DETERMINING GENERAL AND SPECIFIC PURPOSE TRANSFERS: AN INTEGRATED APPROACH

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Abstract

This study attempts to provide an alternative methodology to calculate the horizontal equalization transfers. This methodology follows the Australian horizontal equalization principle using a panel model methodology where both revenue and expenditure side considerations are involved. First, it applies the Canadian model in calculating the fiscal capacity equalization. Then the expenditure side equalization has been carried out for two services - education and health. Results of the exercise indicate that the transfers suggested by the panel model are more progressive than the TFC recommended transfers.

INTRODUCTION

Inter-State Disparities in India

As compared to countries like Australia or Canada where the ratio of the highest per capita Gross State Product (GSP) to lowest per capita GSP among states is only around 1.5 and 1.9 (per capita GDP) respectively the corresponding ratio for India is as high as 9 (when Goa is included) and close to 6 when Goa is excluded.

In order to deal with this problem, the Constitution and the Indian government have made several arrangements, including fiscal transfers to different states according to the needs perceived by the government. In India, Finance Commission is the body that has been constitutionally assigned the task of determining transfers in the form of tax devolution under global tax sharing and grants. The Finance Commission transfers are supplemented by the Planning Commission grants and other discretionary grants determined by the central government. The approach pursued by the Finance Commission in deciding transfers is normative only to a limited extent. Equalization transfers aim at providing citizens of every state a comparable standard of services provided their revenue effort is also comparable. In other words, equalization transfers neutralize deficiency in fiscal capacity but not in revenue effort. The horizontal dimension of transfers given by TFC asserts "If, in per capita terms, all states were similar in fiscal capacities and cost conditions, the equalization criterion would be met by equal per capita transfers." But in practice it is seen that one-third of the deficiency in revenue effort of the states is also covered up by the transfers. This partial gap-filling approach creates a potential adverse incentive among states. In addition to this, the cost conditions are only partially equalized. So the goal of horizontal equalization remains fundamentally unachieved.

Table 1: Per Capita Expenditure on General, Economic and Social Services (Average Over 2004-05 to 2006-07)

(Rupees)

States	GEN	SOC	ECO	EDN	HTH	WSS
Bihar	283	751	334	473	85	25
Uttar Pradesh	302	892	449	492	118	28
Madhya Pradesh	418	1020	722	456	128	48
Rajasthan	324	1296	787	725	160	142
Assam	622	1736	957	1035	173	99
Orissa	323	1238	575	590	126	70
West Bengal	341	1201	519	671	159	30
Andhra Pradesh	401	1635	1197	703	170	87
Karnataka	792	1703	1416	898	183	40
Tamil Nadu	545	1841	984	845	193	18
Kerala	635	2024	1050	1168	290	92
Gujarat	342	1595	1137	771	163	45
Punjab	2031	1523	1542	910	244	87
Maharashtra	936	1971	757	1070	189	140
Haryana	653	1718	1967	861	165	152
Coeff of Variation	74.3	26.5	46.5	28.3	29.4	61.3
Min/Max	0.14	0.37	0.17	0.39	0.29	0.12
Min/Mean	0.47	0.51	0.35	0.59	0.50	0.25

Source: State Finance Accounts, various years.
Key: GEN = General services excluding interest payments and pensions.
SOC: Social services; ECO: Economic services; EDN=Education; HTH=Health;
            WSS= Water supply and sanitation.

Table 1 shows the per capita average state government expenditures over the period 2004-05 to 2006-07 in general, social and economic services. The larger states are considered here focusing on the general category states except Goa but including Assam. The Table exhibits a wide gap between the states with the highest and lowest per capita expenditures. This emphasizes the dire need to reform the transfer system so that the aim of horizontal fiscal equalization can be achieved.

The Canadian and the Australian vertical transfer systems have been considered in this regard. States are arranged in increasing order of per capita GSDP; for 2006-07 revised estimates have been considered.

In the Canadian constitution the principle of equalization transfers is stated as "principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation". The Australian equalization differs from the Canadian equalization due to the reference to efficiency and standard of services. The Canadian system makes reference only to equalization in fiscal capacity. In Australia, fiscal equalization looks at both the revenue and expenditure sides.

The Australian model is relevant to India because many states incur higher costs in delivering services owing to reasons which are beyond their control. So it becomes essential to compensate such states and help them reach the average level of services offered by other states. Neglecting a problem like this one could result in regional imbalance in publicly provided goods and services which can lead to high rate of fiscally induced migration of people to high income areas putting pressure on the local government. Though some consideration is given to cost disabilities in India by giving weightage to factors like area and infrastructure, what is needed is separating exogenous and structural disabilities from policy-induced disabilities and treating it.

Objectives of the Study

This paper examines central transfers to states in India by applying the Australian fiscal transfer system of revenue and expenditure equalization. It also takes in to account the effect of disabilities in the expenditure assessment. Disabilities can be categorized into two broad types- structural and exogenous disabilities; and policy-induced disabilities.

Overview of Literature

The Australian fiscal transfer system is one of the oldest and most appreciated systems in the world. The Australian federation comprises of six states- Queensland, New South Wales (NSW), Southern Australia (SA), Victoria, Western Australia (WA) and Tasmania. In addition, there are two territorial administrations, viz, the Northern Territories (NT) and the Australian Capital Territory (ACT). Though the federation is characterized by a high degree of vertical imbalance in its fiscal structure, which has only increased after the introduction of the comprehensive Goods and Services Tax (GST), great emphasis is laid on horizontal fiscal equalization. Various Special Purpose Payments (SPPs) are also a significant component of the system. The uniqueness of the Australian system of fiscal transfers is horizontal fiscal equalization (HFE) that looks into both revenue and expenditure sides of the state budgets and calculates revenue and expenditure 'disabilities' that account for departures from a pure equal per capita distribution of the shareable amounts. In the system the terms "relativities" and "disabilities" are used instead of the commonly adopted "state shares".

In their analysis of relevance of Australian model to India, Rangarajan and Srivastava (2004) have summarized some of the important differences, similarities, and essential lessons in respect of the vertical and horizontal dimensions of transfers. The significant conclusions they arrived at are as follows:

(a) The Australian system is characterized by a high degree of vertical imbalance and centralisation of expenditure. In raising revenues, the Indian system is also characterized by high vertical imbalance but somewhat lower than that in Australia. Also, centralisation of expenditure after transfers in Australia is higher than that in India. This makes Australian model more apt for India.

(b) India has some institutional advantage over the Australian system in that it can control the vertical transfer, which gets automatically

determined in Australia, and, therefore, utilize the system more optimally.

(c) The important concept which they emphasized should be borrowed from the Australian system is their idea of equalization. The Australian equalization payments are based on explicit principles that aim at enabling states to provide its citizens services at comparable standards if they are willing to make comparable revenue efforts and are able to operate at comparable levels of efficiency.   Rather than a gap-filling approach, an approach which equalizes the fiscal capacity of the states should be followed. They suggest considering a macro base for revenue side equalization and focus expenditure equalization in respect of select services where mobility is limited. This suggestion has been adopted as the approach in this paper.

(d) An important feature of the Australian system is its emphasis on cost disabilities. In India, some consideration is given to cost disabilities through incorporation of factors such as area and infrastructure in the devolution formula. The emphasis has to be on neutralizing structural and exogenous cost disabilities. Correcting policy-induced cost disabilities may lead to a loss in efficiency. Separating one from the other is however a difficult task.

(e) The rolling forward method of the Australian system can help India in a more efficient allocation by taking into account the latest status of the states.

(f) The working of loan council has relevance for India as it would help in ensuring macroeconomic stability and bring about fiscal discipline

In this direction the twelfth finance commission suggested the centre to remove the loan component from the grants given to the states by the Planning Commission and encourage the states to borrow from

the market according to their own capacity and the centre has agreed to consider the recommendation.

However, the efficiency of the Australian system has been questioned by many economists. The issue of efficiency in federal arrangements can be considered in terms of whether decentralization of expenditure is efficiency augmenting, and if that is so, whether equalization transfers help promote efficiency of the sub-national governments. In the general literature on efficiency implications of decentralization [e g, Oates 1972], the source of efficiency is traced mainly either to the possibility of non-uniform provision of local public goods based on lower signaling costs of local preferences or to greater competition among jurisdictions [Breton 1996]. In both cases, however, a variety of decentralisation failures [Prud'homme 1995: Breton 2002] may constrain the efficiency-augmenting effects. Some of the cases of decentralisation failure listed, for example, in Breton (2002) relate to costs of information, political participation costs, coordination costs, diminishing supply costs, and dynamic instability arising from unhealthy 'race to bottom' type competition. In their Review of Commonwealth-state Funding, Garnaut and FitzGerald (2002) have summarised in their Final Report several types of efficiency-reducing effects of the transfer arrangements in Australia. They argue that equalising transfers tend to: (i) reduce the incentives for resources to locate in higher productivity locations; (ii) reduce the capacity for investment in human resource development in low productivity regions to enhance national economic potential; (iii) increase the overhead and transactions costs of managing the system; (iv) discourages the attraction and retention of high-value mobile resources in an international market; (v) leads to duplication, lack of co-ordination and game playing by officials; (vi) unduly enlarges the role of the public sector; (vii) encourages grant-seeking behaviour, particularly where states have the capacity to influence the CGC's assessed standard budget; (viii) dilutes incentives for cost reducing reforms; and (ix) discourages growth promoting policies if the benefits of

growth are mostly transferred to others. They observe that most of these efficiency reducing effects arise from the expenditure side of equalization. By compensating for the disabilities they discourage the movement of people out of high cost regions. He found that the provinces which were receiving higher transfers had bigger public sector and a tiny private sector, a situation not very conducive to growth.

The theoretical literature on equalisation, particularly the contributions by Buchanan (1950), Scott (1950), Buchanan and Wagner (1971), Graham(1964), Gramlich (1985), and Mathews (1993) has looked at the issue of the implications of equalization, especially expenditure side equalisation on efficiency in detail. While Scott had argued way back in 1950 that equalisation is detrimental to efficiency because it impedes mobility of factors of production to locations where they would be most productive, Buchanan and Wagner have argued that efficiency would be impeded if migration is fiscally induced by states providing more public goods at lower tax costs. They argued that rich states could induce migration by providing higher net fiscal benefit but, eventually due to the existence of congestible goods, the net fiscal benefit would fall. As too many people migrate to the richer states, there would be a loss of efficiency in the economy as a whole. This incentive towards excessive migration in their view ought to be neutralized through fiscal equalization. Under these circumstances, equalization is consistent with equity and efficiency.

Grewal and Mathews (1983) showed that locational choice is usually influenced by private production and consumption activities rather than by fiscal and other activities of the governments. While there may be a case for making transfers taking into account cost disabilities due to structural and exogenous factors, policy-induced disabilities should not be neutralized. However, in practice, it is often difficult to separate one from the other and measure their impact.

Equalization Transfers: Some Concepts

A good understanding of the following concepts is required in order to study the Australian methodology.

(1) Principle of fiscal equalization: The most recent definition of the principle of fiscal equalization is as follows:

"State governments should receive funding from the pool of goods and services, tax revenue and health care grants such that, if each made the same effort to raise revenue from its own sources and operated at the same level of efficiency, each would have the capacity to provide services at the same standard."

The definition makes it clear that it is the fiscal capacity of the states that is being equalized. Fiscal equalization is not directed towards equalization of the circumstances of individuals, households or communities.

The implementation of the equalization principle rests on what is called by CGC as the pillars:

(a) *Capacity equalization*: Equalization is about equalizing the fiscal capacity of state governments and not their performance. States need not follow any particular policy on either side on their budget- a feature available to them due to the untied nature of the funds.

(b) *Internal standards*- what states do: The commission doesn't make judgment about what the appropriate level of service should be. It applies an average of those actually applied by the states.

(c) *Policy neutrality*: A state's own policies or choices about the services it provides or the revenue it raises should not directly influence the level pf grants it receives. Calculations are based on the standard policies in delivering services or raising revenues.

(2) Financial standards: The standards are the population weighted averages of the States' total expenses or revenues. The standards

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therefore reflect an average of the experiences and policies of all the considered states. They are usually expressed in per capita terms.

(3) Equalization budget: It is the collection of all the expense and revenue categories for which the CGC makes assessments. For this review it includes only financial transactions that have a direct impact on the operating statements of the states.

(4) Disabilities: States do not have the same financial capacity to provide the standard level of services. Differences in their physical and economic circumstances and the characteristics of their population lead to differences in their relative costs of providing services and their relative revenue raising capacities. These differences in state circumstances – which are beyond the control of an individual state government-are called "disabilities". By assessing disabilities the fact that the cost of providing services and the ability to raise revenue from state taxes and charges vary from state to state is recognized.

There are two types of disabilities which the states can face:

(a) *Use disability*: They reflect the differences between States in the use of services as a result of things such as population characteristics and the availability of private services.

(b) *Cost disabilities*: These are influences that affect the cost per unit of service provided to particular (identifiable) groups of people or places. For example, higher costs might be incurred when providing certain services in remote or dispersed areas. Cultural and communication factors can increase the cost of providing some services to people from culturally and linguistically diverse backgrounds. Some cost disabilities arise due to variation in inter-state prices as also due to diseconomies of scale.

(5) Per capita relativity: The measure of the relative per capita need of each State for assistance that, together with the revenue from its taxes and charges, would give it the financial capacity to provide the national average standard of government services. The relativities

are expressed as ratios of an Australian average of one. A relativity below one indicates that a state requires less than an equal per capita share of the total pool.

METHODOLOGY AND ESTIMATES

The proposed methodology is framed on the broad outlines of the Australian horizontal fiscal transfer system. The main idea which it borrows is the two-sided equalization approach. The method has been adapted to Indian needs, keeping in mind the data constraints and the differences in circumstances in the two countries, by considering a macro base for revenue side equalization while focusing on expenditure equalization in respect of select services with restricted mobility.

The first step involves the preparation of a standard budget. The standard budget is comprised of the averages of all states in revenue as well as in expenditure. No exogenous target is considered.

All revenue and expenditure categories are brought under the equalization budget. The per capita expense for each service that the state would incur if it were to provide the Australian average standard of service is calculated. On the revenue side, the per capita revenue each state would raise if it applied the average revenue effort to its revenue base is calculated. Expenditure assessment adjusts the standard expenses to allow for the effects of disabilities.

Revenue Side Equalization: Objective: Revenue equalization requires determining the tax revenue in per capita terms that the states would raise if they applied the same effort on their tax bases for which per capita GSDP would be used as a proxy. The tax may also be affected by the composition of GSDP between agricultural and non-agricultural shares of GSDP. Literacy rate may also affect tax performance and tax

compliance. The lack of reliable data, in the case of own non-tax revenue, dissuades its inclusion in the exercise.

It involves determining transfers equal to the shortfall of a state's normatively determined per capita revenue and the benchmark per capita revenue which may be with reference to highest or average of selected high tax base states on which the average tax effort is applied. Any revenue disability beyond the control of the state may need to be neutralized. Some factors affecting revenue and cost disabilities are shown in Table 2.

Table 2: Some Factors Affecting Revenue and Cost Disabilities

Revenue Base	Factors Affecting Expenditure
• Literacy • Composition of GSDP • Proportion of tribal population	• Density of population • Degree of urbanization • Proportion of population in age group 6-14 • Proportion of population aged 65 and above • Nature of terrain • Relative length of arterial roads

Expenditure Side Equalization: Since only selected services would be used, first the average share of allocation for each service will have to be determined and applied to the normatively determined own tax revenues. This will give total normatively determined availability of own tax revenue for the given service. On the other side, the normatively determined need will be worked out taking into account cost disabilities in providing the relevant service. The gap between the need and own-resource for each service will be the recommended transfers. The services being considered are – education and health. We avoid the other services because including them would magnify the amount of transfers required beyond what is actually available. Some of the factors which affect the revenue and cost disabilities are listed in Table 2.

A mathematical presentation of the equalization methodology can be provided, using symbols defined as below:

e_i = standardized per capita expenditure of state i; γ_i = expenditure disability of state i

r_i = standardized per capita revenue of state i; ρ_i = revenue disability of state i

o_i = per capita transfer from various central schemes to state i;

d_s = per capita budget surplus; $d_i = d_s$ for all states

N_i = population of state i; $\sum N_i$ = population of all states

Subscript's' indicates corresponding numbers for the all-state averages.

The per capita all-state average grant is given by

$$g_s = e_s - r_s + d_s - o_s \qquad \text{...(1)}$$

The per capita grant to state i is given by

$$g_i = e_i - r_i + d_i - o_i \qquad \text{...(2)}$$

Here, e_i and r_i refer to standardized expenditure and revenue for state i, d_i is the standard budget surplus, which is common for all states and o_i is the given transfer from various central schemes. All standardizations are made in relation to corresponding all-state averages which provides the standard, and the relevant expenditure and revenue terms can be written as

$$e_i = \gamma_i\, e_s,\ r_i = \rho_i\, r_s \qquad \text{...(3)}$$

The standard expense per capita is the total expenses of all considered states divided by their total population i.e.

$$e_s = \sum E_i / \sum N_i$$

where, E_i = expense of state i.

Similarly the standard revenue per capita is

$$r_s = \sum R_i / \sum N_i$$

where, R_i = revenue of state i.

For a given state the standardized expenditure and revenue will be the summation of standardized expenditures on different categories and standardized revenues from different sources. The central scheme transfers are considered exogenously determined. First the total grants are determined and then the untied grants are arrived at by deducting the central scheme transfers (o_i) that are treated by inclusion. Grants inclusive of the central scheme transfers may be written as g* and per capita untied grants as g, where

$$g_i^* = g_i + o_i \qquad \qquad \text{...(4)}$$

The procedure will involve setting up 3 panel equations for tax revenue, education and health.

Application to India: Estimation and Results

Two methods are being deployed to arrive at the transfers. The first method is based on the Canadian model where only the revenue side disabilities are compensated. On the other hand, the second method (Australian system) involves estimating the transfers by allowing for both revenue and expenditure side disabilities. Though the methodology involves calculating transfers for all services with limited mobility, in this paper, subject to data constraints, the transfers for only two services have been calculated- health and education.

From Table 3, it can be seen that the minimum to maximum ratio of the relative (to standard state) per capita education expenditure calculated over 2002-2005 for each state is 0.364. A similar ratio for health is 0.25. Bihar has the lowest value in case of both health and education. While Punjab has the highest value for health with 1.699, Maharashtra ranks one in case of education with value 1.622.

Table 3: Relative Per Capita Figures for GSDP, Health Expenditure and Education Expenditure Averaged over 2002-05

State	GSDP	Health	Education
Bihar	0.306	0.434	0.591
Uttar P	0.604	0.685	0.633
Orissa	0.675	0.910	0.845
Assam	0.713	0.767	1.307
Madhya P	0.723	0.787	0.621
Rajasthan	0.819	1.117	1.036
West Bengal	1.096	1.115	0.956
Andhra P	1.149	1.180	0.940
Karnataka	1.188	1.168	1.174
Tamil Nadu	1.312	1.276	1.153
Kerala	1.352	1.734	1.615
Gujarat	1.495	1.173	1.214
Punjab	1.576	1.699	1.410
Maharashtra	1.620	1.187	1.622
Haryana	1.644	1.048	1.186
Min/max	0.186	0.250	0.364
Min/average	0.282	0.400	0.544

Source (Basic Data): Report of the Twelfth Finance Commission

Key: GSDP=Gross State Domestic Product, Education=educational expenditure,

Health = health expenditure.

Revenue Side Equalization: Canadian Approach

This system of horizontal equalization takes care of revenue side equalization.

Two ways of calculating the transfers under this system may be considered. The first method involves compensating the states for the lack of their fiscal capacities by keeping their tax efforts equal. The formula used in this calculation of transfers is as follows:

$$T_i = N_i * A * (h^*-h_i)$$

where,

A=average tax rate, N_i=the population of state i, T_i=transfers to state i
h^*=benchmark per capita revenue, h_i=own per capita revenue of
state i

The benchmark per capita revenue is calculated by taking the population weighted average of five selected states. The average tax rate is obtained by dividing the total own-tax revenue for all states by the total population of all states.

Revenue Side Equalization: A Panel Model Approach

In the second method a panel model is used where the dependent variable is per capita own-tax revenue (OTR) and the independent variables are- literacy rate (LIT), time (YR), per capita GSDP (GSDP), proportion of urban population (URB) and share of manufacturing in GSDP (MNF). The estimated model is given below:

$$ln(OTR) = -0.359 + 0.066 * (YR) + 0.781 * ln(LIT) + 0.196 * ln(GSDP) + 0.142 * ln(MNF) + 0.453 * (URB)$$

It is a one-way random effect model with R-squared value of 94.59%. All the variables in the equation have expected signs. The disabilities of the states are captured by the various independent variables of the equation. The data for the variables- LIT, URB AND MNF has been obtained by interpolation using the census values of 1991 and 2001. Several other variables like- road density, SC/ST proportion in total population, per capita total transfer, ratio of revenue deficit to fiscal deficit, area under forest etc, were tested for significance but were found to be insignificant. Also, as one would expect, share of agriculture and service sector in GSDP were found to be insignificant in the determination of own-tax revenue for a state.

From the model the estimated per capita own-tax revenue for the states are obtained. The next step involves the calculation of the estimated benchmark per capita own-tax revenue. The paper has suggested two approaches for calculating the benchmark per capita own-tax revenue-

(a) Taking the population-weighted average of estimated per capita own-tax revenue of all states for each year.
(b) Taking the population-weighted average of the first five highest estimated per capita own-tax revenues for each year.

The per capita transfers are then determined by the excess of the benchmark estimated per capita own-tax revenue over the state's estimated per capita own-tax revenue. It is then multiplied with population to arrive at the total transfers.

Expenditure Side Equalization: Selected Services

In the Australian approach, horizontal fiscal equalization looks at both revenue and expenditure sides. This ensures equalizing the fiscal capacity as well as the efficiency across states.

Here, along with the panel data model for per capita own-tax revenue, used in the Canadian model, two additional panel data models for- per capita education expenditure and per capita health expenditure- are used. These two additional models calculate transfers for the respective expenditures of the states by taking into account their cost and use disabilities.

For both the panel models a number of independent variables were tested for significance to include as many disabilities as possible. The final models arrived at are given below:

(a) The model with per capita education expenditure as the dependent variable:

ln(EDU) = -3.448   + 0.463 * ln(LIT) + 0.799 * ln(GSDP) + .047 (Yr_dummy)

(b) The model with per capita health expenditure as the dependent variable:

ln(HLTH) = -3.139 + 0.609 * ln(GSDP) + 0.152 * ln(TRNFS) + 0.268 * ln(LIT)

where,

EDU= per capita educational expenditure,

HLTH= per capita health expenditure,

URB= proportion of urban population in the total population,

TRNFS= per capital total transfers,

Yr_dummy = indicates whether after year 2000 or before year 2000,

Variables LIT and GSDP are the same as defined earlier.

Both the above models are two-way random effect models. The R-squared value for (a) is 81.14% and for (b) is 83.08%. As mentioned in the panel model for per capita own-tax revenue, here also the independent variables represent the various disabilities of the states. In both the equations, the independent variables have the expected signs.

From the models the estimated per capita health/education expenditure for the states are obtained. The next step involves the calculation of the estimated benchmark per capita health/education expenditure. It is computed by taking the population-weighted average of the first three highest estimated per capita health/education expenditure for each year. The per capita transfers are then determined by the excess of the estimated benchmark per capita health/education expenditure over the state's own estimated per capita health/education expenditure. It is then multiplied with the population to obtain the total transfers for the particular service.

Horizontal Transfer Projection for India: A Panel Data Approach

The paper presents an alternative way of projecting the central transfers to the states. For projections, we use the same panel data model as has been described in the above sub-section. The projection period is 2006-07 to 2009-10.

Certain assumptions which have been made for the projections are:

(a) The high income states do not get any transfers in the panel model. Therefore, an exogenous per capita amount equal to the Maharashtra's (highest income state) per capita transfers recommended by TFC is given to all states. Other options can also be used. This may be taken as an illustrative exercise.

(b) For projecting the total transfer series it has been divided into two components. One part is composed of the TFC recommended transfers while the second consists of the other (non-FC) transfers to the states from the centre. The projected data for first part was taken from TFC. For the second part, a nominal growth rate of 12 percent was assumed. The TFC has used a GDP growth rate of 12 percent. Using a growth rate of 12 percent implies that variables remain constant as a proportion of GDP.

(c) GSDP for the states has been projected by assuming the growth rates as has been calculated by the TFC. The growth rates are as follows:- Andhra Pradesh, Assam, Bihar, Kerala, Punjab and Orissa- 11 percent; Madhya Pradesh, Maharashtra and Uttar Pradesh- 12 percent and; Gujarat, Haryana, Karnataka, Rajasthan, Tamil Nadu and West Bengal- 12.8 percent.

(d) Income from manufacturing has been projected forward.

(e) All population data has been projected forward.

**Table 4: Comparing Total Transfers Suggested by the Panel Model
with TFC Recommended Transfers Averaged Over 2006-10**

(Rs. crore)

States	TFC	Model 1	Model 2
Andhra Pradesh	9,595	7,300	17,819
Assam	4,220	4,585	8,346
Bihar	18,768	30,492	46,320
Gujarat	4,655	4,047	5,682
Haryana	1,402	1,729	2,987
Karnataka	5,816	4,110	8,910
Kerala	3,476	2,417	5,288
Madhya Pradesh	12,215	12,024	23,790
Maharashtra	6,518	7,717	7,717
Punjab	1,694	1,920	2,972
Orissa	6,732	6,129	11,195
Rajasthan	7,316	8,657	16,912
Tamil Nadu	6,920	4,716	4,716
Uttar Pradesh	26,352	32,323	57,884
West Bengal	9,205	6,836	17,945
Total	**124,883**	**135,000**	**238,483**

Source: (Basic Data): TFC and Census India.
Key: Model 1- benchmark as all states' average, Model 2 – benchmark as average of highest five own-tax revenues.

Projection for Total Transfers

Using the own-tax revenue model we calculate the fiscal capacity equalization transfers to states. Maharashtra was seen as being the state with the highest per capita own tax revenue. Therefore, for the purpose of vertical transfers the per capita amount equal to the per capita transfers to Maharashtra recommended by TFC was given to all states exogenously. Table 4 compares the transfers obtained using the different benchmarks, mentioned earlier, with the TFC recommended transfers.

From Table 5, it can be seen that the panel data model gives more progressive transfers than the methods it is being compared with. High income states get lower amount of transfers under the panel data

model as compared to the two methods.

Table 5: Transfers Suggested By Panel Model Averaged Over 2006-09

(Rs. crore)

States	Education	Health
Uttar Pradesh	17,137	2,819
Bihar	12,633	2,143
Madhya Pradesh	6,608	1,041
Rajasthan	4,690	749
Andhra Pradesh	3,824	534
West Bengal	3,617	552
Orissa	2,880	411
Karnataka	2,161	272
Assam	2,037	272
Tamil Nadu	1,429	165
Gujarat	851	110
Kerala	223	25
Punjab	79	-
Haryana	-	5
Maharashtra	-	98
Total	**58,169**	**9,196**

Source: (Basic Data): TFC and Census India.

Projection for Transfers: Selected Services

For projecting the transfers for the two services considered in the study- education and health- the models (a) and (b) are used respectively for education and health. The same steps are followed as were earlier described. Bihar gets the highest per capita transfers for both education and health expenditure. Table 5 gives the transfers for health and education expenditure to the states as estimated by the panel model. The lowest income states get the highest amounts. Uttar Pradesh gets the highest amount for both its health and educational expenditure needs.

CONCLUSION

There are wide income disparities across states in India. This paper attempts to provide an alternative methodology to calculate the horizontal equalization transfers, than the method used by the TFC and the other bodies responsible for determining transfers. The paper follows the approach of the Australian horizontal equalization methodology but uses a panel model methodology which looks at both the revenue as well as the selected services on expenditure side while determining the transfers compensating the states for the various use and cost disabilities they face. The paper has also presented the application of -the Canadian model of transfers, which looks only at the revenue side equalization, and the Australian system of transfers- for India and compared the results with the transfers recommended by TFC and other methods. Since the paper concerns itself more with the horizontal distribution of transfers rather than the vertical, while comparing the transfers, the transfers have been adjusted so that the total transfers obtained from the model remains equal to those in to those in other methods. The Australian model has been modified during the application keeping in mind the differences in conditions in India and the data constraints.

This paper has presented estimation for equalization transfers consisting of two components. The first is limited to fiscal capacity equalization following a Canadian type approach but using a set of macro determinants in a panel model framework. This is supplemented by equalization exercises for education and health. In the case of capacity equalization, states are put at average tax effort using a one way random effect model. The benchmark was set at 15-state average per capita own-tax revenue (model 1) and alternatively at the highest 5-state average for per capita own-tax revenue.

The expenditure side equalization has been carried out for two services with limited mobility- education and health. A panel data

approach was used. The benchmarks in these cases were set at the average of the highest three per capita expenditures on the relevant services.

The paper has exhibited that the transfers suggested by the panel model are more progressive than the TFC recommended transfers. The model does not compensate the states for their low tax efforts, which is compensated to some extent by the TFC.

Table A1: Transfers Suggested By TFC Over 2006-09

(Rs. crore)

States	TFC Recommended			
	2006-07	2007-08	2008-09	2009-10
Andhra Pradesh	8812	9960	11298	12861
Assam	4207	4749	5378	6111
Bihar	15434	17418	19545	22008
Gujarat	4531	5091	5744	6505
Haryana	1431	1602	1800	2032
Karnataka	5586	6278	7086	8029
Kerala	3405	3819	4302	4867
Madhya Pradesh	11306	12770	14477	16471
Maharashtra	6413	7192	8100	9162
Punjab	2666	2602	2189	2469
Orissa	6442	7255	8201	9306
Rajasthan	6846	7728	8754	9953
Tamil Nadu	6458	7284	8247	9373
Uttar Pradesh	25596	28893	32552	36800
West Bengal	8957	9451	10735	12234
Total	**118090**	**132092**	**148410**	**168180**

Source (Basic Data): Report of Twelfth Finance Commission.

Table A2: Transfers Suggested By Model 1 Over 2006-09

(Rs. crore)

	Model 1 Recommended			
	2006-07	2007-08	2008-09	2009-10
Andhra Pradesh	6033	6906	7684	8580
Assam	3853	4308	4805	5373
Bihar	24861	28361	32188	36558
Gujarat	3364	3773	4248	4802
Haryana	1429	1608	1817	2061
Karnataka	3435	3839	4308	4855
Kerala	2048	2258	2526	2837
Madhya Pradesh	10096	11170	12596	14233
Maharashtra	6413	7192	8100	9162
Punjab	1636	1782	2002	2259
Orissa	5022	5796	6466	7230
Rajasthan	7388	8145	9043	10053
Tamil Nadu	3968	4417	4938	5542
Uttar Pradesh	26580	30170	34049	38494
West Bengal	5867	6353	7118	8006
Total	111993	126077	141886	160043

Key: Model 1-Using average of all state per capita own-tax revenues as benchmark.

Table A3: Transfers Suggested By Model 2 Over 2006-09

(Rs. crore)

States	Model 2 Recommended			
	2006-07	2007-08	2008-09	2009-10
Andhra Pradesh	14703	16754	18768	21053
Assam	6938	7822	8773	9852
Bihar	37799	43133	48897	55452
Gujarat	4619	5217	5992	6900
Haryana	2463	2838	3149	3500
Karnataka	7477	8308	9337	10516
Kerala	4335	4784	5563	6469
Madhya Pradesh	19692	22141	25022	28306
Maharashtra	6413	7192	8100	9162
Punjab	2797	2724	3017	3349
Orissa	9212	10537	11800	13231
Rajasthan	14108	15835	17765	19941
Tamil Nadu	3968	4417	4938	5542
Uttar Pradesh	47358	53966	61061	69150
West Bengal	15023	16754	18824	21178
Total	196905	222422	251006	283600

Key: Model 1-Using average of highest five per capita state own-tax revenues as benchmark.

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