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**EQUALIZATION TRANSFERS BASED ON
SPENDING NEEDS AND FISCAL CAPACITY OF
STATE GOVERNMENTS IN INDIA**

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Equalization Transfers Based On Spending Needs and Fiscal Capacity of State Governments in India

K. Shanmugam and K. R. Shanmugam

Abstract

This study addresses an important policy issue pertaining to determination of equalization transfers to Indian States. It empirically estimates the effect of transfers on expenditures of 29 Indian States using the panel data methodology. It also determines the transfers based on the spending needs and fiscal capacity of States. Results indicate a strong crowding-in effect of transfers on public spending of States and the presence of fly paper effect. The fiscal transfers positively relate to revenue expenditures in 13 out of 18 General Category States and 8 out of 11 Special Category States. Amounts of equalization transfers determined for all 29 States in four alternative scenarios range between ₹. 555 billion and ₹.16,048 billion. We hope that these results will be useful to policymakers and other stakeholders to take appropriate strategies to design fiscal transfer policy such that all citizens can avail a standard level of public services in India.

Keywords: *Fiscal Transfers, Fiscal Equalization, Expenditure Needs, Fiscal Capacity, Indian States, Panel Data Methods*

JEL Codes: *H77, H73, H72, C23*

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INTRODUCTION

In multi-tier Governments by design, the asymmetry arises in assigning resources and expenditure responsibilities between the Centre and sub-national (or State) Governments which causes vertical and horizontal imbalances. As regional or State governments may differ in their fiscal capacity or ability to raise revenues, the rich States are usually better able to finance public service provision than the poorer ones. On the expenditure side, the States may also differ in their spending needs. Even States, with same fiscal capacity, may differ in the cost of providing a standard bundle of public services due to differences in needs arising due to factors like price levels, demographic profiles, geographical and climatic conditions, incidence of poverty and unemployment etc. Under such circumstances, the expenditure needs differ from State to State. This situation prevents States to provide a comparable minimum standard of public services across nations to bring equity and efficiency in governance.

Intergovernmental transfers are important policy instruments for nations to address such issues (Oates, 1999). Buchanan (1950) and other proponents of equalization transfers (Boadway, 1980; Boadway and Flatters, 1991) argue that they, by permitting equal fiscal treatment of identical persons in a federation, can promote "equity". By discouraging fiscally induced migration and enabling the States to provide certain minimum comparable standards of public services, they can reduce barriers to factor mobility, thereby enhance the economic "efficiency" (Shah, 1994).¹ Thus, the equalization transfers are consistent with both normative considerations of equity and efficiency (Munoz, Radics and Bone, 2016).

¹Boadway, Sandra and Shah (1993) argue that the equalization transfers that reduce net fiscal benefit differentials create one of those rare instances in economics when equity and efficiency considerations coincide. Other considerations used for equalization transfers include the prevention of secessionist tendencies in countries with relatively high regional tension (Spahn, 2007; Martinez-Vazquez and Searle, 2007).

Countries like Australia, Canada, Germany and Switzerland have developed their own equalization with different implications for equity, incentives, and distribution (Bahl, Martinez and Sjoquist, 1992; Blair, 1992; Boadway, 2004; Ladd and Yinger, 1994; Ma, 1997 and Ridge, 1992). Among these, the Canadian and the Australian systems are two well-established systems of equalization. The former focuses on the fiscal capacity equalization while the latter focuses on both fiscal capacity and expenditure equalization (Rangarajan and Srivastava, 2004).

In India, the Constitution (1950) provided for a two-tier federal system of Governments, namely the Centre and the State (or sub-national) Governments.² It assigned separate tax sources and spending responsibilities to them. Like in most other federal nations, it allocated almost all broad based and buoyant taxes to the Centre and more expenditure responsibilities to States. At the same time, States' fiscal capacity varied due to their economic base, geographical location etc. These led to the vertical and the horizontal imbalances. To mitigate them, the Constitution provided for transfer of resources from the Centre to States.

The Finance Commission (FC) of India has been constitutionally assigned the task of determining transfers to all States, including larger or General Category States (GCS) and small or Special Category States (SCS) in the form of tax devolution (shared tax) and grants including revenue grants. These transfers have been supplemented by Planning Commission grants (till 2014) and grants under various Centrally Sponsored Schemes (CSS) since 1950. The Central transfers have played important role in the State Governments' budgets. During 2011-12 to 2018-19, the share of Central transfers in the total revenue receipts of (29) Indian States ranged between 38.3 percent (2013-14) and 47.1 percent (2016-17).³ Majority of the transfers were unconditional and a

²In 1992, the 73rd and 74th Constitutional amendments empowered the urban and the rural local governments as the third tier.

³As per the XVth Finance Commission Report, Vol. IV The States, October 2020.

small portion of them was conditional/specific. Generally, the approach pursued by the FC has equalizing content in designing tax devolution by incorporating fiscal capacity distance. It considers to some extent the expenditure side of equalization in the revenue deficit grant. But the procedure is not robust and consistent. There are sharp differences in the level of federal transfers to States in different years. For instance, among the Indian States, Haryana had the lowest per capita transfers of ₹.5,434 in 2018-19 and Arunachal Pradesh had the highest per capita transfers of ₹.90,124. Such differential allocation largely allotted in general devolution instead of equalization which could be made more effective by making it outcome based.

Further such wide temporal and spatial disparities exist in other fiscal indicators also. In 2018-19, Bihar had the lowest per capita own revenues of ₹.2,824 and the lowest per capita revenue expenditures of ₹.10,515. Goa had the highest per capita own revenues of ₹.40,532 and Sikkim had the highest per capita revenue expenditures of ₹.79,197. Such vast variations in fiscal indicators should progressively close in order to achieve equity in public services. In this context, the following important questions that emerge are: (i) whether the existing transfers system has incentive or disincentive effect on State Government expenditures in India? (ii) whether the incentive or disincentive effect of transfers happens in GCS and/or in SGS? (iii) whether there is a need to reform the transfers so that the goal of horizontal fiscal equalization can be achieved? (iv) whether different equalization principles needed for GCS and SCS? and (v) whether additional resources required to achieve the equalization in India? This study attempts to answer these policy issues pertaining to the determination of fiscal equalization transfers in India using the data for 29 Indian States during 2005-06 to 2018-19 and panel data methodology based on a model closer to Australian transfers mechanism. Specifically, it empirically determines a panel regression based expenditure needs for each expenditure category for each State and determines excess fiscal capacity of States using actual (own)

revenues and benchmark revenues.⁴ Then it determines the fiscal equalization transfers as the difference between “spending need” and “excess fiscal capacity”.

The main contributions of this study are as follows. Firstly, although enormous studies emerged on the merits and standards of equalization for various countries, studies on how to practically equalize the spending needs are scarce (Maarten and Lewis, 2011). This study contributes to this sparsely researched area. Secondly, studies designing equalization transfers in the developing countries context is very rare. For instances, Munaz *et. al.*, (2016) estimate for each of 10 Latin American Countries the effects of transfer systems to identify which transfers equalize in greater or lower degree the own revenues of sub-national governments. Saraf and Srivastava (2009) applies the Canadian approach in calculating the fiscal capacity equalization and Australian approach in calculating expenditure need based equalization only for education and health sectors in India. The present study is the first one designing the equalization transfers based on revenue, capital and total expenditures needs with due consideration on the fiscal capacity of GCS and SCS. Thirdly, it also empirically examines in which of the States, transfers have incentive or disincentive or no effects on public spending.⁵ These State specific results might be useful for policy makers to design appropriate strategies to achieve a horizontal balance. Finally, while this study provides policy suggestions based on Indian experience, these may be relevant for similar federal nations.

This study proceeds as follows. The next Section briefly reviews the literature on the study topic. The subsequent two Sections explain

⁴Various approaches can be used to measure the fiscal capacity as explained in review section 2. This study uses a simple procedure due to space constraint. However, it is noted that differences in the estimates in simple measure and panel regression based one are small. The fact is that in general the R square in panel regression which includes year effects and State effects are high and so the difference between the actual and estimated dependent variable will be small.

⁵Studies such as Lalvani (2002), Panda and Velan (2013) and Panda (2015) empirically analyze only the average effect of transfers on State expenditures in India and not State specific effect.

the empirical model, the data and the estimation technique to be employed and the empirical results. The final Section provides the concluding remarks of the study.

BRIEF REVIEW OF LITERATURE

Tiebout (1956), Musgrave (1959) and Oates (1972) developed the "First Generation Theory" (FGT). The FGT considers equalization transfers as a necessary tool to prevent relatively richer jurisdictions attracting more investments at the expense of poorer ones. The second generation theory (SGT), which is an emerging recently, strongly argues for own revenue powers of sub-national Governments. It suggests the importance of horizontal competition between sub-national Governments for economic efficiency and refrainment of federal Government from intervening in sub-national taxing and spending decisions. To the SGT, the Centre's fiscal intervention is distortionary policy instrument that will create incentive compatibility problems by inducing sub-national spending, amassing unsustainable deficits and perpetuating their dependence on the Centre for more support.

Despite these contrary views, large volumes of literature on transfers addressing horizontal fiscal inequalities have emerged. They argue that it is impossible to provide a comparable level of public services at a comparable level of taxation in all jurisdictions. The jurisdictions may have dissimilar needs and the costs of public service provisions vary among them. On the revenue side, jurisdictions with strong tax bases are better able to finance public service provisions than jurisdictions with poor tax bases. These are main justification for net fiscal benefits in the form of equalization which are essential to correct the inefficiency and inequality.⁶

⁶Citizens would move to jurisdictions where they maximize net fiscal benefits. This fiscally induced migration would lead to inefficient allocation of labour across jurisdictions. If citizens with identical income would not migrate despite differences in net fiscal benefits, there would be horizontal inequality. Therefore, transfers would help to ensure efficiency in labour allocation and horizontal equity.

Buchanan (1950, 1952), Boadway (1980) and Boadway and Flatters (1991) have proposed the equalization transfers as remedy. In theory, such transfers from the federal Government can discourage fiscally induced migration and ensure that every sub-national Government is capable of providing standard level of public services at standard tax rates. However, Scott (1952) and Courchene (1978) view that the equalization transfers may induce inefficiency in the regional allocation of resources, because they discourage out-migration of labour to high income jurisdictions where it would be more productive.

Further, other opponents like Shah (1988) argue that in the presence of full capitalization, there may not be any efficiency and equity basis for fiscal equalization transfers, because people in jurisdictions with fiscal surpluses pay relatively more for private services and less for public services, and vice versa for jurisdictions with fiscal deficiencies. Since net benefits are capitalized into property values, a capital gain or loss on account of the local public sector is realized at the time of the sale of property. As a result, Tiebout's prescription that a system of local governments would ensure optimal levels of local public services is not guaranteed. Despite these limitations, as the equalization transfers provide a rationale to estimate the expenditure needs and fiscal capacity as accurately as possible, many procedures have emerged (Munaz *et. al.*, 2016).

Measuring Fiscal Capacity

Various methods measure the fiscal capacity of a sub-national Government which is its ability to raise revenues from its own tax bases. The simplest one uses the current or past year's revenue collections. But this raises many issues: (i) while potential ability to raise revenue is not directly affected by tax rates, the actual revenue are affected by fiscal effort and tax payers compliance (ii) use of current revenue may provide an incentive for the regional Governments to impose low tax or make less effort in order to get higher compensation; (iii) Use of past collection may have time inconsistency because sub-national Governments expect that

current increases in revenue obtained by rates or collection effort would reduce future transfers (Vaillancourt and Bird, 2005). The next method is to use macro economic indicator like GDP at regional level to measure fiscal capacity. However, this may not be a good indicator. The third one is the representative tax system (RTS). It measures the amount of revenue that could be raised by a regional Government if it uses the standard tax bases and rates. The fourth method uses regression method to project fiscal capacity with reference to bench mark revenues chosen from the sample.

Expenditure Needs

The simplest approach is to use historical expenditure patterns (Boex and Martinez-Vazquez, 2004). Although this is simple, there is no guarantee that past expenditures reflect the spending needs. Further, due to changing expenditure norms and priorities, past expenditure on particular service may not reflect current policy objectives (Vaillancourt and Bird, 2007). The second approach assumes that all jurisdictions have identical expenditure needs and so each is allocated the same amount. While it is simple to apply, it leads to significant gap in per capita resource availability.

The third approach regresses the actual expenditures on need indicators and other determinants of regional spending. The coefficients of the need indicators are used to build an allocation formula while keeping the effect of non-need expenditure determinants as constant (Ladd, 1994). However, this approach requires the data on appropriate regional characteristics that influence regional spending. Further, this is applicable only when actual expenditures are good indicator of spending needs. The next is representative expenditure system (RES) method. This measures a sub-national Government's per capita spending need as the sum of its workload for each category of service weighted by average spending on each unit of service, divided by population. Thus, it provides an estimate of how much jurisdictions would spend per capita given and average service level, its work-load and cost of providing services. However, this

approach requires necessary data on various categories of expenditures, work load etc (Maarten and Lewis, 2011).

Interestingly, many countries have designed their own equalization method. For instances, the Australian model considers both revenue and expenditure sides. First it prepares the 'standard budget' for each service based on all-State averages of expenditures as well as revenues so that the system reflects average efficiency. Germany and Switzerland also consider the expenditure needs in fiscal equalization. In Germany, average nation-wise tax revenue per capita is used as the proxy for expenditure of each sub-national Government. In Switzerland, the calculation of expenditure needs of cantons consider population density, mountain zones, productive area etc. The Canadian system uses an elaborate Representative Tax System (RTS) approach where each tax or revenue source is considered individually and the average or representative tax effort is applied to the difference between the standard revenue base and the actual base (see Ma, 1997; Vaillancourt and Bird, 2007 and Hansjörg and Claire, 2008 for main features of fiscal equalization schemes in selective countries).

Most empirical literature considers both income and transfers as two important economic factors determining public spending. Various hypotheses are put forward to analyze the effect of these factors on public spending: (i) **Wagner's Hypothesis** posits a long-run positive relationship between public spending and income (GDP); (ii) **Veil Hypothesis** suggests that as the unconditional transfers like lump sum transfers can be spent on any combinations of public goods/services or used to provide tax relief to residents, they don't affect relative prices (no substitution effect). Therefore, they should not be different from the effect of distributing the lump sum funds directly to local residents. In theory a \$1 increase in local resident's income should have exactly the same impact on local spending as receipt of \$1 of the transfers (Bradford and Oates, 1971); (iii) **Disincentive Effect:** Scott (1952) argues that most sub-national government will distribute the transfers as lower taxes,

and this will crowd out local spending; (iv) ***Flypaper Effect hypothesis*** explains that the unconditional transfers given to a community has a greater stimulatory effect on its spending than the equivalent increase in the income of the median voter. That is, 'money sticks where it hits'.

Large volumes of empirical studies emerged to analyze the more general redistributive effects of transfers systems. Most studies focus on individual countries, examining the equalization capacity of existing systems and suggesting alternatives to reduce horizontal imbalances. Some of them are: ACIR (1986 and 1988) for USA; Martínez-Vázquez and Boex (1999) for Russian Federation; Ruggeri and Yu (2000) for Canada. Regional studies include the analysis of five federal countries-Germany, Australia, Canada, Spain and Switzerland (Hierro, Atienza and Patino, 2007); fiscal disparities in East Asia-China, Indonesia, Philippines, Thailand and Vietnam (Hofman and Guerra, 2005); and the analysis for OECD countries (OECD, 2014).

In the Indian context, a few studies emerged on the topic. For instances, Lalvani (2002) and Panda (2015) empirically tested and show that the fly-paper effect hypothesis is vindicated in Indian context. Panda and Velan (2013) examine the incentive of effects of fiscal transfers on spending of 22 States during 1980-81 to 2004-05 and find that on average transfers are positively and significantly associated with States' aggregate expenditure, revenue expenditure and capital expenditure. Panda (2017) examines the impacts of federal transfers on expenditure of 22 States during 1980-81 to 2007-08 and shows that the Central transfers stimulate States' revenue expenditures, capital disbursements and aggregate expenditures. Saraf and Srivastava (2009) estimate the equalization transfers for health and education sectors by allowing for both revenue and expenditure disabilities in a panel framework.

EMPIRICAL MODEL, DATA AND ESTIMATION

This study employs a framework closer to the Australian Transfer Mechanism. This involves four steps: (i) identify the expenditure categories, (ii) specify and estimate the category wise expenditure equations; (iii) estimate the expenditure needs for each expenditure category for each State utilizing the estimated model and standard benchmark and estimate the fiscal capacity of each State using the per capita own revenues and its standard benchmark; and (iv) determining the equalization transfers for each State utilizing the estimated expenditure needs and fiscal capacity. As States spend on various sectors like education, health, sanitation etc., specifying and estimating sector specific expenditure equations are difficult task. Following past studies which have broadly classified aggregate expenditures into revenue and capital expenditures, this study specify the following the linear panel data expenditure model:⁷

$$E_{it} = \beta_0 + \beta_1 FT_{it} + \beta_2 OR_{it} + \beta_3 GSDP_{it} + \beta_4 NP_{it} + \beta_5 PD_{it} + \beta_6 UR_{it} + \beta_7 RL_{it} + \beta_8 PC_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (1)$$

where E_{it} is the annual real per capita (revenue or capital or total) expenditure of the i th State in year t ; FT_{it} is real per capita Central fiscal transfers, OR_{it} is real per capita (own tax and own non-tax=) own revenues (this is a proxy for States' own revenue effort), $GSDP_{it}$ (=Gross State Domestic Product) is real per capita income, NP_{it} is non-primary sector share in total GSDP, PD_{it} is population density, UR_{it} is urban ratio, RL_{it} is road length, and PC_{it} is per capita power consumption. λ_i is region (State) specific effect which captures the impact of unobserved heterogeneity in the model and μ_t captures the time specific impact. ε_{it} is the stochastic error term.⁸

⁷This study in the initial estimation tried other functional forms like log-linear, log-log etc. However, the linear form fits the data best. Earlier studies Lalvani (2002) and Panda (2017) also used linear specification.

⁸ Since the central transfers variable enters on the right side of the equation (1), one may argue for potential endogeneity issue. In the initial estimation, we have dropped this variable and found that results are more or less the same. Even if there is an endogeneity, the bias could be smaller.

Basically NP, PD, UR, RL, and PC are included to control for economic and social, infrastructure variations in States.⁹ High share of NP means high industrialization or less agrarian State and so State can spend less on revenue but more on capital investments. Larger road length also indicates high prosperity and State can spend less on revenue and more on capital items. High population density and high urban ratio may have negative or positive effect on State expenditures. Power consumption may indicate prosperity and therefore States can spend less. At the same time, if power is constrained, then States need to spend more to procure from others and supply. In that case, it may have negative impact.

The data source for per capita GSDP and share of non-primary sector in total GSDP for 29 Indian States during 2005-06 to 2018-19 (in 2011-12 prices) is NSO and EPW Research Foundation. The data source for revenue expenditures, capital expenditures, total expenditures, transfers to each State and own revenues is the Comptroller and Auditor General (CAG) of India Audit Reports and Finance Accounts of the various State Governments. Using the GSDP deflator and population of the respective States, we compute the real values of fiscal variables. We extrapolate the population density data using Census 2001 and 2011. We obtain the projected urban ratio data from Office of Registrar General and Census Commissioner (2006) till 2010-11 and National Commission on population (2019) after 2010-11. The data source for two infrastructure variables- road length and per capital power consumption is RBI's Handbook of Statistics on State Economy. The data used is a balanced panel data with (29 x 14 =) 406 observations.

⁹Various political economy factors which may influence State expenditures, can be incorporated in the form of dummy for election year, dummy for ruling party etc. As λ_i - the State specific unobserved heterogeneity can also capture these State specific characteristics, these political factors are not included explicitly. Similarly, the FRBM act imposes a restriction on State's net borrowing limit to 3 percent of GSDP. This may affect the capital expenditure as borrowed amounts mostly used for capital investments. Since all States have this common ceiling limit, this factor is not included in capital expenditure equation.

The sample States are: (i) GCS: Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal; and (ii) SCS: Arunachal Pradesh, Assam, Goa, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.¹⁰ Evidences indicate that the share of 11 SCS is approximately 4.8 percent in total own revenues of all 29 States, 13.8 percent in transfers, 9 percent in expenditures and 5 percent in GSDP. The above State expenditure equations in (1) can be estimated using the standard (static) panel data estimation techniques: fixed effects (FE) or random effects (RE) method. The Hausman Statistics can help us to choose the right model.

As GCS and SCS differ in their characteristics, we do a separate (split sample) analyses for the GCS and SCS. Finally, to analyze the effect of fiscal transfers on expenditure categories of each individual State, we allow the fiscal transfer variable to interact with State dummies in an alternative specification of the model. If the estimated coefficient of transfers, β_1 is negative (positive), then there is disincentive (incentive) effect. If it is larger than income coefficient β_3 , there is a flypaper effect. If it is equivalent to income coefficient, then the Veil hypothesis is valid. If income coefficient is positive, then Wagner law is hold.

The spending need of each State is computed as follows. The estimated values from the regression model (1) represent how much the State i spend (in per capita term on given category of expenditure j =revenue or capital or total), conditional on its needs and cost profiles and revenues at period t , on each category, \widehat{E}_{ijt} . From these values for given year, we can establish a bench mark or standardized per capita

¹⁰ In the SCS, almost all States are small and hilly States except Goa which is a small State but not a hilly State. In the GCS, all States are major Indian States including Uttarakhand which is also a hilly State.

expenditure (which may be either all States' average or average of top three States) for each category, \widehat{E}_{ijt}^* . Then, we calculate the real per capita expenditure need for each State i for each category j as: $EN_{ijt} = \widehat{E}_{ijt}^* - \widehat{E}_{ijt}$. Multiplying EN_{ijt} for each State by its population and by GSDP deflator will give the expenditure need in nominal term for a given category j for State i in year t , EN_{ijt}^* . For States spending more than bench mark, EN_{ijt}^* is negative and we assign zero expenditure need value.¹¹ Adding the revenue spending need and the capital spending need gives the total spending need of each State, EN_{it}^* .

To determine the fiscal capacity for each State (see foot note 6), first a bench mark per capita own revenue (nominal), OR_{it}^* is chosen; this may be average or average of top three States. Multiply this with respective population gives the fiscal capacity of each State. The difference between the fiscal capacity and the actual own revenue is the excess fiscal capacity for each State, EF_{it}^* . Then we determine the fiscal equalization transfer for each State as: $T_{it} = EN_{it}^* - EF_{it}^*$. If the difference is negative for any State, the equalization transfer is zero.

Table 1 presents the descriptive statistics of the study variables. The average real per capita total expenditure of SCS is 2.4 times higher than that of GCS. While the average real per capita own revenue of SCG is 1.1 times higher than that of GCS, the average real per capita transfers to SGS is almost 5 times higher than the average transfers to GCS. Thus, GCS and SCS have different characteristics, indicating that they need a separate treatment in determining transfers and common bench mark cannot serve the purpose. The correlation analysis (not shown) indicates that a few independent variables like real per capital own revenue and real per capita income are highly correlated but not perfectly (and so there is no perfect multi-collinearity issue).

¹¹. The FCs also estimate the expenditure needs and revenue availability of States ex ante. Our estimations are ex post based on actuals and used to determine equalization transfers to States.

Table 1: Means and Standard Deviations of the Study Variables

Variables	General Category States		Special Category States	
	Mean	S.D	Mean	S.D
Real Per Capita Revenue Expenditure (Rs.)	10,541.29	4,215.56	23,835.43	11,717.81
Real Per Capita Capital Expenditure (Rs.)	1,803.26	1,079.63	5,719.55	3,901.75
Real Per Capita Total Expenditure (Rs.)	12,914.72	5,506.09	30,447.98	16,809.65
Real Per Capita Transfers (Rs.)	3,957.67	1,887.79	19,810.71	12,213.79
Real Per Capita Own Revenues (Rs.)	6,375.82	2,985.82	7,026.92	7,746.26
Real Per Capita Income (GSDP) in Rs.	8,2258.00	39,207.13	93,324.94	69,174.83
Non Primary Sector Share in GSDP (percent)	77.05	7.53	75.67	9.10
Population Density	488.11	294.05	177.02	134.81
Urban Ratio (percent)	32.56	11.30	29.53	15.68
Road Length (Kms.)	1,98,705.0	1,25,496.2	48,803.2	77,548.1
Per Capita Power Consumption (KWh)	1,069.31	514.11	726.88	577.42
Sample Size	252		154	

EMPIRICAL RESULTS

Estimation Results of State Governments Expenditures

(i) General Category States Results: Column 1 of table 2 reports the two-way random effects (FE) estimation results of real per capita revenue expenditure equation (1). As expected, the coefficient of per capita transfers (β_1) is positive and statistically significant at 1 percent level, indicating a strong incentive (or crowd-in) effect. This means that the revenue expenditure increases with higher transfers. This result confirms that transfers directly affect expenditure. The coefficient of per capita income is also positive and statistically significant at 1 percent level,

confirming the Wagner hypothesis. Further the transfers' coefficient is larger than income coefficient indicating the presence of flypaper effect.

Table 2: Panel Model Estimation Results of Real Per Capita Expenditures of General Category States and Special Category States in India (2005-06 to 2018-19)

Variables	General Category States			Special Category States		
	2-Way RE	One Way RE	2-Way RE	One Way FE	2-Way RE	One Way FE
	Revenue Exp.	Capital Exp.	Total Exp.	Revenue Exp.	Capital Exp.	Total Exp.
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	2459.010 (2.22)**	-2444.159 (-2.66)	6341.309 (3.51)*	-	-113.053 (-0.16)	-
Per Capita Transfers	0.880 (11.79)*	0.317 (9.36)*	1.108 (8.43)*	0.629 (17.7)*	0.236 (9.28)*	1.099 (10.33)*
Per Capita Own Revenues	0.512 (7.76)*	-	0.699 (5.40)*	0.558 (5.69)*	-	-
Per Capita Income	0.047 (9.61)*	0.005 (2.03)**	0.061 (6.14)*	0.019 (2.19)**	0.023 (5.72)*	0.067 (3.97)*
Non Primary Sector Share	-59.265 (-3.69)*	38.989 (2.98)*	-111.417 (-3.88)*	82.609 (2.27)**	-	-
Population Density	1.645 (2.99)*	-0.821 (-2.59)*	1.573 (2.22)**	39.956 (2.68)*	-	-
Urban Ratio	52.481 (4.77)*	-	44.761 (2.15)**	136.75 (3.44)*	-	-
Road Length	-0.002 (-2.17)**	-	-0.004 (-3.34)*	-	-	-
Per Capita Power Consumption	-	-	-	2.889 (2.15)**	-	-
R Square	0.961	0.548	0.935	0.9963	0.7671	0.9769
Hausman Statistics	23.83	1.28	5.76	20.73	3.55	11.28
State Dummies	Included	Included	Included	Included	Included	Included
Time Effect	Included	Not Included	Included	Not Included	Included	Not Included

Note: t-values are in the parentheses. *-1 percent, **-5 percent and ***-10 percent level of significance respectively.

It is expected that States may also distribute the transfers as lower taxes. This will affect the own revenue effort and this in turn will affect the expenditure level negatively, i.e., this will crowd out local

spending (Scott, 1952). But the per capita own revenue is positively and significantly related to the per capita revenue expenditure, implying that States with more fiscal capacity incur more revenue expenditures. Both population density and urban ratio have positive parameters, which are statistically significant at 1 percent level. As expected, both non-primary sector share and road length are negatively and significantly associated with per capita revenue expenditure.

Column 2 of table 2 shows the one way RE results of capital expenditures equation. The own revenue, urban ratio, road length variables and per capita power consumption are not included as they are not statistically significant even at 10 percent level. Both transfers and income have positive and statistically significant coefficients and magnitude of the former is higher than that of later, indicating the presence of flypaper effect. The coefficient of population density is negative and statistically significant at 1 percent level. As expected, the non-primary sector has a positive and significant impact on capital expenditures.

In Column 3, the 2-way RE results of total spending equation are shown. Both transfers and income positively and significantly influence per capita total expenditures and the magnitudes of their parameters confirm the presence of flypaper effect. A 1-rupee increase in per capita transfers leads to 1.11 rupees increase in per capita total expenditures. Own revenues, population density and urban ratio influence positively and significantly while non-primary sector share affects negatively and significantly.

(ii) Special Category States Results: Columns 4-6 of Table 2 present the estimation results for SCS. Both transfers and income have positive and statistically significant effect and the transfer coefficient is higher than the income coefficient in all three equations, indicating the presence of flypaper effect. The per capita own revenue, the share of non-primary

sector, population density, urban ratio and power consumption have positive and significant impact on per capita revenue expenditures.

(iii) Estimation Results of Expenditure Equations with Transfers Interaction: Table 3 depicts the estimation results of the alternative specifications of expenditures equations which allow interaction between the State dummies and transfers for GCS. In all GCS except Bihar, Gujarat, Maharashtra, Uttar Pradesh and West Bengal, the effect of transfers on revenue expenditures is positive and significant. The impact of transfers is positive and significant on capital expenditures in all GCS except Haryana, Kerala, Maharashtra, Punjab and Tamil Nadu. The transfers' effect on total expenditures is not significant in Bihar, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal and in the remaining 10 GCS, it is positive and significant. The effects of other variables are more or less the same as in Table 2 except the following changes: (i) income, share of non-primary sector, and road length turn out to be insignificant in total expenditures equation; and (ii) road length is not significant in revenue expenditures equation.

Table 3: Panel Model Estimation Results for GCS States with Transfers Interaction

Variables	2-Way RE		One Way RE		2-Way RE	
	Revenue Exp.		Capital Exp.		Total Exp.	
	Coefficient	T ratio	Coefficient	t ratio	Coefficient	t ratio
Constant	2292.936	0.82	-1567.412	-1.34	-1108.875	-0.48
Per Capita Own Revenues	0.456	8.74*	-	-	0.531	4.36*
Per Capita Income	0.026	3.05*	0.012	2.69*	0.006	0.29
Non Primary Sector Share	-30.992	-2.22**	26.254	1.64***	30.474	0.93
Population Density	3.215	6.61*	-1.212	-2.19**	3.251	2.86*
Urban Ratio	48.552	4.71*	-	-	46.381	1.93***
Road Length	0.001	1.30	-	-	0.002	0.71
Per Capita Power Consumption	-	-	-	-	-	-
R Square	0.988		0.902		0.961	
General Category States						
Andhra Pradesh* Per Capita Transfers	0.753	8.41*	0.197	2.70*	1.437	6.87*
Bihar*Per Capita Transfers	-0.349	-1.58	0.463	4.08*	-0.697	-1.35
Chhattisgarh*Per Capita Transfers	0.633	7.41*	0.194	3.85*	0.654	3.28*
Gujarat *Per Capita Transfers	0.086	0.56	0.338	2.18**	0.484	1.35
Haryana *Per Capita Transfers	0.896	4.95*	0.291	1.59	1.483	3.51*
Jharkhand*Per Capita Transfers	0.252	1.77***	0.267	5.27*	0.150	0.45
Karnataka *Per Capita Transfers	0.401	3.44*	0.203	1.78***	0.617	2.27**
Kerala*Per Capita Transfers	0.646	4.80*	0.064	0.50	0.558	1.77***
Madhya Pradesh* Per Capita Transfers	0.297	2.26**	0.275	4.36*	0.367	1.20
Maharashtra*Per Capita Transfers	0.064	0.33	-0.026	-0.15	-0.004	-0.01

Variables	2-Way RE		One Way RE		2-Way RE	
	Revenue Exp.		Capital Exp.		Total Exp.	
	Coefficient	T ratio	Coefficient	t ratio	Coefficient	t ratio
Orissa *Per Capita Transfers	0.475	5.67*	0.259	5.77*	0.530	2.71*
Punjab*Per Capita Transfers	0.739	5.20*	-0.008	-0.07	1.266	3.81*
Rajasthan*Per Capita Transfers	0.701	5.90*	0.190	2.53**	0.809	2.91*
Tamil Nadu*Per Capita Transfers	0.349	2.58*	0.133	1.03	0.484	1.53
Telangana*Per Capita Transfers	0.472	4.06*	0.369	3.21*	1.160	4.27*
Uttar Pradesh*Per Capita Transfers	-0.243	-1.22	0.455	5.31*	-0.486	-1.05
Uttarakhand*Per Capita Transfers	0.788	11.83*	0.234	3.66*	1.050	6.75*
West Bengal*Per Capita Transfers	-0.149	-0.80	0.316	2.97*	-0.445	-1.02
State Effect	Included		Included		Included	
Year Effect	Included		Not Included		Included	

Note: *-1 percent, **-5 percent and ***-10 percent level of significance respectively.

Table 4 shows the estimation results of expenditure equations allowing interaction of transfers with State dummies for SCS. The effects of other variables are more or less the same as in Table 2, except that urban ratio and power consumption turn out to be insignificant in revenue expenditures equation. The effect of transfers on revenue expenditures is positive and significant in all SCS except Goa, Meghalaya and Sikkim. Except in Assam, the effect of transfers is positive and significant on capital expenditures of all SCS. Except in Assam, Manipur and Sikkim, the transfers influence positively and significantly the total expenditures of all SCS.

Table 4: Panel Model Estimation Results of SCS With Transfers Interaction

Variables	One Way FE		2-Way RE		One Way FE	
	Revenue Exp.		Capital Exp.		Total Exp.	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant	-	-	325.251	0.30	-	-
Per Capita Own Revenues	0.341	3.40*	-	-	-	-
Per Capita Income	0.059	4.72*	0.009	3.06*	0.093	2.89*
Non Primary Sector Share	151.136	3.36*	-	-	-	-
Population Density	139.800	3.94*	-	-	-	-
Urban Ratio	71.501	1.01	-	-	-	-
Road Length	-	-	-	-	-	-
Per Capita Power Consumption	0.212	0.15	-	-	-	-
R Square	0.997		0.851		0.979	
<i>Special Category States</i>						
Arunachal Pradesh* Per Capita Transfers	0.599	13.83*	0.284	10.05*	1.246	8.71*
Assam *Per Capita Transfers	-1.680	-2.71*	0.214	1.01	1.174	1.17
Goa *Per Capita Transfers	0.090	0.56	0.727	5.08*	1.031	1.86***
Himachal Pradesh * Per Capita Transfers	0.358	2.73*	0.201	2.67*	0.923	2.19**
Jammu and Kashmir * Per Capita Transfers	0.404	2.01**	0.313	3.79*	1.231	2.01**
Manipur *Per Capita Transfers	0.513	2.78*	0.270	3.71*	0.809	1.38
Meghalaya *Per Capita Transfers	0.216	1.12	0.205	2.06**	1.189	2.45**
Mizoram *Per Capita Transfers	0.579	10.44*	0.212	6.23*	0.812	4.48*
Nagaland*Per Capita Transfers	0.869	6.23*	0.197	3.93*	1.359	4.57*
Sikkim *Per Capita Transfers	0.174	1.51	0.288	9.23*	0.446	1.26
Tripura*Per Capita Transfers	0.135	0.49	0.296	3.39*	1.077	1.92***
State Effect	Included		Included		Included	
Year Effect	Not Included		Included		Not Included	

Note: *-1 percent, **-.5 percent and ***-10 percent level of significance respectively.

Spending Needs of Indian States

As explained in Section 3, we use the predicted values of real per capita revenue, capital and total expenditures from the results given in Table 2 to determine the expenditure needs for each of GCS and SCS in respective expenditure category. We use two alternate bench marks for each expenditure category: average of top 3 States (bench mark 1) and average of all States (bench mark 2). The expenditure need is the difference between the bench mark expenditure and predicted value of expenditure of State *i*. Notice that we use separate bench marks for GCS and SCS. Table 5 shows the estimated expenditure needs for GCS and SCS for the year 2018-19.¹²

¹² Due to space constraint, we report the results for only the latest year 2018-19. As results using Tables 3 and 4 are also almost equivalent to these results, we do not report them.

**Table 5: Expenditure Needs for State Governments in India in
2018-19 (₹.1 Crore=10 million)**

States	Revenue Expenditure Need		Capital Expenditure Need		Total Expenditure Need	
	Top 3 Avg.	Average	Top 3 Avg.	Average	Top 3 Avg.	Average
General Category States						
Andhra Pradesh	26,227	0	9,620	254	20,162	0
Bihar	2,36,680	1,42,871	40,574	18,547	2,83,569	1,76,707
Chhattisgarh	21,373	153	2,972	0	23,689	0
Gujarat	35,690	0	5,527	0	33,310	0
Haryana	6,517	0	4,980	0	7,290	0
Jharkhand	53,484	26,010	8,083	1,632	62,184	30,887
Karnataka	25,940	0	2,881	0	26,558	0
Kerala	0	0	7,651	1,288	2,038	0
Madhya Pradesh	1,27,444	56,515	24,350	7,695	1,44,498	63,698
Maharashtra	59,877	0	22,558	1,921	76,199	0
Odisha	32,650	1,243	3,411	0	36,300	523
Punjab	15,312	0	8,197	2,874	18,748	0
Rajasthan	85,159	25,677	20,183	6,217	1,00,787	33,028
Tamil Nadu	30,585	0	13,904	593	33,357	0
Telangana	15,584	0	4,564	0	9,550	0
Uttar Pradesh	3,99,649	2,15,697	66,511	23,317	4,83,321	2,73,772
Uttarakhand	0	0	0	0	0	0
West Bengal	1,42,488	61,340	35,140	16,086	1,82,437	89,997
All GCS Total	13,14,659	5,29,505	2,81,107	80,424	15,43,998	6,68,613
Special Category States						
Arunachal Pradesh	0	0	0	0	0	0
Assam	1,73,265	87,359	62,540	30,294	2,62,746	1,31,525
Goa	0	0	207	0	492	0
Himachal Pradesh	19,586	1,866	8,825	2,174	30,962	3,895
Jammu and Kashmir	51,720	15,449	19,029	5,414	80,910	25,507
Manipur	15,951	6,889	5,078	1,676	23,078	9,235
Meghalaya	15,101	6,281	5,735	2,425	23,216	9,745
Mizoram	685	0	568	0	1,426	0
Nagaland	6,609	558	2,699	428	10,055	813
Sikkim	129	0	0	0	430	0
Tripura	16,552	6,562	5,300	1,550	24,428	9,169
All SCS Total	2,99,598	1,24,965	1,09,980	43,960	4,57,743	1,89,888
All States	16,14,257	6,54,470	3,91,087	1,24,384	20,01,741	8,58,501

Uttarakhand, Kerala and Haryana are the top 3 States in revenue expenditures. States spending above the bench mark get negative expenditure need value and are assigned zero need value. In Table 5, the spending needs of Kerala and Uttarakhand are negative and are assigned zero using bench mark 1 for revenue expenditures of GCS. The revenue expenditure need of Haryana is the minimum. Uttar Pradesh has the highest revenue expenditure need of about ₹.4,000 billion, followed by Bihar and West Bengal. As per this bench mark 1, the total revenue spending need of GCS is about ₹.13,147 billion. With average bench mark 2, only 8 out of 18 GCS have revenue spending needs. The total estimated revenue spending need based on the bench mark 2 is about ₹.5,295 billion. Similarly, the total revenue expenditure need estimated for all SCS is about ₹.2,996 billion using bench mark 1 and ₹.1,250 billion using bench mark 2. Thus, the total revenue expenditure need for all 29 States is about ₹.16,143 billion (with bench mark 1) and ₹.6,545 billion (with bench mark 2). The total capital expenditures need for all 29 States is about ₹. 3,911 billion (bench mark 1) and ₹.1,244 billion (bench mark 2) and the total expenditures need is about ₹.20,017 billion (bench mark 1) and ₹.8,585 billion (bench mark 2).

Determining Fiscal Equalization Transfers

The expenditure need (EN^*) is the sum of revenue and capital expenditure needs from table 5. It is noted that the estimated EN^* of each State slightly varies from total expenditure need of State in Table 5. As indicated in Section 3, the difference between the fiscal capacity and the actual own revenue is the excess fiscal capacity for each State i in t , EF_{it}^* . Table 6 shows the expenditure needs and excess revenue capacity using two bench marks for each State. The fiscal equalization transfer for a State is: $EN^* - EF^*$. We consider four scenarios by considering (i) excess fiscal capacity and expenditure needs both based on top 3 average bench marks (Scenario 1); (ii) excess revenue capacity based on all States' average bench mark and expenditure needs based on top 3 average bench mark (Scenario 2); (iii) excess fiscal capacity based on top 3 average bench mark and average expenditure needs (Scenario 3); and (iv) excess fiscal capacity and expenditure needs both based on average bench marks (Scenario 4).

Table 6: Equalization Transfers for Indian States in 2018-19 (₹. Crore)

States	Exp. Need (EN ⁺)		Excess Revenue (EF ⁺)		Transfers			
	Top 3 Avg.	Avg.	Top 3 Avg.	Avg.	Top 3 EN ⁺ , Top 3 EF ⁺	Top 3 EN ⁺ , Avg EF ⁺	Avg EN ⁺ , Top 3 EF ⁺	Avg. EN ⁺ , Avg EF ⁺
General Category States								
Andhra Pradesh	35847	254	32472	0	3375	35847	0	254
Bihar	277254	161418	186010	109330	91244	167924	0	52088
Chhattisgarh	24345	153	24181	5562	164	18783	0	0
Gujarat	41217	0	31339	0	9878	41217	0	0
Haryana	11497	0	1579	0	9918	11497	0	0
Jharkhand	61567	27642	45713	21711	15854	39856	0	5931
Karnataka	28821	0	18981	0	9840	28821	0	0
Kerala	7651	1288	1649	0	6002	7651	0	1288
Madhya Pradesh	151794	64210	88336	35557	63458	116237	0	28653
Maharashtra	82435	1921	21626	0	60809	82435	0	1921
Odisha	36061	1243	35988	7843	73	28218	0	0
Punjab	23509	2874	17441	0	6068	23509	0	2874
Rajasthan	105342	31894	65271	15937	40071	89405	0	15957
Tamil Nadu	44489	593	19909	0	24580	44489	0	593
Telangana	20148	0	0	0	20148	20148	0	0
Uttar Pradesh	466160	239014	264219	119471	201941	346689	0	119543
Uttarakhand	0	0	5138	0	0	0	0	0
West Bengal	177628	77426	117548	54004	60080	123624	0	23422
All GCS Total	1595765	609930	977399	369414	623503	1226351	0	252525
Special Category States								
Arunachal Pradesh	0	0	2529	321	0	0	0	0
Assam	235805	117653	64977	18185	170828	217620	52676	99468
Goa	207	0	0	0	207	207	0	0
Himachal Pradesh	28411	4040	8603	0	19808	28411	0	4040
Jammu and Kashmir	70749	20863	22542	3264	48207	67485	0	17599
Manipur	21029	8565	7576	2962	13453	18067	989	5603
Meghalaya	20836	8706	6883	2103	13953	18733	1823	6603
Mizoram	1253	0	1920	294	0	959	0	0
Nagaland	9308	986	4378	1501	4930	7807	0	0
Sikkim	129	0	172	0	0	129	0	0
Tripura	21852	8112	8235	2789	13617	19063	0	5323
All SCS Total	409579	168925	127814	31419	285004	378480	55488	138636
All States	2005344	778855	1105213	400834	908507	1604831	55488	391160

The aggregate equalization transfers, considering both expenditure needs and excess fiscal capacity for all 29 States is about ₹.9,085 billion (4.95 percent of GSDP of 29 States) in Scenario 1, ₹.16,048 billion (8.74 percent) in Scenario 2, ₹.555 billion (0.3 percent) in Scenario 3 and ₹.3,912 billion (2.13 percent) in Scenario 4.¹³

SUMMARY AND CONCLUSION

In this study, an attempt has been made to address an important policy issue pertaining to the determination on fiscal transfers in India guided by the equalization principle. It has used a model closer to Australian model to determine both spending needs and the fiscal capacity of 29 Indian States. It has also empirically analyzed the effect of fiscal transfers on broad categories expenditures of each of 29 Indian States during 2005-06 to 2018-19 using the standard panel data methodology. As fiscal attributes vary among small and hilly States and larger or General Category States, it has considered a separate bench marks for these groups of States.

The empirical results indicate a strong incentive or the crowding-in effect of transfers on revenue, capital and total expenditures of State Governments in India. The Wagner hypothesis is hold as the income has a positive and significant impact on all three categories of public spending. Further, the transfers' coefficient is greater than income coefficient. Thus, the fly-paper effect hypothesis is vindicated in the Indian context. These results are consistent with results in past studies.

Results also indicate that in all GCS, except Bihar, Gujarat, Maharashtra, Uttar Pradesh and West Bengal and in all SCS except Goa, Meghalaya and Sikkim, the fiscal transfers significantly and positively contribute to the revenue expenditures. Except in Haryana, Kerala,

¹³ The aggregate equalization transfers, considering only revenue expenditure needs for all States is about ₹ .5,342 billion in Scenario 1, ₹ .12137 billion in Scenario 2, ₹ .224 billion in Scenario 3 and ₹ .2,672 billion in Scenario 4.

Maharashtra, Punjab and Tamil Nadu, the fiscal transfers policy significantly increases the capital expenditures of all GCS, while it significantly increases the capital expenditures of all SCS, except Assam. While the transfers' effect on total expenditures is not significant in Bihar, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal, in the remaining 10 GCS, it is positive and significant. Except in Assam, Manipur and Sikkim, the transfers influence positively and significantly the total expenditures of all SCS.

As per the all States' average bench mark, the total amount of expenditure (revenue+capital) needs for all 29 States was about ₹. 7,790 billion. Using the top 3 States' average norms for GCS and SCS, total amount of expenditure needs for all States was ₹. 20,053 billion. The total amount of excess revenue for all States was ₹.11,050 billion using top 3 average bench mark and ₹.4,008 billion using average bench mark.

The study has determined the fiscal equalization transfers under four alternative scenarios. The total transfers for all 29 States (i) under Scenario 1 which considers the excess fiscal capacity and expenditure needs both based on top 3 average bench marks was ₹.9,085 billion; (ii) under Scenario 2 which uses average fiscal capacity and expenditure needs based on top 3 average bench mark was ₹.16,048 billion; (iii) under Scenario 3 that considers excess fiscal capacity based on top 3 average bench mark and average expenditure needs was ₹.555 billion and (iv) under Scenario 4 which utilizes the excess fiscal capacity and expenditure needs both based on average bench marks was ₹.3,112 billion (this is consistent with the Australian approach which equalizes with respect to average benchmarks).

In 2018-19, the Centre's actual gross revenue receipts (GRR) was ₹.25,679 billion. The actual transfers to all 29 States was ₹.11,933 billion (i.e., it accounts for 46.47 percent of GRR). It seems that it could be possible for the Centre to fully or mostly equalize the transfers. To start with, it can consider the scenario 4. Under this Scenario, 17 out of

29 States would get additional transfers. Over the years, the Centre may target to reach Scenario 1. Thus our analyses broadly indicate the relevance of First Generation Theorem which suggest the importance of equalization transfers.

To our knowledge, this is the first empirical study to show the State specific effect of transfers on expenditures of Indian States and provides the estimates of spending needs, fiscal capacity and equalization transfers for GCS and SCS in India. Nevertheless, the study is not free from limitations. First, the results may suffer from econometric issues like endogeneity of transfers, misspecification of expenditure equations etc. However, the bias may be smaller. Second, this study computed spending needs based on underlying assumption that each unit of public services delivery cost is equal for all States. However, as discussed above, the cost of public service delivery may differ. Third, this study computes the spending needs using the level of expenditures incurred. This may provide an adverse incentive or favouring the gap filling approach. Fourth, in the Australian model, the capital expenditure needs are supplemented by an elaborate framework of distribution of loans for the States. This study ignores this. Fifth, this study uses the average per capita revenue bench mark as the fiscal capacity. However, fiscal capacities of States may not be equal and revenue mobilization may dependent on tax compliance and tax effort. Lastly the results are sensitive based on bench marks. Despite these limitations, we hope that the findings of this study are useful to policy makers, international agencies and others researchers to take appropriate strategies to design effectively the equalization transfers to Indian States such that all citizens can avail comparable standard level of public services.

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