opportunistic electoral cycles in aggregate fiscal measures. The evidence is more consistent with the hypothesis that incumbent political parties find it not politically advantageous to engage in expansionary spending and/or budget deficits for re-election purposes, perhaps anticipating that such policies can cause macroeconomic instability and result in accumulating government debt that will lower their electoral chances.[19] Instead incumbent governments find it safer to manipulate the composition of the budget strategically, reducing spending on specific components early in the term to allow their more advantageous provision later in the governing cycle.

-- Table 4 about here --

Sensitivity analysis

In this sub-section we check whether our findings are sensitive to minor modifications in the definition of our variable of interest and the measure of capital in our subcomponent of visible spending.

In the earlier part of this paper we argued that Khemani's (2004) hypothesis that only scheduled elections should be taken into account in a test for opportunism is less relevant for our hypothesis that argues for an upward trend in those budget items with greater visible spending across all governing periods (independent of length). Nevertheless, the greater is the likelihood that the exogeneously scheduled election date will be maintained, the greater would be the willingness of the government to lower its capital spending early in its mandate for more effective use later. Hence while the case for using scheduled elections alone is not as strong, there may still be more of a trend associated with governing intervals associated with exogenously scheduled elections. During the period of our study, 167 state elections were held and of them 43 involved mid-term elections while the remaining 124 were scheduled elections. This suggests that if we modify our elapse variable to include elapse only in scheduled elections, i.e., use *scheduled elapse*, we should expect the size of the coefficient estimate and the t-statistic of *scheduled elapse* to increase relative to our earlier findings (using all election periods). Table 5 reports these results for the revised variable in relation to our two capital ratios and the two aggregate fiscal measures. Once again only the more appropriate ARDL model results are shown as selected by the Hausman test. The results show that the coefficient estimates and associated t-statistics in columns (1) and (2) do rise as predicted (compared to columns (1) in Tables 2 and 3). Similarly the

[19] For instance, fiscal deficits at the state level are mostly debt financed. Increasing debt financing in pre-election years can lead to higher inflation in the post-election years.

insignificance of the coefficient estimates in columns (3) and (4) confirm the earlier finding that the data provide no evidence of an opportunistic election cycle in either measure of aggregate fiscal policy. As such these results reinforce the predications made for electoral cycles in capital spending and their absence for our measures of aggregate fiscal outcomes.

-- Table 5 about here –

As a second robustness test we use the fact that in state budgets capital expenditure consist of two broad types: state capital outlays as opposed to loans and advances made by state governments. Capital outlays consist of expenditures that the government can control directly through its various ministries. Loans and advances by the state government, on the other hand, are revenues transferred to such quasi-government agencies such as housing boards, electricity boards and various other public sector undertakings over which the state government has much less control. This suggests the capital outlay component of capital expenditure would be more responsive to political incentives and would be more likely to provide evidence of opportunism in its timing if opportunism were present. In Table 6, then, we rerun our ARDL models for the more specific definition of visible capital (substituting capital outlays for capital expenditure). The results for the more appropriate, Hausman test selected, ARDL models are presented in Table 6. Inspection of columns (1) and (2) of that table shows that the results for capital outlays that are very similar to those found earlier for capital expenditure (in Tables 2 and 3), with the elapse coefficient showing only minor increases in its size and significance. Interpreting this in the context of our hypothesis, the results *suggest* a roughly equivalent degree of political influence in both dimensions of capital expenditure.

-- Table 6 about here –

Finally we return to the question of the more appropriate time interval needed to reflect political decision making that began this section. To do so we re-estimate the mg version of the *elapse* error correction model of Table 2 using the year prior to a *scheduled election* rather than *elapse* as the time interval most appropriate to test for presence of election motivated spending. The results, presented as column (3) in Table 6, are qualitatively similar to those found earlier for the static fixed effects model. That is, while the data is not inconsistent with the hypothesis of opportunism, evidence in support of the prediction of a pre-election bulge in capital spending is relatively weak (the coefficient estimate of *scheduled electionyear(+1)* is significantly different from zero only at the low 10 percent level). However, rather than interpreting this result as implying only weak support for the hypothesis that governments do manipulate their capital spending plans in response to election considerations, the stronger results found for *elapse* in Tables 2 and 3 suggest a predictable pattern of capital spending for electoral purposes that spans the entire governing interval. To the extent that capital spending is politically more visible than other budget items, the components of a platform of promised capital spending can be reallocated intertemporally to permit more capital projects being featured in the later stages of the governing cycle. This implies a diminished role for capital spending early in the governing cycle and thus a pattern of increased spending over the life of a government that can be better captured by a variable like *elapse.*

V. Conclusion

In this paper we have argued that one weakness of the usual approach to testing for political opportunism in government budgets is the absence of a strong reason for why such expenditures should be restricted solely to the period leading into the next election. Here we argue that the need to fulfill a set of election platform promises in combination with the characteristic that some budget items better attract the attention of voters (with deteriorating memories) leads to a predictable reallocation of budgetary spending across the life of a government. Using capital expenditures as our example of more politically visible budgetary items, we use data from a set of 14 Indian states over 54 years (1959/60 – 2012/13) to test the hypotheses that capital expenditure as a ratio of both total government expenditure and government consumption alone should rise across the entire governing interval. The results are found to be consistent with this hypothesis. In addition the results can be seen to fit the data marginally better than do more traditional models that use either all pre-election periods or (for parliamentary governments) only the pre-election year of scheduled elections to test for opportunism. The analysis also tests for the presence of a similar interval effect on aggregate state expenditures and on state budgetary surpluses. The absence of any significant effect there suggests, at least for the major Indian states in our sample, that evidence of political influence is more likely to be found in variations in the composition of state budgets rather than in its level or in the size of its deficits and surpluses.

Of more technical interest is the result that the capital spending pattern predictions receive even greater support when the model testing for an interval effect allows for the separation of the long run from the short run and the convergence process. The ARDL models used to test for a long run relationship in this context confirm the existence of a cointegrating relationship among our variables and suggest the importance of per capita state income, the share of agriculture, the amount of fiscal space as important co-determinants of our capital ratios. Finally, the data presents evidence of partisan effects for the regional political parties that arose to challenge the dominance of the Congress party. These parties appear to be somewhat more devoted to state development objectives than their national party rivals.

Data Appendix

Description and Sources of Data used

The data used in this paper covers 14 major Indian states: Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal; and spans the fiscal years 1959-60 to 2012-13. Variables are collected from a variety of sources as detailed below.

Public finance variables

The *Reserve Bank of India (RBI) Bulletin* provides longest time-series public finance data at the state level. Data for relatively less disaggregated fiscal outcomes such as capital expenditure, current expenditure, development and non-development expenditure, spending on debt servicing, revenue receipts from tax and non-tax sources, intergovernmental transfers, and debt are available from fiscal year 1959-60 onwards. All expenditure variables are net of interest. Various issues of the *RBI Bulletin* have been used to collate this dataset.

Political variables

The *Election Commission of India (ECI)* publishes details of both parliamentary and assembly elections on their website (http://eci.nic.in/eci/eci.html). Information available in *ECI's* reports is used to prepare the coding of the qualitative variables: election year, elapse, political alignment, congress party, and regional party.

Economic and demographic variables

Our study has used economic and demographic variables such as per capita state domestic product in constant prices (2004-05 rupees), the share of agriculture in state domestic product, and state population. Data for these variables are obtained from the *National Accounts Statistics*. Time-series data for variable state domestic product in constant prices (2004-05 rupees) is not readily available for the entire period. The base year changes approximately once in every decade, and the method of back-ward splicing is used to account for base year adjustment.

Table A1

Summary statistics

State	Capital expenditure/Total noninterest expenditure [1]		Capital expenditure/Noninterest current expenditure [2]		Fiscal deficit/SGDP [3]		Total noninterest expenditure/SGDP [4]		Per capita SGDP [5]		Share of agricultural output in SGDP [6]		Fiscal space [7]		Election year [8]		Scheduled election year [9]		Elapse [10]		Political alignment [11]		Congress party [12]		Regional party [13]	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Andhra Pradesh	23.57	7.46	0.32	0.14	-1.62	1.66	14.85	3.22	12559	18885	41.99	13.77	67.25	7.97	0.20	0.41	0.19	0.39	2.00	1.49	0.78	0.42	0.70	0.46	0.30	0.46
Bihar	26.22	10.7	0.39	0.22	-2.47	2.70	20.33	5.43	4150	6083	49.83	14.87	60.30	10.25	0.24	0.43	0.17	0.38	1.76	1.55	0.61	0.49	0.50	0.50	0.31	0.47
Gujarat	25.45	6.69	0.35	0.12	-1.86	1.92	13.45	3.19	15954	23377	32.87	12.92	65.29	8.80	0.22	0.42	0.18	0.39	1.88	1.41	0.59	0.50	0.55	0.50	0.00	0.00
Haryana	24.30	10.2	0.35	0.20	-1.54	1.80	14.72	3.02	21151	29594	40.86	14.29	64.93	11.20	0.23	0.43	0.15	0.36	1.81	1.41	0.81	0.40	0.60	0.50	0.19	0.40
Karnataka	25.60	8.24	0.36	0.17	-1.57	1.60	14.66	3.17	13154	18914	38.57	13.74	67.52	5.70	0.22	0.42	0.19	0.39	1.94	1.47	0.56	0.50	0.67	0.48	0.04	0.19
Kerala	17.73	6.93	0.22	0.11	-1.87	2.03	13.34	2.56	14718	21481	33.56	14.11	60.57	12.15	0.24	0.43	0.15	0.36	1.81	1.53	0.37	0.49	0.41	0.50	0.04	0.19
Madhya Pradesh	25.20	8.51	0.35	0.16	-1.83	1.87	17.57	4.65	7474	10377	44.01	12.79	68.43	7.27	0.20	0.41	0.17	0.38	2.02	1.47	0.67	0.48	0.70	0.46	0.00	0.00
Maharashtra	23.09	6.39	0.31	0.11	-1.38	1.48	11.91	2.14	18241	25848	21.27	8.77	58.97	9.91	0.20	0.41	0.19	0.39	2.04	1.50	0.76	0.43	0.87	0.34	0.13	0.34
Orissa	23.51	7.01	0.32	0.13	-1.65	2.15	14.97	3.64	8492	11848	43.47	13.12	60.39	10.30	0.22	0.42	0.13	0.34	1.87	1.44	0.57	0.50	0.50	0.50	0.31	0.47
Punjab	25.98	12.3	0.39	0.24	-2.20	2.18	12.32	4.15	16980	21371	43.64	9.19	54.54	18.87	0.22	0.42	0.17	0.38	2.02	1.62	0.52	0.50	0.50	0.50	0.41	0.50
Rajasthan	25.91	9.04	0.37	0.20	-2.08	2.06	14.75	2.97	9810	13632	38.71	9.77	59.54	10.55	0.20	0.41	0.17	0.38	2.02	1.47	0.67	0.48	0.69	0.47	0.00	0.00
Tamil Nadu	20.24	7.61	0.27	0.13	-1.27	1.39	13.42	2.95	15581	23521	26.37	12.11	66.56	7.37	0.22	0.42	0.17	0.38	1.94	1.55	0.35	0.48	0.15	0.36	0.85	0.36
Uttar Pradesh	27.11	8.09	0.39	0.16	-2.20	2.25	14.12	4.39	6595	8158	41.63	10.08	57.38	11.09	0.26	0.44	0.15	0.36	1.76	1.48	0.65	0.48	0.50	0.50	0.28	0.45
West Bengal	17.93	6.80	0.23	0.11	-2.35	2.75	11.04	2.43	10724	14813	33.18	6.41	53.61	16.64	0.24	0.43	0.19	0.39	1.83	1.46	0.31	0.47	0.26	0.44	0.09	0.29
All States	23.69	8.86	0.33	0.17	-1.85	2.04	14.38	4.18	12471	19255	37.83	14.08	61.77	11.99	0.22	0.42	0.17	0.37	1.91	1.48	0.58	0.49	0.54	0.50	0.21	0.41

Indian States: Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal; Time period: 1959-60 to 2012-13.

Table A2

Unit root tests

	Level		1st Difference	
	Fisher	Pesaran	Fisher	Pesaran
Log(Capital expenditure/Total noninterest expenditure)	38.7*	-5.56***	544.21***	-16.09***
Log(Capital expenditure/Noninterest current expenditure)	38.83*	-5.67***	550.87***	-16.35***
Log(Total noninterest expenditure/SGDP)	40.09*	-7.22***	675.02***	-16.9***
Fiscal deficit/SGDP	14.14	-6.56***	418.01***	-14.06***
Log(Per capita SGDP)	0.64	-4.43***	389.22***	-14.77***
Log(Share of agricultural output in SGDP)	0.72	-2.32***	453.72***	-16.22***
Log(Fiscal space)	24.08	-3.37***	415.15***	-17.45***
Election Year	605.75***	-17.91***	845.89***	-17.89***
Scheduled Election Year	589.96***	-17.72***	853.44***	-17.89***
Elapse	534.25***	-17.07***	639.3***	-17.89***
Political alignment	98.58***	-5.38***	460.17***	-16.26***
Congress party	77.72***	-4***	355.11***	-13.11***
Regional party	139.45***	-0.9	378.26***	-7.82***

Note: (*), (**), and (***) indicate significance at 10%, 5%, and 1%. The null hypothesis for both tests assumes that all series are non-stationary. Among first generation unit root tests, the Fisher test is the only one compatible with unbalanced dataset. Second generation unit root test proposed by Pesaran (2007) allows for cross-sectional dependence among the residuals within the panels. The Stata commands for the two tests are *xtfisher* and *pescadf*.

Table A3

Westerlund (2007) error-correction-based panel cointegration tests

Cointegration among log(capital expenditure/total noninterest expenditure), log(per capita SGDP), log(agricultural share of state GDP), log(fiscal space)

Statistic	Value	z - value	P - value
Gt	-2.99	-4.503	0.000
Ga	-12.485	-2.004	0.023
Pt	-11.142	-4.583	0.000
Pa	-11.596	-3.835	0.000

Cointegration among log(noninterest capital expense/government consumption), log(per capita SGDP), log(agricultural share of state GDP), log(fiscal space)

Statistic	Value	Z - value	P - value
Gt	-3.145	-4.512	0.000
Ga	-12.640	-2.097	0.018
Pt	-11.148	-4.589	0.000
Pa	-11.644	-3.867	0.000

Note: The tests used the xtwest command in Stata (see Persyn and Westerlund (2008)).
For both tests, the results reject the hypothesis that the series are not cointegrated.

Table 1

Fixed Effects estimates of different assumed patterns of opportunistic spending on the ratio of capital expenditure relative to total and consumption spending in Indian State budgets

(Absolute value of t-statistics in brackets)

	Log(Capital expenditure/Total noninterest expenditure) (1)	Log(Capital expenditure/Total noninterest expenditure) (2)	Log(Capital expenditure/Total noninterest expenditure) (3)	Log(Capital expenditure/Noninterest current expenditure) (4)
Election year (+1)	0.036 (1.47)			
Scheduled election year (+1)		0.053* (1.93)		
Elapse			0.015** (2.15)	0.020** (2.26)
Log(Per capita SGDP)	-0.234*** (12.26)	-0.235*** (12.34)	-0.239*** (12.81)	-0.323*** (13.67)
Log(Share of agricultural output in SGDP)	-0.351*** (4.67)	-0.351*** (4.66)	-0.385*** (5.3)	-0.541*** (5.89)
Log(Fiscal space)	0.346*** (7.16)	0.35*** (7.22)	0.356*** (7.45)	0.401*** (6.62)
Political alignment	0.08*** (2.82)	0.08*** (2.81)	0.078*** (2.76)	0.093*** (2.60)
Congress party	-0.082** (2.48)	-0.086*** (2.63)	-0.09*** (2.47)	-0.108*** (2.62)
Regional party	-0.043 (1.14)	-0.04 (1.06)	-0.042 (1.14)	-0.062 (1.34)
Constant	4.85*** (10.01)	4.85*** (10.02)	4.96*** (10.50)	1.69*** (2.84)
Statistics: Observations R^2 – within - between - overall F(7, 699) Prob > F	 720 0.511 0.000 0.396 104.15 0	 720 0.512 0.000 0.397 104.6 0	 734 0.511 0.001 0.387 105.85 0	 734 0.521 0.012 0.381 110.77 0

(*), (**), and (***) indicate significance at 10%, 5%, and 1%.

Table 2

ARDL Panel models of the ratio of capital to total state expenditure: 1959/60 – 2012/13

(Absolute value of t-statistics in brackets)

	Mean group (MG) (1)	Pooled Mean Group (PMG) (2)	Dynamic Fixed Effects (DFE) (3)
Long Run			
Elapse	0.028*** (2.81)	0.022** (2.17)	0.028** (2.16)
Log(Per capita SGDP)	-0.289*** (4.55)	-0.273*** (8.69)	-0.278*** (7.3)
Log(Share of agricultural output in SGDP)	-0.507** (2.02)	-0.484*** (3.92)	-0.558*** (3.73)
Log(Fiscal space)	0.372** (2.08)	0.66*** (8.63)	0.422*** (4.49)
Political alignment	0.079 (1.22)	0.048 (1.10)	0.093* (1.77)
Congress party	0.004 (0.06)	-0.041 (0.88)	-0.095 (1.56)
Regional party	0.187* (1.79)	0.087* (1.65)	0.028 (0.40)
Short Run			
Error correction Term	-0.610*** (9.5)	-0.436*** (6.11)	-0.432*** (14.19)
D(Log(Per capita SGDP))	0.018 (0.012)	0.022 (0.23)	0.088 (0.77)
D(Log(Share of agricultural output in SGDP))	0.008 (0.05)	-0.056 (0.77)	0.039 (0.34)
D(Log(Fiscal space))	-0.183 (1.47)	-0.147 (1.57)	-0.186*** (2.60)
Constant	3.32*** (4.81)	1.89*** (5.81)	2.39*** (5.40)
No. Observations	722	722	722
Chosen model	MG		

(*), (**), and (***) indicate significance at 10%, 5%, and 1%. The top panel shows long-run effects, whereas the lower panel reports both short-run effects and the speed of adjustment. A Hausman test is used to select the appropriate model.

Table 3

ARDL models of the ratio of capital to consumption Indian state expenditures: 1959/60 – 2012/13

(Absolute value of t-statistics in brackets)

	Mean group (MG) (1)	Pooled Mean Group (PMG) (2)	Dynamic Fixed Effects (DFE) (3)
Long Run			
Elapse	0.037*** (2.98)	0.027** (2.06)	0.038** (2.28)
Log(Per capita SGDP)	-0.383*** (4.8)	-0.37*** (9.27)	-0.369*** (7.6)
Log(Share of agricultural output in SGDP)	-0.687** (2.3)	-0.686*** (4.43)	-0.75*** (3.94)
Log(Fiscal space)	0.431** (1.98)	0.792*** (8.17)	0.479*** (3.99)
Political alignment	0.079 (0.074)	0.058 (1.01)	0.106 (1.58)
Congress party	0.005 (0.06)	-0.042 (0.71)	-0.116 (1.49)
Regional party	0.218* (1.83)	0.112* (1.65)	0.019 (0.21)
Short Run			
Error correction Term	-0.598*** (9.6)	-0.430*** (6.35)	-0.422*** (14.04)
D(Log(Per capita SGDP))	0.045 (0.23)	0.029 (0.23)	0.128 (0.9)
D(Log(Share of agricultural output in SGDP))	0.053 (0.3)	0.098 (1.01)	0.043 (0.31)
D(Log(Fiscal space))	-0.252 (1.58)	-0.217* (1.84)	-0.156*** (2.88)
Constant	1.33* (1.68)	0.423*** (4.47)	1.01* (1.94)
No. Observations	722	722	722
Chosen model	MG		

Note: (*), (**), and (***) indicate significance at 10%, 5%, and 1%. The upper panel shows long-run effects, whereas the lower panel reports both short-run effects and the speed of adjustment. A Hausman test is used to select the appropriate model.

Table 4

Effect of election timing on noninterest total expenditure and fiscal surplus as percentage of SGDP

(Absolute value of t-statistics in brackets)

	Non interest total spending/SGDP (1)	Fiscal surplus/SGDP (2)
Long Run		
Elapse	0.005 (0.45)	0.054 (1.56)
Log(Per capita SGDP)	0.108** (2.07)	-0.708*** (6.02)
Log(Share of agricultural output in SGDP)	-0.268 (1.40)	1.587*** (3.21)
Log(Fiscal space)	0.994*** (4.09)	2.27*** (9.5)
Political alignment	0.011 (0.25)	-0.08 (0.56)
Congress party	-0.094* (1.68)	0.332* (1.77)
Regional party	-0.075 (1.12)	0.113 (0.57)
Short Run		
Error correction Term	-0.356*** (7.01)	-0.403*** (9.69)
D(Log(Per capita SGDP))	-0.829*** (10.12)	0.929** (2.04)
D(Log(Share of agricultural output in SGDP))	-0.023 (0.26)	-0.134 (0.21)
D(Log(Fiscal space))	-0.36*** (5.07)	2.03*** (5.9)
Constant	-0.284 (0.48)	-4.697*** (9.11)
No. Observations	722	722
Chosen model	MG	PMG

Note: (*), (**), and (***) indicate significance at 10%, 5%, and 1%. The upper panel shows long-run effects, the lower panel reports both short-run effects and the speed of adjustment. A Hausman test was used to select the appropriate ARDL model.

Table 5

Elapse only in terms with scheduled elections and their effect on fiscal outcomes

(Absolute value of t-statistics in brackets)

	Log(Capital expenditure/Total noninterest expenditure) (1)	Log(Capital expenditure/Noninterest current expenditure) (2)	Log(Non interest total spending/SGDP) (3)	State Fiscal surplus/SGDP (4)
Long Run				
Elapse in Scheduled elections	0.033*** (3.17)	0.044*** (3.35)	0.001 (0.11)	0.037 (1.08)
Log(Per capita SGDP)	-0.285*** (4.56)	-0.379*** (4.80)	0.107** (2.04)	-0.708*** (6.00)
Log(Share of agricultural output in SGDP)	-0.47* (1.92)	-0.643** (2.19)	-0.259 (1.37)	1.575*** (3.18)
Log(Fiscal space)	0.372** (2.08)	0.43** (1.98)	0.984*** (4.03)	2.27*** (9.50)
Political alignment	0.077 (1.17)	0.076 (1.01)	0.005 (0.11)	-0.078 (0.55)
Congress party	-0.006 (0.09)	-0.008 (0.01)	-0.086* (1.72)	0.329* (1.75)
Regional party	0.193* (1.88)	0.226* (1.93)	-0.08 (1.31)	0.104 (0.52)
Short Run				
Error correction Term	-0.618*** (9.75)	-0.606*** (9.84)	-0.357*** (7.15)	-0.403*** (9.76)
D(Log(Per capita SGDP))	-0.019 (0.13)	-0.046 (0.23)	-0.826*** (10)	0.931** (2.05)
D(Log(Share of agricultural output in SGDP))	0.002 (0.01)	0.044 (0.24)	-0.019 (0.21)	-0.126 (0.2)
D(Log(Fiscal space))	-0.17 (1.38)	-0.232 (1.48)	-0.367*** (5.26)	2.031*** (5.93)
Constant	3.303*** (4.84)	1.29* (1.67)	-0.283 (0.47)	-4.675*** (9.15)
No. Observations	722	722	722	722
Chosen model	MG	MG	MG	PMG

Note: (*), (**), and (***) indicate significance at 10%, 5%, and 1%. The upper panel shows the long-run effects, whereas the lower panel reports both short-run effects and the speed of adjustment. A Hausman test was used to select the more appropriate ARDL model.

Table 6

ARDL models using an alternative measure of capital spending

(Absolute value of t-statistics in brackets)

	Log(Capital outlays/Total noninterest expenditure) (1)	Log(Capital outlays/Noninterest current expenditure) (2)	Log(Capital expenditure/Total noninterest expenditure) (3)
Long Run			
Elapse	0.030** (2.03)	0.038** (2.38)	
Schedule Election Year (+1)			0.088* (1.94)
Log(Per capita SGDP)	-0.295*** (6.12)	-0.317*** (3.6)	-0.298*** (4.92)
Log(Share of agricultural output in SGDP)	-0.950*** (4.75)	-0.823** (2.44)	-0.487** (2.01)
Log(Fiscal space)	0.609*** (6.45)	0.354 (1.33)	-0.235** (2.01)
Political alignment	0.085 (1.35)	0.025 (0.27)	0.064 (0.90)
Congress party	-0.098 (1.28)	0.160 (1.27)	-0.036 (0.48)
Regional party	0.039 (0.49)	0.348** (2.18)	0.110 (1.11)
Short Run			
Error correction Term	-0.408*** (6.35)	-0.578*** (8.94)	-0.599*** (9.46)
D(Log(Per capita SGDP))	0.086 (0.43)	-0.086 (0.3)	0.011 (0.06)
D(Log(Share of agricultural output in SGDP))	-0.185 (1.02)	-0.039 (0.11)	-0.069 (0.30)
D(Log(Fiscal space))	-0.353** (2.25)	-0.415*** (2.72)	0.106 (1.29)
Constant	2.451*** (6.06)	1.754 (1.59)	4.71*** (4.33)
No. Observations	722	722	722
Chosen model	PMG	MG	MG

Note: (*), (**), and (***) indicate significance at 10%, 5%, and 1%. The first panel shows the long-run effects, whereas the second panel reports both short-run effects and the speed of adjustment. A Hausman test was used to select the more appropriate ARDL model.

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