INTERGOVERNMENTAL FISCAL TRANSFERS IN INDIA: SOME ISSUES OF DESIGN AND MEASUREMENT

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Abstract

Intergovernmental transfers are made either to offset fiscal disadvantages of the States or to upgrade specified public services to normative levels in the deficient States Yet the transfers designed in the Indian context fail to take account of these objectives satisfactorily. The paper attempts to provide a design of intergovernmental transfer schemes incorporating the above objectives. An important pre-requisite for operationalising such transfer schemes is to estimate unit costs of public services and expenditure needs in the States. The paper provides a methodology to estimate these fiscal parameters based on the cost functions of five important public services.

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Introduction

The case for intergovernmental transfers has rested mainly on the grounds that they are required (i) to offset fiscal disadvantages of sub-central units with low resource base and/or high unit cost of public services and (ii) to ensure certain minimum levels of specific public services having substantial benefit spillovers [Breton (1965) Le Grand (1975), Gramlich (1977), Oates (1972)]. While the fiscal disadvantage argument provides a rationale for general revenue sharing or unconditional grants, ensuring minimum levels of specific services requires the Pigovian price reduction (matching) grants, either open-ended or closed-ended.[1]

Redressal of fiscal disadvantage is argued for mainly on considerations of horizontal equity. It is very well recognised that the two important sources of inter-State inequity are lower revenue base and higher unit costs of public services. Residents in States with lower revenue base and/or higher unit costs face significantly higher tax burdens and/or receive lower levels of public services than their counterparts in States with high revenue base and/or lower unit costs. Intergovernmental transfers are intended to augment States to provide some normative level of service to their residents at a standard level of tax effort.[2,3]

The justification for specific purpose transfers, on the other hand, arises from the Central Government's intention to ensure the provision of minimum levels of specified services. The extent to which expenditure on a particular service will actually increase for a rupee of grants will ultimately depend upon the matching ratio and the price elasticity of demand for the service [Wilde (1971)].

In India, wide inter-State differences in levels of development create significant variations in the States' ability to raise revenues. Further, in a country so large and diverse, unit cost of providing public services also cannot be presumed as constant across the States. Besides in an economy where social linguistic and economic factors pose constraints on inter-State population mobility, and where severe imperfections exist in both product and factor markets it cannot be presumed that these fiscal inequities would be self-policing through capitalisation of property values [4] Intergovernmental transfers are therefore, extremely important to offset fiscal disadvantages.

Given the objectives of the two types of transfers the important issues to be considered are: (i) the design of the transfer schemes and (ii) their operationalisation which requires the measurement of the differences in the levels of public services and their unit costs.[5] The objective of this paper is primarily to address these issues In Section II design of intergovernmental transfers - both general purpose and specific purpose - to ensure minimum levels of services in the States is outlined. Section III highlights the problems of the existing Centre-State fiscal transfer schemes in India. Section IV, presents a methodology for estimating cost functions for public services which form the basis of measuring unit costs of public services and expenditure needs of the States. The summary and conclusions of the study are given in Section V.

II. Design of Intergovernmental Transfers

1. General Purpose Transfers

In the literature, a number of transfer schemes equalising various fiscal parameters of the sub-Central units have been designed. [Musgrave (1961), Hoffman (1969), Thurow (1970), Le Grand (1975)]. Of these, equalising of the `need-revenue' gap across the States is considered to be an appropriate method of offsetting revenue and cost disadvantages [Bradbury, et.al., (1984)]. The need-revenue gap measures the difference between what the State ought to spend to provide specified levels of public services and the revenue it can raise at a given standard level of tax effort

Thus the need-revenue gap for the i^{th} State can be taken as

$$G_i = \bar{Q}C_i - \bar{t}B_i \qquad (1)$$

where, G_i is the gap (per capita) $\bar{Q}$ is the desired (normative) level of composite public service provided by the State per capita, C_i is the unit cost of the public service, (reckoned at justifiable costs), $\bar{t}$ is the standard tax effort, and B_i is the per capita tax base.

C_i, in turn, consists of two sets of factors: (i) cost factors within the control of the State Governments, (C_{1i}), and (ii) those beyond the States' control (C_{2i}). For need calculations the cost factors within the control of the State Governments (C_{1i}) would also have to be reckoned at justifiable levels ($\bar{C}_i$). Thus,

$$G_i = \bar{Q}(\bar{C}_1 + C_{2i}) - \bar{t}B_i \qquad (2)$$

The fiscal disadvantage of the State (D_i), is determined on the basis of the difference between a State's need-revenue(G_i) gap and the normative gap (G^*) or the gap of the baseline State. That is

$$D_i = G_i - G^* = \bar{Q}(\bar{C}_1 + C_{2i}) - \bar{t}B_i - G^* \qquad (3)$$

A State with a disadvantage [$D_i > 0$] is eligible to receive aid, whereas, the one without [$D_i < 0$] is not. If the Central Government sets apart M rupees to be distributed to the eligible States on the basis of their fiscal disadvantage, the amount of funds the i^{th} eligible State would receive is given by

$$S_i N_i = \frac{(D_i N_i)^a}{\sum_i (D_i N_i)^a} M \text{ for all } D_i > 0 \qquad (4)$$

where S_i represents per capita transfer received by the i^{th} State N_i its population.

First whether or not a State is eligible to receive aid depends on the normatively chosen G^*. It is possible to select G^* such that even the State with the lowest G_i (or the State with the highest fiscal strength) is also eligible to receive aid.[6] Second, the States may not be given grants to fill the entire gap, $G_i - G^*$; the share of individual States in this case is determined by the exponential "a" of the gap to be equalised, total amount of funds available for transfer (or perceived vertical fiscal imbalance) and gap of the State in relation to the total gap. The degree of equalisation achieved, thus, depends upon the normatively chosen (G^*), the value of the exponential (a), and the amount of funds available for transfer (M).

2. Specific Purpose Transfers

The provision of minimum levels of public services is justified either for `merit goods´ reasons [Musgrave (1971)] or for compensating spillovers to ensure optimal public output [Breton (1965) Gramlich (1977)]. This would require the estimation of expenditure needs to make explicit categorical aid programmes

Under the scheme the additional per capita outlay (A_{ij}) required to ensure a minimum level of the public service `j´ in the i^{th} State would be the difference between the justifiable cost of providing the required minimum level of the service per capita ($\bar{Q}_j^* C_{ij}$) and the justifiable cost of providing the prevailing level of the service per capita ($Q_{ij}^* C_{ij}$).

That is

$$A_{ij} = \bar{Q}_j^* C_{ij} - Q_{ij}^* C_{ij} \qquad (5)$$

The per capita grant to be given to each State to ensure the minimum standard of service is given by:

$$S_{ij} = r_c [\bar{Q}_j^* C_{ij} - Q_{ij}^* C_{ij}] \qquad (6)$$

$$\text{such that, } r_c + r_s = 1 \qquad (7)$$

where `$r_c$´ is the proportion of additional outlay the Central Government bears and `r_s´ is the matching proportion the State Government contributes. To ensure the specified level of service, `r_c´ should be inversely related to the price elasticity of demand for the service. If the price elasticity is zero, to ensure the minimum level of service it would be necessary for the Central Government to transfer the entire expenditure amount required to provide the prescribed level

of the public service [Wilde (1971)]. If the price elasticity of demand differs across the States a uniform matching rate would not be an efficient instrument to serve the objective.

The foregoing discussion highlights the importance of measuring the levels of public services provided by the States and their unit costs in order to efficiently design both general purpose transfers and specific purpose matching transfers Yet this has received virtually no attention in the Indian context so far.

III. Intergovernmental Transfers in India: Some Observations

Before going into the measurement of the levels of public services and their unit costs it would be useful to analyse the major problems of Indian fiscal federalism, particularly in the light of the discussion on the designing of the intergovernmental transfer schemes [7]

One of the more severe problems in designing an efficient intergovernmental transfer scheme in India is the existence of several channels of devolution from the Centre to the States. The Finance Commissions only recommend transfers to meet the non-Plan current budgetary needs of the States. The transfers for Plan purposes are determined by the Planning Commission (for State Plan Schemes) and various Central Ministries (for the Central Sector and Centrally Sponsored Schemes).[8] The shares of different agencies in the current transfers effected in 1986-87, are presented in Table 1.

There is close interdependence between Plan and non-Plan expenditures, and in practice, this classification is not uniformly followed. Conceptually, the expenditure on completed Plan schemes is considered as non-Plan and spending on all new developmental schemes is put under the Plan. However, in practice, the States tend to classify expenditures under either Plan or non-Plan head, depending upon what is

advantageous. Therefore, defining the scope of the Planning Commission and of the Finance Commissions based thereon can blur the objectives of federal transfers altogether.

Overlapping and duplication are evident in that both the Finance and the Planning Commissions make unconditional as well as specific purpose transfers to the States. While the specific purpose transfers made by the Finance Commissions are non-matching, those given by the Planning Commission for Centrally Sponsored Schemes prescribe uniform matching requirements for each scheme across the States

The design of intergovernmental transfer programmes in India would thus seem to be at odds with the objectives of federal transfers This is true of all the three types of transfers, viz., the statutory transfers recommended by the Finance Commission grants for State Plan schemes and the schematic assistance given through the Central Sector and the Centrally Sponsored Schemes[9].

The Finance Commissions have recommended transfers mainly on the basis of non-Plan budgetary needs as indicated by the gaps between projected revenues and non-Plan revenue expenditures of the States [10] After devolving the assigned taxes (grant in lieu of the Railway Passenger Fare Tax and Additional Excise Duties in lieu of Sales Tax) and the shared taxes (Income Tax and Union Excise Duties), grants-in-aid are recommended to cover post-devolution deficits in the non-Plan revenue accounts of the States.

Determining States entitlements of grants-in-aid on the basis of projected non-Plan gaps in the revenue account is alleged to have a strong disincentive effect on tax effort and on economy in expenditure.[11] Although the principles governing the grants-in-aid were laid down by the very first Finance Commission that budgetary needs should be supplemented with factors like tax effort and economy in spending, these Commissions have largely adopted the role of fiscal

dentists filling budgetary cavities Over the years as the approach was subjected to severe criticism, the response of the succeeding Commissions was to raise the quantum of tax devolution substantially so that few States were left with projected post-devolution deficits. As tax devolution was not directly related to fiscal disadvantages but was based on general indicators of need such as population and backwardness the relevance of revenue and expenditure assessment was marginalised and the bulk of the Finance Commission transfers was made on the basis of factors related only indirectly with the fiscal disadvantages of the States.[12]

The pattern of Plan assistance given on the basis of a formula determined by the National Development Council is not related to the fiscal disadvantages of the States either. After providing for the requirements of the Special Category States, the available Central assistance (both grants and loans) for State Plan schemes is distributed among the other States on the basis of the modified Gadgil formula. According to the formula, 60 per cent of the assistance (both grants and loans) is distributed on the basis of population, 20 per cent is given to the States whose per capita income is below all States' average, 10 per cent is distributed on the basis of tax effort (as indicated by tax-income ratio) and 10 per cent is given to the States for their special problems. Although, 10 per cent weight assigned to the tax effort factor is intended to encourage better tax performance, the transfer scheme as a whole has not been designed to offset fiscal disadvantages of the States

In the Indian context, to ensure minimum standards of services upgradation grants have been given by the Finance Commissions Planning Commission and various Central Ministries. The specific purpose grants recommended by the Finance Commissions are schematic without any matching requirements from the States, whereas, the grants

for Centrally Sponsored Schemes require varying matching requirements depending upon the scheme, but are uniformly applicable across the States All specific purpose grants are closed-ended.

As in the case of block transfers, the specific purpose transfers too have not been designed to conform to the objective of ensuring minimum levels of public services. Providing specific purpose non-matching transfers implicitly assumes that the aided public service has zero price elasticity. Again, the targeted minimum levels of the public services are not clearly specified. An equally important weakness of the transfer schemes is the ignoring of the cost differences across the States. In the event, such transfers, at best, can equalise per capita expenditure levels and not the levels of services provided.[13]

IV. Estimating Cost-Function for Public Services: Methodological Issues

1. Model

We have attempted to measure cost differences across the State Governments in the decisive voter's utility maximisation model similar to those used by Ladd et al (1986) and Bradbury et al. (1984). Let 'R_m' be decisive voter's consumption of a composite private good and 'Q' be the level of public services provided by the State Government available in equal amounts to all resident households.

The decisive voter s objective is to maximise his utility which is a function of R_m and Q, and is faced with two sets of constraints. The first is the voter s own budget constraint wherein Y_m, his disposable income, must be equal to his expenditure on the composite private good R_m and the taxes paid to the State, tB_m, where t is the effective tax rate and B_m is the tax base. The second is the State's budget constraint according to which per capita expenditure shall be equal to the own per capita revenue capacity and per capita transfers received from the Central Government Per capita expenditure

incurred input and environmental costs of providing the services and the production function for public services determines the per capita service level Q. The cost function [Ξ (Q,I,C)] obtained by inverting the production function indicates the per capita expenditure required to provide `Q´ level of the service in a State having `I´ input costs and `C´ environmental costs. Thus, the decisive voter maximises, U_m (R_m, Q)

subject to, $Y_m + tB_m$, and

$$\Xi (Q,I,C) = t\bar{B} + S \qquad (8)$$

where B is the per capita tax base in the State. Thus, the decisive voter maximises the function choosing R_m, Q and t such that his marginal rate of substitution between the State public good and the composite private good equals the marginal cost of services on the State public good.

$$(\partial U_m/\partial Q/(\partial U_m/\partial R_m) = (\partial \Xi/\partial Q)(B_m/\bar{B})$$

From this model, the factors determining States´ expenditure can be identified. The choice between Q and R at the equilibrium level depends upon the voters income and total revenue available to the State. Similarly, the marginal cost of the public service depends upon the input costs (I) and the environmental costs (C) Therefore the level of expenditure in a State is a function of own revenue, intergovernmental aid input costs environmental costs and voters' preferences (D).[14] Thus, the cost function can be determined as,

$$\Xi = f (B \quad S \quad I \quad C \quad D) \qquad (9)$$

2. Estimation of Cost Functions

We have attempted to estimate the States' expenditure needs and unit costs in respect of five important services, namely, (i) Administrative Services; (ii) Police Services; (iii) Primary Education; (iv) Secondary Education, and (v) Medical, Family Welfare and Public Health

Expenditures on the above services have been regressed on the variables representing own revenue, intergovernmental transfers, input costs, environmental costs and preferences. For our analysis, as the emphasis is on quantifying the service levels, we have taken total revenue expenditure on the service without making a distinction between Plan and non-Plan components. The variable 'own revenue' represents revenue from both tax and non-tax sources. Inter-governmental transfers include all current transfers. We have tried to estimate the effects of 'Finance Commission transfers', grants for State Plan Schemes' and of all 'Other Transfers' separately. The analysis has been done only for the 14 major States In order to minimise the effect of short-term fluctuations we have taken three-year average values of the variables separately for the period 1981-82 to 1983-84 and 1984-85 to 1986-87 and pooled them for estimating the regression equations. Equations have been selected from the following alternative functional forms:

$$E = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + C_1D_1 + C_2D_2 + u \qquad (10)$$

and

$$\text{Log } E = \text{Log } a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + b_6 \log X_6 + C_1D_1 + C_2D_2 + u \qquad (11)$$

where E denotes expenditure on a public service either total or per capita (per child in the case of education), X_1, X_2, X_3, X_4 respectively denote groups of own revenue federal transfer preference and environmental factors, X_5 and X_6 respectively represent input cost factors within and beyond the control of State Governments D_1 and D_2 are dummy variables representing period 1 (1980-83) and period 2 (1983-86) respectively a b_1 to b_6, C_1 and C_2 represent parameter estimates and u is the stochastic error term.

Equations from these alternative specification, have been selected on the basis of the results of the statistical tests for specifications, normality and heteroscedasticity. These tests have been done using the Data-Fit econometric software package (Pesaran and Pesaran, 1987). The package employs Ramsey tests for specification errors, Jarque-Eera's test for nomality and a variant of the Glesjer method for heteroscadasticity.

The chosen equation presented in Table 2 satisfies the statistical properties and also many of the regressors are significant. In all the cases except Police Services the linear form of the equation has the best fit and, hence, is chosen for estimating cost indices and expenditure needs In the case of Police Services the log-linear form has been preferred.

In all the equations the variable Own Revenue has been found to be a significant determinant. Of the federal transfer variables, Finance Commission transfers is significant only in the cases of Administrative Services and Primary Education. Interestingly, both Transfers under State Plan Schemes and Other Transfers seem to show a negative relationship with expenditures on Administrative Services and Police Services indicating the possibility of expenditure substitution probably in favour of some developmental expenditures. At the same time, as none of the federal transfer variables is found to be

significant in the cases of the three important social services[15] analysed by us, the stimulation in expenditures perhaps has occurred in economic services which are not analysed here.

Many of the input cost variables have also been found to be significant in the five expenditure categories analysed by us. Of the input cost variables, `Number of Standard Employees'[16] for Administrative Services `Number of Police Constables' and `Number of Cognizable Offences per thousand population' for Police Services, Salary levels of primary school teachers' and Price Differences' for Primary Education, `Enrolment in secondary schools', `Salary levels of secondary school teachers' and Student-teacher ratio' for Secondary Education and `number of hospital beds' for Medical Services have been found to be significant

The equations also bring out the importance of environmental cost factors in determining expenditure levels of the States. In the case of Administrative Services none of the environmental cost variables is statistically significant. In the case of Police Services, both the proportion of urban population and Population density' are significant, the latter with a positive sign indicating the diseconomies of scale, due perhaps to the positive association of population density with the crime rate. In the case of Medical Services the `coefficient of population density' is negative and significant indicating the operation of economies of scale in the provision of the service.

The equations do not show significant cost disabilities in providing services in hill/desert regions. The coefficient of the variable, the proportion of hill/desert population to total population , is not found to be significant, though it has the expected sign.

3. Measurement of Cost Indices and Expenditure Needs

The cost differences in the provision of various public services (C_i) across the States is given by the percentage of justifiable cost of providing average per capita level of services ($\hat{\bar{E}}_i$) to all-States average per capita expenditure ($\bar{E}$)

$$C_i = (\hat{\bar{E}}_i/\bar{E}) \times 100 \text{ for the } i^{th} \text{ State.} \qquad (12)$$

It may be noted that all our equations are for total expenditures. To get the estimate of justifiable total expenditures on a service in a State required to provide an average per capita level of service, it is necessary to substitute actual values of variables X_4 (environmental cost) and X_6 (cost factors beyond States' control) and total values corresponding to average per capita values of X_1, X_2, X_3 and X_5.

Table 3 presents the cost indices in the States for the five major services analysed by us. It is seen that the unit costs vary from 0 71 in Punjab to 1.27 in Rajasthan for Administrative Services from 0.86 in Maharashtra to 1.15 in Bihar for Police Services, from 0.64 in Punjab to 1 51 in Kerala for Primary Education from 0 74 in Punjab to 1.47 in Kerala for Secondary Education and from 0.62 in Punjab to 1.21 in Rajasthan for Medical Services It may also be noted that the pattern of cost variation differs from one service to another substantially Kerala for example has the highest unit cost for Primary and for Secondary Education but for Medical Services, the unit cost in the State is next only to the lowest that of Punjab Similarly, the unit cost for Administrative Services in Orissa (1.20) is next only to the highest (Rajasthan) but for Secondary Education the cost index is the second lowest (0.75). This shows the need to estimate the cost indices separately for different services

Another important objective of our analysis is to estimate the expenditure needs of the States for the five public services. Expenditure need has to be computed with reference to the 'normative' level of service. We have taken all-States average level of the service as the norm and estimated additional expenditures that would be required to provide this level, which is given by:

$$A_i = \hat{\bar{E}}_i - \hat{E}_i \text{ for all } A_i > 0 \qquad (13)$$

where $\hat{\bar{E}}_i$ is estimated by substituting as explained earlier and $\hat{E}_i$, or justifiable cost of providing the existing level of services. $\hat{E}_i$ estimated by substituting the actual values of all variables except X_4, which is substituted at the average level.[17]

The additional justifiable assistance required to enable the States to provide average levels of the five services computed as detailed above is shown in the last column of Table 3. It is clear that the shortfall in the levels of these services from the all-States average is found mainly in the States with below average per capita income Bihar Rajasthan and Uttar Pradesh the three poorest States, would qualify for substantial assistance in all the five services Orissa qualifies in three services On the contrary Gujarat, Haryana, Maharashtra and Punjab do not qualify for assistance in any of these services

This method of assessment can be employed to determine both the normative levels of expenditures for making general purpose unconditional transfers and to give specific purpose transfers to equalise the levels of particular services. In the case of the former, the expenditure needs of individual services would have to be estimated separately and then added up to arrive at the total expenditure needs.[18] In the case of the latter while the additional needs can be estimated using the above methodology, the amount of Central assistance and the matching ratio would have to be decided on the basis of *inter alia* the price elasticity of demand for the service.

Summary and Conclusions

1. It is generally acknowledged that intergovernmental transfers are made either to offset fiscal disadvantages or to ensure certain minimum levels of public services. The fiscal disadvantage argument provides a rationale for general revenue sharing or unconditional grants whereas ensuring minimum levels of specified public services call for specific purpose matching transfers. The transfer schemes, therefore, should be designed to meet these objectives.

2. In the Indian context, the design of inter-governmental transfer schemes does not take account of these objectives of federal transfers satisfactorily. The multiple agencies transferring funds with overlapping roles make the achievement of the objectives difficult. Further the current transfers made by the Finance Commission by the Planning Commission and by other agencies have not been designed either to offset fiscal disadvantages or to ensure minimum levels of specified public services.

3 The paper attempts to provide a framework for intergovernmental transfers designed primarily to offset fiscal disadvantages of the States and raise levels of specified public services to the normative standards in deficient States. An important pre-requisite of designing these unconditional grants and specific purpose matching grants is to measure the levels of public services and their unit costs in the States In this paper we have attempted to measure cost indices and levels of public services in a decisive voter's utility maximisation model. For the purpose, expenditures on five important public services are regressed on variables representing own resources, federal transfers, input costs within and beyond the control of State governments, environmental costs and preferences. The cost indices and expenditure needs in respect of the five important services are derived on the basis of the estimated equation.

4. The estimated cost indices show substantial inter-State variations in the costs. Further, it is seen that cost variations across the States differ substantially from one service to another.

5. Our computations show that in order to ensure average levels of the five services, a sizeable increase in the outlay of poorer States would be justified The grants required for the purpose would also have to be enhanced considerably from the present levels.

Limitations of the Study

Before concluding it is necessary to mention that this is the first attempt to measure unit costs of providing public services and expenditure needs of the States in India and therefore suffers from a number of limitations. Firstly, the model does not determine the amount of funds available for transfer to the States but takes this as exogenously given. Secondly, the model chosen for estimation can be criticised as being somewhat ad hoc as it has not been derived. As already mentioned, considerable experimentation would be required before a model is finally chosen for estimation. Again, our purpose of estimating the impact of different variables on expenditures rather than to test detailed hypothesis on expenditure decision making, is adequately served by the estimated model. Thirdly, much more work needs to be done in properly specifying the variables, particularly to avoid possible endogeneity bias arising from the inclusion of some variables in the equation. Fourthly, it may also be mentioned that the study does not provide a comprehensive estimate of expenditure needs of the States as the analysis is confined to only five public services In spite of these limitations, the method suggested above holds enormous promise. It must be mentioned that accurate measurement of unit costs and expenditure needs is an important pre-requisite for evolving an objective and equitable scheme of federal transfers and the methodology suggested in this paper holds great potential in this task.

NOTES

1. Gramlich [1977] makes a distinction between open-ended and closed-ended matching grants. While the objective of the former is to ensure optimal provision of public output in the wake of benefit spillovers political-institutional reasons are advanced to justify the latter. In any case both open-ended and closed-ended matching grants enhance performance levels by altering the price ratio between aided and unaided goods

2. The emphasis is on enabling every State to provide the normative level of public services at a given level of tax effort and not ensuring them This indicates that the voters in the State can exercise their choice of spending the aid either to enhance the level of public services or to reduce their own tax burden.

3. The fiscal disadvantage argument for unconditional grants is relevant only for ensuring inter-State equity and does not provide any guidance on the total volume of transfers the Central Government should make to the States. The latter has to be decided on the consideration of vertical fiscal imbalances. See Hunter [1977].

4. Such an argument has been advanced by Oates [1969, 1972, 1977]. However, Oates himself states that this would be more applicable within the metropolitan areas and has much less validity in the context of States. Further, in the context of developing countries like India, where income levels do not necessarily reflect their resource endowments, equitable transfers given to offset fiscal disadvantages would not be at the cost of efficiency and growth On the trade-off between the two objectives, see Scott [1964].

5. The issues of measuring revenue capacities of the States are equally important. However, as some studies are already available in this area, [Thimmaiah (1979) Chelliah and Sinha (1982) Government of India (1988)] this paper does not address the issues.

6. In situations where vertical fiscal imbalances are high even the State with the highest fiscal strength may not be able to provide levels of services as warranted by the Constitutional obligations in absolute terms at a satisfactory level. Therefore, aid may have to be given even to such a State.

7. The literature on the problems of Indian fiscal federalism is vast. The important among the studies are Grewal (1975) Thimmaiah (1976), Chelliah et al. (1981) and Gulati (1987).

8. The terms of reference given to the Ninth Finance Commission, however, do not make a distinction between Plan and non-Plan requirements.

9. It must be stated in this connection that even the studies evaluating inter-governmental transfers do not seem to have a proper conceptual framework. The federal transfers are evaluated merely in terms of their income equalising impact. [Gulati and George (1988)]. Such an analysis does not distinguish between the objectives of different types of transfers. Income equalisation may perhaps be justified as equalising revenue capacities Even in that case it would be preferable to equalise revenue capacities directly rather than resorting to the indirect method. Besides equalising only revenue capacities would not take account of the differences in costs of providing public services across the States If on the contrary, income equalisation itself is taken as the objective, then as stated by Wilde (1971, p. 150), ".....it is far from clear that inter-governmental transfers are very efficient means of accomplishing income redistribution." See also, Oates (1977, p. 14) for a similar view

10. It must be mentioned here that the Ninth Finance Commission in its second report has estimated fiscal needs which is a gap between revenue capacities and expenditure needs of the States

11. Gulati (1973) therefore states "By undertaking voluntarily to become `gap-fillers' the Finance Commissions were not only encouraging laxity in fiscal management but also discouraging tax effort on the part of the States." See also Chelliah et al. (1981).

12. Although the tax devolution formula adopted by the more recent Commissions has assigned high weightage to backwardness as denoted by the inverse of per capita income or the distance from the per capita income of the most prosperous State, as these were multiplied with population for determining relative shares of the States, the implicit and explicit weight assigned to the latter variable was predominant.

13. The distinction between public expenditure levels and public service levels is clearly brought out in Bradford, Malt and Oates [1969].

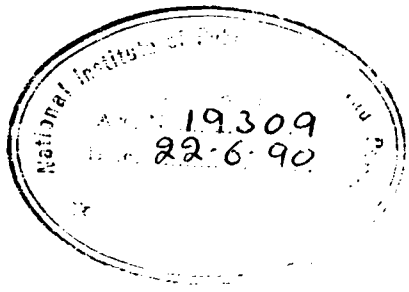
14. It must be mentioned here that the functional form chosen by us is somewhat ad hoc. However, the model serves our objective as the purpose of the analysis is merely to estimate the impact of the variables on States' expenditures and not to test detailed hypothesis on expenditure decision-making at the State level

15. In the equation presented here only total federal transfers' is taken However, the regression analysis done by including `Finance Commission transfers , Transfers under State Plan Schemes and Other transfers' separately, has shown that all the three variables are insignificant.

16. The number of standard employees has been computed by dividing the outlay on salaries under Administrative Services by the all-States average salary per employee.

17 Strictly it is necessary to substitute revenue capacity and not the actual revenues in the equation.

18. In the case of some items of expenditure, regression analysis may not be appropriate. Recurring expenditures on some items depend upon the stock of physical assets or financial liabilities. In the case of the former, the expenditure requirements would have to be assessed on the basis of engineering norms. Expenditures on the maintenance of roads, buildings and irrigation works fall in this category. In the case of the latter, recurring expenditures would have to determined on the basis of the contractual terms on monetary liabilities. Interest liability, for example, depends on the value of debt and rate of interest payable thereon. Some other items of expenditure may not be subject to proper statistical analysis and therefore may have to be taken on the actual basis.



REFERENCES

1. Bradbury, K.L., Ladd, H F., Perrault M , Reschovsk A., and Yinger J., [1984], "State Aid to Offset Fiscal Disparities Among Communities", National Tax Journal.

2. Bradford D.F., Malt R.A., and Oates, W E. (1969), "The Rising Cost of Local Public Services: Some Evidence and Reflections", National Tax Journal, Vol. 22.

3. Breton, Albert, (1965), "A Theory of Government Grants", Canadian Journal of Economics and Political Science, Vol. 31.

4. Chelliah, R.J., Aggarwal, P., Ghoshal, R., Gupta, A. and Rao, M.G. (1981), Trends and Issues in Indian Federal Finance, Allied Publishers Private Limited, New Delhi.

5. Chelliah, R.J., and Sinha N. (1982), Measurement of Tax Effort of State Governments, 1973-76, NIPFP, New Delhi.

6. Government of India (1988) First Report of the Ninth Finance Commission, Ministry of Finance (July), New Delhi.

7. Gramlich E.M. (1977), "Intergovernmental Grants: A Review of the Empirical Literature" in, Oates, W.E. (Ed)., The Political Economy of Fiscal Federalism, Lexington, Massachusetts.

8. Grewal B.S , (1975) Centre-State Financial Relations in India Punjabi University Press, Patiala.

9. Gulati I S , (1973) "Approach of the Finance Commissions" Economic and Political Weekly, June 23 and July 21, reprinted in Gulati I.S. (Ed) 1987 Centre-State Budgetary Transfers, Oxford University Press, New Delhi.

10. Gulati I S , and George K K , (1980) Essays in Federal Financial Relations, Centre for Development Studies, Trivandrum.

11. Hoffman, R F., (1960) A Systematic Approach to a Practicable Plan for State Aid to Local Governments, Public Finance/Finances Publiques Vol XXIV

12. Hunter J.S H , (1977) Federalism and Fiscal Balance: A Comparative Study, Australian National University Press, Canberra.

13. Ladd H . Yinger J Bradbury K L Ferguson R. Vidal A , (1986), The Changing Economic and Fiscal Conditions of Cities: Final Report John F Kennedy School of Government, Harvard University, Cambridge, Massachusetts.

14. Le Grand Julian, (1975), "Fiscal Equity and Central Government Grants to Local Authorities", Economic Journal, Vol. 85.

15. Musgrave, R.A., (1961), "Approaches to a Fiscal Theory of Political Federalism" in, Public Finance: Needs, Sources and Utilisation, Princeton University Press.

16. Musgrave, R.A., (1971), "Economics of Fiscal Federalism" Nebraska Journal of Economics and Business, reprinted in Musgrave R.A., (1986) Public Finance in a Democratic Society, New York University Press, New York.

17. Musgrave, R.A. and Polinsky A.M., (1970) "Revenue Sharing - A Critical View", in Financing State and Local Governments, Proceedings of the Monetary Conference Federal Reserve Bank of Boston, Boston.

18. Oates W.E, (1969) "The Effects of Property Tax and Local Spending on Property Values", Journal of Political Economy, Vol. 77

19. Oates W.E (1972) Fiscal Federalism, Harcourt Brace Jovanovich New York.

20. Oates W.E (1977) "An Economist s Perspective on Fiscal Federalism", in Oates W.E. (Ed), The Political Economy of Fiscal Federalism, Lexington Books

21. Scott A.D., (1964), "The Economic Goals of Federal Finance", Public Finance/Finances Publiques, Vol. XIX.

22. Thimmaiah, G., (1976), Federal Fiscal Systems in Australia and India: A Study in Comparative Relevance.

23. Thimmaiah G. (1979) Revenue Capacity and Revenue Efforts of Southern States in India, Oxford and IBH, New Delhi.

24. Thurow L.C., (1970), "Aid to State and Local Governments", National Tax Journal, Vol. 33 No. 1.

25. Wilde, James A. (1971), "Grants-in-Aid: The Analytics of Design and Response", National Tax Journal, Vol. 24.

Table 1

Current Transfers (To 14 Major States) By Different Agencies 1986-87

		Rs lakh	Percentage share
I.	Finance Commission Transfers	8,15,211	62.08
	a. Shares of Taxes	7,75,814	59.08
	b. Specific-Purpose Grants	33,472	2.55
	c. Other Grants	5,925	0.45
II.	Plan Grants	4 08 827	31.13
	a. State Plan Schemes	1,81,972	13.86
	b. Centrally Sponsored Schemes	1 36,331	10.38
	c. Others	90,524	6.89
III.	Other Non-Plan Grants	89 041	6.78
IV.	Total Block Transfers	10 54,235	80 29
V.	Total Specific-Purpose Grants	2 58 844	19.71
VI.	Total Current Transfers	13 13 079	100 00

Table 2

Regression Results

S. No.	Independent Variables	Administrative Services (Linear)	Police (Log Linear)	Primary Education (Linear)	Secondary Education (Linear)	Medical and Public health (Linear)
1.	Time period 1 (1981-82 to 1983-84)	282.0145 (0.4017)	-3.0709 (-4.7754)	-38781.4000 (-2.4789)	-4790.0000 (0.9504)	1439.0000 (0.3684)
2.	Time period 2 (1984-85 to 1986-87)	837.3402 (2.7487)	0.3285 (0.1479)	-10794.6000 (-2.1455)	4048.9000 (-1.5446)	1575.3000 (1.2848)
3.	Finance Commision Transfer	0.0539 (3.1325)	0.0801 (1.3331)	0.3638 (3.1119)	-	-
4.	Transfer under the State Plan Schemes	-0.1036 (-2.1401)	-0.1495 (-2.5588)	-0.4361 (-1.6251)	-	-
5.	Other Transfers	-0.1078 (-3.7373)	-0.0438 (-1.5637)	-	-	-
6.	Total transfers	-	-	-	0.0209 (0.7575)	0.0320 (0.9839)
7.	Own revenue of States	0.0126 (2.1478)	0.1539 (2.0572)	0.0414 (2.2220)	0.0508 (2.5120)	0.1058 (5.7506)
8.	Proportion of urban to total population	-4971.1000 (-1.5944)	-0.1986 (-2.0099)	-	-	-14969.7000 (-1.000)
9.	Population density	-	0.0897 (3.1998)	-	7.0927 (1.7556)	-8.1524 (-1.9156)
10.	Density of urban population	-0.2576 (-0.2163)	-	-	-	-
11.	Proportion of population in hill/ desert areas	574.9093 (0.95421)	-	8369.6000 (2.2729)	3660.7000 (1.2147)	1505.9000 (0.4706)
12.	Price differences	-	-	274.4807 (2.5938)	-	-
13.	Number of standard analysis for administrative services	0.1254 (7.7346)	-	-	-	-

14	Number of Police Constables (below SI rank)	-		0.9587 (13.4984)		-		-		-	
15.	Cognizable offences per 1000 population	-		-0.0949 (-2.1399)		-		-		-	
16.	Enrolment in primary/ secondary schools	-		-		0.0005 (0.5397)		0.0027 (1.3677)		-	
17.	Student-teacher ratio in primary/ secondary schools	-		-		109.7511 (-0.7898)		-396.4911 (-3.7052)		-	
	R^2	0.9575		0.9877		0.8957		0.8681		0.9308	
	Diagnostic tests	LM Version (Ch Sq 1)	F.Version	LM Version (Ch Sq 1)	F.Version	LM Version (Ch.Sq.1)	F.Version	LM Version (Ch Sq 1)	F.Version	LM Version (Ch.sq 1)	F.Version
	Functional Form	3.4519	2.3905 (F,19)	0.8413	0.5266 (F1,17)	1.1708	2.1708 (F1,17)	10.3999	10.5389 (F1,18)	4.7568	1.6837 (F1,19)
	Heteroskedas-ticity	0.0044	0.0041 (F1,26)	0.1547	0.1444 (F1,26)	0.1324	0.1235 (F1,26)	3.7780	4.0553 (F1,26)	0.0308	0.0279 (F1,26)
	Normality (Ch.Sq2)	2.2786	-	5.9554	-	0.7052	-	0.8393	-	1.1165	-

(Figures in brackets denote t statistics)

Table 3

Cost Indices and Additional Expenditure Needs of Selected Services

State	Total Expenditure (Rs. lakh)	Just. Cost (Existing Levels) (Rs lakh)	Normative Expenditure (Rs lakh)	Per Capita Normative Expenditure (Rupees)	Cost Index	Additional Need (Rs lakh)
			A D M I N I S T R A T I V E S E R V I C E S			
1. Andhra Pradesh	6914 00	6900 30	4457 33	7 630	0.975	-
2. Bihar	5142 00	4119 98	6535.12	8 47[illegible]	1.083	2415.14
3. Gujarat	2302 00	2789 16	2466 70	6 594	0.842	-
4. Haryana	1158 33	1207 13	1268 44	8 655	1.106	61.31
5. Karnataka	2446.00	3048.97	2874.46	7.014	0.896	-
6. Kerala	2247 33	2576.23	2566.83	9.286	1.186	-
7. Madhya Pradesh	3632.67	3604.71	4577.34	7.937	1.014	972.63
8. Maharashtra	11517 67	11283.83	4809.26	6.955	0.888	-
9. Orissa	1999.33	2244.95	2696.24	9.413	1.202	451.28
10. Punjab	1635.33	1545.44	1024.35	5.572	0.712	-
11. Rajasthan	2594.67	2266.81	3862.40	9.960	1.272	1595.59
12. Tamil Nadu	6632.00	5661.26	3646.37	6.983	0.892	-
13. Uttar Pradesh	4696.33	5123.35	9814.69	8.043	1.027	4691.34
14. West Bengal	2196.67	2647.46	4419.99	7.396	0.945	1772.53
	55114.33	55019.58	55019.55	7.828	1.00	11959.82
			P O L I C E			
1. Andhra Pradesh	10927.00	11018.09	13060.52	22.358	0.988	2042.43
2. Bihar	13390.33	13513.87	20132.70	26.118	1.154	6618.83
3. Gujarat	11959.00	10890.32	7365.36	19.698	0.870	-
4. Haryana	4213 67	4090 84	3384 08	23.092	1.020	-
5. Karnataka	7757 00	8481 30	8329 95	20.325	0.898	-
6. Kerala	5608 00	5791 56	6280 01	24 888	1 099	1088 45
7. Madhya Pradesh	12678.67	12768.40	11499.20	19.939	0.881	-
8. Maharashtra	21831 67	21303 43	13292 17	19 366	0.855	-
9. Orissa	5437 33	5425.49	6886.11	24.040	1.062	1460.62
10. Punjab	7311 00	6994 66	4383 11	23 842	1 053	-
11. Rajasthan	7848 67	8096 41	8734 12	22 523	0 995	637 72
12. Tamil Nadu	9794 00	9931 46	11010.66	21.087	0 931	1079.20
13. Uttar Pradesh	24554 00	25445 49	29582 88	24.243	1 071	4137 40
14. West Bengal	13853.33	13596.21	14480.61	24.229	1.070	884.40
	157163.67	157347.53	159121.48	22.640	1.000	17949.05

State	Total Expenditure (Rs. lakh)	Just. Cost (Existing Levels) (Rs. lakh)	Normative Expenditure (Rs. lakh)	Per Capita Normative Expenditure (Rupees)	Cost Index	Additional Need (Rs. lakh)
PRIMARY EDUCATION						
1. Andhra Pradesh	24076.00	25585.19	21522.39	36.843	0.849	-
2. Bihar	30808.67	26930.26	29049.44	37.69	0.87	2099.17
3. Gujarat	25984.00	21957.00	16301.41	43.579	1.005	-
4. Haryana	5896.00	8644.57	5668.50	38.679	0.892	-
5. Karnataka	20138.00	21247.44	20658.13	50.406	1.162	-
6. Kerala	21083.67	17475.79	18045.79	65.281	1.505	570.00
7. Madhya Pradesh	19808.33	18260.58	20932.09	36.296	0.837	2671.51
8. Maharashtra	36453.33	35587.56	30930.36	44.728	1.031	-
9. Orissa	8595.67	12553.18	12193.17	42.567	0.981	-
10. Punjab	7763.33	7549.27	5075.44	27.608	0.636	-
11. Rajasthan	17159.33	16556.75	22805.16	58.807	1.356	6248.41
12. Tamil Nadu	26776.00	26340.03	27196.36	52.084	1.201	856.33
13. Uttar Pradesh	38719.00	40239.34	52104.82	42.700	0.984	11865.49
14. West Bengal	21345.33	25956.03	22419.93	37.514	0.865	-
	304606.66	304902.99	304902.99	43.382	1.000	24310.91
SECONDARY EDUCATION						
1. Andhra Pradesh	14638.33	14906.43	14676.24	25.124	0.896	-
2. Bihar	9975.67	12765.41	21668.90	28.111	1.003	8903.49
3. Gujarat	13268.33	12872.81	8909.35	23.817	0.850	-
4. Haryana	6154.33	7672.86	4210.84	28.733	1.025	-
5. Karnataka	8519.33	10185.28	10558.46	25.763	0.919	373.19
6. Kerala	11950.33	12787.02	11413.45	41.288	1.473	-
7. Madhya Pradesh	10498.33	13758.90	14418.23	23.001	0.892	659.33
8. Maharashtra	29802.34	27418.57	19363.00	28.001	0.999	-
9. Orissa	7804.00	8670.77	5986.31	20.898	0.746	-
10. Punjab	11001.33	11448.94	3823.91	20.800	0.742	-
11. Rajasthan	10833.68	9584.15	10730.69	27.671	0.987	1146.54
12. Tamil Nadu	14183.00	14710.25	15355.42	29.487	1.049	645.17
13. Uttar Pradesh	26489.00	24366.64	36169.55	29.641	1.057	11802.91
14. West Bengal	21967.30	17859.05	19722.29	33.000	1.177	1863.24
	197085.00	197007.08	197006.64	28.031	1.000	25393.87

State	Total Expenditure (Rs. lakh)	Just. Cost (Existing Levels) (Rs. lakh)	Normative Expenditure (Rs. lakh)	Per Capita Normative Expenditure (Rupees)	Cost Index	Additional Need (Rs. lakh)
			MEDICAL, FAMILY WELFARE AND PUBLIC HEALTH			
1. Andhra Pradesh	25704.00	26771.79	25724.92	44.037	1.043	-
2. Bihar	16248.33	18618.53	34445.15	44.686	1.058	15286.62
3. Gujarat	18312.33	20941 22	14899.92	39.832	0.943	-
4. Haryana	9105.00	7825.83	4803.45	32.777	0 776	-
5. Karnataka	16601.33	20473 04	16804.79	41 004	0.971	-
6. Kerala	12519.33	14595.28	8585 11	31.057	0.735	-
7. Madhya Pradesh	25737 00	22833 03	26477 82	45 912	1 087	3644 79
8. Maharashtra	45096 00	43067 29	29247 51	42 295	1 001	-
9. Orissa	11133 33	10106 35	13504.54	47.145	1.116	3398.19
10. Punjab	10598 33	10300.64	4775 58	25 977	0.615	-
11. Rajasthan	18882 33	17479.08	19874.23	51 249	1.213	2395.15
12. Tamil Nadu	25501.67	25695.67	20209.84	39.704	0.916	-
13. Uttar Pradesh	37915 00	36337.48	55178.64	45.219	1.071	18841.16
14. West Bengal	24473.33	22554.31	22322.32	37.350	0.884	-
	297827.31	297599.54	296853.82	42.237	1.000	43565.91

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