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Electoral goals and center-state transfers: A theoretical model and empirical evidence from India ☆

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bstract

We construct a model of redistributive politics where the central government is opportunistic and uses its discretion to make transfers to state governments on the basis of political considerations. These considerations are the alignment between the incumbent parties at the central and state levels and whether a state is a swing state or not. A testable prediction from the model is that a state that is both swing and aligned with the central government is especially likely to receive higher transfers. We test this prediction using Indian data for 14 states from 1974–75 to 1996–97. We find that a state which is both aligned and swing in the last state election is estimated to receive 16% higher transfers than a state which is unaligned and non-swing.
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1. Introduction

The allocation of grants (i.e. transfers) from central to subnational 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 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, India.

Specifically, we study the hypothesis that central government transfers to state governments in India are motivated by political considerations. Our theoretical framework explicitly

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incorporates the fact that different political parties may be in

level. It is possible therefore for the central incumbent party to have different objective functions based on whether re-election is at the state or the central level. Our benchmark model focuses on the first case where the central incumbent party is interested in promoting the interests of the (L) party at the state level. We then show that under some assumptions, the predictions l6saed[()18.48(on)1880(b)21.8.9(e)-234.5(c)0(e)14.7(n)0(t)18.9(r)0(a)19.2(l)-338.9(in)18

by choice of grant allocation, g_s. We assume that the central incumbent's problem has an interior solution. Assumption 1 below ensures that the solution is a global maximum. The first-order condition for a state $s \in S^L$ is:

$$\gamma'(g_s^*) + \Phi_s'(X(g_s^*, L))U'(g_s^*) = \lambda \tag{6}$$

and for a state $s \in S^R$:

$$\gamma'(g_s^*) + \Phi_s'(X(g_s^*, \theta, R))(2\theta - 1)U'(g_s^*) = \lambda \tag{7}$$

where λ denotes the Lagrange multiplier and g_s^* is the allocation of grants to state s that is optimal for the central incumbent, L.

Before discussing the implications of Eqs. (6) and (7), we consider the following situation. Suppose state s does not receive any grant from the central incumbent. With g_s set equal to 0, notice that the cut-point in state s is pegged at 0. We interpret the density at the cut-point 0, $\Phi_s'(0)$, to be a measure of how *swing* state s is. For example, if state s has a higher density than state l at the cut-point 0 – i.e., $\Phi_s'(0) > \Phi_l'(0)$ – then this is interpreted as saying that relative to state l, state s has a higher proportion of voters who are not ideologically attached to either party ("floating voters" or "independents") and hence is more swing.

Our theoretical propositions relate variations in grant levels across states to variations in states' swing and variations in states' alignment with the central incumbent. However, we need some further notation and extra assumptions in order to state the propositions formally. Consider two states s, l and assume w.l.o.g. that $\Phi_s'(0) > \Phi_l'(0)$. Let $\overline{x}_{sl}$ be the first crossing point to the right of zero for the two p.d.f.s Φ_s', Φ_l'; let $\underline{x}_{sl}$ be the first crossing point to the left of zero for the two p.d.f.s Φ_s', Φ_l'.[6] Given $\overline{x}_{sl}$, $\overline{g}_{sl}$ is defined to be the grant level such that $X(\overline{g}_{sl}, L) = \overline{x}_{sl}$; given $\underline{x}_{sl}$ and $\theta < \frac{1}{2}$, $\underline{g}_{sl}(\theta)$ is defined to be the grant level such that $X(\underline{g}_{sl}(\theta), 0, R) = \underline{x}_{sl}$. So, the grant level $\overline{g}_{sl}$ ensures that the resulting cut-point is $\overline{x}_{sl}$; the grant level $\underline{g}_{sl}(\theta)$ ensures that the resulting cut-point is $\underline{x}_{sl}$.

When state $s \in S^k$, $k = L, R$, receives grant g from the central incumbent, let $V_s(g, \theta, k)$ denote the *per person* contribution of the state to the objective function of the central incumbent, given in Eq. (4). Thus, for state $s \in S^L$, $V_s(g, \theta, L)$ is equal to $\gamma(g) + \Phi_s(X(g, L))$; for state $s \in S^R$, $V_s(g, \theta, R)$ is equal to $\gamma(g) + \Phi_s(X(g, \theta, R))$. We will assume that the functions $\{V_s(g, \theta, k)\}_{s \in S^k}$, $k = L, R$, are concave in g.

ssumption 1. For all states $s \in S^k, k = L, R, V_s(g, \theta, k)$ is concave in g.[7]

Recall that $\{g_s^*\}_{s \in S}$ is the allocation of grants that is optimal for the central incumbent, L. Proposition 1 considers the case wherein $\theta \leq \frac{1}{2}$ (goodwill leakages are "large") and shows that, regardless of cut-point densities, states that are unaligned with the central incumbent receive lower grants than states that are aligned. This is called the *Alignment Effect*, and it arises only because in our model the role of incumbent parties is different from challenger parties, in that state incumbents are able to reap the benefits of grants coming from the central government since voters are not able to distinguish the source of the grants.

Proposition 1. *Consider two states s, l. If $\theta \leq \frac{1}{2}$, $s \in S^L$ and $l \in S^R$, then $g_s^* > g_l^*$.*

Proof. The first-order condition for state $s \in S^L$ is given in Eq. (6) and the first-order condition for state $l \in S^R$ is given in Eq. (7). Thus,

$$\gamma'(g_s^*) - \gamma'(g_l^*) = \Phi_l'(X(g_l^*, \theta, R))(2\theta - 1)U'(g_l^*) - \Phi_s'(X(g_s^*, L))U'(g_s^*) \tag{8}$$

Recall that we have assumed that $\Phi_s'(X)$ and $\Phi_l'(X)$ are strictly positive for all $X \in [\underline{X}, \overline{X}]$. Hence, $\theta \leq \frac{1}{2}$ implies that $\Phi_l'(X(g_l^*, \theta, R))(2\theta - 1)U'(g_l^*) - \Phi_s'(X(g_s^*, L))U'(g_s^*)$ is strictly less than 0. Thus, $g_s^* > g_l^*$ follows from the concavity of $\gamma(.)$.

Consider now a comparison of two states that are both

First assume that $\theta > \frac{1}{2}$. Since $\Phi_s'(X) > \Phi_l'(X)$ for all $X < \overline{x}_{sl}$, it follows that $\partial V_s(g_s, \theta, R)/\partial g_s > \partial V_l(g_l, \theta, R)/\partial g_l$ if $g_s = g_l < \overline{g}_{sl}$. Concavity of $V_s(.)$ and $V_l(.)$ in g ensures that $g_s^* > g_l^*$ when $g_s^*, g_l^* < \overline{g}_{sl}$ if the first-order condition is to be satisfied.

Now consider the case when $\theta < \frac{1}{2}$. Observe that if $g < \underline{g}_{sl}(\theta)$, then $\partial V_s(g,\theta,R)/\partial g_s < \partial V_l(g,\theta,R)/\partial g_l$

level elections. If the central incumbent has the same objective function i.e. to maximize its vote shares across states in the central level election, then we get the same predictions as in Propositions 1–5, but for central elections.

To summarize, when the objective function of the central government is to get re-elected through maximizing the vote shares across states and voters are assumed to vote on party lines, then the predictions of Propositions 1–5 still hold.

3. Institutional details

In this section, we present some relevant facts about political institutions in India, outline the electoral history of political parties since independence in 1947, discuss the basic structure of center-state transfers, and provide examples of central government schemes financed by the central grant category on which our paper focuses.

3.1. Political institutions

3.1.1. Electoral rules

India has a parliamentary democracy at both the central and state levels. The central parliament, the *Lok Sabha*, has 543 members. The country is divided into 543 separate geographical areas (that is, Lok Sabha constituencies), each of which returns one Member of Parliament. The size and shape of the Lok Sabha constituencies are determined by an independent *Delimitation Commission*. The Commission ensures that Lok Sabha constituencies *strictly* respect state boundaries and, as near as is practicable, have the same population. This means, of course, that the number of Lok Sabha constituencies assigned to a state is in rough proportion to its population.

Given single-member constituencies, elections to the Lok Sabha use the first-past-the-post system: a voter in a specific constituency casts a vote for one of the candidates up for election in that constituency; the candidate mustering the most votes is declared the election winner. While most candidates stand as Independents (that is, without formal affiliation with any political party), successful candidates are usually representatives of recognized political parties.[11]

State governments have their own parliament, the *Vidhan Sabha*, with assembly size depending on state population (Uttar Pradesh has 425 members and Haryana, 90). The procedures for Vidhan Sabha elections exactly mirror those for central elections. Each state is divided into single-member Vidhan Sabha constituencies (the boundaries of Vidhan and Lok Sabha constituencies are different) and the first-past-the-post system is used.

3.1.2. Government formation

Once Lok Sabha election outcomes are declared and there is a single-party majority, the party with the largest number of seats is invited by the president of India to form the central government. When there is no clear majority, coalitions with sufficiently large support can form the government. The government that eventually forms, whether single-party or coalition, must command the confidence of a majority of the Lok Sabha members.

The constitution of India mandates that a national legislative assembly have a normal term of 5 years from the date appointed for its first sitting. Hence, Lok Sabha elections must be held every 5 years, unless called earlier. Two circumstances lead to *mid-term* (that is, early) elections. First, a government may lose the confidence of the Lok Sabha. The president of India, upon verifying that no claimant can form an alternative government claiming majority support, conventionally calls for fresh elections. Second, a government may, principally for electoral gains, voluntarily petition the president of India to dissolve the Lok Sabha and hold mid-term elections; by convention, such recommendations are consented to. For the period that we study (financial year 1974–75 to 1996–97), Lok Sabha elections took place in 1977, 1980, 1984, 1989, 1991 and 1996.

The rules for government formation at the state level are identical to those at the center. Once Vidhan Sabha election outcomes are declared, the governor of the state invites the party with the largest number of seats to form the state government, which must command the support of a majority of the Vidhan Sabha members. The constitution of India stipulates that the normal term of a state legislative assembly is 5 years from the date appointed for its first sitting. Hence, Vidhan Sabha elections are normally held every 5 years, unless called earlier.[12] State elections were formally de-linked from central elections in 1969, when several states held mid-term elections.

3.2. Electoral history

The electoral history of India divides into two distinct phases. In the first phase, which spanned the years from independence in 1947 until 1967, the Congress Party monopolized the electoral landscape: indeed, in this period, the Congress Party never obtained less than 70% of the seats in any Lok Sabha election and won all but two Vidhan Sabha elections.[13] However the con-

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Lok and Vidhan Sabha elections of 1967 marked the beginning of a new phase in Indian politics: the Congress Party lost 78 seats in the Lok Sabha election and retained a majority of just 23 seats; subsequently in the Vidhan Sabha elections, non-Congress governments came to power in five states. The post-1967 era has beheld lively inter-party competition for seats at both the central and state levels.

Our theoretical model assumes that there are two parties: in reality of course India has many parties,of of which may differ at the state and central levels. However, for the period that we study, 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),of1989-1991of(when a coalition

be seen from the websites of the respective ministries. The Ministry of Rural Development (http://rural.nic.in/) talks about a scheme called "Bharat Nirman" under which there are targets set down for electrification of villages, telephone connectivity, provision of clean water to villages, and so on. The Ministry of Power has the responsibility for the electrification plan through a program called "Rajiv Gandhi Vidyutikaran Yojana" and the agency for implementation is the Rural Electrification Corporation, a public sector agency, rather than the state government. On the other hand, for drinking water, the scheme is a centrally sponsored scheme where state governments contribute 50% of the funds and have a role in the targeting of beneficiaries. Examples of other schemes under the Ministry of Rural Development include "Swarnajayanti Gram Swarozgar Yojana" (which provides bank finance so that beneficiaries can buy productive assets and be self-employed) and "Indira Aawas Yojna" (which provides houses to households below the poverty line).

4. The data

The data set for our study consists of annual observations spanning the financial years 1974–75 to 1996–97 for the 14 major states of India. Thus, we exclude from our study the so-called special category states that receive exceptionally generous financial treatment from the Indian government on account of their specific problems (see Rao and Singh (2001) for further details) and the tiny state of Goa, which was upgraded from union territory status as recently as 1987.[18] In financial year 1996–97, the 14 major states accounted for 83.1% of India's land area, 93.3% of her population, and 92.6% of the domestic product. The details on sources of data and the method of construction of variables are provided in the Appendix.

The grant variable that we use is defined as the per capita sum of *central plan scheme* and *centrally sponsored scheme* grant levels in constant prices (1980–81 rupees). Column [1] of Table 2 provides state-specific means and standard deviations of this grant variable computed over the sample period. There is enormous across-state variation in the levels of per capita grants. For example, per capita grants average 115.61 rupees in Rajasthan (high) and 38.69 rupees in West Bengal (low).

The set of explanatory variables are partitioned 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 domestic product) that capture the need for central assistance.

4.1. Political controls

There are four main predictions from our benchmark theoretical model: (i) Alignment Effect, (ii) Aligned Swing Effect, (iii) Unaligned Swing Effect, and (iv) Swing Effect for targeted grants. Prediction (i) says that when the fraction of goodwill received by the incumbent at the center, θ, is low, then independent of swing, an aligned state receives higher grants relative to an unaligned state. Prediction (ii) states that an aligned and swing state obtains higher grants relative to a non-swing state, whether aligned with the central incumbent or otherwise. Prediction (iii) points out that if θ is high, then a state that is unaligned and swing receives higher grants relative to a state that is unaligned and non-swing. This conclusion is reversed when θ is low. We are unable to test predictions (i) and (iii) because they depend on the unobservable θ. Since data on targeted grants are not available, we are also unable to test prediction (iv). We discuss below how we translate prediction (ii) into empirically testable hypotheses.

Our political variables are Swing and Alignment. We construct both as dummy variables. The swing dummy is denoted SW: states are therefore categorized as 'swing' (SW equals one) or 'non-swing' (SW equals zero). The alignment dummy is denoted AL. Consider a linear regression model that includes the interacted regressors AL * SW, AL * (1 − SW) and (1 − AL) * SW and let α, β and δ be the corresponding coefficients. Then, prediction (ii) implies that $\alpha > 0$ and $\alpha - \beta > 0$.

In order to proceed with the construction of the two crucial dummy variables, AL and SW, we first assume that decisions regarding the allocation of central grants to state s for financial year t are made at the very beginning of that financial year (that is, March 31 of financial year $(t-1)$) using state electoral outcome information from the *last* Vidhan Sabha election as well as the *last* Lok Sabha election.

We opt for the March 31 decision date because by that time, the amount of aggregate central grants (on account of central plan schemes and centrally sponsored schemes) available for disbursement in the forthcoming financial year is formally recorded in the annual fiscal budget of the central government *and* there is at least an implicit understanding in the Planning Commission regarding the grant amounts assigned to each of the states. This reasoning notwithstanding, the March 31 deadline is of course somewhat arbitrary. So, in Section 6 we report our results when the central grants-related decision date for financial year t is pegged instead at March 1 of financial year $(t-1)$ (that is, we bring forward the decision date by one month).

We construct the alignment dummy as follows: AL_{st} is defined as 1 if the central government and the state government of state s on March 31 of financial year $(t-1)$ share at least one political party in common *and* there is no *President's Rule* in state s on that date.[19,20] The state-specific averages for this

[18] The 14 major states are as follows: Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. In financial year 1996–97, India consisted of 25 states: the 14 above-mentioned major states, Goa, and 10 special category border states.

[19] Notice that the date used to construct the alignment dummy is the date on which decisions regarding central grant allocations are presumed to be made.

[20] Recall that President's Rule may be imposed on a state when the president of India is satisfied that constitutional breakdown has occurred at the state level. We exclude President's Rule from our definition of the alignment dummy since the center-state relationship during a spell of President's Rule is qualitatively different from that in normal times.

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Table 2
Descriptive statistics 1974/75–1996/97

	Per capita grants: central plan schemes + centrally sponsored schemes (in 1980–81 rupees) [1]		Alignment variable (March 31) [2]	Annual rainfall (in meters) [3]		State population (in millions) [4]	Share of state population characterized as scheduled caste or scheduled tribe [5]	Per capita state domestic product (in 1980–81 rupees) [6]		Share of agriculture in state domestic product (in percentage) [7]	Per capita allocation of central tax proceeds, determined by the Finance Commission (in 1980–81 rupees) [8]	
State	Mean	SD	Mean	Mean	SD	Mean	Mean	Mean	SD	Mean	Mean	SD
Andhra Pradesh	86.60	33.48	0.39	0.95	0.12	59.5	0.21	1355.22	139.25	39.3	293	79
Bihar	60.35	33.92	0.70	1.28	0.13	77.8	0.23	607.36	60.93	43.8	321	111
Gujarat	72.52	30.93	0.70	0.69	0.19	37.5	0.22	2949.73	412.46	30.2	227	65
Haryana	88.58	32.10	0.87	0.70	0.17	14.6	0.19	8597.66	618.28	47.9	201	39
Karnataka	81.92	32.03	0.39	1.85	0.40	40.8	0.19	2069.53	187.56	38.3	261	59
Kerala	57.19	24.66	0.52	2.68	0.35	27.1	0.11	2523.62	283.35	34.9	242	56
Madhya Pradesh	65.90	28.14	0.74	1.12	0.13	58.8	0.37	945.65	66.55	42.6	232	49
Maharashtra	66.06	28.34	0.70	0.88	0.14	70.4	0.18	1669.00	183.36	23.1	218	30
Orissa	86.15	32.01	0.78	1.44	0.20	28.8	0.38	1781.90	152.76	45.3	273	84
Punjab	74.01	37.72	0.56	0.73	0.15	18.4	0.27	8892.37	586.59	46.4	241	48
Rajasthan	115.61	57.27	0.65	0.54	0.12	38.9	0.29	1763.52	182.38	47.6	257	77
Tamil Nadu	59.43	27.38	0.35	0.99	0.13	52.0	0.20	1455.10	229.48	23.7	260	54
Uttar Pradesh	63.24	37.36	0.70	1.15	0.16	124.0	0.21	467.38	20.17	44.7	267	77
West Bengal	38.69	18.02	0.13	2.05	0.33	60.8	0.28	1485.46	79.46	32.4	282	75
Average	72.59	37.34	0.58	1.22	0.62	50.6	0.24	2611.68	2604.93	38.6	255	73

variable are given in Column [2] of Table 2 and the listing is given in Appendix Table 1. It turns out that the states of Bihar, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh are highly aligned states. The least aligned state is West Bengal, which had an aligned state government only during the three initial years (1974–75 to 1976–77).

The construction of the alignment dummy may give rise to some concern. Suppose that at the start of financial year t, the center and state s are governed by distinct coalitions that have only a minimal party in common. Yet, despite the plainly tenuous overlap between the two coalition governments, we code AL_{st} to equal 1. Fortunately, such concerns are misplaced in the Indian context during the period under review. Between financial years 1974–75 and 1996–97, the central government was a coalition for a total of 2 years and 5 months. Averaged over the 14 states, coalition governments at the state level accounted for a total of 1 year and 2 months.[21] 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.

Consider, now, how we create the political control variables that indicate whether a state–year (s, t) is swing or not.[22] We construct the swing dummy to satisfy the following criteria: First, it should be a relative measure in line with our theoretical model; and second, it should take account of multi-party contests that are a standard feature of constituency-level elections in India.

Our theoretical model shows that both Vidhan and Lok Sabha election outcomes may affect the flow of central funds. This means that we end up creating *two* sets of measures of swing for state–year (s, t) – one set is derived from Vidhan Sabha election outcomes while the other is based on Lok Sabha election outcomes – and include interactions between these two sets of swing measures in our empirical model. Consistent with the construction of the alignment dummy, the various swing measures for state–year (s, t) use outcomes from the last Vidhan and Lok Sabha elections as viewed from the decision date pegged at March 31 of financial year ($t-1$).

Our construction of the swing measures proceeds as follows. Given state–year (s, t), we identify the last Vidhan Sabha and Lok Sabha elections occurring in state s prior to financial year t.[23] Now, for both elections, we observe the vote shares of the contending political parties in each of the electoral constituencies of state s. So, for each election, we first define a variable *winmarg*, which for electoral constituency i is the difference in the percentage vote shares of the two political parties that secure the highest number of votes in

[21] For each state s, we computed the number of months between financial years 1974–75 and 1996–97 during which the state government was a coalition. The average of these numbers over the 14 states is 14 months.

[22] Note that we use "state–year (s, t)" as a shorthand for "state-financial year (s, t)."

[23] For concreteness, consider the financial year 1974–75. To obtain the swing measures, we identify the last Vidhan Sabha and Lok Sabha elections occurring before March 31, 1974.

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constituency i (see footnote for further details);[24] this done, we classify electoral constituency i as a 'swing' constituency if its *winmarg* value is less than or equal to the cutoff value of 1%. Let $vswing01_{stg}$

Table 3
Descriptive statistics of "Swing" measures

State	Proportion of constituencies with winning margin [1]				Proportion of times the state was a swing state [2]			
	≤1%	≤2%	≤5%	≤10%	≤1%	≤2%	≤5%	≤10%
State elections — Vidhan Sabha								
Andhra Pradesh	0.046	0.084	0.217	0.415	0.435	0.435	0.435	0.435
Bihar	0.052	0.097	0.235	0.422	0.739	0.783	0.783	0.783
Gujarat	0.029	0.068	0.155	0.301	0	0.087	0	0
Haryana	0.061	0.105	0.233	0.422	0.609	0.609	0.609	0.609
Karnataka	0.042	0.081	0.205	0.397	0.435	0.522	0.522	0.435
Kerala	0.073	0.144	0.383	0.671	0.826	1	1	1
Madhya Pradesh	0.037	0.083	0.203	0.384	0.304	0.348	0.348	0.304
Maharashtra	0.038	0.069	0.190	0.30(h)13/F11Tf0.7042D[(Karnataka490.70.435)-49Oriss20.434TD[(Maharashhar)-9456.2				

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 central transfers in India may actually be regressive. Farmers and industrialists represent distinct lobbies with disparate interests. The strengths of these two groups play 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, economic efficiency considerations could induce a negative relationship between the volume of central grants and the share of agriculture in state domestic product. Finally, why do we use the *explicitly* formula-based per capita allocation of central tax revenues as a regressor? It is generally agreed that the Finance Commission, which determines states' share of central tax revenues, does not exhibit noticeable

political bias and instead bases its awards on variables that reflect states' genuine need for central assistance. By using these Finance Commission transfers as a regressor, we ask whether the variables on which we focus – the swing and alignment dummies – account for central grants once we control for states' needs as perceived by the Finance Commission.[26]

5. Empirical model and results

In our theoretical model, the party in power at the center maximizes the objective function in Eq. (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: Is there an association between the central grant awards and the political factors identified by our theoretical model? To this end, we estimate the following log-linear model for grants:

$$\ln(\text{grants})_{st} = \beta' p_{st} + \gamma' x_{st} + \alpha_s + \delta_t + u_{st} \tag{13}$$

where grants_{st} is the per capita real grants (on account of central plan schemes and centrally sponsored schemes) from the center to state

Table 4
Least squares (within-group estimation) results for per capita grants

	Basic model without 'other controls' [1]	Basic model [2]	Variant 1 [3]	Variant 2 [4]	Variant 3 [5]	Variant 4 [6]
AL∗VSW∗LSW	0.135 (1.87)	0.179 (2.58)	0.188 (2.80)	0.177 (2.52)	0.222 (2.76)	
AL∗VSW∗(1−LSW)	0.087 (1.30)	0.130 (2.09)	0.140 (2.23)	0.118 (1.84)	0.190 (2.75)	
AL∗(1−VSW)∗LSW	−0.057 (0.75)	−0.026 (0.37)	−0.002 (0.02)	−0.040 (0.55)	0.051 (0.65)	
AL∗(1−VSW)∗(1−LSW)	−0.041 (0.06)	−0.005 (0.10)	0.001 (0.16)	−0.033 (0.54)	0.096 (1.60)	
(1−AL)∗VSW∗LSW	0.005 (0.08)	0.011 (0.15)	0.019 (0.25)	0.019 (0.27)	0.040 (0.49)	
(1−AL)∗VSW∗(1−LSW)	0.039 (0.69)	0.035 (0.60)	0.023 (0.38)	0.038 (0.65)	0.093 (1.31)	
(1−AL)∗(1−VSW)∗LSW	0.004 (0.05)	−0.012 (0.17)	−0.019 (0.24)	−0.008 (0.11)	0.023 (0.30)	
Alignment dummy						0.055 (1.38)
Proportion of constituencies in the state that are swing in the last state election						1.470 (2.38)
Proportion of constituencies in the state that are swing in the last national election						0.190 (0.59)
R^2 (within-group)	0.850	0.860	0.861	0.853	0.861	0.856
Alignment date	March 31	March 31	March 1	March 31	March 31	March 31
Finance Commission grant	Excluded	Included	Included	Excluded	Included	Included
President's Rule included in the definition of alignment	No	No	No	No	Yes	No

Notes: (i)The dependent variable is the natural log of per capita grants in 1980–81 rupees, where grants is defined as the sum of central plan scheme grants and centrally sponsored scheme grants. There are 14 states observed over 23 years in the sample. Specification [1] only includes state and time dummies. All the other regressions also include the following variables: *ln*(annual rainfall), *ln*(state population), proportion of state population characterized as scheduled caste or scheduled tribe, *ln*(per capita state domestic product (in constant 1980–81 rupees)), the share of agriculture in state domestic product, and, in some specifications, the *ln*(per capita allocation of central tax proceeds, as determined by the Finance Commission (in constant 1980–81 rupees)). (ii) Fix a state–financial year. VSW takes the value of 1 if the proportion of Vidhan Sabha constituencies in the state that are 'swing' is greater than the median value for the proportion taken over all states in the given financial year. A constituency is defined as 'swing' if the winning margin is less than or equal to 1%. (iii) Fix a state–financial year. LSW takes the value of 1 if the proportion of Lok Sabha constituencies in the state that are 'swing' is greater than the median value for the proportion taken over all states in the given financial year. A constituency is defined as 'swing' if the winning margin is less than or equal to 1%. (iv) Fix a state–financial year. AL takes the value of 1 if the central and state governments on a specified date (March 1 of the previous financial year in Column [3] and March 31 of the previous financial year in Columns [1], [2], [4], [5] and [6]) share at least one political party in common; the treatment of President's Rule in the construction of AL is given in the final row of Table 4. (v) The absolute *t*-ratios given in parentheses are based on robust standard errors that correct for clustering at the state level.

For comparison purposes, we also report the baseline regression without 'other (that is, non-political) controls' in Column [1] of Table 4. Comparing Columns [1] and [2], we see that the main coefficient of interest, that on AL∗VSW∗LSW, remains positive and significant when 'other controls' are excluded from the model.

In summary, there is clear evidence of the Aligned Swing Effect emphasized in our theoretical model.

6. Robustness issues

Section 6 consists of two parts. In the first part, we consider several variants of our basic model but do not tinker with the two swing dummies, VSW and LSW, used in the construction of the 'political controls'. In the second part, we study how the conclusions in Section 5 are affected when the swing dummies are constructed somewhat differently.

6.1. Variants of the basic model

Recall that our basic model has the following three features: first, we maintained that central grants-related decisions for financial year t are made on the basis of political considerations prevailing on March 31 of financial year $(t-1)$; second, we included state's per capita allocation of central tax revenues, as determined by the Finance Commission, in our set of regressors; and third, the construction of the alignment dummy classified a spell of President's Rule as a period of center-state non-alignment. Consider what happens to our results when these three features of the basic model are changed one at a time.

Variant 1 of the basic model (Column [3] of Table 4) uses March 1 of financial year $(t-1)$ as the date on which central grant allocations for financial year t are decided (see footnote for details).[32] Shifting the decision date by a month (from March 31 to March 1) leaves the conclusions of the basic model unaltered: as in Section 5, the coefficients that are significantly different from zero are the coefficients on (i) AL∗VSW∗LSW and (ii) AL∗VSW∗(1−LSW).

[32] The shift in the decision date from March 31, as in the basic model, to March 1 forces us to redefine the variables comprising 'political controls' in the following two ways: (i) the dummy variable AL_{st} is now coded as 1 if the central government and the government of state s on March 1 of financial year $(t-1)$ share at least one political party in common and there is no President's Rule in state s on that date; and (ii) the construction of the various swing measures for state–year (s, t) is based on the last Vidhan and Lok Sabha elections occurring in state s before March 1 of financial year $(t-1)$.

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Variant 2 of the basic model (Column [4] of Table 4) excludes the Finance Commission transfers from the set of regressors. While the results in Column [4] are somewhat worse than those in Column [2] (the coefficient on AL * VSW * (1 − LSW) is statistically significant at only the 10% level and the model's R^2 goes down), the substantive implications of the two sets of results are broadly similar.

Variant 3 of the basic model (Column [5] of Table 4) constructs the alignment dummy by implicitly classifying a period of President's Rule as a spell of center-state alignment (see footnote for details).[33] This alteration in the treatment of President's Rule makes little difference to the conclusions of the basic model: while the coefficients in Column [5] are mostly larger than those in Column [2], the same two variables are significant in both cases.

Finally, in Variant 4 (Column [6] of Table 4), we re-estimate the basic model with 'political controls' consisting of three separate regressors: AL, *vswing*01 and *lswing*01.[34] Two conclusions follow from Column [6] estimates. First, the coefficient on the alignment dummy is not statistically significant from zero, implying that central grants are not conditioned *per se* on whether a state is aligned or not. The *Core Support* hypothesis (Cox and McCubbins, 1986; Case, 2001) states that the central government uses grants to reward its core support: in Case (2001) this is tested empirically using the proportion of voters in a constituency that vote for the leading party in the national election. Observe that the central incumbent's vote share in the state election (Case's core support measure) and the alignment dummy are positively correlated so that *ceteris paribus*, aligned states have higher core support than unaligned states. Hence, one test of the Core Support hypothesis would be that alignment (by itself) matters for grants. Our first conclusion therefore suggests that there is no evidence for the Core Support hypothesis.[35] Second, the coefficient on *vswing*01 is positive and significantly different from zero. So, an increase in the proportion of swing constituencies in the last Vidhan Sabha election increases the central grants received by a state.

6.2. Varying the cutoff value

The results in Section 5 show that Lok Sabha election outcomes do not impact central transfers. So, we re-estimate the basic model given in Column [2] of Table 4 without the Lok Sabha swing dummy, LSW . Column [1] of Table 5 provides the regression estimates.

Before discussing these estimates, we observe that the 'political controls' of our empirical model now consists of three interacted variables: AL * VSW, AL * (1 − VSW) and (1 − AL) * VSW. Let β_1, β_2 and β_3 denote, respectively, the coefficients on AL * VSW, AL * (1 − VSW) and (1 − AL) * VSW. Two main conclusions

cent0.8(e)0(0.6(f)0(7.3(c)0(8.24e)0(5.1(d)-8.2475t)13.9(h)0(a.1(d)-8.2475
cenTha8-262.97e2(t4.m)-wo62.96d719b,9(j4.m)-oint1yJ-.96d71impy63.9

transfers in India satisfies the Aligned Swing Effect property of our theoretical model.

Finally, we consider how our findings change as we vary the construction of the Vidhan Sabha swing dummy, VSW. Columns [2] to [4] of Table 5 report the regression results when the Vidhan Sabha swing dummy is, respectively, *vswingdum*02, *vswingdum*05 and *vswingdum*10.[36] The results in Table 5 show that when the cutoff value for the winning margin, used to decide whether a constituency is 'swing' or not, is raised from 1%, the coefficient on AL*VSW remains positive in sign; however, statistical significance is lost. This suggests that only Vidhan Sabha constituencies witnessing especially close elections affect grant allocations of the central incumbent.

7. Conclusion

This paper constructs 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 alignment between the incumbent parties at the central and state levels and whether a state is a swing state or not. The main testable prediction from the model is that a state that is both swing and aligned with the central government receives higher grants relative to a state that is non-swing, whether aligned with the central government or otherwise. We test this prediction using Indian data for 14 states from 1974–75 to 1996–97. We find that a state which is both aligned and swing in the last state election is estimated to receive 16% higher grants than a state which is unaligned and non-swing.

Many empirical questions remain to be explored. Our study is 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 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 sub-national level, condition its vote on central grants? Some evidence, employing US 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.

[36] Recall that *vswingdum*02, *vswingdum*05 and *vswingdum*10 define a Vidhan Sabha constituency to be 'swing' if the winning margin is, respectively, less than or equal to the cutoff value of 2%, 5% and 10%.

ppendix

The data used in the paper come from a variety of sources. They cover the 14 major states of India and span the financial years 1974–75 to 1996–97.

A.1. Center-state transfer variables

Transfers from the center to the states (various categories) are measured per capita in constant prices (1980–81 rupees). Three categories of central transfers are considered: the allocation of the proceeds of the central taxes as determined by the Finance Commission, grants on account of central plan schemes, and grants on account of centrally sponsored schemes. The nominal transfer data from the center to the states (various categories) are from the Reserve Bank of India Bulletin, 1974–1996, an annual publication of the Reserve Bank of India. The nominal transfer data are deflated using the implicit state domestic product deflator (base year 1980–81), obtained from the National Accounts Statistics (Government of India, Ministry of Planning, Department of Statistics, 1974–1996). The state population data, used to express magnitudes in per capita terms, are obtained from the National Accounts Statistics, 1974–1996.

A.2. Political control variables

The center-state alignment dummy was coded from Butler et al. (1996) and Grover and Arora (1998). The Vidhan Sabha swing dummy and the Lok Sabha swing dummy were coded, respectively, from Vidhan Sabha and Lok Sabha constituency-level electoral data, downloaded from the website of the Election Commission of India (http://eci.gov.in).

A.3. Other control variables

The other control variables are: (i) annual rainfall, (ii) per capita state domestic product in constant prices (1980–81 rupees), (iii) the share of agriculture in state domestic product, (iv) state population, (v) the proportion of state population characterized as scheduled caste or scheduled tribe, and (vi) state's per capita allocation of the proceeds of central taxes, as determined by the Finance Commission, in constant prices (1980–81 rupees).

The annual rainfall data are from the Statistical Abstract of India (Government of India, Ministry of Planning, Department of Statistics, 1974–1996). Data for variables (ii)–(iv) are from the National Accounts Statistics. The proportion of state population characterized as scheduled caste or scheduled tribe is estimated from the decennial Census of India (Government of India, Office of the Registrar General) for the years 1971, 1981, 1991 and 2001. Between any two successive censuses, total state population and scheduled caste/scheduled tribe population are assumed to grow at a constant rate. For the variable (vi) data source, refer to "Center-State transfer variables."

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Appendix Table 1
Alignment and swing dummies using 1% cutoff used in the basic regression

State		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Andhra	AL	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0
	VS	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0
	LS	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1
Bihar	AL	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	VS	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
	LS	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gujarat	AL	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
	VS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LS	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haryana	AL	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1
	VS	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1
	LS	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Karnataka	AL	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0
	VS	0	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1
	LS	0	0	0	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1
Kerala	AL	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	1	1	1
	VS	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1
	LS	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0
MP	AL	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1
	VS	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maharashtra	AL	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0
	VS	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Orissa	AL	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1
	VS	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1
	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Punjab	AL	1	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
	VS	1	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
	LS	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1
Rajasthan	AL	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	VS	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
	LS	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tamil Nadu	AL	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1
	VS	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0
	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UP	AL	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	VS	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
West Bengal	AL	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VS	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LS	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1

Notes: (i) The decision date used is March 31. (ii) Fix a state–financial year. AL takes the value of 1 if the central and state governments on March 31 of the previous financial year share at least one political party in common and there is no President's Rule in the state on that date. (iii) Fix a state–financial year. VS (LS) takes the value of 1 if Vidhan Sabha (Lok Sabha) election outcomes result in the state being classified as a swing state in the given financial year. A state is defined as a swing state if the proportion of constituencies in the state that are swing (winning margin less than or equal to 1%) is greater than the median value for the proportion taken over all states in the given financial year. (iv) MP (see the column showing state names) refers to Madhya Pradesh; UP refers to Uttar Pradesh.

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