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Some Patterns in Center-State Fiscal Transfers in India: An Illustrative Analysis

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### Publication Date

2004-09-01

# **Some Patterns in Center-State Fiscal Transfers in India:**

## **An Illustrative Analysis\***

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**Revised September 2004**

### **Abstract**

India's federal system is distinguished by tax and expenditure assignments that result in large vertical fiscal imbalances, and consequent transfers from the central government to the state governments. Several channels are used for these transfers: the Finance Commission, the Planning Commission, and central government ministries. We use panel data on center-state transfers to examine how the economic and political importance of the states influences the level and the composition of per capita transfers to the states, as well as differences in temporal patterns of Planning Commission and Finance Commission transfers. We find evidence that states with indications of greater bargaining power seem to receive larger per capita transfers, and that there is greater temporal variation in Planning Commission transfers.

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\* This paper extends some ideas presented at the National Institute for Public Finance and Policy (NIPFP), New Delhi in September 1998, and the Columbia University-World Bank Conference on Institutional Elements of Tax Design and Reform, February 2000, in joint work of the first author with M. Govinda Rao. We are indebted to Bhaskar Dutta, John McLaren, Dilip Mookherjee, Rohini Pande, Ratna Sahay, T.N. Srinivasan and Barry Weingast for comments and suggestions on related work. They are all blameless for the remaining shortcomings. We are also grateful for financial support from the UCSC Academic Senate.

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## I Introduction

There are two broad strands of research with respect to center-state transfers in India. One seeks to improve the normative criteria for making transfers, while the other tries to understand the factors that determine actual transfer patterns. The former approach has been dominant in policy-making, but suffers from a lack of detailed analysis of what actually does happen.<sup>1</sup> The second approach, aside from its intrinsic interest, helps to address this weakness. Focusing on a positive analysis of intergovernmental transfer patterns highlights some of the political economy features of transfers. By this we mean simply that both the design and the implementation of a transfer system will be affected by distributional concerns that are in the realm of political bargaining. This “political bargaining” view of federalism is very general (Riker, 1975), and intergovernmental transfers are just one aspect of it. However, center-state fiscal transfers are a particular, quantifiable expression of the complex bargaining relationships between the central and state governments in India.

In this paper, we use some illustrative panel data on center-state transfers to examine how the economic and political importance of the states may influence the level and the composition of per capita transfers to the states, as well as differences in temporal patterns of Planning Commission and Finance Commission transfers. We find evidence that states with indications of greater bargaining power seem to receive larger per capita transfers, and that there is greater temporal variation in Planning Commission transfers. Our work extends Rao and Singh (2002), and is related to recent work such as Dasgupta, Dhillon and Dutta (2001), and Biswas and Marjit (2000). All these papers address different political economy aspects of India’s federal system of intergovernmental transfers.<sup>2</sup> Since the data we use only covers the ten-year period 1983-1992, our analysis is chiefly meant to be illustrative of what can be done with more comprehensive data sets. In performing the empirical work, we have combined earlier data sets from Rao and Singh (2002) and Biswas and Marjit (2000).

To capture economic importance, we use overall economic size of states, as measured by State Domestic Product, as a simple measure. We also consider demographic size (population) as a political variable, since the size of a state (viewed in a simplifying assumption as an irreducible unit) affects its political weight. In addition, we use three more explicit measures of political influence: degree of representation in the ruling party or coalition; alignment between the ruling party at the center and a state, and representation of different states in the ministerial cabinet. Constructing these political variables represents the most time-intensive aspect of extending our data set for potential future work.

Section II reviews some key features of Indian fiscal federalism and the system of center-state transfers, as motivation for our analysis, including the roles of the Finance Commission, the Planning Commission, and the central government, through its various ministries, in making transfers. We particularly analyze the functioning of the Finance Commission, because of its

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<sup>1</sup> The normative approach can also be criticized for shortcomings in conceptualization, irrespective of implementation issues that come up in a positive analysis.

<sup>2</sup> A larger literature, beginning with Rao (1981), examines the political economy of expenditures and deficits at different levels of government. Examples are Karnik (1990), Dutta (2000), Khemani (2002), and Rajaraman (2004).

constitutional status, and the importance of its tax-sharing rules. In Section III, we present our empirical framework and results. Section IV concludes.

## II Key Features of Indian Fiscal Federalism

The Indian Constitution, in its seventh schedule, assigns the powers and, by implication, expenditure functions of both the center and the states. The schedule specifies the exclusive powers of the center in the Union list; exclusive powers of the states in the State list; and those falling under the joint jurisdiction are placed in the Concurrent list. All residual expenditure powers are assigned to the center. The nature of the assignments is typical of federal nations. The assignment of tax powers is based on the principle of separation, i.e., tax categories are exclusively assigned either to the center or to the states. Most broad-based taxes have been assigned to the center, including taxes on non-agricultural income. Out of a long list of taxes assigned to the states, only the tax on the sale and purchase of goods has been significant for state revenues. The center has also been assigned all residual tax powers.

The Constitution recognized that its assignment of tax powers and expenditure functions would create imbalances between expenditure needs and abilities to raise revenue. The imbalances could be both vertical, among different levels of government, and horizontal, among different units within a sub-central level. Therefore, the Constitution provided for the assignment of revenues (as contrasted to assignment of tax powers) through sharing of the proceeds of certain centrally levied taxes with the states and making grants to the states from the Consolidated Fund of India. The shares of the center and the states and their allocation among different states of both the taxes are determined by the Finance Commission appointed by the President of India every five years, or earlier as needed. In addition to tax devolution, the Finance Commission is also required to recommend grants to the states in need of assistance under Article 275.

The result of the Indian assignments of tax and expenditure authority, as well as their implementation in practice, has been a substantial vertical fiscal imbalance. In 2002-2003, the states on average raised about 38 percent of government revenues, but incurred about 58 percent of expenditures. Transfers from the center made up the balance.<sup>3</sup> In fact, the ability of the states to finance their current expenditures from their own sources of revenue has seen a long-run decline, from 69 percent in 1955-1956 to 52 percent in 2002-2003. While the expenditure shares of central and state governments suggest a fairly high degree of decentralization, states' control over expenditure policies is less than the figures indicate since about 15 per cent of states' expenditures was on central sector and centrally sponsored schemes. These are specific purpose transfer schemes administered by various central ministries.

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<sup>3</sup> The figures focus on current expenditures and revenues. Borrowing provides an alternative source of funds for the states. The Constitution allows the states to borrow from the market, but stipulates that when a state is indebted to the center, it has to obtain the center's permission for market borrowing. As all the state governments are indebted to the center, states have no discretion. In practice, the Planning Commission, in consultation with the Union Finance Ministry and the Reserve Bank of India (RBI), has determined the total quantity of states' borrowing, and allocated the shares of each state.

There are three channels of current transfers from the center to the states. First, as mentioned earlier, the Finance Commission decides on tax shares and makes grants. Second, the Planning Commission makes grants and loans for implementing development plans. Third, there are the central sector and centrally sponsored schemes, in which various ministries give grants to their counterparts in the states for specified projects either wholly funded by the center (central sector projects) or requiring the states to share a proportion of the cost (centrally sponsored schemes).

Historically, as development planning gained emphasis, the Planning Commission became a major dispenser of funds to the states. Before 1969, plan transfers were project-based. Since then, the distribution has been done on the basis of a consensus formula decided by the National Development Council (NDC).<sup>4</sup> Since central ministries still wished to influence states' outlays on selected items of expenditure, they increasingly used specific purpose transfers (the third category). These are supposed to be monitored by the Planning Commission.

So far, eleven Finance Commissions have made recommendations and, barring a few exceptions, these have been accepted by the central government. However, the working of these Commissions, their design of the transfer system, and the approach and methodology adopted by them have come in for criticism. Much of the policy discussion and research in this regard falls under our normative categorization, though there has been some analysis of equity outcomes that cuts across positive and normative concerns.<sup>5</sup> The Eleventh Finance Commission did receive a broader charge, and made recommendations accordingly, but whether this marks a significant institutional departure remains to be seen. Conversely, the liberalization of India's economy has altered the conceptual underpinnings of the Planning Commission, which earlier grew in importance as a result of India's adoption of a planned development strategy.

The typical restriction of the Finance Commissions to the non-plan side of the budget has led to a number of problems, which are only now being examined or addressed. First, larger transfers through the Planning Commission have significantly reduced the ability of the Finance Commission to achieve redistribution for horizontal fiscal equity across states. Second, it has prevented a comprehensive periodic review of state finances. Third, conceptually, the plan and non-plan distinction is unsound. Besides poor co-ordination, the separate treatment of plan and non-plan expenditure needs, and the emphasis on having large plans have led to inadequate provision for, and maintenance of, assets created under previous plans. From the states' point of

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<sup>4</sup> The NDC is chaired by the Prime Minister and its members include all cabinet ministers at the center, Chief Ministers of the states, and members of the Planning Commission. According to the recent formula, 30 per cent of the funds available for distribution are kept apart for the special category states. Assistance to them is given on the basis of plan projects formulated by them and 90 per cent of the transfer is given as grants, with the remainder as loans. The 70 per cent of the funds available to the major states is distributed with 60 per cent weight assigned to population, 25 per cent to per capita SDP, 7.5 per cent to fiscal management and the remaining 7.5 per cent to special problems of states. Of the 25 per cent weight assigned to per capita SDP, the major portion of the funds, 20 per cent is allocated only to the states with less than average per capita SDP on the basis of the "inverse" formula; the remaining 5 per cent of the funds is assigned to all the states according to the "distance" formula. For the major states, assistance is given by way of grants and loans in the ratio of 30:70. The transfers given to the states for plan purposes are not related to the required size or composition of plan investments.

<sup>5</sup> See Rao and Singh (2002) for a summary of such work, and additional references.

view, separate plan and non-plan assessments gave them the opportunity to submit different projections to the two Commissions – an overestimated non-plan budgetary gap to the Finance Commission and overestimated saving in the non-plan account to the Planning Commission.

The Planning Commission functions as follows. It works out five-year-plan investments for each sector of the economy and each state. With this as background, the states work out their respective annual plans for each year, based on the estimated resource availability, which includes the balance from current revenue, contributions of public enterprises, additional resource mobilization, plan grants and loans, market borrowings and other miscellaneous capital receipts. The state plans are then approved by the Planning Commission. Thus, in the final analysis, given the amount of central transfers to the states as determined by the formula, at the margin it is mainly the own resource position of the states that determines their plan sizes. The conceptual foundation of the Commission's working has also been criticized.<sup>6</sup>

Assistance given to states through central sector and centrally sponsored schemes is in some respects the most controversial form of transfers. These transfers are discretionary, which is not in itself a problem. However, there is a proliferation of ad hoc schemes, and their articulation with Planning Commission transfers is very poor, although they often are meant to serve similar or overlapping objectives. Furthermore they can incorporate inefficient conditionalities, such as requirements on staffing patterns, which tend to distort the states' own spending.

### III Empirical Framework and Results

Our goal is to use a parsimonious framework to try to explain the observed pattern of center-state fiscal transfers. We restrict attention to explicit current transfers. By a parsimonious framework, we mean the use of regressions with just a few key variables that describe the economic, demographic and political characteristics of the states. We use data from the National Institute for Public Finance and Policy (NIPFP), on fiscal transfers from the center to the 14 major states. The sample excludes the so-called Special Category states, and the small state of Goa, which was upgraded from Union Territory status. We have, for comparability with previous work (Rao and Singh, 2002), and due to data-gathering constraints restricted our empirical analysis in this paper to the 10-year period from 1983-84 to 1992-93. Hence, our analysis should be chiefly viewed as illustrative of what can be done with longer data sets.<sup>7</sup> The NIPFP data set also included figures on State Domestic Products in current and constant prices, and in total and per capita terms. We recovered state population figures from the ratio of per capita and total values for each year and deflators from the ratio of current to constant price figures. These were used to convert the fiscal data to constant price terms (with 1981 as the base year), and to per capita terms wherever required. We describe the fiscal data in more detail below.

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<sup>6</sup> Again, see Rao and Singh (2002) for an overview.

<sup>7</sup> The main data constraint is in constructing the political variables used.

We also use data on political characteristics of the states. For our first political variable, we use data on the share of different states' parliamentary representation<sup>8</sup> in the ruling party or ruling coalition. This data is constructed from Butler, Lahiri and Roy (1995). The period of estimation included majority Congress governments from 1980 to 1984 and 1985 to 1989, as well as a minority Congress government from 1991 to 1996. From 1989 to 1991 (a period of about a year and a half), there were two Janata Dal minority governments). The existence of 'outside support' for minority governments introduces some noise into using the share variable as a measure of political strength of the state in the central process, but for the present paper we work with this variable.<sup>9</sup> For our second political variable, we use data on the control of the various state governments, using this to create a variable that takes the value one if and only if the party at the center and the state level are the same in a particular year, and zero otherwise.<sup>10</sup> Our third measure of political influence is a 'lobbying power' variable based on representation of different states in the ministerial cabinet. 'Lobbying power' for a state is calculated as the summation of proportional representation of various categories of ministers in the cabinet contributed by the state in question, normalized in terms of state population.<sup>11</sup> To some extent the second and third variables capture similar effects, so we include them as alternatives in separate regressions, along with the first political variable.

We now describe the data on transfers in greater detail. The table below illustrates the tax data we have, using the original (current price) data from Andhra Pradesh for 1983-84. For our present analysis, we consider only the aggregate of shared taxes. Recall that these are centrally collected taxes, which are constitutionally required to be shared with the states. The Finance Commission determines both the aggregate share of the states, and the distribution among the states.

Total Tax Revenue =	118440.6
Own Tax Revenue +	82352.0
Shared Taxes =	36088.6
Shared Income Taxes +	9069.5

<sup>8</sup> We used figures for the lower house only, since this is the main legislative body. The upper house has limited, though not completely negligible powers.

<sup>9</sup> Ideally, we would like to calculate a power index, such as the Banzhaf Index, to measure the political clout of different states in the ruling party/coalition at the center, but such calculations will require implementing a complex computer program, which we have obtained, but not yet tried.

<sup>10</sup> This data was made available to us by Bhaskar Dutta, who used it in an analysis of the state governments' expenditure patterns (Dutta, 2000). The data is also in Butler, Lahiri and Roy (1995). Again, the existence of coalition governments in states can make the matching variable we use somewhat less reliable.

<sup>11</sup> This variable is the same as that used in Biswas and Marjit (2000), and is taken from their paper.

Shared Estate Duty +	107.5
Share of Union Excise Duties =	26911.7
Basic Union Excise Duties +	23294.2
Additional Excise Duties	3617.5

The data on non-tax revenue of the states is also available broken down by categories. The table below illustrates the nature of the original data, also using figures from Andhra Pradesh, again at current prices for 1983-84. The four grant categories are further disaggregated in the original data, but we do not present that disaggregated data here.

Total Non Tax Revenue =	57966.50
Total Own Non Tax Revenue +	30942.44
Grants from Central Government =	27024.06
Non Plan Grants +	6317.80
Grants for State Plan Schemes +	7862.07
Grants for Central Plan Schemes +	3108.55
Grants for Centrally Sponsored Schemes	9735.65

For the empirical analysis in this paper, we examine transfers in four categories, as indicated below:

1. Shared Taxes
2. Non Plan Grants
3. Grants for Central Plan Schemes
4. Grants for Centrally Sponsored Schemes

The sum of these four categories constitutes total transfers. In Rao and Singh (2002), we aggregated the first two categories into “statutory transfers,” and the final two categories into “discretionary transfers,” but here we examine them all separately. Summary statistics and correlations for the data (Table 9) suggest that, in general, neither lack of variation nor high correlation between independent variables is likely to be a problem.

We used the LIMDEP7 program to estimate fixed effects models for various specifications. We report selected results in detail in this paper, and briefly discuss other specifications. All regressions were run for each of the four categories of transfers (in per capita terms) listed above, at 1981 prices. The independent variables used were State Domestic Product at 1981 prices (SDP), per capita constant price SDP (SDPPC), population (POP), the proportion of the ruling party’s Members of Parliament (lower house only) coming from a particular state (PROP), the variable measuring whether the same party was in power at the center and the state level (MATCH), and the variable measuring lobbying power (LP). In incorporating the latter three political variables, we fixed them at the levels that were current in the year that decisions were made by the relevant commission. These variables are therefore denoted PROP\_FIX, MAT\_FIX, and LP\_FIX respectively. By ‘fixing’ the political variables in this fashion we attempt to capture the five-year cycle of decision-making that affects both the Finance Commission and the Planning Commission. (These cycles are no longer contemporaneous). Hence, for regressions with shared taxes and non-plan grants as the dependent variables, the political variables are fixed at the levels that are current in the year the



Finance Commissions' decisions were made. The political variables in regression specifications (3) and (4) were set so as to be current in the year the Planning Commission decisions were made. We also ran regressions using the original political variables, but the results with the 'fixed' variables were more plausible, and only those are reported.

Dummy variables for various Finance Commissions (FC7 and FC8) and Planning Commissions (PC6, PC7 and PC8) are also included. Tables 1-4 report regression results with PROP\_FIX and MAT\_FIX, while Tables 5-8 report regression results with the second political variable replaced by LP\_FIX. In addition to these independent variables, state fixed effects were also included. The model without state fixed effects was always rejected in the standard F-tests, and therefore those results are not reported. We tried three specifications: linear, loglinear, and translog. However, we report the results for the first two specifications only, since the results for third model did not differ much from those for the second. In each case the political variables were unchanged across the linear and loglinear specifications. All estimations were carried out using the White heteroscedasticity-corrected variance covariance matrix.

### Linear Specification

Table 1 reports the results for the linear specification for each of the four dependent variables. Note that, since the three independent variables SDP, SDPPC and POPN are multiplicatively related<sup>12</sup>, the coefficients of these variables cannot directly give us marginal impacts of changes in state characteristics. However, these marginal effects can be calculated as in Rao and Singh (2002). The regression for shared taxes per capita (1) has the coefficients for population and PROP\_FIX statistically significant. Population has a positive effect on per capita shared taxes. The demographic size of a state can be viewed as an indicator of its political influence. The PROP\_FIX variable captures the impact of the degree of representation in the ruling party/coalition on shared taxes per capita. The differences across Finance Commissions are not statistically significant, though the dummy coefficients are not negligible in magnitude. The overall fit of the regression is reasonable. The regression for non-plan grants per capita (2) has only the coefficient of SDPPC (State Domestic Product per capita at 1981 prices) significantly different from zero. The overall fit of the regression is reasonable though lower than that for regression (1).

Regression (3) presents the results for Grants for Central Plan Schemes as the dependent variable. Here, the coefficients for population, per capita state domestic product and the 7<sup>th</sup> Planning Commission dummy are found to be statistically significant and positive. Regression (4) presents the results for Grants for Centrally Sponsored Schemes as the dependent variable. Here, the coefficients for population and the 8<sup>th</sup> Planning Commission dummy are found to be statistically significantly different from zero. It is interesting to note that neither of the political variables is significant in these two regressions. Though the coefficient of the population variable can't directly give us the marginal impacts, the sign of the coefficient in regressions (3) and (4) suggests that demographically larger states receive more of these transfers regardless of the political characteristics of the state.

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<sup>12</sup> Because of the units we have used for the three variables, the relationship is  $SDP81 = POPN * SDPPC81 * 10$ .

Table 2 reports the fixed effects coefficients for the fourteen states, for each of the regressions (1) - (4) reported in Table 1. The coefficients for the shared taxes regression vary from  $-28.9$  to  $43.8$ . However, most of the coefficients are not statistically significantly different from zero. Uttar Pradesh is the only state with a large negative fixed effect (though it is not statistically significant). Bihar, Maharashtra, Andhra Pradesh and Madhya Pradesh have very low positive fixed effects coefficients. The variation in the estimated fixed effects points towards potentially important determinants of transfers that are missing from the regressions. One such missing variable is the poverty rate. Higher poverty ratios are reflected in the positive fixed effects for Bihar, Madhya Pradesh and Rajasthan. However, a sizeable negative fixed effect for U.P., the fourth 'BIMARU' state does not fit the relative poverty explanation. One would expect higher poverty ratios to be reflected in fixed effects that are positive.

The fixed effects for the non plan grants per capita regression are all negative and range from  $-7.1$  (Orissa) to  $-63.0$  (U.P). Most of the coefficients are statistically significant. The fixed effects for grants for central plan schemes per capita range from  $-8.9$  (Rajasthan) to  $-38.7$  (U. P.) and are smaller (in absolute value) than those for regression (2). A noteworthy feature is that the coefficients display some of the same patterns across states as in regression (2). Column (4) represents the fixed effects for Grants for Centrally sponsored Schemes per capita. The coefficients display considerable variation, ranging from  $-54.4$  (U.P.) to  $3.5$  (Haryana). However, most of the coefficients are not statistically significant. It is interesting to note that the differences in the estimated fixed effects mark the greatest difference between regressions for the various categories of transfers, rather than the political, economic and demographic measures.

### Loglinear Specification

The results for the loglinear specification are reported in Table 3, with the corresponding fixed effects in Table 4. The log of SDP is omitted from these regressions since it is a sum of the logs of population and per capita SDP. The political variables are not included in log form. Now, the coefficients of SDP per capita and population are precisely the elasticities of per capita transfers with respect to these variables, keeping the other variable constant. The significance of the political variable that captures the state's degree of representation in the ruling party/coalition (PROP\_FIX) is in line with that in the linear regressions. The coefficient of PROP\_FIX is positive and significant only for the per capita shared taxes regression. This result is surprising since one would expect discretionary transfers ((3) and (4)) to display some political influence. The variable that measures the alignment between the ruling party at the center and the state (MAT\_FIX) continues to be insignificant.

One result worth noting is the large and positive coefficient of population in the case of regressions (3) and (4). As noted earlier, population may be viewed as an indicator of political influence, solely due to the size of the state and regardless of its political influence. Furthermore, it is important to note that the coefficients for the 6<sup>th</sup> and the 7<sup>th</sup> Planning commission dummies remain positive and statistically significantly different from zero. The 8<sup>th</sup> Planning Commission dummy is positive and significant for regression (4).<sup>13</sup>

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<sup>13</sup> This result on the temporal variation in Planning Commission transfers carries over to a more general translog specification, the details of which are available from the authors.

Thus, broadly speaking, the results for the loglinear specification appear to be consistent with those of the linear specification. The importance of the PROP\_FIX variable in the shared taxes regression is an unexpected result. The fixed effects for the log linear specification (Table 4) display patterns across states that suggest that factors missing from the regressions might be important determinants of transfers. However, it is possible that the variation in the fixed effects is a result of misspecification of regressions. The complicated formulas used for shared taxes might not be adequately captured by the linear or the loglinear specifications.

### **Alternative Specification**

We re-estimated the regressions with an alternative measure of political influence, namely, the Biswas and Marjit (2000) 'lobbying power' variable: these results are reported in Tables 5-8. As noted, the regressions are run with the variable fixed at the level that is current in the year that decisions are made. Table 5 reports the linear specification results, with the corresponding fixed effects reported in Table 6. Compared to the previous linear specification results, the population variable is significant only for grants for centrally sponsored schemes. The 'lobbying power' variable (LP\_FIX) has a positive and significant effect for grants for central plan schemes per capita. This result corroborates our hypothesis that discretionary transfers would be subject to political influence. The results on the temporal variation in Planning Commission transfers carry over from the earlier linear specification results in Table 1.

Table 7 reports the results for the loglinear specification with lobbying power as one of the independent variables, with corresponding fixed effects in Table 8. The lobbying power variable is positive and statistically significant for shared taxes per capita and grants for central plan schemes. This specification provides stronger evidence (compared to the linear case) that political variables matter. Another noteworthy result is the large positive influence of the population variable on grants for central plan schemes and grants for centrally sponsored schemes. This is consistent with the results in Table 1 and 3, which did not include the 'lobbying power' variable. Furthermore, coefficients for PC6 and PC7 continue to be positive and statistically significant. The coefficients for PC8 are also statistically significant for regression (3) and (4).

## **IV Conclusion**

The motivation for our analysis is the perspective of a federal system as a constitutional or political bargain. Even though India was not formed out of an explicit bargaining process (except to some extent with respect to the inclusion of the princely states at the time of independence), the perspective of bargaining is commonly applied informally to resource sharing among the different constituent governments. The states, do not have sovereign status, and, constitutionally speaking, exist at the discretion of the central government. Nevertheless, they represent real and significant political groupings, based on language and culture. They are the subnational political units that matter above all, more so than caste or class. The recent election results in India would seem to bear this contention out to some degree. In any case, center-state

transfers in India provide a useful data set with which to test hypotheses on functioning of a federal system as an ongoing political bargain.

Using a panel data set on center-state transfers, we analyzed the extent to which the economic and political importance of the states influences the pattern of per capita transfers to the states. We innovated from previous work in the way we included political variables to correspond to the decision cycles of the Finance and Planning Commissions. We also introduced dummies for the various Finance Commissions and Planning Commissions to study the temporal patterns in their transfers. All regressions were run alternatively using the four categories of transfers (in per capita terms), at 1981 prices. Overall, the results suggest that states with greater bargaining power, as proxied by our political variables, tend to receive larger per capita transfers. The positive estimated effects of the demographic size of the states suggest that population may well be an indicator of political influence, solely due to the size of the state and irrespective of its political influence. We also found evidence for temporal variation in Planning Commission transfers, which bears further investigation. Since our data set is restricted to a ten-year period, our findings should be taken as illustrative of an empirical methodology that can and should be extended to longer time periods and more recent data.

Our methodological emphasis in this paper is a positive analysis, to examine the overall outcomes emerging from a complex and heterogeneous set of institutions and motivations. However, if these outcomes exhibit patterns, predictable or unexpected, work such as ours may ultimately aid in the normative task of designing a more effective set of institutions for intergovernmental transfers in India. An additional hypothesis may also be that a system with large vertical transfers is inevitably subject to political pressures and unintended effects, implying a need to reconfigure the underlying tax assignments to achieve a better match with expenditure responsibilities at different levels of government.

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**Table 1: Linear Specification Coefficients**

Variable	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
SDP	-0.510E-05 (- .556)	-0.120E-04 (-1.228)	-0.517E-05 (-1.260)	-0.383E-05 (-0.614)
SDPPC	-0.468E-05 (-0.001)	0.139E-01** (2.486)	0.421E-02* (1.814)	0.192E-02 (.545)
POPEN	0.656* (1.764)	0.561 (1.418)	0.342** (2.040)	0.546** (2.146)
MAT_FIX	2.768 (1.439)	-1.277 (-0.623)	1.316 (1.452)	-1.234 (-0.896)
PROP_FIX	52.436* (1.730)	-9.074 (-0.281)	-2.371 (-0.211)	10.988 (0.642)
FC7	-3.7095 (-1.245)	4.156 (1.309)		
FC8	-2.750 (-1.466)	1.657 (0.829)		
PC6			1.942 (1.570)	-0.230 (-0.122)
PC7			4.883*** (6.218)	-0.265 (-0.222)
PC8			-1.027 (-1.156)	3.638*** (2.695)
Adjusted R-squared	0.62767	0.40680	0.57432	0.36781

Note: All financial variables are measured in 1981 Rupees

t-ratios in parentheses

\*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10 % level (all two-sided)

**Table 2: Linear Specification Fixed Effects**

State	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
Andhra Pradesh	10.910	-39.461	-19.300	-21.408
Bihar	1.881	-45.672	-26.341	-31.544
Gujarat	13.727	-39.866	-20.776	-8.431
Haryana	28.050	-38.214	-13.169	3.512
Karnataka	21.740	-38.829	-15.633	-11.032
Kerala	34.928	-26.263	-13.149	-5.305
Madhya Pradesh	9.570	-39.903	-20.598	-21.309
Maharashtra	2.772	-49.209	-24.845	-23.750
Orissa	43.827	-7.090	-9.529	0.355
Punjab	29.224	-42.359	-15.543	-2.996
Rajasthan	22.673	-28.140	-8.919	-8.323
Tamil Nadu	24.510	-39.106	-18.238	-17.490
Uttar Pradesh	-28.973	-63.025	-38.744	-54.396
West Bengal	20.094	-35.960	-23.466	-26.454

**Table 3: Log Linear Specification Coefficients**

Variable	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
LNSDPPC	9.560 (1.142)	18.097** (2.030)	2.613 (0.774)	-2.497 (-0.472)
LNPOPEN	26.098 (1.235)	21.262 (0.945)	29.784*** (2.942)	41.874*** (2.637)
MAT_FIX	1.757 (0.909)	-1.508 (-0.733)	1.413 (1.621)	-0.885 (-0.647)
PROP_FIX	70.457** (2.384)	-3.354 (-0.107)	-6.043 (-0.562)	4.181 (0.248)
FC7	-1.324 (-0.393)	4.568 (1.273)		
FC8	-0.956 (-0.464)	1.966 (0.897)		
PC6			4.020*** (2.784)	1.472 (0.650)
PC7			5.916*** (6.951)	0.534 (0.400)
PC8			-1.385 (-1.589)	3.361** (2.458)
Adjusted	0.62894	0.40971	0.60135	0.36896
R-squared				

Note: All financial variables are measured in 1981 Rupees

t-ratios in parentheses

\*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10 % level (all two-sided)



**Table 4: Log Linear Specification Fixed Effects**

State	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
Andhra Pradesh	-134.774	-216.462	-139.406	-142.956
Bihar	-133.230	-216.202	-148.432	-155.437
Gujarat	-137.118	-214.834	-132.500	-120.816
Haryana	-112.591	-196.122	-100.730	-79.268
Karnataka	-126.987	-215.163	-129.481	-125.892
Kerala	-107.746	-198.240	-118.515	-110.326
Madhya Pradesh	-133.876	-215.909	-140.441	-142.940
Maharashtra	-151.092	-229.624	-148.085	-146.593
Orissa	-98.262	-179.618	-116.510	-107.004
Punjab	-117.162	-201.732	-107.908	-92.356
Rajasthan	-122.738	-203.490	-122.254	-123.130
Tamil Nadu	-123.938	-216.607	-136.226	-136.638
Uttar Pradesh	-153.513	-229.245	-162.500	-173.274
West Bengal	-127.510	-213.987	-144.233	-148.099

**Table 5: Linear Specification Coefficients**

Variable	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
SDP	-0.141E-05 (-0.155)	-0.131E-04 (-1.352)	-0.244E-05 (-0.595)	-0.544E-05 (-0.858)
SDPPC	0.840E-04 (0.016)	0.141E-01** (2.512)	0.335E-02 (1.474)	0.250E-02 (0.711)
POP	0.472 (1.308)	0.627 (1.635)	0.256 (1.536)	0.593** (2.299)
LP_FIX	8867.831 (1.012)	318.522 (0.034)	15848.05** (2.473)	-7650.673 (-0.772)
PROP_FIX	48.409 (1.575)	-9.347 (-0.286)	-12.223 (-1.014)	12.088 (0.648)
FC7	-3.836 (-1.283)	4.296 (1.352)		
FC8	-2.901 (-1.544)	1.766 (0.885)		
PC6			1.968 (1.621)	-0.302 (-0.161)
PC7			4.873*** (6.309)	-0.251 (-0.210)
PC8			-1.296 (-1.514)	3.884*** (2.933)
Adjusted R <sup>2</sup>	0.62442	0.40487	0.58806	0.36670

Note: All financial variables are measured in 1981 Rupees

t-ratios in parentheses

\*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10 % level (all two-sided)

**Table 6: Linear Specification Fixed Effects**

State	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
Andhra Pradesh	18.101	-42.794	-16.358	-23.100
Bihar	14.523	-51.113	-20.464	-34.999
Gujarat	19.323	-43.244	-17.363	-10.795
Haryana	29.017	-40.767	-14.108	3.031
Karnataka	25.259	-41.362	-14.619	-11.820
Kerala	38.308	-28.555	-11.734	-6.200
Madhya Pradesh	19.598	-44.604	-16.191	-23.989
Maharashtra	9.674	-53.562	-22.847	-25.232
Orissa	49.105	-10.263	-7.824	-1.136
Punjab	32.606	-44.941	-12.779	-4.950
Rajasthan	27.157	-31.348	-8.145	-9.365
Tamil Nadu	31.203	-42.448	-15.462	-19.017
Uttar Pradesh	-10.872	-71.115	-31.683	-58.216
West Bengal	26.581	-39.205	-21.148	-27.826

**Table 7: Log Linear Specification Coefficients**

Variable	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
LNSDPPC	15.409* (1.851)	16.772* (1.871)	3.845 (1.148)	-3.081 (-0.577)
LNPOP	19.626 (0.982)	26.146 (1.215)	26.789*** (2.688)	43.425*** (2.734)
LP_FIX	14760.964* (1.741)	1350.728 (0.148)	15587.289** (2.573)	-7128.123 (-0.738)
PROP_FIX	60.577** (2.046)	-2.680 (-0.084)	-14.201 (-1.260)	6.451 (0.359)
FC7	-1.277 (-0.384)	4.907 (1.370)		
FC8	-0.984 (-0.485)	2.174 (0.995)		
PC6			3.971*** (2.795)	1.484 (0.656)
PC7			5.845*** (6.986)	0.577 (0.432)
PC8			-1.631* (-1.934)	3.517*** (2.617)
Adjusted R <sup>2</sup>	0.63559	0.40718	0.61402	0.36963

Note: All financial variables are measured in 1981 Rupees

t-ratios in parentheses

\*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10 % level (all two-sided)

**Table 8: Log Linear Specification Fixed Effects**

State	(1) Shared Taxes per capita	(2) Non Plan Grants per capita	(3) Grants for Central Plan Schemes per capita	(4) Grants for Centrally Sponsored Schemes (pc)
Andhra Pradesh	-151.649	-227.047	-137.112	-144.567
Bihar	-145.388	-229.680	-143.444	-158.450
Gujarat	-158.120	-224.259	-130.445	-122.401
Haryana	-144.445	-200.924	-105.801	-77.468
Karnataka	-148.907	-224.091	-129.541	-126.374
Kerala	-130.462	-205.685	-118.721	-110.648
Madhya Pradesh	-148.841	-228.226	-136.703	-145.325
Maharashtra	-169.509	-241.940	-145.793	-148.341
Orissa	-119.145	-188.486	-116.113	-107.801
Punjab	-144.216	-207.066	-109.060	-92.244
Rajasthan	-144.249	-213.320	-122.390	-123.728
Tamil Nadu	-141.993	-226.876	-134.238	-138.050
Uttar Pradesh	-164.599	-245.402	-156.999	-176.494
West Bengal	-145.594	-224.389	-142.452	-149.471

**Table 9: Summary Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>
Shared Taxes per capita (Rs.)	50.04	9.66
Non Plan Grants per capita (Rs.)	7.74	8.15
Grants for Central Plan Schemes per capita (Rs.)	5.68	3.96
Grants for Centrally Sponsored Schemes per capita (Rs.)	12.93	4.94
State Domestic Product (Rs. 10,000,000)	995,824	549,135
State Domestic Product per capita (Rs.)	2027	724
Population (millions)	53.07	29.21
Match between central and state ruling parties	0.55	0.50
Proportion of MPs from state in ruling party/coalition	0.066	0.054
Lobbying Power	0.14E-03	0.86E-04

Note: All financial variables are measured in 1981 Rupees

### Correlations of Independent Variables

	<b>SDP</b>	<b>SDP per capita</b>	<b>Population</b>	<b>Match</b>	<b>Proportion</b>	<b>Lobbying Power</b>
<b>SDP</b>						
<b>SDP per capita</b>	0.1826					
<b>Population</b>	0.7721	-0.3801				
<b>Match</b>	0.1388	0.0654	0.0999			
<b>Proportion</b>	0.4853	-0.2291	0.6210	0.4128		
<b>Lobbying Power</b>	-0.1766	-0.1089	-0.0890	0.3042	0.3188	