Electoral Goals and Center-State Transfers: A Theoretical Model and Empirical Evidence from India*

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ABSTRACT

We construct a model of redistributive politics, where the central government is opportunistic and uses its discretion to make grants to state governments on the basis of political considerations. These considerations are the degree of alignment between the incumbent party at the central and state levels and whether a state is a swing state or not. The model predicts that swing states that are aligned with the central government will get more grants relative to non-swing states. We test these predictions using Indian data for 15 states from 1968-69 to 1996-97. We find that the aligned swing effect is large in magnitude and statistically significant.
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1 Introduction

The allocation of grants from central to sub-national governments has always been an important issue of fiscal federalism. Central government grants help to break the linkage between revenue and expenditure assignments by levels of government, and permit the center to pursue various objectives. While the traditional literature on fiscal federalism discusses these objectives from alternative perspectives, it always assumes that the central government is a "benevolent planner", interested in maximizing social welfare.

The recent literature on political economy emphasizes the institutional constraints and rigidities under which policies are formulated. In particular, policymakers are typically political parties or politicians, who may be *opportunistic* and implement policies so as to maximize their chances of re-election, or be *partisan* and so want to further the interests of their own support groups. Of course, the pattern of transfers implemented by a benevolent government will typically be very different from those followed by opportunistic or partisan governments. While there are a number of theoretical and empirical models of opportunistic governments proposed in the literature, the diverse nature of political variables that are used to proxy the theoretical variables makes it important to test the theory in different settings. Our paper is a contribution in this direction - we focus on a developing country.

Specifically, we study the hypothesis that the central government transfers to state governments in India are motivated by political considerations. We explicitly incorporate the fact that different political parties may be in control of governments at different levels. This is important since the state government stands "between" the central government and the voters in the state. Central grants relax the budget constraints of state governments and permit the state governments to increase their expenditure. To the extent that voters in the state are unsure about how the additional expenditure is financed, the ruling party in the state also benefits from increased central grants.

We assume that central grants are used to finance public projects in the states, and that they generate goodwill amongst voters for the ruling party at the center. However, since these grants improve the welfare of the state population, the incumbent in the state also reaps some of the benefits.[1] Of course, if the incumbent in the state and the center happens to be the same party (i.e. the state government is *aligned* with the central government), then that party derives the entire (electoral) benefit of any additional expenditure in the state. On the other hand, if say party L is in power at the center and party R is in power in state s, then some of the electoral benefits of additional expenditure "leaks" to party R. This gives party L less of an incentive to give grants to this state. The central incumbent party in our model seeks to maximize the number of states it can win. Given this objective, it

[1] Khemani (2004) provides indirect evidence that state governments in India derive electoral benefits from undertaking public projects. Specifically, she shows that state governments woo voters by substantially increasing the completion of new roads in (state legislative assembly) election years.

follows that states that are *partisan*[2] towards either party lose out vis-a-vis states that have less of a partisan bias towards either party. We call such non-partisan states *swing* states.

Our model predicts that the ruling party at the center will be biased in favor of states which are aligned swing states. We call this the *Aligned Swing* effect. However, the swing factor may work very differently amongst those states which are ruled by the opposition party. Such swing states may actually be discriminated against since some of the goodwill leaks to the incumbent and this leakage is costlier if the electoral contest is expected to be close in the state. We test the predictions from our theoretical model and find strong support for the Aligned Swing effect.

We then use the model to analyze the political economy of center-state *discretionary* transfers in India.[3] The data provides strong support for the hypothesis that aligned swing states will get higher grants.

In our empirical work, we also focus on the possible influence of *lobbying* by members of the parliament. More specifically, we assume that lobbying power is restricted to members of the ruling party. That is, if party L is in power at the center, then members of parliament(MP) elected from state s and belonging to party L can exert pressure to get additional grants to their constituencies. Members of the opposition have less lobbying power because Cabinet Ministers perceive no benefit in increasing expenditure in constituencies where the incumbent belongs to the opposition. There is also some support for the lobbying hypothesis - ceteris paribus, states which elect relatively more MPs from the ruling party get higher discretionary grants.

Our paper is not the first to study such issues: Cox and McCubbins (1986), Dixit and Londregan (1996)(henceforth DL), and Lindbeck and Weibull (1987)(henceforth LW) construct theoretical models of *tactical redistribution* which describe how political parties will design their policy platforms in order to further their electoral goals. DL assume that parties design tactical redistribution programs in order to maximize their (expected) vote share, while LW also consider the case where each party's objective is to maximize the probability of winning a majority of the seats. These differences in objectives may matter when the prior distribution of support for the two parties is not symmetric (LW).

While these papers were not explicitly concerned with inter-governmental transfers, their basic ideas have been used by Case (2001) and Johanssen (2003) to test whether the party in power at the center uses block grants to sub-national governments to further its own electoral prospects. Using data on social assistance block grants from the central government to communes in Albania, Case tests the validity of the empirical predictions implied by the two political objective functions outlined by LW. She concludes that politics does matter in determining the pattern of block grants, in particular that swing communes get higher block grants. Johanssen analyzes data on grants from the central government to the municipalities in Sweden and

[2] A state is partisan if one of the parties has a devoted "vote bank" which constitutes more than half the electorate. In such states, there is no electoral compulsion to "buy" votes.

[3] A part of central grants to states in India is governed by explicit formulas. Discretionary grants refer to the part of grants which is not governed by these formulas. See Section 3 for details.

finds limited support for the hypothesis that intergovernmental grants are influenced by political considerations. Khemani (2003) analyzes whether discretionary grants are related to political considerations as compared with non-discretionary grants that are ruled by formulae, and Khemani (2004) studies political cycles or the impact of elections on public service delivery in India.

The plan of the paper is the following. In section 2, we describe the theoretical model, while Section 3 contains some institutional details. Section 4 describes the data, Section 5 contains the main results. Section 6 contains some concluding remarks while the last section is the Data Appendix.

2 Theoretical Framework

In this section, we build on the DL and LW models of electoral competition to show how the incumbent party at the center can use center-state transfers to promote the electoral prospects of the party by spreading goodwill among voters for the incumbent party at the center.

We assume that electoral competition takes place between parties L and R at the state level. The central incumbent is interested in promoting the interests of the party at the state level since a stronger state-level party is more likely to result in better performance in the central elections in that state. Let S^L be the set of states where the incumbent party is L, while S^R is the set of states where R is the incumbent. Without loss of generality, let party L be the incumbent at the center.

Grants from the center to each state s are used to finance development projects in the state. These projects increase state incomes, and so the grants generate some *goodwill* amongst voters in the state. Since the grants are channelled through the state governments (which also implement the projects), voters cannot perceive perfectly that it is the central government (and hence the L party) which is the source of the grants. Hence, the goodwill generated by these grants is shared by both tiers of government, or more accurately by the incumbent parties at the two levels of government.

Within each state, there are three types of voters. Some voters are partisans; that is, their voting behavior is not affected by grants. These are voters who base their voting decisions on political and sociological issues (e.g., ideology, religion or caste). Given that there are two parties, we may have *L-partisans* and *R-partisans*. The third type of voter is the *floating* voter. These are voters who may have some ideology, but can also be affected by the economic policies of the parties. Denote the fraction of L-partisan voters in state s as π_L^s and the fraction of R-partisan voters in state s as π_R^s. Thus the fraction of floating voters in state s is $\lambda_s = 1 - \pi_L^s - \pi_R^s$.

We assume that there is a continuum of floating voters of mass $N_s\lambda_s$, who may differ in their ideologies. A floating voter located at X on the ideology spectrum has preference X for party R over party L, where $X \in [-x, x]$. The ideology of floating voter j in state s, represented by a point X_j on the ideology spectrum $[-x, x]$ is private information, while the cumulative distribution function of X, $F(X)$ is common knowledge. For simplicity we will assume that floating voters are uniformly

distributed on the interval $[-x, x]$. Thus the density is given by $h = \frac{1}{2x}$. In principle these distributions could differ across states, but it does not alter our results to make this simplifying assumption.

Floating voters in each state vote on the basis of two criteria: ideology and the amount of goodwill received by the parties. In addition there is a stochastic component in their voting behavior which is a result of an anti-incumbency shock δ revealed just before the election. Hence if the L (R) party is in power at the state then δ is a shock *against* the L (R) party. δ can take positive or negative values. We assume that δ is distributed according to the distribution function $\Phi(\delta)$ on the interval $[-a, a]$. We assume that $|a|$ is sufficiently large so that $\Phi'(g_s, \cdot) > 0$, for any $0 \leq g_s \leq B$. In principle, δ could be state specific but we assume, for notational convenience, that all states have the same draw of δ. This assumption does not affect the results.

Consider a state $s \in S^L$, which has received a per capita grant of g_s from the center, and let voter j in state s be located at X_j on the ideology spectrum. Denote by $U_j(g_s)$ the total goodwill that voter j receives as a result of the grant g_s. Part of this goodwill goes to the central incumbent party and the rest goes to the state incumbent party. Let $\theta \in (0, 1)$. Then, θ is the fraction of goodwill corresponding to per capita grant g_s received by party L, the incumbent at the center, while $(1-\theta)$ is the fraction of goodwill received by the incumbent in the state. Of course, if party L is in power in the state, then it receives the entire goodwill. θ depends on perceptions of voters.

Noting that party L has received a total goodwill of $U_j(g_s)$, from voter j in state s, voter j will vote for party R if $X_j + \delta - U_j(g_s) > 0$, and will vote for party L otherwise. On the other hand, if $s \in S^R$, then party R receives a goodwill of $(1-\theta)U_j(g_s)$, while party L receives $\theta U_j(g_s)$. Then, voter j will vote for party R if $X_j + (1-\theta)U_j(g_s) - \theta U_j(g_s) - \delta > 0$. Assume that all voters have the same goodwill function, $U(g_s)$, such that $U'(g_s) > 0$, and $U''(g_s) < 0$. These define *cut-points* $X(g_s, \delta, \theta, L)$ and $X(g_s, \delta, \theta, R)$ such that for $k = L, R$, a voter located at X_j in state $s \in S^k$ votes for party R iff $X_j > X(g_s, \delta, \theta, k)$. Thus, the share of floating votes that the L party receives in $s \in S^L$ is $F(U(g_s) - \delta)$ and in state $s \in S^R$ is $F((2\theta - 1)U(g_s) + \delta)$. Notice that

$$\frac{dX(g_s, \delta, \theta, R)}{dg_s} = (2\theta - 1)U'(g_s), \frac{dX(g_s, \delta, \theta, L)}{dg_s} = U'(g_s). \tag{1}$$

The central incumbent engages in tactical redistribution of block grants in order to influence the location of the cut-points $X(\cdot, L)$ and $X(\cdot, R)$ among states. Notice that given equation (1), any increase in g_s leads to a rightward shift in $X(\cdot, L)$. It will lead to a rightward shift in $X(\cdot, R)$ if $\theta > \frac{1}{2}$. In other words, an increase in g_s to a state $s \in S^L$ has an *unambiguous* effect - it improves the electoral prospect of party L. The effect of an increase in g_s when $s \in S^R$ is ambiguous. Suppose θ is less than half. Then, more goodwill accrues to party R which is the incumbent in the state than to party L, the incumbent at the center. In this case, party R benefits more than party L. However, if $\theta > \frac{1}{2}$, then the incumbent at the center receives a

higher share of the goodwill, and this results in a rightward shift in the cut-point.

We assume that the tactical redistribution program of the federal government is subject to *two* constraints. First, the total transfers must satisfy an overall budget constraint. Second, the central incumbent is also interested in maximizing per capita welfare. We capture this aspect by specifying a function $\gamma(g_s)$, where $\gamma(.)$ is the per capita welfare. We make the following assumptions on γ.

(i) $\gamma'(0) = \infty$.

(ii) $\gamma'(g_s) > 0$.

(iii) $\gamma''(g_s) < 0$

We can now write the objective function of the central incumbent L. Recall that the central incumbent party L is interested in promoting its interests at the state level. This takes the form of maximizing a weighted sum of the probabilities of winning a state s given g_s. Weights for each state depend on the population as it is the population of a state that determines it's importance in the central legislature. Define *L-partisan* (*R-partisan*) states as those where $\pi_L^s > \frac{1}{2}$ ($\pi_R^s > \frac{1}{2}$). Clearly, these states will always be won or lost regardless of grants and these will not appear in the second (electoral) part of the objective function. States which have $\max(\pi_L^s, \pi_R^s) < \frac{1}{2}$ are called non-partisan or *swing* states.[4] Let us now derive the expression for the probability of winning a swing state $s \in S^L$ denoted by P_s^L.

This is the probability that the share of partisan voters and the floating voters who vote for party L is larger than $\frac{1}{2}$, i.e. the probability that $\pi_L^s + \lambda_s[F(U(g_s) - \delta)] \geq \frac{1}{2}$. Let $\frac{\pi_L^s - \frac{1}{2}}{\lambda_s h} + x = T_s^L(\pi_L^s, \lambda_s, h)$. Then we have

$$P_s^L = \Phi(T_s(\pi_L^s, \lambda_s, h) + U(g_s)) \tag{2}$$

Let $\frac{\frac{1}{2} - \pi_L^s}{\lambda_s h} - x = T_s^R(\pi_L^s, \lambda_s, h)$. Similar manipulations for the probability of winning an R-state show us that

$$P_s^R = 1 - \Phi[T_s^R(\pi_L^s, \lambda_s, h) - (2\theta - 1)U(g_s)] \tag{3}$$

Denote the set of L-states that are swing (R-states that are swing) as S_s^L (S_s^R). The objective function is therefore:

$$\sum_s N_s \gamma(g_s) + \sum_{s \in S_s^L} N_s P_s^L + \sum_{s \in S_s^R} N_s P_s^R. \tag{4}$$

The first term in (4) represents the effect of block grants on per capita welfare, while the second and third terms represent the effects of block grants on the probability of winning in swing states which are aligned and unaligned respectively. Note that the first term includes all states including swing and non-swing (partisan) states.

[4]Note that our definition of swing states differs from that of Dixit and Londregan (1996). In their model swing states are those with a higher density of floating voters at the cut-points.

The central incumbent then maximizes its objective function subject to the budget constraint:

$$\sum_s N_s g_s = B \tag{5}$$

by choice of grant allocation, g_s.

We assume that the objective function is quasi-concave, so that second order conditions are satisfied. Also we assume grants to be non-negative.

The first order conditions for maximization allow us to deduce the pattern of block grants.

Consider first the condition that needs to be satisfied for two states s and n, when s is an aligned swing state and n is a non-swing state. In this case the first order condition yields the following[5] :

$$\gamma^{'}(g_s) + \Phi'(U(g_s) + T_s^L(\pi_L^s, \lambda_s, h))U'(g_s) = \gamma^{'}(g_n) \tag{6}$$

Rearrange this equation as:

$$\gamma^{'}(g_s) - \gamma^{'}(g_n) = -\Phi'(U(g_s) + T_s^L(\pi_L^s, \lambda_s, h))U'(g_s) \tag{7}$$

Since $\Phi'(U(g_s)+T_s^L(\pi_L^s, \lambda_s, h))U'(g_s) > 0$, $\gamma^{'}(g_s)-\gamma^{'}(g_n) < 0$ in equilibrium. By concavity of $\gamma(\cdot)$ equation (7) implies that the swing state s gets more grants than the non-swing state n regardless of alignment.

Second, let us compare an unaligned swing state s and a non-swing state n. In this case the first order condition yields the following:

$$\gamma^{'}(g_s) + (2\theta - 1)U'(g_s)\Phi'((T_s^R(\pi_L^s, \lambda_s, h) - (2\theta - 1)U(g_s)) = \gamma^{'}(g_n) \tag{8}$$

Rearrange this equation as:

$$\gamma^{'}(g_s) - \gamma^{'}(g_n) = -(2\theta - 1)U'(g_s)\Phi'(T_s^R(\pi_L^s, \lambda_s, h) - (2\theta - 1)U(g_s)) \tag{9}$$

If $\theta < \frac{1}{2}$ then since $\Phi'(\cdot) > 0$, the right hand side of this equation is always positive. Thus concavity in $\gamma(\cdot)$ implies that to get the left hand side to be positive we need $g_s < g_n$, that is, a swing unaligned state gets less than a non-swing state. Obviously if $\theta > \frac{1}{2}$, this logic is reversed. Thus, the sign of the unaligned swing effect is ambiguous and depends on θ.

Third, consider two partisan (non-swing) states: regardless of their alignment they receive the same level of grants since the first order condition here relies only on the function $\gamma(\cdot)$.

We put these observations together in the following Proposition.

Proposition: Assume that the central incumbent is L. Then, the optimal pattern of block grants will satisfy the following.

(i) $g_s > g_n$ if s is an aligned swing state and n is a non-swing state.

[5]The boundary conditions on γ ensure an interior solution.

(ii) If θ is high, and s is an unaligned swing state and n is a non-swing state, then $g_s > g_n$. However if θ is low this conclusion is reversed.

(iii) If s, n are both non-swing states, then they get the same grants regardless of alignment.

In what follows, we will refer to (i) as the *Aligned Swing effect*, (ii) as the *Unaligned Swing effect* and (iii) as the *Alignment non-effect*.

3 Institutional Details

In this section, we present some relevant facts about the political situation in India and briefly discuss the structure and importance of center-state transfers.

India has a parliamentary democracy at both the central and the state level. The central parliament, the *Lok Sabha* has 543 members elected from various state level constituencies. State governments (except for union territories) have their own parliament, the *Vidhan Sabha* with the size depending on the population (Uttar Pradesh has 425 members and Pondicherry, 30).

Central parliamentary elections are held every 5 years but the central government or the president may call an election before the five years, if there is a vote of no confidence. General elections to the Lok Sabha took place in 1952, 1957, 1962, 1967, 1971, 1977, 1980, 1984, 1989, 1991, 1996, and 1998. State elections, which are also normally held every 5 years, were formally de-linked from central elections around 1969. There are one-member districts at both the central and state level elections, with the first past the post system. The district boundaries for state and central elections are different.

Our theoretical model assumes that there are two parties: in reality of course India has many parties some of which may differ at the state and central level. However for the period we study (financial year 1968-69 to 1996-97), table 1 shows that the Congress party has been in power at the center except for three phases: 1977-1980 (when the Janata party was in power), 1989-1991 (when a coalition called the National Front was in power), and 1996-1997 (when a coalition called the United Front was in power). Adding up these three phases, the Congress party was in power at the center for all but a total of 4 years and 2 months. In the main, state elections have witnessed two-party contests. For the period under review, the Congress party was the dominant party, engaged in competition with different parties in different states.

We now briefly outline relevant aspects of the fiscal structure of state governments. The revenue *raised* by a state government has two components: own tax revenue and own non-tax revenue. State governments levy taxes on agricultural income, property, and commodities. In financial year 1996-97 (the last year in our sample), commodity taxes yielded 86.8 percent of states' own tax revenue. State governments' own non-tax revenue derives from various sources, the three most important sources being interest receipts from loans issued by the state government,

dividends and profits from public sector undertakings owned by the state government, and revenues from state lotteries.

The *total* revenue of a state government is the sum of own tax revenue, own non-tax revenue, and funds received from the center. There are *three* major channels through which the center transfers funds to the state governments. These are

(i) tax devolution and grants through the Finance Commissions

(ii) grants and loans given by the Planning Commission

(iii) transfers for various central sector and centrally sponsored schemes by various central ministries.

The Indian Constitution specifies that the states are entitled to a share of the tax revenues collected by the center. The aggregate share as well as the distribution amongst the states is decided by Finance Commissions which are appointed at periodic intervals. Successive Finance Commissions recommend *explicit* formulas to determine the allocations amongst states. While Finance Commission awards have also been criticized from time to time, it is generally agreed that the formulas are *not* influenced by political considerations.

A sizeable proportion of grants and loans are also channelled through the Planning Commission. From 1969, plan transfers have been effected on the basis of a formula decided by the National Development Council, which is chaired by the Prime Minister, and contains all cabinet ministers at the center, Chief Ministers of the states and members of the Planning Commission. Since the transfers on account of *state plan schemes* are based on this consensus formula, it is tempting to exclude them from the category of *discretionary* grants to the states. However, discretionary elements can enter into the determination of these grants for two reasons. First, while each state proposes its plan size to the Planning Commission, the final approval of the size rests with the Commission. So, there is some scope for negotiation and "persuasion." Second, the formula explicitly sets aside 7.5 percent of the grants on account of *special problems* of states. Again, this allows for some subjectivity to creep in to the determination of grants for state plan schemes.

The transfers given to states through *central plan schemes* and *centrally sponsored schemes* have attracted the sharpest criticism because these are essentially completely *discretionary*. In fact, Rao and Singh (2000) define discretionary grants to consist of these two categories alone.[6] Central plan schemes are funded entirely by the center, the states merely exercising an agency role in executing these programs. Centrally sponsored programs involve some element of cost-sharing between the center and the concerned state. We consider the above grants in our empirical model which come under the categories (ii) and (iii), thus explicitly ignoring those in part (i) that are made by the Finance Commission, as the latter are governed by a formula.

[6]However, their results are somewhat surprising. They find a positive alignment effect for transfers on account of state plan schemes. On the other hand, they do not find *any* evidence of political influences on either component of discretionary grants!

State governments get a substantial proportion of their total revenues from the center. In financial year 1996-97, states' share of central taxes accounted for 23.3 percent of states' total revenues, while grants on account of state plan schemes, centrally sponsored schemes, and central plan schemes (that is, items (ii) and (iii)) jointly amounted to 15.9 percent of states' total revenues (averaged over the states in our sample).

4 The Data

The data set for our study consists of annual observations. It spans twenty-nine financial years (1968-69 to 1996-97) and covers the fifteen major states of India. In financial year 1996-97, these fifteen states accounted for 85.5 percent of India's land area and 95.9 percent of her population.

For the most part, our empirical work uses per capita central grants (in 1980-81 rupees) as the dependent variable.[7] However, in section 5.3 we take a disaggregated view and examine the *three* components of per capita central grants: per capita central grants on account of centrally sponsored schemes, central plan schemes, and state plan schemes. For each of these grants types, table 2 provides state-specific means and standard deviations, computed over the financial years 1968-69 to 1996-97. Table 2 documents the enormous across-state variation in the levels of per capita grants. For example, per capita grants on account of central plan schemes averages 39.66 rupees in Rajasthan (high) and 5.68 rupees in West Bengal (low).

The independent variables that we use partition into two distinct categories. The first category, referred to as *political controls*, measures political attributes of states that are likely to influence central grant awards. The second category, referred to as *other controls*, measures ostensibly non-political attributes of states (e.g., per capita state net domestic product) that capture the need for central assistance.

4.1 Political Controls

To test for possible alignment effects, we define a variable[8] denoted Al, to indicate the extent to which a state and the center are ruled by the same political party or coalition. Specifically, Al_{st} is obtained by calculating the fraction of financial year t during which the state government of state s and the central government have at least one party in common. For concreteness, consider the following example. Suppose party L is in power at the center throughout financial year t; furthermore, suppose party L is in the state government of state s for 4 months of that period. Then, Al_{st} will be 0.33. Should state s experience *President's Rule*[9] during financial year t, we follow the convention of treating the entire spell of President's Rule

[7] The regressions run actually logs the per capita data (see equations (10) and (11) in section 5).

[8] See the Data Appendix for the source of these variables.

[9] The president of India, upon receipt of a report by the governor of a state or otherwise, may be satisfied that constitutional breakdown has occurred at the state level. This leads, in general, to the temporary imposition of President's Rule.

as a period of center-state alignment. This is in conformity with allegations that state administrations under President's Rule typically act as agents of the central government.

The construction of the Al variable may give rise to some concern. Suppose that throughout financial year t, the center and state s are governed by distinct coalitions that have only a minimal party in common. Despite the plainly tenuous overlap between the two coalition governments, we set $Al_{st} = 1$. Fortunately, such concerns are misplaced in the Indian context during the period under review. Between financial years 1968-69 and 1996-97, the central government was a coalition for a total of two years and five months. Averaged over the fifteen states, coalition governments at the state level accounted for a total of five years and one month.[10] In most instances, all the parties of a state government coalition were either in power at the center or out of power at the center. In fact, averaged over the fifteen states, coalition governments of the above two varieties accounted for a total of four years and two months. In other words, coalition state governments were in general either unambiguously aligned or unaligned with central governments.

We define a variable, denoted $Margin$, to indicate the likelihood that a given state-year is non-swing. Specifically, $Margin_{st}$ is calculated as follows. We assume that parties believe that the outcome of the *last* state legislative assembly election is a good predictor of whether the next election is at all likely to witness a change in the identity of the state government. Accordingly, we first identify the last state legislative assembly election in state s occurring prior to the second half of financial year t. For concreteness, consider the financial year 1968-69. To calculate the value of *Margin*, we identify the last state legislative assembly election occurring prior to October 1, 1968. Given the identified assembly election, we compute the proportion of seats captured by the ruling state government. Let this be p_{st}. The skewness of the assembly election outcome is measured by how far the ruling state government was from winning just 50 percent of the seats. We posit that the ruling state government's electoral prospects are secure if the election outcome had been lopsided and set $Margin_{st} = |p_{st} - 0.5|$.[11,12]

For the most part, our empirical work does not employ $Margin$ as a regressor. Rather, we make use of a dummy variable, denoted SwD_{st}, which takes value 1(0) when $Margin_{st}$ is weakly less (strictly more) than 0.067. This cut-off value ensures that one-third of the state-years in our sample have $SwD_{st} = 1$. The construction of SwD is certainly arbitrary. On the other hand, the broad message of our empir-

[10] For each state s, we computed the number of months during which the state government was a coalition. The average of these numbers across the fifteen states was 61 months.

[11] Our use of $Margin_{st}$ to proxy for whether state-year (s,t) is non-swing requires an extra assumption. Note that the state government receives votes from partisan and floating voters. Thus, an increase in p_{st} signals an increase in the share of partisan voters only if the increase in p_{st} is not *fully* driven by a favorable shift in floating voters.

[12] Miguel and Zaidi (2003) use data from Ghana to study whether the ruling party at the center provides education funding to administrative districts on the basis of political returns. Their approach to the problem is similar to ours: for each administrative district, a narrow margin of victory in the previous election is used as a proxy for political competitiveness in the future.

ical results is unaltered if $Margin$ is used as a regressor or the dummy variable is constructed somewhat differently (see tables 6 and 7 for details).

Our theoretical model - based on center-state alignment and swing - is far from a complete picture of center-state transfers. In particular, lobbying by states' Members of Parliament may also influence the flow of central funds. We define a variable, denoted MP, to measure states' lobbying power. Specifically, MP_{st} is the ratio of the number of Members of Parliament from state s (in the last parliamentary election) belonging to the party (or coalition) ruling at the center in financial year t to the total number of parliamentary seats in state s. The larger the number of ruling party Members of Parliament, the greater their lobbying power. However, since our dependent variables are per capita grants, an adjustment for the state population is needed. That is why we divide the number of ruling party Members of Parliament by the total number of parliamentary seats in the state.

For each of the three political variables - $Al, Margin, MP$ - table 3 provides means and standard deviations. These are computed over the financial years 1968-69 to 1996-97 and are arrayed by state. Table 3 clearly shows that the political variables exhibit substantial variation both within and across states. Our empirical analysis exploits only within-state variation to estimate the parameters of interest.

4.2 Other Controls

The set of "other controls" comprises five regressors: *annual rainfall*, *proportion of state population characterized as scheduled caste or scheduled tribe*, per capita *state net domestic product* (in constant 1980-81 rupees), the *share of agriculture in state net domestic product*, and *voter turnout* in the last state legislative assembly election.[13] For each of the above regressors, table 4 provides means and standard deviations. These are computed over the financial years 1968-69 to 1996-97 and are arrayed by state.

We briefly outline why the allocation of central grants may be conditioned on the set of "other controls." State incomes derived from agriculture depend on rainfall levels; central grants may provide insurance to state governments by responding to rainfall shocks. Scheduled castes and scheduled tribes represent historically disadvantaged groupings of citizens; equity considerations could induce a positive relationship between grant awards and the share of such groups in states' population. Equity concerns also lead us to believe that poorer states will receive more of the central pie than richer states. Chakraborty (2003), on the other hand, argues that state income is a good proxy for lobbying power. This suggests that the nature of central transfers in India may actually be regressive. Farmers and industrialists represent distinct lobbies with disparate interests. The relative strengths of these two groups plays a role in determining whether industrial states are favored in terms of grant awards relative to agricultural states. Alternatively, public investments may have greater value in industrial states (e.g., because of higher population density). Here,

[13] In table 9, the five regressors are given the following names: *Rainfall*, *SC/ST*, *GDP*, *Share-Agri*, and *Turnout*.

economic efficiency considerations could induce a negative relationship between the volume of central grants and the share of agriculture in state net domestic product. Finally, we include voter turnout as a proxy for a state's political awareness. Politically aware states *may* have a large proportion of partisan voters. This may explain the negative relationship between state turnout and central grants received by a state.

5 Estimation and Results

In our theoretical model, the party in power at the center maximizes the objective function in equation (4) subject to an aggregate budget constraint. The maximization problem yields a behavioral function where the supply of central grants to a particular state depends on the exogenous characteristics of *all* states. Our empirical work does *not* estimate this behavioral function. Instead, we record the grants given by the central incumbent to the various states and ask the following question: Are political factors identified by our theoretical model (causally) related to central grant awards? To this end, we consider estimating an error components model of the form:

$$\begin{aligned} Grants_{st} = \alpha_s + \beta Al_{st} + (\delta_1 SwD_{st} + \delta_2 MP_{st}) \times Al_{st} + (\gamma_1 SwD_{st} + \gamma_2 MP_{st}) \\ \times (1 - Al_{st}) + \omega_s t + \theta Z_{st} + \epsilon_{st} \end{aligned} \quad (10)$$

where $Grants_{st}$ is the natural log of per capita real grants from the center to state s in financial year t; Al_{st}, SwD_{st} and MP_{st} are the political controls - as described in section 4.1; Z_{st} is the (5×1) vector of "other controls" - as described in section 4.2; α_s is a state fixed effect; $\omega_s t$ is a time trend specific to state s; and ϵ_{st} is the error term, presumed to be orthogonal to all of the regressors. The various political considerations impose restrictions on the signs and magnitudes of β, γ's and δ's.

We highlight *four* important features of equation (10). First, equation (10) presumes that central grants for state-year (s,t) vary continuously with the political circumstances of that state-year. For concreteness, consider the treatment of Al_{st}. Equation (10) maintains that in terms of expected central grants, a state-year with uninterrupted center-state affiliation (Al_{st} equals one) is distinct from a state-year with eleven months of center-state affiliation (Al_{st} equal to $\frac{11}{12}$). Such fine-tuning requires federal grants to respond promptly and continuously to the politics of state s.[14]

Second, what restriction on equation (10) is imposed by the alignment non-effect result of our theoretical model? In the discussion that follows, state-year (s,t) and state s are referred to as *aligned* (*unaligned*) when $Al_{st} = 1(0)$; state-year (s,t) and state s are referred to as *swing* (*non-swing*) when $SwD_{st} = 1(0)$. The alignment

[14] It turns out that our empirical results are *not* sensitive to how center-state affiliation is coded. In column (6) of table 6, we show that nothing substantive is altered if a dummy variable is used to represent the affiliation term.

non-effect result says that an aligned and non-swing state ($Al_{st} = 1$ and $SwD_{st} = 0$) is expected to receive the same central grants as an unaligned and non-swing state ($Al_{st} = 0$ and $SwD_{st} = 0$). Thus, β must equal 0.

Third, we interact SwD_{st} with both Al_{st} and $(1 - Al_{st})$ because the relationship between political swing and the ability to attract central grants is dependent on whether the central and state governments are affiliated. Our theory predicts that $\delta_1 > 0$ - that is, aligned states that are swing receive more federal grants than aligned states that are non-swing. Recall, however, that our theory is ambivalent about the sign of γ_1. The intuition is the following. Consider a central government providing grants to an unaligned and swing state. When the voter goodwill generated by central grants is disproportionately conferred on the incumbent state government ($\theta < \frac{1}{2}$), each rupee transferred *decreases* the probability that this state switches support in favor of the party at the center. The central incumbent therefore favors unaligned states that are non-swing to unaligned states that are swing - that is, $\gamma_1 < 0$. On the other hand, when the goodwill leakage to the incumbent state government is small ($\theta > \frac{1}{2}$), each rupee transferred *increases* the probability that the party at the center will capture the swing state in the next state election. The central incumbent therefore has an incentive to favor unaligned states that are swing to unaligned states that are non-swing - that is, $\gamma_1 > 0$.

Fourth, we interact MP_{st} with Al_{st} and $(1-Al_{st})$ to allow the lobbying power of a state's ruling party MPs to depend on the extent of center-state alignment. Informal theories of such dependence can be constructed without difficulty. Our expectation is that δ_2 and γ_2 are positive.[15]

The specification of equation (10) raises immediate concerns about the endogeneity of the political controls. Voter preferences and hence political characteristics of state-year (s, t) could respond to grants shocks, ϵ_{st}. Note that such a response is not a priori impossible when a state legislative assembly election takes place in state s during the first half of financial year t. As a matter of fact, approximately 10 percent of the sample state-years (s, t) witnessed a state legislative assembly election in the first half of financial year t. To circumvent the endogeneity problem, we employ two different estimation strategies. These are described below.

Let P_{st} denote the political controls in state-year (s, t). Our first approach estimates equation (10) by using one-period lagged political controls, $P_{s,t-1}$, to instrument for P_{st}. Objections can be raised about the validity of the chosen instruments. If $P_{s,t-1}$ responds to grant allocations in financial year $(t - 1)$ and before, then persistence in grant shocks induces an undesired correlation between $P_{s,t-1}$ and ϵ_{st}. To the extent that this objection is valid, our results need to be viewed with caution. On the other hand, taking long lags of the political variables as instruments for P_{st} is infeasible: the correlation between P_{st} and $P_{s,t-a}$ drops off dramatically with lag

[15] Grossman (1994) and Worthington and Dollery (1998) develop an alternative model: grants are used by federal politicians to buy the support of state voters and state politicians, thereby enhancing their own chances of reelection. A "high" value of MP_{st} indicates that the federal government has a strong base in state s. This reduces the incentive to purchase additional state support through intergovernmental grants. Of course, this would imply that δ_2 and γ_2 are negative.

length a.

Our second approach uses one-period lagged political variables, $P_{s,t-1}$, directly as regressors.[16] Thus, we consider running a panel regression of the form:

$$Grants_{st} = \alpha_s + \beta Al_{s,t-1} + (\delta_1 SwD_{s,t-1} + \delta_2 MP_{s,t-1}) \times Al_{s,t-1} + (\gamma_1 SwD_{s,t-1} + \gamma_2 MP_{s,t-1}) \times (1 - Al_{s,t-1}) + \omega_s t + \theta Z_{st} + \epsilon_{st} \quad (11)$$

Can the coefficients of the political variables in equation (11) be *interpreted* in terms of real world processes? Suppose central grants for state-year (s,t) are largely determined at the beginning of financial year t. Then, conditioning on the political attributes of state s in financial year $(t-1)$ (that is, $P_{s,t-1}$) is reasonable.

A problem arises, however, when a state legislative assembly election takes place in state s during financial year $(t-1)$. In this event, central grants for state-year (s,t) should depend only on the *post-election* political characteristics of state s. Equation (11), on the other hand, averages the political characteristics of state s over the entire financial year $(t-1)$. For concreteness, consider the following example. Let state s have an assembly election six months into financial year $(t-1)$; furthermore, suppose that state s is unaligned prior to the election but aligned in the post-election phase. At the time that central grants are allocated to state-year (s,t), the central government should simply note that the current state s government is aligned. Instead, equation (11) assigns to the current state s government an average measure of alignment equal to $\frac{1}{2}$. That is, $Al_{s,t-1} = \frac{1}{2}$.

In light of this interpretation problem, we proceeded as follows. Should state s witness a state legislative assembly election in financial year $(t-1)$, we excluded state-year (s,t) from our sample. Equation (11) estimates, restricted to the identified subsample, turned out to be virtually identical to those reported in this paper.

We end this section by pointing out why our equation (11) estimates may *not* represent a causal effect. The specification of equation (11) ensures that at the time that central grants are allocated to state-year (s,t), $P_{s,t-1}$ is fixed by construction. Nonetheless, concerns about endogeneity are not misplaced: we have already noted that long-lived grant shocks engender a non-zero correlation between $P_{s,t-1}$ and ϵ_{st}. Even if $P_{s,t-1}$ and ϵ_{st} are uncorrelated, a second problem crops up. Note that the central government provides grants to state s precisely because its political characteristics can thereby be altered - that is, $P_{s,t-1}$ is potentially correlated with *past* grant shocks, $\epsilon_{s,t-a}$. Since $P_{s,t-1}$ is therefore not strictly exogenous, the fixed effects estimator is inconsistent. On the other hand, since our data are weakly dependent over time and T (=29) is large, the magnitude of the inconsistency is likely to be small (see, e.g., Wooldridge (2002), chapter 11).[17]

[16] Using U.S. data, Levitt and Poterba (1999) examine the link between congressional representation and state economic growth. They confront an endogeneity problem similar to ours: does politics affect growth, or growth affect politics? Their estimation strategy coincides with our second approach.

[17] Bertrand et al. (2004) analyze difference in differences estimation and demonstrate that conventional standard errors are severely biased downwards when the error term, ϵ_{st}, and the independent variables are serially correlated. Our estimation of equations (10) and (11) allows for within-state clustering of the error term.

5.1 Basic Regression Results

The basic regression results for central grants are given in table 5. Column (3) corresponds to the estimates obtained by instrumenting the political controls in equation (10); column (4) corresponds to the estimates obtained by applying ordinary least squares to equation (11). The five independent variables, clubbed together as "other controls" in section 4.2, were included in all regressions. We reserve a discussion of these variables for section 5.4.

Columns (3) and (4) indicate that β, the coefficient of Al, is not statistically significant at conventional levels. Thus, in conformity with our theory, insofar as non-swing state-years are concerned, central grants are *not* conditioned on the extent of center-state affiliation. We draw the reader's attention to the substantial literature that uses U.S. data to test for the alignment effect. For example, Alvarez and Saving (1997), Levitt and Snyder (1995), and Wilson (1986) study whether a House district is favored in terms of central funds when its Representative is a member of the majority party in the U.S. Congress. Our study extends this literature to a different setting.

Columns (3) and (4) also indicate that δ_1, the coefficient of the interaction term between SwD and Al, is positive and statistically significant at the 5 percent level. Thus, within the class of aligned state-years, swing states receive a larger share of the central government pie than their non-swing counterparts. How large in magnitude is this swing effect? We take a conservative stance and favor the smaller column (4) estimate of δ_1. Now, contrast state-years of two sorts: one type represents aligned states with SwD equal to zero; the other type represents aligned states with SwD equal to one. Per capita central grants are 22.1 percent higher in state-years of the latter kind.

Our theory is ambivalent about the sign of γ_1, the coefficient of the interaction term between SwD and $(1 - Al)$. This ambivalence is reflected in our findings. In marked contrast to δ_1, γ_1 is not close to being statistically significant at conventional levels. Numerous U.S. studies have explored the link between political competitiveness of geographical constituencies and the ability to attract federal dollars (see, e.g., Alvarez and Saving (1997), Poterba and Levitt (1999), and Wright (1974)). These studies maintain that political competitiveness per se is positively related to central grants awards. Our empirical results suggest that a more nuanced story "works" for India.

To make this point somewhat differently, we re-estimate equations (10) and (11) with the alignment variable, Al, *removed*.[18] Column (1) corresponds to the estimates obtained by instrumenting the political controls in the modified equation (10); column (2) corresponds to the estimates obtained by applying least squares to the modified equation (11). Columns (1) and (2) show that the coefficient of SwD is positive and statistically significant at the 10 percent level. Hence, swing state-years receive more central grants than non-swing state-years. However, columns (3)

[18] Equation (10) with Al removed is as follows: $Grants_{st} = \alpha_s + \delta SwD_{st} + \gamma MP_{st} + \theta Z_{st} + \omega_s t + \epsilon_{st}$. Equation (11) with Al removed is as follows: $Grants_{st} = \alpha_s + \delta SwD_{s,t-1} + \gamma MP_{s,t-1} + \theta Z_{st} + \omega_s t + \epsilon_{st}$.

and (4) demonstrate that this finding is entirely driven by grant awards for aligned state-years.

We now demonstrate that the least squares estimates of equation (11) (column (4) of table 5) are not spurious. Indeed, the results are remarkably stable even though we define variables differently and tinker with model specification. Consider table 6. Column (5) of table 6 differs from column (4) of table 5 in *two* ways. First, to conserve on parameters, column (5) does not allow the lobbying power of states' ruling party MPs to depend on the extent of center-state affiliation. Hence, possible interactions between MP and Al are left unmodeled; instead, one-period lagged MP is directly introduced as a regressor. Second, our construction of the swing dummy, SwD, is admittedly somewhat arbitrary (e.g, cut-off value fixed at 0.067). In column (5), we therefore replace SwD in equation (11) with the continuous measure, $Margin$. Column (6) of table 6 differs from column (5) in its treatment of the alignment variable. Specifically, the continuous variable Al is replaced by a dummy variable, $AlDum$; $AlDum_{st}$ takes the value 1 if the state government of state s during financial year t is affiliated with the central government for at least six months, and is 0 otherwise. Column (7) of table 6 replaces the state-specific time trends in equation (11) with year dummies.

We highlight three features of table 6, all of which are consistent with results from table 5. First, for non-swing state-years, notice that there are *no* alignment effects in table 6 (the coefficients of one-period lagged Al and $AlDum$ are not statistically significant at conventional levels). Second, observe that for unaligned state-years, central grants are *not* conditioned on the outcome of the last state legislative assembly election (the coefficients of one-period lagged $Margin \times (1 - Al)$, $Margin \times (1 - AlDum)$, and $SwD \times (1 - Al)$ are not statistically significant at conventional levels). Third, for aligned state-years, central grants *are* related to the outcome of the last state legislative assembly election (the coefficients of one-period lagged $Margin \times Al$, $Margin \times AlDum$, and $SwD \times Al$ are statistically significant at the 10 percent level). How large in size is the aligned swing effect? Consider a state-year (s, t) with twelve months of center-state affiliation. Then, per capita central grants for this state-year decline by 7.4 percent for a one standard deviation increase in $Margin_{st}$.[19]

Finally, tables 5 and 6 show that the flow of central funds to a state is influenced by *MP*, our proxy for states' lobbying power (refer to columns (1) and (2) of table 5 and all three columns of table 6). Specifically, since the coefficient of *MP* is positive and statistically significant, an increase in a state's ruling party MPs brings forth additional central grants. What is the size of this lobbying effect? Central grants for state-year (s, t) increase by 5.4 percent for a one standard deviation increase in MP_{st}.[20] There is a substantial literature that uses U.S. data to explore the link between states' (or House districts') political clout in Congress and central grants received (see, e.g., Atlas et al. (1995), Rich (1989), and Roberts (1990)). Our study

[19] To arrive at this result, we set the coefficient of $Margin \times Al$ to -0.70. Over the sample state-years, the mean of $Margin$ is 0.15 and the standard deviation is 0.11.

[20] To arrive at this result, we set the coefficient of *MP* to 0.17. Over the sample state-years, the mean of *MP* is 0.57 and the standard deviation is 0.31.

of the lobbying power of Indian states' extends this literature to a different setting.

Taken in total, the regression results in this section lend support to our theoretical model: alignment effects are absent in non-swing state-years and swing effects are present only in the presence of center-state affiliation. Furthermore, the estimated magnitude of the swing effect is non-negligible. Whilst unrelated to our theoretical model, we also demonstrate that states' ruling party MPs influence (through lobbying perhaps) central grants awards.

5.2 Subsample Results: Central Grants

In this section, we restrict our empirical analysis to state-years satisfying two conditions: center-state affiliation must last for the entire financial year and there should be no incidence of President's Rule.[21] Such state-years provide an unambiguous picture of political circumstances at both the center and the state. We anticipate, therefore, that central grants awards restricted to the identified subsample will prominently incorporate the political features of our theoretical model. Note, however, that Al_{st} takes the value of one for all state-years (s,t) in our subsample; hence, β cannot be identified in equation (10). Accordingly, the purpose of this section is to undertake a detailed exploration of the swing effect in aligned state-years.

To prevent a proliferation of parameters, section 5.1 categorized state-years as swing ($SwD = 1$) or non-swing ($SwD = 0$). We now introduce a trichotomous classification of state-years. To this end, two new indicator variables – $VerySwD$ and $ModSwD$ – are constructed. Specifically, $VerySwD_{st}$ takes the value of one in state-year (s,t) if $Margin_{st}$ is weakly less than 0.07, and is zero otherwise; $ModSwD_{st}$ takes the value of one in state-year (s,t) if $Margin_{st}$ lies between 0.07 and 0.24, and is zero otherwise. The two indicator variables jointly divide the state-years into three distinct groups: group 1 has $VerySwD_{st}$ equal to one, group 2 has $ModSwD_{st}$ equal to one, while group 3 has both $VerySwD_{st}$ and $ModSwD_{st}$ equal to zero. The chosen cut-off values, 0.07 and 0.24, make the three groups equal-sized in our subsample.

The model that we first estimate is essentially equation (10) restricted to the state-years in our subsample. Hence, our model is of the form:

$$Grants_{st} = \alpha_s + \delta_1 VerySwD_{st} + \delta_2 ModSwD_{st} + \beta MP_{st} + \theta Z_{st} + \omega t + \epsilon_{st} \quad (12)$$

In contrast to equation (10), note that equation (12) replaces the state-specific time trends with a common time trend. This is done to conserve degrees of freedom. Equation (12) is estimated by instrumenting the political variables on the right-hand side with one-year lagged values. Column (1) of table 7 details the results obtained.

Using least squares, we also estimate several models based on equation (11). The model with which we begin is of the form:

$$Grants_{st} = \alpha_s + (\delta_1 VerySwD_{s,t-1} + \delta_2 ModSwD_{s,t-1}) \times Al_{s,t-1} + (\gamma_1 VerySwD_{s,t-1}$$

[21] A similar analysis restricted to state-years with twelve months of center-state mismatch is infeasible - there are only 91 such state-years in our sample. Furthermore, with missing observations for the dependent and independent variables, the final data set shrinks to less than 80 observations.

$$+\gamma_2 ModSwD_{s,t-1}) \times (1 - Al_{s,t-1}) + \beta_1 Al_{s,t-1} + \beta_2 MP_{s,t-1} + \theta Z_{st} + \omega t + \epsilon_{st} \quad (13)$$

The results obtained from estimating equation (13) are in column (2) of table 7. Notice that table 7 only shows the estimates of δ_1, δ_2 and β_2; this is because the coefficients of the remaining political variables never approach statistical significance at conventional levels. To ensure that our column (2) results are not spurious, we re-estimate equation (13) after replacing the common time trend with year dummies. Column (3) of table 7 shows our findings. As a final robustness check, we remove the two swing dummies from equation (13). Instead, we introduce two continuous variables – $Margin_{s,t-1} \times Al_{s,t-1}$ and $Margin_{s,t-1} \times (1 - Al_{s,t-1})$ – as regressors. The obtained results are in column (4) of table 7.

The aligned swing effect makes, at a minimum, one prediction regarding the parameters of equations (12) and (13): $\delta_1 > 0$ (that is, group-one aligned state-years receive larger central grants than group-three aligned state-years). Table 7 confirms this prediction: δ_1 is always correctly signed and statistical significant at the 5 percent level. Added support for the aligned swing effect comes from column (4) of table 7. Here, the coefficient of $Margin_{s,t-1} \times Al_{s,t-1}$ is negative as well as statistically significant at the 5 percent level. Summing up, for aligned state-years, there is *clear* evidence that the volume of central grants is increasing in the closeness of the preceding state assembly election.

How large in magnitude is the aligned swing effect? We adopt a conservative stance and use the smallest estimate of δ_1 (column (3) of table 7) to provide an answer. Contrast state-years of two sorts: one type consists of aligned states in group one ($VerySwD_{st} = 1$); the other type comprises aligned states in group three ($VerySwD_{st} = ModSwD_{st} = 0$). Per capita central grants are 23.4 percent higher in a state-year of the first kind than in a state-year of the latter variety. Thus, the aligned swing effect is of non-negligible size.

5.3 Subsample Results: Categories of Central Grants

We continue to restrict our analysis to state-years with twelve months of center-state affiliation and no incidence of President's Rule. For such state-years, we anticipate that the political features of our model may crop up even in the *individual* categories of central grants – i.e., grants on account of central plan schemes, centrally sponsored schemes, and state plan schemes.

We proceed as follows. In section 5.2, a trichotomous classification of state-years was introduced. Now, we revert to our initial dichotomous classification: state-years are either swing ($SwD = 1$) or non-swing ($SwD = 0$).[22] For each of the central grants categories, we estimate equation (12) using instrumental variables (after replacing $VerySwD_{st}$ and $ModSwD_{st}$ with SwD_{st}). We also estimate equation (13) using least squares (again, after replacing $VerySwD_{s,t-1}$ and $ModSwD_{s,t-1}$ with $SwD_{s,t-1}$). Our findings for equations (12) and (13) are detailed in, respectively, columns labeled (1) and (2) of table 8.

[22] When a trichotomous classification of state-years is introduced, the results are slightly worse; however, the broad message of this section is unchanged.

The aligned swing effect says that aligned and swing state-years receive larger central grants than aligned and non-swing state-years (in other words, the coefficients of SwD and one-period lagged $SwD \times Al$ should be positive in, respectively, columns labeled (1) and (2) of table 8). Notice that regardless of the grants category considered and the estimation strategy employed, the relevant coefficients are correctly signed. We had pointed out that grants for state plan schemes possess a substantial formula-based component. This makes it difficult for the central government to deploy such grants for the purposes of tactical redistribution. In conformity with this viewpoint, the aligned swing effect is *not* statistically significant at conventional levels for grants on account of state plan schemes. On the other hand, for the remaining two grants categories, the aligned swing effect turns up as statistically significant at the 10 percent level.

How large in magnitude is the aligned swing effect? For brevity, we base our answer on column (2) estimates only. Contrast state-years of two sorts: one type consists of aligned states that are swing ($SwD_{st} = 1$); the other type comprises aligned states that are non-swing ($SwD_{st} = 0$). Then, per capita grants on account of central plan schemes and centrally sponsored schemes are, respectively, 64.9 percent and 18.5 percent higher in a state-year of the first kind than in a state-year of the latter variety.

5.4 Impact of "Other Controls"

For all the state-years in our sample, recall that tables 5 and 6 show how political considerations impact on central governments' grant awards to states. Here, we ask: do the "other controls" *also* affect central governments' grant decisions?

We focus on the different variations of equation (11) in tables 5 and 6 (column (4) through column (7)). Corresponding to each variation, table 9 records the estimated coefficients of the five control variables. Table 9 elicits three preliminary remarks. First, when year dummies are incorporated in equation (11) (column (7)), the proliferation of parameters makes estimation very imprecise. Hence, all of the control variables end up being statistically insignificant. Second, two of the control variables – *Rainfall* and SC/ST – are statistically insignificant throughout. Thus, central governments' grant awards do not respond to state agricultural income shocks (proxied by *Rainfall*) or the proportion of historically disadvantaged citizens in state population (proxied by SC/ST). Third, we had anticipated that states' political awareness (proxied by *Turnout*) would be negatively correlated with grants from the center. The coefficient of *Turnout* is persistently negative, though never statistically significant at the 5 percent level.

The striking feature of table 9 is the behavior of *Share-Agri* and *GDP*; both variables are statistically significant at the 1 percent level. Since the coefficient of *Share-Agri* is negative, central governments' grants increase when a state's structure of production moves away from agriculture. The magnitude of this industrial bias is large: a one standard deviation increase in *Share-Agri* engenders a 24.5 percent

decrease in per capita central grants.[23] Since the coefficient of *GDP* is positive, an increase in state per capita income brings forth a greater volume of grants from the center. Richer states obviously enjoy greater political clout and have differential access to central coffers; naturally, this yields tangible material gains as well. The magnitudes involved are not small: a one standard deviation increase in *GDP* produces a 3.1 percent increase in per capita central grants.[24,25] For comparison, we note that the impact of political factors on central grants slightly exceeds that of *GDP* but is far less that that of *Share-Agri*. Recall that a one standard deviation decrease in *Margin* and a one standard deviation increase in *MP* raise per capita central grant awards by, respectively, 7.4 percent and 5.4 percent.

6 Conclusion

This paper constructed a political economy model wherein the federal government provided grants to the states in order to affect state-level voter preference. The model's solution indicated that the allocation of federal funds satisfied two properties, which were referred to as the alignment non-effect and the aligned swing effect. Both of these properties were detected in state-level data from India.

Many empirical questions remain to be explored. Our study was confined to the analysis of explicit center-state transfers in India. Yet, intergovernmental transfers in India are frequently implicit (e.g., subsidized borrowing by states from the central government). A future study could estimate the extent to which political factors account for such transfers. Biswas and Marjit (2000) represent a start on this problem. They show that states' representation in the central government cabinet affects the statewise distribution of Letters of Intent and Industrial Licenses.

Finally, we have tested but one half of the complete story. Specifically, while central governments' grant decisions were analyzed, voter behavior was left unaddressed. Does the electorate, at the subnational level, condition its vote on central grants? Some evidence, employing U.S. data, already exists. Levitt and Snyder (1997) demonstrate that central spending in a House district enhances the vote share of the incumbent member of Congress. Stein and Bickers (1994) use survey data to establish that a voter is more likely to support the incumbent House candidate when she is aware of new central grant awards to her district. Comparable work with Indian data is non-existent. In sum, the analysis of voter behavior in India remains a fruitful research topic.

[23] To obtain this result, we set the coefficient of *Share-Agri* to -2.50. Over the sample state-years, the mean of *Share-Agri* is 0.42 and the standard deviation is 0.11.

[24] To obtain this result, we set the coefficient of *GDP* to 4×10^{-5}. Over the sample state-years, the mean of *GDP* is 1771 and the standard deviation is 770.

[25] Chakraborty (2003) and Rao and Singh (1998) have also shown that central governments' transfers to states (implicit credit subsidies and explicit central grants) are regressive in character.

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7 Data Appendix

7.1 Center-State Transfer Variables

• Real Per Capita Grants for Various Categories
– real grants from the center for different scheme types divided by state population.
– unit: 1980-81 rupees per person
– nominal grants from the center for different scheme types
source: Reserve Bank of India Bulletin, Reserve Bank of India
– state population data
source: National Accounts Statistics, Government of India, Ministry of Planning, Department of Statistics
– deflator used is the implicit state net domestic product deflator (base year 1980-81)
source: National Accounts Statistics, Government of India, Ministry of Planning, Department of Statistics

7.2 Political Control Variables

• Alignment Between Center and State
– number of days (in a financial year) during which governments at the center and state have at least one political party in common divided by 365.
– unit: proportion between 0 and 1
– if a state is under President's Rule, center-state alignment over that period is assumed.
source: coded from India Decides, Elections 1952-1995 and Encyclopedia of India and Her States (see References for details)

• Ruling Party Members of Parliament of the State
– number of Members of Parliament elected from the state (in the last parliamentary election) belonging to the ruling party (or parties) at the center divided by the number of parliamentary seats in the state.
– unit: proportion between 0 and 1
source: coded from India Decides, Elections 1952-1995

• Margin in State Legislative Assembly
– for each day (in a financial year), compute the absolute difference between 0.5 and the proportion of seats in the state legislative assembly captured by the ruling state government in the last state election.
– for each financial year, compute margin in the state legislative assembly as the average of the above numbers.
source: coded from India Decides, Elections 1952-1995 and Encyclopedia of India and Her States

7.3 Other Control Variables

• Annual Rainfall
– unit: meters
source: Statistical Abstract of India, Government of India, Ministry of Planning, Department of Statistics

• Real Per Capita State Net Domestic Product
– unit: 1980-81 rupees per person
source: National Accounts Statistics, Government of India, Ministry of Planning, Department of Statistics

• Share of Agriculture in State Net Domestic Product
– state net domestic product from the agricultural sector divided by state net domestic product (all sectors).
– unit: proportion between 0 and 1
source: National Accounts Statistics, Government of India, Ministry of Planning, Department of Statistics

• Turnout
– valid votes cast in the last state legislative assembly election divided by the size of the state electorate.
– unit: proportion between 0 and 1
source: coded from India Decides, Elections 1952-1995

• SC/ST Proportion
– state population characterized as scheduled caste or scheduled tribe (SC/ST) divided by total state population.
– unit: proportion between 0 and 1
source: censuses 1961, 71, 81 and 91, Government of India, Office of the Registrar General. Census of India. New Delhi.
– total state population and SC/ST population assumed to grow at a constant (compound) rate derived from the respective population totals for interpolation.

Table 1: Lok Sabha Elections, 1967-1996

Year	Party
1967	Congress Party (Indira Gandhi)
1971	Congress Party (Indira Gandhi)
1977	Janata Party (Morarji Desai)
1980	Congress Party (Indira Gandhi)
1984	Congress Party (Rajiv Gandhi)
1989	National Front (coalition of Janata Dal and regional parties, led by V.P. Singh)
1991	Congress Party (P.V. Narasimha Rao)
1996	United Front (coalition led by H.D. Deve Gowda and I.K. Gujral)

Table 2: Summary Statistics for Per Capita Grants from the Center to the States of India

	GRANTS FOR CENTRAL PLAN SCHEMES		GRANTS FOR CENTRALLY SPONSORED SCHEMES		GRANTS FOR STATE PLAN SCHEMES	
	Avg.	Std. Dev.	Avg.	Std. Dev.	Avg.	Std. Dev.
Andhra Pradesh	17.42	18.39	11.10	6.58	50.41	72.24
Assam	17.78	23.45	10.74	7.79	324.02	522.57
Bihar	6.50	11.29	8.76	7.47	34.64	43.64
Gujarat	9.27	21.70	12.40	7.48	51.64	70.41
Haryana	10.76	18.29	14.49	8.96	82.93	167.38
Karnataka	18.00	22.00	11.20	6.79	39.12	57.65
Kerala	12.03	15.30	10.47	6.47	60.65	87.80
Madhya Pradesh	20.65	25.48	11.46	7.07	57.62	77.62
Maharashtra	13.12	14.32	11.16	6.14	45.40	76.61
Orissa	26.41	27.89	13.65	8.44	83.84	118.71
Punjab	18.59	17.83	9.82	5.44	44.59	61.41
Rajasthan	39.66	45.06	18.61	12.02	85.43	116.66
Tamil Nadu	13.20	14.07	9.59	6.57	57.60	86.51
Uttar Pradesh	13.59	11.61	9.60	7.48	83.82	137.24
West Bengal	5.68	6.61	5.65	3.07	68.49	119.65

Notes: The grants categories have been described in section 3 of the paper (for further details, refer to the Data Appendix). All of the grants variables are measured per capita in 1980-81 rupees. For each grants variable, Avg. and Std. Dev. show, respectively, the state-specific means and standard deviations. The sample period is financial year 1968-69 to 1996-97.

Table 3: Summary Statistics of Political Variables

	CENTER-STATE ALIGNMENT (AL)		MARGIN IN STATE LEGISLATURE (MARGIN)		PROPORTION OF RULING PARTY MP'S (MP)	
	Avg.	Std. Dev.	Avg.	Std. Dev.	Avg.	Std. Dev.
Andhra Pradesh	0.56	0.47	0.16	0.07	0.54	0.34
Assam	0.80	0.39	0.14	0.14	0.33	0.20
Bihar	0.78	0.39	0.05	0.05	0.61	0.30
Gujarat	0.89	0.28	0.18	0.13	0.59	0.31
Haryana	0.87	0.33	0.13	0.11	0.79	0.20
Karnataka	0.59	0.45	0.18	0.10	0.76	0.31
Kerala	0.60	0.47	0.10	0.09	0.34	0.25
Madhya Pradesh	0.82	0.35	0.19	0.09	0.75	0.21
Maharashtra	0.84	0.35	0.14	0.12	0.77	0.20
Orissa	0.68	0.43	0.21	0.12	0.73	0.22
Punjab	0.82	0.34	0.13	0.08	0.68	0.26
Rajasthan	0.80	0.36	0.13	0.11	0.60	0.32
Tamil Nadu	0.45	0.46	0.14	0.12	0.38	0.27
Uttar Pradesh	0.87	0.28	0.14	0.12	0.65	0.33
West Bengal	0.24	0.42	0.29	0.07	0.26	0.14

Notes: The political variables have been described in section 4.1 of the paper (for further details, refer to the Data Appendix). For each political variable, Avg. and Std. Dev. show, respectively, the state-specific means and standard deviations. The sample period is financial year 1968-69 to 1996-97.

Table 4: Summary Statistics of "Other" Control Variables

	RAINFALL		SHARE-AGRI		SC/ST		GDP		TURNOUT	
	Avg.	Dev.	Avg.	Dev.	Avg.	Dev.	Avg.	Dev.	Avg.	Dev.
Andhra Pradesh	0.92	0.12	0.43	0.08	0.20	0.020	1512	265	0.69	0.03
Assam	2.41	0.24	0.46	0.09	0.20	0.014	1402	249	0.65	0.13
Bihar	1.29	0.14	0.47	0.08	0.23	0.003	924	123	0.56	0.04
Gujarat	0.68	0.18	0.33	0.08	0.22	0.007	2215	592	0.55	0.06
Haryana	0.68	0.17	0.51	0.09	0.19	0.004	2621	678	0.67	0.05
Karnataka	1.81	0.38	0.41	0.07	0.18	0.027	1858	360	0.66	0.03
Kerala	2.69	0.34	0.37	0.06	0.11	0.006	1629	287	0.76	0.03
Madhya Pradesh	1.14	0.13	0.45	0.07	0.36	0.018	779	486	0.53	0.03
Maharashtra	0.87	0.14	0.24	0.04	0.17	0.036	2774	801	0.61	0.04
Orissa	1.45	0.18	0.49	0.12	0.38	0.006	1334	173	0.50	0.08
Punjab	0.70	0.15	0.49	0.05	0.27	0.016	3037	740	0.61	0.18
Rajasthan	0.53	0.12	0.50	0.07	0.29	0.007	1492	311	0.56	0.02
Tamil Nadu	0.99	0.13	0.27	0.08	0.19	0.007	1843	414	0.69	0.05
Uttar Pradesh	1.13	0.17	0.48	0.08	0.21	0.002	1351	205	0.50	0.04
West Bengal	2.03	0.32	0.35	0.05	0.28	0.015	1792	374	0.68	0.10

Notes: RAINFALL is annual rainfall (in meters), SHARE-AGRI is the share of agriculture in state net domestic product, SC/ST is the share of state population characterized as scheduled caste or scheduled tribe, GDP is the per capita state net domestic product (in 1980-81 rupees), and TURNOUT is voter turnout in the last state legislative assembly election. For each variable, Avg. and Dev. show, respectively, the state-specific means and standard deviations. The sample period is financial year 1968-69 to 1996-97.

Table 5: Regression Results for Per Capita Grants (all state-years)

	IV (1)	OLS (2)	IV (3)	OLS (4)
Al	-0.09		-0.32	
	(-0.57)		(-0.82)	
SwD	0.24[a]			
	(2.02)			
MP	0.36[a]			
	(1.97)			
Lagged Al		-0.03		-0.16
		(-0.39)		(-0.94)
Lagged SwD		0.15[b]		
		(1.93)		
Lagged MP		0.17[b]		
		(1.71)		
SwD×Al			0.32[a]	
			(1.99)	
SwD×(1 – Al)			-0.09	
			(-0.34)	
MP×Al			0.23	
			(0.82)	
MP×(1 – Al)			0.34	
			(1.52)	
Lagged SwD×Al				0.20[a]
				(2.07)
Lagged SwD×(1 – Al)				-0.03
				(-0.34)
Lagged MP×Al				0.11
				(0.95)
Lagged MP×(1 – Al)				0.15
				(1.32)
Observations	332	333	332	333

Notes: The dependent variable is the natural log of per capita grants in 1980-81 rupees. The *t*-ratios, which are heteroscedasticity-robust and corrected for within-state clustering of the error term, are given in parentheses; a = significance at the 5 percent level (two-tailed test), b = significance at the 10 percent level (two-tailed test). All of the regressions include state dummies, state-specific time trends, and "other controls."

Table 6: Additional Regression Results for Per Capita Grants (all state-years)

	OLS (5)	OLS (6)	OLS (7)
Lagged Al	0.08		-0.16
	(0.75)		(-1.25)
Lagged SwD×Al			0.14[b]
			(1.68)
Lagged SwD×(1-Al)			-0.03
			(-0.37)
Lagged Margin×Al	-0.70[b]		
	(-1.72)		
Lagged Margin×(1-Al)	0.08		
	(0.25)		
Lagged AlDum		0.07	
		(0.69)	
Lagged Margin×AlDum		-0.67[b]	
		(-1.67)	
Lagged Margin×(1-AlDum)		0.04	
		(0.12)	
Lagged MP	0.17[b]	0.18[b]	0.29[a]
	(1.78)	(1.76)	(2.53)
State-Specific Time Trends	Yes	Yes	No
Year Dummies	No	No	Yes
Observations	333	333	333

Notes: The dependent variable is the natural log of per capita grants in 1980-81 rupees. The *t*-ratios, which are heteroskedasticity-robust and corrected for within-state clustering of the error term, are given in parentheses; a = significance at the 5 percent level (two-tailed test), b = significance at the 10 percent level (two-tailed test). All of the regressions include state dummies and "other controls."

Table 7: Regression Results for Per Capita Grants
(12 months of Center-State Alignment)

	IV (1)	OLS (2)	OLS (3)	OLS (4)
VerySwD	0.35[a] (2.48)			
ModSwD	0.30[a] (4.14)			
Lagged VerySwD×Al		0.30[a] (2.20)	0.21[a] (2.05)	
Lagged ModSwD×Al		0.28[a] (4.08)	0.08 (1.13)	
Lagged Margin×Al				-1.16[a] (-2.15)
MP	0.47 (1.25)			
Lagged MP		0.31 (1.30)	0.22 (1.08)	0.30 (1.39)
"Other Controls"	Yes	Yes	Yes	Yes
Time Trend	Yes	Yes	No	Yes
Time Dummies	No	No	Yes	No
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	164	164	164	164

Notes: The dependent variable is the natural log of per capita grants in 1980-81 rupees. The OLS equations in columns (2) and (3) also include one-period lagged *Al*, one-period lagged *VerySwD*×(1 – *Al*), and one-period lagged *ModSwD*×(1 – *Al*) as regressors. The OLS equation in column (4) also includes one-period lagged *Al* and one-period lagged *Margin*×(1 – *Al*) as regressors. The *t*-ratios, which are heteroscedasticity-robust and corrected for within-state clustering of the error term, are given in parentheses; a = significance at the 5 percent level (two-tailed test), b = significance at the 10 percent level (two-tailed test).

Table 8: Disaggregated Regression Results for Per Capita Grants (12 months of Center-State Alignment)

	Central Plan Schemes		Centrally Sponsored Schemes		State Plan Schemes	
	IV (1)	OLS (2)	IV (1)	OLS (2)	IV (1)	OLS (2)
SwD	0.61[a]		0.21[b]		0.09	
	(2.34)		(1.95)		(1.62)	
MP	0.60		0.33		0.17	
	(0.57)		(1.45)		(1.26)	
Lagged SwD×Al		0.50[a]		0.17[b]		0.07
		(2.46)		(1.86)		(1.57)
Lagged MP		0.29		0.21		0.11
		(0.47)		(1.29)		(1.15)
"Other Controls"	Yes	Yes	Yes	Yes	Yes	Yes
Time Trend	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173	173	198	198	203	203

Notes: The dependent variable is the natural log of per capita grants on account of central plan schemes, centrally sponsored schemes, and state plan schemes in 1980-81 rupees. The OLS equations (columns labeled (2)) also include one-period lagged *Al* and one-period lagged $SwD\times(1 - Al)$ as regressors. The *t*-ratios, which are heteroscedasticity-robust and corrected for within-state clustering of the error term, are given in parentheses; a = significance at the 5 percent level (two-tailed test), b = significance at the 10 percent level (two-tailed test).

Table 9: Regression Coefficients for "Other Controls" in Tables 5 and 6

	OLS (4)	OLS (5)	OLS (6)	OLS (7)
Lagged RAINFALL	-0.07	-0.05	-0.05	0.02
	(-0.98)	(-0.71)	(-0.72)	(0.30)
Lagged SHARE-AGRI	-2.50[a]	-2.59[a]	-2.59[a]	-0.11
	(-3.33)	(-3.55)	(-3.58)	(-0.08)
Lagged SC/ST	-0.67	1.62	1.42	-1.86
	(-0.10)	(0.28)	(0.24)	(-0.56)
Lagged GDP	$10^{-5}\times4$[a]	$10^{-5}\times5$[a]	$10^{-5}\times4$[a]	$-10^{-5}\times1$
	(2.70)	(3.23)	(3.20)	(-0.68)
Lagged TURNOUT	-0.50	-0.53	-0.52	0.30
	(-1.59)	(-1.68)	(-1.66)	(0.80)

Notes: The column numbers of table 9 (that is, (4)-(7)) match up with the column numbers of tables 5 and 6. RAINFALL is annual rainfall (in meters), SHARE-AGRI is the share of agriculture in state net domestic product, SC/ST is the share of state population characterized as scheduled caste or scheduled tribe, GDP is the per capita state net domestic product (in 1980-81 rupees), and TURNOUT is voter turnout in the last state legislative assembly election. In the regressions that were run, all of the control variables were lagged by one period. The *t*-ratios, which are heteroscedasticity-robust and corrected for within-state clustering of the error term, are given in parentheses; a = significance at the 5 percent level (two-tailed test).