

***Reforming India's Fiscal Transfer System:  
Resolving Vertical and Horizontal  
Imbalances***

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# **Reforming India's Fiscal Transfer System: Resolving Vertical and Horizontal Imbalances**

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## **Abstract**

*Two central problems in a fiscal transfer system relate to resolving vertical and horizontal imbalances. In the context of the setting of the 13th Finance Commission, this paper looks at the methodological background of fiscal transfers followed by recent Finance Commissions in India, particularly the Twelfth Finance Commission (TFC). It is noted that in India, there is long - term stability in the share of states after transfers in the combined revenues of the centre and the states. It is argued that this stability depends on linking the share of states in the transfers, particularly tax devolution with the difference in the buoyancies of central and states taxes. In the context of horizontal imbalance, it is argued that some of the recent Finance Commissions have implicitly followed an axiomatic approach to tax devolution and brought in some normative elements in determining grants. In spite of large difference in fiscal capacities, a high degree of equalization has been achieved. It is shown, for example, that in the case of TFC recommended transfers, nearly 88 percent of needed equalization was achieved while devoting 50 percent of transfers to resolving vertical imbalance. A methodology is also developed to determine weights of vertical and equalizing components of transfers through devolution. In the case of the Twelfth Finance Commission, the horizontal component of tax devolution is strengthened by a scheme of equalizing health and education grants.*

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## 1. Introduction

With the recent constitution of the Thirteenth Finance Commission, issues of resolving vertical and horizontal imbalances in the system of fiscal transfers in India have once again come to the fore. The Twelfth Finance Commission (TFC) submitted its Report [1] at the end of 2004 in the backdrop of a severe fiscal stress affecting government finances, particularly states finances in India. The Report contained, apart from the recommendations concerning the core tasks of the Finance Commission regarding tax devolution and grants, a detailed roadmap for the restructuring of India's public finances including an incentive linked debt-relief scheme for the states. Government finances have shown significant improvements since then. The targets of achieving a fiscal deficit and revenue deficits under the restructuring programme seem well within reach for the central as well as the state governments. Many states have enacted fiscal responsibility legislations and others are following suit. In spite of these achievements, the fiscal transfers system in India requires further reforms concerning both its vertical and horizontal dimensions. These concerns primarily revolve around the following main questions:

1. **Stability in Vertical Transfers:** Vertical transfers should be stabilized around an appropriate level. These should not be continuously changed in favor of one side or the other. The question assumes importance also because of likely impact of the proposed goods and services tax (GST) on vertical imbalance in India.
2. **Composition of Transfers:** The composition of transfers should be changed towards grants as compared to tax devolution and

within grants, larger emphasis should be on grants on statutory basis as recommended by the Finance Commission (FC) rather than grants at the discretion of the centre.

3. **Gap-filling Approach to Determining Transfers:** In the case of horizontal transfers, the long-term criticism of the Indian approach has been the so-called gap-filling approach in the assessment of needs and resources by the Finance Commission because of the implicit adverse incentives.
4. **Measurement of Fiscal Capacity:** In applying the equalization principle, measurement of fiscal capacity of states is a key requirement. The measurement of state level fiscal capacity in India is proxied by estimates of the gross state domestic product (GSDP) at factor cost. This provides an incomplete indicator of fiscal capacity although the Central Statistical Organization prepares comparable estimates of GSDP. We need a more comprehensive indicator of fiscal capacity.
5. **Determination of Relative Weights of Sharing Criteria:** The revenue sharing criteria used by the Finance Commission account by far the largest share of transfers. However, the relative weights assigned to different criteria remains by and large ad hoc. There is a need to develop a more objective framework for determining suitable weights for the alternative revenue sharing criteria.
6. **Bail-outs and Controls on Borrowing:** In a system where states have been borrowing heavily from the centre, there is a

built-in expectation that centre will provide a bailout from time to time. This leads to strong adverse incentives for the states to finance current expenditures through borrowing from the centre and other sources and expect that either a gap-filling grant or a debt-service write off will bail them out in future.

7. **Growing Centralization of Expenditure on State Subjects:** This is an issue concerning the relative ambits of assignments of the two tiers of governments. There is a clearly noticeable trend of central government getting involved in progressively spending more and more on subjects that are clearly under the Concurrent or the State List in the constitution, sometimes through the state governments and sometimes bypassing them.

This paper attempts to address these questions. Section 1 summarises the evolving fiscal scenario since the recommendations of the TFC. Section 2 looks at the issue of resolving vertical imbalance in the context of the proposed goods and services tax (GST). Section 3 looks at the horizontal dimension of transfers, particularly the equalization methodology and its adaptation in India in an axiomatic framework guiding tax revenue sharing. It also highlights the extent of equalization achieved by the TFC recommendations by decomposing recommended transfers into vertical, equalizing, and special needs components. Section 4 looks at the considerations relevant for determining suitable weights for the revenue sharing criteria used by the Finance Commissions. Section 5 discusses the equalizing health and education grants recommended by the TFC and the need for strengthening these. Section 6 looks at the

steps relative to borrowing by the states in the wake of the TFC recommendations. Section 7 provides the concluding observations.

## I. Fiscal Developments since the Recommendations of the Twelfth Finance Commission

### a. Empirical Back Drop

The TFC deliberated on fiscal transfer issues in the background of severe fiscal imbalances affecting both the central and the state finances. To reverse these trends, the TFC recommended a scheme that provided for a major restructuring of government finances including the borrowing and on-lending regimes for the states. These changes were aimed at limiting the borrowing levels of both tiers of governments to sustainable levels, removing the adverse incentives in the on-lending mechanism, and maximizing growth by keeping revenue account in balance and augmenting the saving rate. The evident progress towards lower revenue deficits since 2004-05 also led to the elimination of public sector dis-saving. This was accompanied by moderate interest rates and increase in investment thereby leading to higher growth. During 2001-02 to 2006-07, the aggregate saving rate has gone up from 23.5 percent to 32 percent. Nearly half of this increase comes from the turnaround in the public sector saving, which increased from (-) 2.0 percent to 2.0 percent, a turn about of more than 4 percentage points coming from the reduction in government's dis-saving. This corresponds to a fall in the combined revenue deficit from about 7 percent of GDP to a little over 2 percent during the same period.

Table 1 shows the profile of fiscal imbalance of the central and the state governments, as indicated by revenue, fiscal, and primary deficits

from 1990-91 to 2006-07. Consistent with the restructuring plan suggested by the TFC, there are clear signs that both the central and the state governments are likely to meet the fiscal responsibility targets of reducing fiscal deficit to GDP ratio to 3 percent. In 2006-07, the revenue deficit of the states relative to GDP fell to a near-zero level.

**Table 1: Fiscal and Revenue Deficits of the Centre and the States**

	(Percent to GDP)					
	Fiscal Deficit		Revenue Deficit		Primary Deficit	
	Centre	States	Centre	States	Centre	States
1990-91	7.76	3.27	3.23	0.92	4.02	1.76
1991-92	5.50	2.86	2.46	0.86	1.47	1.20
1992-93	5.31	2.76	2.45	0.68	1.20	1.01
1993-94	6.93	2.37	3.76	0.44	2.71	0.55
1994-95	5.63	2.70	3.03	0.60	1.33	0.81
1995-96	5.01	2.62	2.47	0.68	0.85	0.79
1996-97	4.82	2.69	2.36	1.16	0.52	0.84
1997-98	5.78	2.87	3.02	1.06	1.51	0.91
1998-99	6.44	4.22	3.80	2.48	2.01	2.18
1999-00	5.35	4.67	3.45	2.75	0.74	2.36
2000-01	5.64	4.25	4.04	2.54	0.93	1.79
2001-02	6.18	4.21	4.39	2.59	1.47	1.47
2002-03	5.92	4.17	4.40	2.25	1.11	1.31
2003-04	4.47	4.46	3.56	2.22	-0.03	1.50
2004-05	4.00	3.49	2.51	1.16	-0.06	0.68
2005-06	4.11	3.20	2.59	0.48	0.39	0.70
2006-07	3.71	2.58	2.03	0.04	0.15	0.16

**Source (Basic data):** RBI and CSO.

**Notes:** GDP figures relate to the 1999-00 base series. Figures prior to 1999-00 have been adjusted by a conversion factor. State fiscal data are taken from RBI and follow RBI coverage and definitions. 2006-07 data for the centre is RE and for the states, BE.

The fiscal deficit of the states has also fallen to below 3 percent of GDP. These changes indicate that the revenue deficit and fiscal deficit targets relative to GDP set out by the TFC for 2008-09 are well within reach. With the fall in fiscal deficit ratio, the debt-GDP has also started falling. For the centre, after reaching a peak at 63.8 percent in 2004-05, it has fallen to an estimated level of 60.3 percent in 2006-07. The state debt relative to GDP also fell in the corresponding period from 33.4 to 30.8 percent. The combined debt-GDP ratio has fallen by nearly 6.6 percentage points from 82.4 to 75.8 percent. Thus, although the fiscal deficit to GDP ratio has fallen, the fall in the debt-GDP ratio is slower and it will take some more years to reach the target of 56 percent of GDP as set out by the TFC. That is why, it is important to continue to adhere to the suggested reform path beyond 2008-09. As shown in Rangarajan and Srivastava (2005), the adjustment period for reaching the debt level relative to GDP at which it should be stabilized could extend beyond the mid-thirties of the current century while maintaining the fiscal deficit of 6 percent of GDP throughout the period. It can be advanced by a few years by achieving a higher growth rate but the broad message is that fiscal responsibility targets will have to be adhered to for a long period.

## II. Resolving Vertical Imbalance

An excess of federal revenues relative to its responsibility and a corresponding deficit in the state accounts where expenditures exceed own revenues is referred to as the vertical fiscal gap. The notion of a vertical gap conceptually contrasts with a benchmark situation in which responsibilities and resources perfectly match for the two tiers of

government. In federal systems, a vertical gap is often deliberately created for efficiency gains that result from the relative assignments and fiscal transfers that are used to close the gap or convert it into a balance. The main justification for such transfers may be listed as follows:

1. Transfers may be purely passive responses to the asymmetric decentralization of expenditure and revenue-raising authority (vertical transfers).
2. These may be used to equalize the fiscal capacity of the regions to avoid inefficient migration of persons and businesses among regions and to foster horizontal equity in the federation as a whole (Boadway *et al*, 2002).
3. These may also be used in conditional forms to neutralize fiscal externalities imposed by regional governments on other regions, as well as to achieve national standards in social programs and to induce efficiency in the internal economic union of the federation (Dahlby, 1996).
4. These may be used as instruments for insuring regions against shocks to their fiscal capacities (Lockwood, 1999).

### a. Some Analytical Considerations

The terms vertical gap, vertical imbalance, and vertical fiscal imbalance are often used interchangeably in the literature. However, in the more recent literature, following a normative approach, a distinction is made between vertical gap, optimum vertical gap, and vertical fiscal imbalance. Boadway and Tremblay (2005) and Dahlby and Wilson (1994)

define vertical fiscal imbalance in revenue-raising as a deviation from optimum vertical gap where the optimum vertical gap is a situation in which the marginal cost of public funds is equalized across the levels of government. In many studies, the allocation of spending responsibilities is taken as pre-determined, and the issue is how revenue-raising and federal-regional transfers should be designed so as to achieve a second-best optimum in a decentralized setting, given that taxes are distortionary.

In Boadway and Tremblay (2005), the notion of imbalance is related to the inability to achieve a second-best optimum in a decentralized federation, and the distinction between the vertical fiscal gap and vertical fiscal imbalance (VFI) reflects that inability. Specifically, the vertical fiscal gap is taken to be the optimal level of transfers when the second best is achieved by a hypothetical central planner, or equivalently a unitary national government that can take coordinated decisions for both levels of government. A vertical fiscal imbalance is then defined as any deviation whether positive or negative from the optimal vertical fiscal gap. These deviations will occur in a decentralized setting because of the fact that regional governments emit fiscal externalities on one another (Keen, 1998) and are unable to coordinate their decisions. The existence of a VFI will be an optimal response of the federal government to this coordination failure between regional governments, and will be efficiency-enhancing.

Empirically, separating VFI from the horizontal fiscal imbalance (HFI) is quite difficult although it is attempted here in section IV in the context of the TFC transfers. Bird and Tarasov (2002) observe that "...it

is important to understand that the two concepts of fiscal balance....- VFI and HFI- cannot be cleanly separated. One way to think of VFI, for example, is that it might be considered to be eliminated—that is vertical fiscal balance is achieved—when expenditures and revenues (excluding transfers) are balanced for the *richest* local government, measured in terms of its capacity to raise resources on its own. Even if this is achieved, fiscal gaps or VFI will of course still remain for all poorer local governments. Generally, it is common to discuss such gaps instead as HFI..." In section V, we follow the approach of taking the per capita transfer to the richest state as the benchmark for calculating the vertical transfers.

#### **b. India: Long-term Stability in Vertical Imbalance**

As shown in the TFC Report, in India there has been long - term stability in the vertical distribution of resources after transfers. It is remarkable that while the relevant ratios and shares have been adjusted from time to time, there is a perceptible stability of the relative shares of the centre and the states in the combined revenue receipts and combined revenue expenditures. The main features of the resultant vertical distribution of resources may be highlighted since the period of the Seventh Finance Commission as follows:

- a. Prior to transfers, centre collects on average about 63-64 percent of the combined revenue receipts; after transfers, states get nearly 64 percent of the combined revenue receipts.
- b. This enables the states to spend nearly 57 percent of the combined expenditure on an average on revenue account. The centre spends

about 43 percent of the combined revenue expenditure by retaining 36 percent of revenues after transfers by borrowing relatively more.

Table 2 summarises this picture for the period since the Seventh Finance Commission.

**Table 2: Share of States in Combined Revenues**  
(percent)

Average (Award Period) <b>Finance Commissions</b>	Revenue Receipts		Revenue Expenditure
	Before Transfer	After Transfer	
Seventh	35.3	61.4	58.0
Eighth	34.6	62.0	55.7
Ninth	37.5	64.7	56.9
Tenth	38.6	63.0	56.8
Eleventh	39.0	63.9	57.1

**Source (Basic data):** Indian Public Finance Statistics.

The Eleventh Finance Commission (EFC) had suggested for the first time an indicative benchmark of 37.5 percent covering all transfers from the centre to the states with a view to achieving stability in the overall transfers from the centre to the states. Given the historical trends and the current relatively high buoyancies of the central taxes, particularly the direct taxes and service tax, the TFC suggested a marginally higher benchmark of 38 percent. The TFC also recommended an increase in the share of states in central taxes to 30.5 percent of the divisible revenues. There has been an argument that this share should be fixed in nominal terms for a few decades or so. It can be argued that the objective of stability will not be served by fixing the share of the states in the central taxes in nominal terms as long as the central and the state taxes are

growing with different buoyancies. In particular, some upward adjustment is needed if central taxes are growing more than that of the states. At the present juncture this was justified as centre's tax buoyancy is expected to be relatively higher due to their exclusive power to tax the base of growing services while for some time states will be undergoing adjustments on account of moving to the state level VAT.

As detailed in Annexure 1, it can be shown that between any two periods, the share of states in the total tax revenue of the centre and the states after transfers will be constant only if the share of states in the central taxes is increased by the margin by which the buoyancy of central tax revenues exceeds the buoyancy of the combined tax revenues. This result can also be stated in terms of the buoyancies of the central and the state taxes. Representing the respective buoyancies of state, central, and combined tax revenues as b, c, and d and the share of states in central taxes as t and t' between two periods, it can be shown that the share of states (or centre) in total tax revenues after transfers will be constant between the two periods if

$$t' - t = (c-d) g \tag{1}$$

where, g is the GDP growth rate. If a is the share of states' own revenues in total tax revenues, this condition can also be written as

$$t' - t = (c-b) a . g \tag{2}$$

This also implies that for stability, there should be no change in the share of states if the buoyancy of central taxes is equal to that of the states [2]. Adjustments are also needed if the central government changes the size of the divisible pool by additional surcharges and cesses that are not divisible.



A scheme of assignment of resources, heavily in favor of the centre purely for efficiency reasons, is always prone to lead to a centralization of expenditures in direct and indirect ways. There is a noticeable tendency in India for various expenditures in the concurrent list, and often even if they belong to the State List, to be incurred by the central government.

### **c. Vertical Imbalance and GST**

Considering some important forthcoming tax reforms in India, it is important also to recognize that the vertical imbalance would be affected depending on the way the goods and services tax (GST) is implemented in India. In Australia, the implementation of GST led to a substantial increase in the vertical imbalance because the states agreed to forego a number of taxes assigned to them in favor of a national GST. In India, the 2007-08 budget has mentioned the plan for implementing a National GST by April 1, 2010. The exact contours of the plan for GST, which have not yet been spelt out by the government, would have a significant bearing on the vertical imbalance in the system. In this context, the following three issues are of importance.

#### **c1. Nature of GST Regime**

First, it is important to determine whether the proposal is for a central GST, or state GST or concurrent or dual GST. In the first two cases, the pre-transfer vertical imbalance would increase substantially. The options may be as follows:

a. Central GST: In this case the GST is levied by the central government and state VATs are all subsumed in this central levy. This would be like

the Australian model. This option would deliver harmonization by definition as only uniform rates will prevail. The whole country would have one common market and there would be no problems related to inter-state trade. But this will increase vertical imbalance tremendously. States will have to forego their power to levy a sales tax. A provision will have to be made for distribution of the centrally collected VAT. Although a similar arrangement has been implemented in Australia, it will have a significant impact on the nature of fiscal federal relations. States will lose their autonomy to fix rates and collect their own revenues. It is doubtful that states will agree to such an arrangement. The scheme of redistribution would also be required to follow a principle different from the one normally used by the Finance Commissions so that states are adequately compensated for the revenues that they would have otherwise earned through the existing system of state VAT or sales taxes.

b. Concurrent or Dual GST: This seems the most practical route as it can be implemented while maintaining the current pre-and post-transfer profiles of vertical imbalance. It would require that states be enabled to tax services and the service tax rate should be the same as that for goods. Alongside, central government should be enabled to tax value added in the case of goods up to the retail stage. These changes would lead to a comprehensive and unified system of taxation of goods and services. The major problem in this case will be handling of inter-state transactions. In the literature, three main solutions have been suggested, viz., (a) system of compensating VAT (CVAT), (b) dual VAT, and (c) Viable Integrated VAT (VIVAT). The system of compensating VAT (CVAT) is also known as the Versano proposal. McLure Jr.(2000) suggested a

modified version of the CVAT. In CVAT, uniform definitions and laws for the tax base in all jurisdictions are needed. States are allowed however to have their own tax rates with the proviso that all inter-state transactions are zero-rated for state VAT. In addition to the central VAT, the central government levies a compensating VAT for all inter-state transactions. The rate of compensating VAT is common across states. For inter-state imports, a system of deferred payment of state VAT and credit for compensating VAT is then put in place. The Compensating VAT is an additional federal level tax to ensure the tax revenues that might otherwise be lost to cross-border tax evasion. One alternative to CVAT in concurrent tax regimes is the dual VAT as practiced in Canada [see, Bird and Gendron (2000)]. In dual VAT, central and state VAT rates are applied. States have autonomy to determine the State VAT rates. The central VAT is included in the tax base of the state VAT. States therefore have an incentive to collect the central component, if they are asked to collect it. The VIVAT system pertains to the exclusive state level VAT system.

c. State level VAT: This option takes one to the other extreme where the GST/VAT is levied exclusively by the state governments. This also changes the vertical balance equations drastically although in favor of the states. The centre will then largely lose power to undertake transfers for purposes of horizontal transfers. Even to provide centrally provided public goods, it may need to have some sumptuary excises for itself. Otherwise it may have to depend on reverse transfers. The problem of inter-state harmonization and inter-state transactions will remain. For the case of an exclusive state VAT regime, Keen and Smith (2000) suggested the system of Viable Integrated VAT (VIVAT). In this case, for all intermediate purchases, that is, sales between dealers, a uniform tax rate regime is

advocated for sales between dealers. This would be applied to transactions within a state as also across the states. There is no central VAT or GST.

If the vertical imbalance in the system is not to be drastically altered, the concurrent or dual VAT regime seems to be most relevant in the current fiscal conditions of India.

### **c2. Determining the Overall Rate**

The second issue is to determine a suitable GST rate. At present goods are taxed at the core rate of CENVAT at 16 percent (changed to 14 percent in the 2008-09 Central Budget) and State VAT of 12.5 percent. This together would be very high although it would be less than 28.5 percent as the 16 percent rate (changed to 14 percent) applies to value added only up to the manufacturing stage and the GST will have a larger base. The service tax rate is 12 percent. The suggestion of the Kelkar Committee (2004) to aim at a 20 percent combined GST rate seems to be a suitable target as it compares well with some of the international GST rates. The highest GST rates are in Sweden and Denmark at 25 percent. At the lower end, Switzerland, Japan, Thailand and Singapore have GST/VAT rates at 5 percent or marginally above.

### **c3. Determining the Central and the State GST Rate Components**

The third issue relates to decomposing the overall GST rate into its central and state components making sure that the relative pre-transfer revenue levels are not disturbed. To achieve a 20 percent composite rate, both tiers of governments have to jointly bring down the overall tax rate, which at present amounts to 16 percent (14 percent from 2008-09)

and 12.5 percent on the respective tax bases of the CENVAT and State VAT as far as manufacturing and sales of goods are concerned. While the tax rate on goods can come down, that on services, which is at 12 percent may have to be incrementally raised to bring it closer to the long term desired norm. In the medium term, with a view to preserving our federal structure, a system of dual taxation consisting of a state GST (SGST) and a central GST (CGST) seems to be a viable option. The Kelkar Committee had suggested a division of the overall rate of 20 percent into a 12:8 ratio in favor of the centre. This may need to be reexamined with current levels of revenues under CENVAT and service taxes and the statevat and other related taxes that may be subsumed in the GST.

### **III. Resolving Horizontal Imbalance: Towards Equalizing Transfers**

In theory as well as practice, a system of equalization transfers is considered desirable as it is consistent with both equity and efficiency. The efficiency implications follow from two considerations:

- (a) Locational inefficiencies that can result from inefficient migration induced by fiscal surpluses is neutralized by equalization transfers; and
- (b) The redistribution implied by equalization transfers from the richer to poorer states gives a return also to the richer states by avoiding congestion resulting from excessive migration in the context of services provided by these states that are in the nature of 'congestible' goods.

Courchene (1984, 1998) had argued that the efficiency case of equalization depends on the existence of fiscally induced migration. If there is no fiscally induced migration, there is no efficiency case for equalization. In a recent contribution, Dahlby and Wilson (1994) make out a case for equalization on efficiency grounds even in the absence of fiscally induced migration. They examine the role of equalization grants as an instrument for maximizing a social welfare function or minimizing the 'excess burden' of taxation. Optimal tax theory suggests that the social cost of raising revenues depends not only on the size of the tax base but also on the responsiveness of the tax base to tax rate changes. They argue that it is important to use 'responsiveness' (or buoyancies in the formula for equalization) rather than just the tax rate. The higher the demand and supply elasticities to tax rate changes, the larger is the marginal cost of public funds. On this basis they show that differences in fiscal capacities, even in the absence of fiscally induced migration, are sound grounds for arguing for equalization.

#### **a. Equalization: Some International Practices**

In Canada, the 'equalization' payments have been mandated in the constitution since 1982, which commits the federal government to the "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 equalization transfer to a province in absolute amount is determined by applying the average revenue effort to the difference between standard base and the actual base for that province with respect to the various

revenue sources. This produces an estimate of revenue, which is higher than the actual revenue for provinces that have 'below-average' capacity. This exercise is done for all revenue bases used by the provinces (see, for example, Rangarajan and Srivastava, 2004a for a discussion). In the Canadian system, there is no reference to cost differentials and the states are free to use their equalized capacities in providing any mix of public goods and merit goods. The equalization grants are supplemented by health and social sector transfers that are equally important in volume and are also of an equalizing nature.

The Australian system of equalization transfers (see, Rangarajan and Srivastava, 2004b) goes into the question of cost differentials relevant for comparison with some notion of equal efficiency in the provision of goods and services by the provincial authorities. The guiding principle of horizontal transfers system is fiscal equalization, which is defined by the Commonwealth Grants Commission (CGC)(2004) 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 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. It may be noted that the typical methodology for determining equalization transfers is not totally devoid of adverse

incentives, as discussed in some recent literature (e.g. Garnaut, 2002) on the subject.

The ground conditions in India are different from Canada or Australia in two critical respects. First, the extent of difference in the resource bases is far larger than in Australia or Canada. For example, the ratio of maximum per capita GSDP to minimum is 1.6 to 1 between Ontario (leaving Alberta as a special case) and Prince Edwards Islands; in Australia, the ratio of per capita GSDP of New South Wales to Tasmania is 1.5 to 1. In India, this ratio between Maharashtra (leaving Goa as a special case) and Bihar is close to 6 to 1. The second difference is that the population that resides in the main 'donor' states as compared to main recipient states is much larger in Canada and Australia. In India, it is the other way round. As a result, the amount of redistribution implicit in the equalizing scheme is far larger when the recipients are more than donors, making it extremely difficult to achieve full equalization. Thirdly, there are large inter-state differences in cost conditions in India due to differences in density and composition of population, nature of terrain etc.

In India, the horizontal imbalance is resolved through a combination of tax devolution and revenue-gap grants. In Canada, this is done by grants. In Australia, this is done by sharing the revenue under the Goods and Services Tax (GST) topped up by the Health Care Grants. The Australian system has switched from grants to revenue sharing and back from time to time. Some economists consider grants as the right means of transfers. States themselves overwhelmingly prefer revenue-

sharing. The transfer system in India has evolved in a manner that relies on both modes of transfers. Finding a suitable combination is the relevant problem.

#### **b. India: Tax Revenue Sharing under an Axiomatic Framework**

An explicit equalization methodology was not developed or followed in India. Instead, an elaborate framework of tax revenue sharing was developed supplemented by revenue-gap grants. This methodology can also lead to an equalizing system of transfers if some basic principles are followed. The evolution of criteria-based tax revenue sharing as recommended by the Finance Commission can be interpreted in an axiomatic framework. Fully equalizing transfers are a special case under this axiomatic framework. The following five axioms may be proposed as desirable axioms for criteria-based revenue sharing: (a) Normalization 1, (b) Normalization 2, (c) Horizontal equity, (d) Comprehensiveness, and (e) Neutrality. The two normalization axioms and horizontal equity can give rise to a system of fully equalizing transfers.

##### *Axiom 1: Normalization 1*

If two states have the same criterion values, their shares should be proportional to their populations.

##### Axiom 2: Normalization 2

The sum of the shares of all states should add to 1.

##### Axiom 3: Horizontal Equity

Between any pair of states, the state with lower per capita fiscal capacity should have higher per capita share, and per capita shares should be equal for states with equal per capita fiscal capacity.

##### Axiom 4: Comprehensiveness

In determining the share of any one state, information on all states should be used. A corollary of this is that under each criterion, every state should get a positive share.

##### Axiom 5: Neutrality

The allocation criterion should be neutral with respect to the organization of States. There should not be an incentive to bifurcate states with a view to benefiting from the allocation mechanism.

These axioms are discussed in Annexure 2. It may be noted that the Finance Commissions have endeavored to meet these criteria even though they were not explicitly stated. The same cannot be said for example of the dispensation criteria for determining grants under the Gadgil formula. Under their deviation formula, states with per capita GSDP above the national per capita GDP or average per capita GSDP get a zero share thereby not satisfying the comprehensiveness criterion. Similarly, Assam with a lower per capita GSDP may some times get a per capita grant which is lower than Meghalaya, thereby violating the horizontal equity criterion. Since shares under the individual criteria under the Gadgil formula are not made public, it is not possible to subject these to a critical review.

#### **a. Measuring the Extent of Equalization: TFC Recommendations**

For broad issues like those of resolving vertical and horizontal imbalances, the fiscal transfer scheme needs to be analyzed in terms of the combined effect of all components of transfer. The total recommended

transfers to the states may be calculated based on the projections of the TFC regarding tax devolution and adding to these the grants already specified in nominal terms. The grant profile tends to give larger grants in the initial years, and to get a better picture of the inter-state distribution of the recommended transfers, we have given the average annual transfers by dividing total transfers by 5 and considering the average annual transfers as centered in 2007-08. These are given in Appendix Table 1 in per capita terms using state-wise population of 2001 Census.

The issue of determination of revenue-gap grants as ‘gap-filling’ has been raised by many authors from time to time. The concern arises from the implicit adverse incentive for a state to create a history of expenditure in the expectation of getting a grant later. For the period covered by the recent Finance Commissions, except for a very limited number of general category states and for some years, the revenue-gap grant is given mostly only for the special category states. The fact that the special category states get a large share of the revenue-gap grant follows from their large committed expenditures linked to the large plan assistance that they have obtained in the past.

Let the per capita income (GSDP) of the states arranged in ascending order of per capita GSDP be denoted by  $y_1, y_2, \dots, y_n$  and corresponding population be denoted by  $N_1, N_2, \dots, N_n$ . If the vertical fiscal is measured with reference to the richest state, in per capita terms, it may be defined as  $[e - a \cdot y_n]$  (assuming that  $e > a \cdot y_n$ ), where  $e$  is per capita expenditure norm,  $a$  is the average tax-effort, and  $y_n$  is the per capita fiscal capacity of the highest income state. If  $e$  is exogenously or

normatively determined, the total transfer to the highest income state is given by

$$N_n \cdot [e - a \cdot y_n].$$

Since every state gets at least the amount  $[e - a \cdot y_n]$  in terms of per capita transfers, we may write total vertical transfer as

$$\sum N_i [e - a \cdot y_n] = [e - a \cdot y_n] \sum N_i \quad (3)$$

All other states have a lower fiscal capacity and would get an amount, in per capita terms, higher than that obtained by the highest income state in a progressive scheme of transfers under the axiom of horizontal equity. The transfers to these states can be seen as consisting of the vertical component equal to the per capita transfer to the highest income state, an ‘equalizing’ component due to deficiency in fiscal capacity and a residual which reflects cost disabilities and other special need considerations.

Thus, for any state  $i$ , the per capita transfer can be decomposed into three components reflecting (a) transfers made on account of vertical imbalance, (b) transfers on account of equalization transfers, and (c) the residual component. Thus per capita transfers to a state can be written as:

$$t_i = (e - ay_n) + (ay_n - ay_i) + res_i \quad \text{for a state where } res_i \geq 0. \quad \dots (4)$$

Here,  $e$  is permitted per capita expenditure norm,  $a$  is average tax effort, and ‘res’ is the residual reflecting other cost and special need considerations. The term  $(ay_n - ay_i)$  represents equalization transfers. The states may be divided into two groups: one where the per capita recommended transfer consists of three components, vertical, equalizing,

and special needs as given above. There may be other states, where after vertical transfers are taken out, the balance falls short of equalization entitlement and there is nothing left for special needs. Let the shortfall in such cases be  $def_i$ . In their case, we may write per capita transfers as

$$t_i = (e-ay_n) + (ay_n-ay_i) - def_i \quad (5)$$

In both cases, we can multiply the per capita transfers by respective populations to get total transfers. By adding up the two sets, we get the total transfers (TT) as

$$TT = \sum N_i t_i = \sum N_i (e-ay_n) + [\sum N_i (ay_n-ay_i) - \sum N_i def_i] + \sum N_i res_i$$

Here,  $def_i > 0$  for states that get less than their equalization entitlement and  $res_i > 0$  for states who get more than their equalization entitlement.

The total transfers can thus be divided into three components, the respective shares of which in total transfers may be written as:

- a. Share of vertical transfers in total transfers:  $A1 = \sum N_i (e-ay_n)/TT$
- b. Share of equalizing transfer in total transfers:  
 $A2 = [\sum N_i (ay_n-ay_i) - \sum N_i def_i]/TT$
- c. Share of transfers for special needs:  $A3 = \sum N_i res_i/TT$

We calculate below these shares for the TFC recommended transfers. In making these calculations, the following qualifications apply:

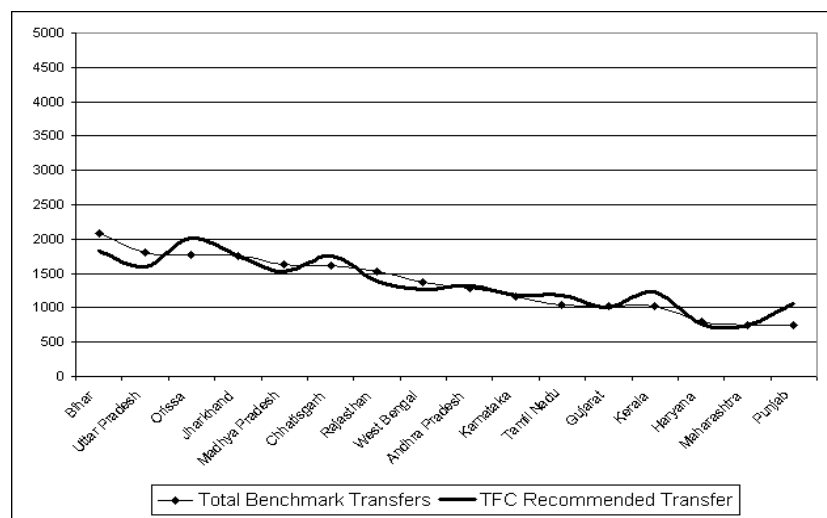
- (1) Average per capita comparable GSDP at current prices for 1999-00 to 2001-02, as used by the TFC, is taken as a macro proxy of the state base for own tax revenues.

- (2) Population according to 2001 census is used wherever population is required to be used for conversions of aggregates into per capita terms or vice versa. It may be noted that wherever relevant, TFC had used 1971 population.
- (3) The estimated per capita transfer of Maharashtra is used to determine the vertical transfers. Maharashtra has the minimum per capita transfer among all states.
- (4) The all-state average tax-GSDP ratio is taken as 6.54 percent as given in the TFC Report.
- (5) Comparisons are made for transfers centered in 2007-08, which is the mid-year of the TFC award period. Tax devolution is taken as projected by TFC for different years and grants as spread out for different years and the total is divided by 5 to obtain transfers centered in 2007-08.

It is shown that the per capita transfers for the highest benchmark state, viz., Maharashtra is Rs. 746.67. This multiplied by total population of all states in 2001 at 101.209 crore gives total vertical transfer of Rs. 75570 crore. Total transfer recommended by TFC consists of Rs. 613112 crore of estimated devolution and Rs. 142640 crore of grants for five years. Thus, the per year transfer is Rs. 151150.4 crore. As shown in Table 3, vertical transfers constitute about 50 percent of total transfers. We calculate below the degree of equalization achieved and the share of transfers devoted for equalization.

The equalization transfer is calculated and added for each state as determined by  $[N_i \cdot (a) \cdot (y_n - y_i)]$ , where symbols have meaning defined as earlier. In particular 'a' is the average tax price, which is equal to average own tax revenue to GSDP ratio of the states, equal to 6.54 percent [as given in Annexure 7.9 of TFC Report]. The details of the calculations and the related decomposition are given in Appendix Tables 1 and 2. A comparison of equalizing transfers plus vertical transfers, called benchmark transfers with the TFC recommended transfers is depicted in Chart 1.

**Chart 1: Comparing Equalizing Benchmark Transfers with TFC Recommended Transfers: General States**



In Chart 1, the general category states (leaving Goa) are arranged in ascending order of per capita income. It will be seen that the TFC recommended transfers are progressive and follow the same pattern as

equalization transfers determined at the average tax price. It can be said that for the general category states that, except Goa, the pattern of transfers follows an equalizing approach and not a gap filling approach. This is because, in their case the effective determinant of transfers is tax devolution supplemented by equalizing grants on health and education that supplement the equalizing content of tax devolution. At the same time, vertical transfers are taken care of by the larger weight to population criterion, the weights given to tax effort and fiscal discipline criteria and a number of grants that relate to maintenance and special needs.

Table 3 summarises the relative shares of the three components in total transfers, viz., vertical, equalizing, and special needs. Details are given in Appendix Tables 1 and 2.

**Table 3: TFC Recommended Transfers: Vertical and Horizontal Components**

(Rs. crore)

Total Transfers (average per year centered in 2007-08)	<b>151150.4</b>
Amount used for vertical transfers	75570
Share of vertical transfer	<b>50.00</b>
Amount for equalization transfers	58738
Share of equalizing transfers in total transfers	<b>38.86</b>
Amount needed for full equalization	66740
Extent of equalization achieved	<b>88.01</b>
Amount used for cost differential and special needs	16843
Share of transfers for cost diff and special needs	<b>11.14</b>

**Source:** Estimated based on Appendix Tables 1 and 2.



It is thus clear that 50 percent of total transfers are used as vertical transfers. In spite of this large share for vertical transfers, 88 percent of equalization has been achieved when it is evaluated at the average tax-GSDP ratio. A little more than 11 percent of transfers are used for special needs that has gone mainly to the special category states. This large degree of equalization could be achieved by introducing the health and equalization grants, which use relatively a small amount of transfer but improve the equalizing content of transfers significantly as they go only to those states that are less than average in the per capita health and education expenditure. The TFC has made a new beginning in this context. However, the gap covered was only 30 percent in the case of health and 15 percent in the case of education. These ratios will have to be increased to a larger extent to achieve full equalization.

Several qualifications may be noted in respect of the above comparisons. First, the equalization benchmark is calculated with a revenue side approach and expenditure side considerations are not included. Secondly, a macro base reflecting fiscal capacity like the GSDP is used. Thirdly, the highest per capita GSDP among states, excluding Goa, is used as the benchmark. Fourthly, shortfalls from the equalization benchmarks are equally weighted. Ideally shortfalls for lower income states would require a relatively higher weight.

#### IV. Determining Relative Weights of Tax Devolution Criteria

Considerable time is spent by the Finance Commissions on determining the relative weights that should be attached to the different

tax devolution criteria, yet an explicit analytical framework has not been spelt out for this purpose. Given the preceding discussion, it is possible to develop a framework for determining suitable weights for alternative devolution criteria. Given the benchmark for equalization (such as the highest or mean income), the total amount needed for equalization gets determined. Thus, the amount needed for equalization (horizontal transfer) is given by

$$H = a \cdot \sum N_i (y_n - y_i) \quad (6)$$

Here,  $a$  is the average tax effort. The vertical transfer ( $V$ ) may be determined exogenously as it relates to the overall balance of responsibilities and resources. Both the vertical and horizontal transfers can be given through either route, i.e. grants or tax devolution. In the case of both tax devolution and grants, three components can be distinguished: vertical component, horizontal component that is equalizing, and horizontal component reflecting other considerations. Suppose these three components given through grants are referred to as  $g^v$  (same for all states),  $g_i^h$ , and  $g_i^o$ . The latter two have different per capita amounts for different states. The corresponding transfers through tax devolution are, say,  $d^v$ ,  $d_i^h$ , and  $d_i^o$ .

Thus, we have the following sets of decompositions:

$$t_i = t^v + t_i^h + t_i^o \text{ (same as equation 4 given earlier)}$$

$$g_i = g^v + g_i^h + g_i^o$$

$$d_i = d^v + d_i^h + d_i^o$$

$$\text{where } t^v = g^v + d^v, t_i^h = g_i^h + d_i^h, \text{ and } t_i^o = g_i^o + d_i^o \quad (7)$$

Let a share W of per capita devolution (=W.d) be given for (total devolution D= d.ΣN<sub>i</sub>) equalizing horizontal transfers (using criterion like the distance criterion), a share W1 of d for vertical transfer (under population or similar criterion). The remaining part of devolution constitutes a share W2, which is given for other considerations (like cost differentials), where the three weights add to 1. W2 may be taken as exogenously determined. Putting together the equalizing horizontal transfers under grants and through tax devolution, the following condition should be satisfied:

$$W.D + \sum N_i g_i^h = a. \sum N_i (y_n - y_i)$$

This can be solved to yield,

$$W.D = a. \sum N_i (y_n - y_i) - \sum N_i g_i^h \quad \dots(8)$$

$$\text{Or, } W.d = a. (y_n - \bar{y}) - g^h \quad \dots(9)$$

Where, d is per capita devolution, y<sub>n</sub> is benchmark per capita income,  $\bar{y}$  is mean income (=ΣN<sub>i</sub>y<sub>i</sub>/ΣN<sub>i</sub>), and g<sup>h</sup> is mean per capita equalizing transfers given as grant. For the vertical transfer, we have

$$V = (\sum N_i) [g^v + d^v] \text{ or the per capita vertical transfer is, } v = [g^v + d^v].$$

Per capita vertical transfers given through devolution is

$$(1-W-W2)d = d^v \quad \dots(10)$$

Using equations (9) and (10), we have,

$$(1-W-W2)/W = d^v / [a. (y_n - \bar{y}) - g^h]$$

This can be solved to yield,

$$W = (1-W2) * [a. (y_n - \bar{y}) - g^h] / [d^v + a. (y_n - \bar{y}) - g^h] \quad \dots(11)$$

$$\text{Correspondingly } d = [d^v + a. (y_n - \bar{y}) - g^h] / (1-W2) \quad \dots(12)$$

This indicates that given

- (1) the exogenously determined average per capita equalizing grant (g<sup>h</sup>),
- (2) weight to be given to considerations other than vertical or equalizing transfer in devolution (W2),
- (3) the benchmark (y<sub>n</sub>) and average per capita fiscal capacity (μ),
- (4) the average tax-GSDP ratio (a), and
- (5) the exogenously determined per capita vertical devolution (d<sup>v</sup>),

the weight that needs to be given to horizontal equalizing devolution (under the distance or similar criteria) and the total amount of per capita devolution may simultaneously be determined in order to achieve full equalization.

In practice, in applying this to India, the tax devolution criteria in India may be considered in three parts: those meant for vertical transfers (population, and a large component of transfer under tax effort, fiscal discipline criteria), those meant for equalizing horizontal transfers (distance), and those reflecting cost disabilities (like area). The effort and fiscal discipline criteria are efficiency-promoting modifications of the population criterion and should be taken as part of the group of tax devolution criterion meant for vertical transfers and the deviations may be counted as part of the 'other' considerations.

Illustrating these considerations, with the TFC per capita amounts, centered in 2007-08, subject to some approximations, Table 4 provides

the relevant numbers. State-wise details are given in Appendix Table 3. The numbers are derived in a manner consistent with the decompositions given in equation 7.

**Table 4: Illustrative Derivation of Weight for Equalization**  
(Amounts in Rs.)

$g^v$	$g^h$	$g^o$	$g$
114.2	38.5	129.2	281.87
$d^v$	$d^h$	$d^o$	$d$
632.5	541.91	37.18	1211.58
$v$	$h$	$o$	$t$
746.7	580.4	166.4	1493.4
$a.(y_n - \mu)$	641.20		
Weight to horizontal equalizing devolution and per capita devolution			
	Desired		Actual (as per TFC)
W	0.47		0.45
D	1274.34		1211.58

**Source (Basic Data):** TFC Report (2004),

**Notes:** Variables defined as in text; Amounts are in per capita terms.

It may be noted that the weight given to the distance formula in the TFC recommendations was 50 percent. However, since even in the distance formula an amount is given to the highest income state, there is a vertical component. The actual weight to the equalizing horizontal component is estimated to be 45 percent, obtained by dividing  $d^h$  by  $d$ . The desired weight as derived for full equalization weight is marginally more at 47 percent. In addition, this is associated with higher per capita devolution amounting to Rs. 1275 instead of the actual amount of Rs. 1212. It may be also noted that increasing the amount of equalizing

horizontal grants would reduce the total amount needed for devolution almost by the same margin since the term  $g^h$  occurs in the numerator. This would also affect the weight to the equalizing component of the devolution formulae, but the effect operates through both numerator and denominator. In general, increasing the equalization component of grants makes it easier to achieve full equalization through devolution. That is why, the equalization grants given in respect of education and health, which was a new type of grant given by the TFC, but where equalization was limited only to 15 and 30 percent respectively, needs to be strengthened.

## V. Equalization Grants for Health and Education

In devolution formulae, it is difficult to use the mean income as the benchmark as states with per capita incomes higher than the mean income will get a zero share in tax devolution. The practice followed by the Finance Commissions in India has been to allocate a positive share to all states. It is easier to use benchmarks with reference to the mean of per capita incomes or service levels in determining grants for selected services. In this context, the TFC introduced, equalization grants for education and health with the aim of augmenting the equalization content of fiscal transfers focusing on two high merit services.

In devising a grant that is specific-purpose and aimed at given sectors, it is important to make up for the deficiency in resources but not to underwrite the deficiency in priority accorded to the sector by the concerned state government. The TFC methodology entailed the following steps: a. derivation of the average preference for allocation to health

and education (say a) and b. derivation of the gap of the state-specific expenditure on the concerned service (education/health) from the corresponding group average (general category/ special category states) evaluated by applying the average preference to the state's aggregate expenditure. Thus for, any service, suppose that the group average per capita expenditure is z and state-specific expenditure for a state, z<sub>i</sub>.

$$\text{Here, } z = \frac{\sum z_i N_i}{\sum N_i} \quad (13)$$

Subscript i varies over the states belonging to the relevant group. The per capita capacity of a state is given by r<sub>i</sub> and the average capacity is given by

$$r = \frac{\sum r_i N_i}{\sum N_i} \quad (14)$$

The average budgetary allocation for the given service is given by

$$a = \frac{\sum z_i N_i}{\sum r_i N_i}$$

Thus, z<sub>i</sub> = a<sub>i</sub> . r and z = a . r .

Actual gap in expenditure between a state and the group-average can be seen as the sum of two components: one due to deficiency in fiscal capacity and the other due to giving the concerned sector less than average preference. It is only the first part, that is deficiency in expenditure due to lack of capacity, that is taken into account while the deficiency that results from giving less than average preference in budgetary allocation is ignored. Thus, the actual gap may be written as:

$$z - z_i = (z - a r_i) + (a r_i - z_i) \quad (15)$$

$$\text{or, } z - z_i = a(r - r_i) + (a - a_i) r_i \quad [\text{where } a_i = z_i / r_i] \quad (16)$$

Thus, the relevant gap is reflected in the first term, which is due to the deficiency in the fiscal capacity, given the average allocation to the concerned sector. The second term is the difference due to allocating less than average share given the capacity of the state, and this difference does not require to be made up under the equalization principle. Thus, the total grant should be determined by  $\sum N_i a_i (r - r_i)$ . In estimating the resources, r was proxied by resources devoted to expenditure excluding interest payments and pensions. In the TFC scheme only 15 and 30 percent of the equalizing grants were provided in the case of education and health. Clearly, there is a need for providing larger equalizing transfers as this would ease the pressure on tax revenue sharing to accommodate a large share of equalizing transfers.

## VI. Discontinuance of Further Debt Relief

Recommendations in regard to debt relief were formulated in the context of the overall programme for restructuring government finances in the country. Debt-relief was linked to the states governments meeting a set of conditionalities including enactment of a fiscal responsibility legislation. According to available information, all state governments, except two, have already enacted their respective fiscal responsibility legislations.

Two major recommendations regarding the state level borrowing from the centre were: one, to delink grants and loans in plan assistance, and two, to discontinue centre's intermediation for state borrowing. Once centre's intermediation is discontinued, the moral hazard in expecting

periodic bailouts would also be eliminated or at least significantly reduced. There is now no case for including a 'debt-relief' clause in the terms of reference for future Finance Commissions. RBI has recommended that states should go more and more for the auction route as it leads to price discovery, promotes market discipline, and improves secondary market liquidity. With some degree of flexibility in borrowing from the NSSF, the states should be able to adapt to the new market-oriented regime without much difficulty. In regard to the NSSF, the obligatory share of the States has been reduced to 80 percent with effect from 2007-08. RBI has made arrangements so that State Development Loans (SDLs) are eligible for repo transactions under the liquidity adjustment facility and it has been decided to introduce the non-competitive bidding facility in respect of the primary auctions of SDLs. While the centre's intermediation has been discontinued, loans and grants have not been delinked in plan assistance except in the case of external assistance. This linking requires reexamination on the part of the Planning Commission particularly when the assistance is for social sector projects or for poverty alleviation where the capacity to service the loan is not created as a result of assistance.

The TFC had also recommended the constitution of a loan council, which may decide the overall annual borrowing limits for the state governments. While a full fledged loan council has not been constituted, some steps have been taken towards achieving the related objectives. In particular, RBI has moved to set up a Standing Technical Committee (STC) with representation from the Central and State governments and the RBI. The STC will make annual projections of borrowing requirements of the State Governments, build alternative scenarios and suggest

alternative strategies and instruments for raising resources of States. It will also advise a mechanism for annual allocation of market borrowings among the States. It will take note of actual and budgeted borrowings of the state governments, develop a suitable database, assess fiscal risks from issuances of guarantees, and advise State Governments on various issues relating to their borrowings.

It is useful to note that the reference to the debt relief clause has now been withdrawn from the terms of reference to the Thirteenth Finance Commission. This follows from the discontinuance of centre's intermediation in state borrowing and on-lending to states subject to limited exceptions like the external assistance, which is also being passed on back to back terms, except for the special category states.

## **VII. Concluding Observations**

This paper has reviewed the fiscal transfer arrangements in India in the context of resolving the vertical and horizontal imbalances. The main conclusions may be summarized as follows:

### **Vertical Imbalance**

In the literature, a distinction has been made between the concepts of vertical gap, optimum vertical gap, and vertical fiscal imbalance. In the context of the Indian transfer system, in resolving the vertical fiscal imbalance, the following points have been made.

1. In India, there has been a long-term stability in the share of the centre and the states in the combined tax revenues of the system after tax devolution. It may be considered desirable to continue

to maintain this stability as long as there are no basic changes in the division of responsibilities between the centre and the states. It is further shown that maintaining such a stability would require an upward adjustment in the share of states in the divisible pool of taxes in periods where the expected buoyancy of central taxes is higher than that of the states.

2. The proposed move to a national GST will have significant implications for vertical imbalance. For maintaining the existing extent of vertical imbalance, a concurrent system of GST is recommended. The GST rates for the two tiers should be determined taking into account the present level of revenues of the two tiers from the concerned taxes. If, however, a central GST is adopted, vertical imbalance of resources prior to transfers will shift excessively in favour of the centre, and the resultant vertical gap will have to be resolved by a corresponding increase in transfers. This will also have significant implications for the horizontal distribution of transfers.
3. For operational purposes, 'vertical gap' is measured in this paper as the total transfer to all states. This reflects division of resources between the two tiers of government without looking into the *inter se* distribution of the share of states among the states. With a view to examining the *inter se* distribution, the transfers recommended by the Finance Commission are further decomposed into (a) the vertical component of transfers (as distinct from the vertical gap) indicating per capita transfers to all states including the highest income state, (b) equalizing transfers indicating the component of transfers only to the states

with a fiscal capacity less than the defined benchmark capacity, and (c) a residual reflecting special needs and ad hoc components.

### **Horizontal Imbalance**

In respect of the horizontal dimension of transfers, the equalization approach to transfers, which is followed by some of the important federal systems like Canada and Australia, is suitable for India also. While in Canada, attention is focused on equalizing revenue capacities only, in Australia, this is complemented by a comprehensive expenditure side equalization covering all services. In this context, the following points are made:

1. Subject to certain assumptions, tax revenue sharing under an axiomatic framework will result in transfers that will be consistent with the concept of revenue side equalization used in Canada. The difference is that in the Indian case, a macro base rather than a tax by tax approach is followed on the revenue side. While using a macro approach, there is a need to obtain a better measure of fiscal capacity as GSDP at factor cost is an incomplete indicator for this purpose. The Central Statistical Organization, which prepares comparable estimates of GSDP for the Finance Commission should be asked to prepare a more comprehensive indicator of fiscal capacity taking GSDP at market prices and providing supplementary information on remittances and other influences that add to the spending capacity in different states.

2. A suitable methodology can be developed to objectively determine the relevant weights in the tax-devolution formulae, given the large share of tax devolution in total transfers, which it is not easy to scale down and substitute by grants.
3. Using available information, it has been shown that contrary to the contention made by several economists, transfers in India are not necessarily 'gap-filling' in nature in the recent past, at least for the general category states subject to the exception of one or two states for some years. Taking the TFC recommended transfers, it is shown that, under specific assumptions, systematic elements of transfers constitute a high proportion of transfers: 50 percent of transfers are used as the vertical component of transfers and nearly 40 percent is equalizing in nature, consistent with the revenue side equalization approach. The remaining is for assessed special needs and goes mainly to the special category states.
4. It is shown that for achieving full equalization, subject to various assumptions, the weight to distance formula should have been marginally higher to ensure that an equalizing transfer has a 47 percent weight in total per capita devolution. In the TFC formula, the 50 percent weight given to the distance formula provided about 45 percent equalizing transfers. Further, this higher weight should be combined with a higher amount of per capita devolution. It is advisable to increase the amount of per capita equalizing grants to reduce the necessity for using devolution to perform this task.

5. In the present exercise, equalization has been viewed in terms of fiscal capacity equalization only, which is the approach followed in Canada. Considerations of cost differentials and efficiency will modify the results.
6. Equalizing grants may be extended particularly in services like health and education. These also provide cases where revenue side equalization should be supplemented by expenditure side equalization where cost and use disabilities should be fully neutralized, extending the methodology suggested by the TFC.

### **Others**

1. If GST is levied and collected as a central levy, the principles of distribution of transfers to states may need to keep divisible revenues of GST as a separate category. States would need to be compensated on the basis of 'return' requiring estimation of revenue foregone on account of sales and related taxes.
2. As on-lending to states from the centre has been discontinued, there is no case for including a debt-write off clause in the terms of reference to the future Finance Commissions as has been done in the case of the Thirteenth Finance Commission.

### **End Notes**

1. The subject of resource sharing in federal systems has important theoretical underpinnings and the TFC Report also evoked a number of responses from economists, an example of which is EPW's issue

of July 30, 2005 that carried contributions of some well known experts on the subject. Notwithstanding several issues raised, in writing the overview of these contributions, Amaresh Bagchi, member of the Eleventh Finance Commission, observed in the summary of his overview: "The Twelfth Finance Commission has broken new ground in several key areas and made recommendations which, if fully recommended, will have a far reaching impact on the finances and functioning of government in the country at all levels."

2. If the power to levy the sales tax in respect of three commodities namely, textiles, sugar and tobacco is reverted back to states, the states' share in the divisible pool of central taxes would be 29.5 percent. Until this is done, it will be 30.5 percent.
3. Sometimes area of a state is considered as a scaling factor, but this is more appropriately taken as a determinant of per capita cost, which may be higher in states where large areas are sparsely populated. It may also be higher if population density is extremely high.

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## Annexure 1: Vertical Stability and Relative Tax Buoyancies

We examine the conditions under which the share of centre (or states) in the combined revenues of the centre and states remains constant over time. The following symbols are used.

Central tax revenues prior to transfers:  $R_c$

State tax revenues prior to transfers:  $R_s$

Total Revenues:  $R = R_c + R_s$

The buoyancies of central, states and combined tax revenues are given by c, b, & d, respectively.

Thus,

$$c = [\Delta R_c / R_c] \cdot [Y / \Delta Y] \quad \text{or} \quad \Delta R_c = c \cdot R_c \cdot \Delta Y / Y = c \cdot R_c \cdot g$$

where  $g = \Delta Y / Y$  is the growth rate between the relevant periods

Similarly  $\Delta R_s = b \cdot R_s \cdot g$  and  $\Delta R = d \cdot R \cdot g$

Let transfers (T) be a fraction t of central revenues in the initial period.

$$T = t \cdot R_c$$

Share of centre after transfers in total revenues

$$\text{Share (centre)}_0 = (R_c - t R_c) / (R) = [R_c (1-t)] / [R]$$

After a given period let the ratio of transfer be t'. The new share of centre in total revenues will be

$$\text{Share (centre)}_n = [(R_c + \Delta R_c) - t' (R_c + \Delta R_c)] / [R + \Delta R]$$

$$= [(R_c + \Delta R_c) (1-t')] / [R + \Delta R]$$

$$= [(R_c + R_c \cdot c \cdot g) (1-t')] / [R + R \cdot d \cdot g]$$

$$= [R_c (1+cg) (1-t')] / [R (1+d \cdot g)]$$

The relative shares of the centre and states between the two periods is constant of

$$[R_c (1-t)] / [R] = [R_c \{(1+cg)\}(1-t')] / [R (1+dg)]$$

$$\text{Or,} \quad 1-t = \{(1+cg) (1-t')\} / (1+dg)$$

$$(1-t) (1+dg) = (1+cg) (1-t')$$

Ignoring 2<sup>nd</sup> order terms,  $t' - t = (c-d) g$

Thus, if the buoyancy of the central taxes is higher than the combined tax revenues, the ratio of transfer to the states will need to go up between two periods in order to keep the relative share of centre and states stable after transfers. The extent of increase will depend on the growth rate and the difference between central and combined tax buoyancies. This condition can also be written in terms of buoyancy of state tax revenues.

We have,  $\Delta R = \Delta R_c + \Delta R_s$

$$d \cdot R \cdot g = c R_c \cdot g + b R_s \cdot g$$

$$d \cdot R = c R_c + b R_s$$

$$d = [c.R_c] / [R] + [b.R_s] / [R]$$

$$= c [R - R_s] / R + b [R_s / R]$$

$S^*_i$  = per capita transfers received by a state in absolute amount by a state

Let the share of states' own revenues in total revenues be

$$\alpha = R_s / R$$

We have

$$d = c(1-\alpha) + b \alpha$$

the condition of stabilization is

$$t' - t = [c - \{c(1-\alpha) + b \alpha\}] g$$

$$= [c - c(1-\alpha) - b \alpha] g$$

$$= [c - c + c \alpha - b \alpha] g$$

$$t' - t = (c-b) \alpha g$$

Thus, an increase in the share of transfer is warranted provided the central tax buoyancy exceeds that of states taxes for keeping the share of the two tiers in total tax revenues stable.

Let the number of states be 'n'. States are arranged in ascending order of per capita tax base, i.e.

$$y_1 \leq y_2 \leq \dots \leq y_n$$

The per capita macro tax base ( $y_i$ ) is approximated by the comparable per capita GSDP in determining Finance Commission transfers. We can write the state shares and per capita shares under the well known population and distance criterion as given below:

**Population criterion:** share of  $i$ th state =  $q_i$  (say) =  $N_i / \sum N_i$  and per capita share as  $q^*_i = 1 / \sum N_i$

**Distance criterion:** share of  $i$ th state =  $a_i$  (say) =  $N_i(y_n - y_i) / \sum N_i (y_n - y_i)$  and per capita share as  $a^*_i = (y_n - y_i) / \sum N_i (y_n - y_i)$ . The state shares and per capita shares can be written in more general form as follows.

## Annexure 2: Criteria- Based Tax Revenue Sharing: Axiomatic Basis

In discussing this axiomatic framework, the following additional symbols will be used:

- $N_i$  = Population of state  $i$
- $y_i$  = per capita tax base of state  $i$
- $s_i$  = share of the  $i$ th state
- $s^*_i$  = corresponding per capita share
- $S_i$  = total transfer in absolute amount received by a state under a criterion

Let the per capita share of a state in an allocation mechanism be a function of per capita income (tax base) and a set of other variables. The set of variables used in a criterion is referred to in a general way by  $f(.)$ . Let this be normalized by a function written as  $\theta$ . Thus, the per capita share of the  $i$ th state is

$$s^*_i = \theta f_i(.) \quad \dots (A1)$$

Correspondingly, the share for the state as a whole is given by

$$s_i = \theta f_i(.)N_i \quad \dots(A2)$$

The total and per capita transfers in absolute amounts can be written as

$$S_i = \theta f_i(.)N_i T \text{ and } S^*_i = \theta f_i(.)T \quad \dots(A3)$$

where T is the total amount of transfers.

**Axiom 1: Normalization 1**

*If two states have the same criterion values, their shares should be proportional to their populations.*

The entitlement of a state under any criterion should be determined in per capita terms. If two states have the same value of the allocation variable, but different sizes of population, the share of the state with the larger population should be larger by the ratio by which its population is larger compared to the other state. The basic consideration here is that all transfers are aimed at citizens residing in the state, because all services are meant for the citizens. Population is the appropriate scaling factor in this context. This axiom means that, for two states i and j,

$$s_i / s_j = N_i / N_j \quad \text{if } \theta f_i(.) = \theta f_j(.) \quad \dots(A4)$$

**Axiom 2: Normalization 2**

*The sum of the shares of all states should add to 1.*

Under any criterion, the share of all states should add to 1. This axiom ensures that the entire sum to be transferred to the states as a whole would be precisely exhausted among the states. If the total

amount of transfer is T, we require that the sum of transfers received by each state should be equal to the total amount T, i.e. the transfer received by each state is equal to  $(s_i T)$

Therefore,

$$s_1 T + s_2 T + \dots + s_n T = T \quad \dots(A5)$$

$$\sum s_i T = T \text{ or } \sum s_i = 1$$

$$\text{Thus, } \sum \theta f_i(.)N_i = 1 \text{ or } \theta = 1 / \sum f_i(i)N_i \quad \dots(A6)$$

For a given set of  $N_i$ , and values of variables entering  $f(.)$ ,  $\theta$  could be taken as given. This axiom also ensures that all allocation criteria satisfying it would be indifferent with respect to scalar changes in population. If population of all states increase by a factor 'k', we have the new set of shares, given as indicated below:

$$f_i(.) (kN_i) / \sum f_i(.) (kN_i) = f_i(.) N_i / \sum f_i(.) N_i = s_i$$

so long as population is not a variable entering  $f_i(.)$

**Axiom 3: Horizontal Equity**

*Between any pair of states, the state with lower per capita fiscal capacity should have higher per capita share, and per capita shares should be equal for states with equal per capita fiscal capacity.*

The allocation mechanism should be consistent with horizontal equity. Horizontal equity requires that the allocation mechanism should treat equally two states if their criterion values are the same. It should treat them differently if their criterion values are different. This implies

that if two states have the same per capita fiscal capacity, they would receive the same per capita share, and if the two states have different per capita fiscal capacities, states with the lower fiscal capacity would get a higher share. A criterion that satisfies this characteristic may be referred to as a progressive transfers mechanism, which ensures that a poorer state receives a higher per capita transfer according to the specified criterion. The poorer the state, the lower is its fiscal capacity to raise own resources if these are assessed at a common tax effort. This condition requires that for a pair of state,  $b_i$  and  $b_{i+1}$ , where they have been arranged in an ascending order of per capita income if,

$$b_i < b_{i+1}, \quad s_i^* > s_{i+1}^*$$

and if  $b_i = b_{i+1}, \quad s_i^* = s_{i+1}^*$ .

Considering the case where no two per capita incomes are equal, we require, for progressivity,

$$\theta f_i(.) > \theta f_{i+1}(.)$$

$$\text{or } f_i(.) / f_{i+1}(. ) > 1 \text{ or } f_i(.) - f_{i+1}(. ) > 0 \quad \dots(A7)$$

Since  $f_i(.)$  among other variables is also a function of per capita income, we may write

$$s_i^* > s_{i+1}^* \quad \text{if } \partial s_i^* / \partial y_i = \theta \partial f(.) / \partial y_i < 0, \text{ for a given value of } \theta.$$

#### Axiom 4: Comprehensiveness

*In determining the share of any one state, information on all states should be used. A corollary of this is that under each criterion, every state should get a positive share.*

The Finance Commissions have followed the practice that under no criterion, any state is given a zero share. This implies that information on all states is always considered together. The shares of any subsets of states are not to be determined independently ignoring relevant information pertaining to the remaining states. Suppose that some state (j) receives a zero share in the allocation mechanism. In this case,

$$s_j^* = \theta f_j(.) = 0$$

$$\text{and } s_j = \theta f_j(.) N_j = 0 \text{ or } f_j(.) N_j = 0 \text{ since } \theta \neq 0$$

The normalization axiom indicates that

$$1 / \theta = f_1(.) N_1 + \dots + f_n(.) N_n \quad \dots(A8)$$

If for some j,  $f_j(.) N_j = 0$ , it will not enter in the allocation formula. As such no information on the jth state would enter into the allocation formula. Thus, to ensure that information on all states are used in the allocation exercise, we require,

$$s_i^* > 0 \text{ for all } i$$

However if  $f(.)$  itself contains the relevant information of the jth state, in the criterion values of all the states, the share of the jth state can still be set at zero.

#### Axiom 5: Neutrality

*The allocation criterion should be neutral with respect to the organization of States. There should not be an incentive to bifurcate states with a view to benefiting from the allocation mechanism.*

As shown below, all non-linear criteria implicitly give an incentive either for splitting a state into smaller states or for regrouping a state into larger states. All convex and progressive allocation criterion provide an incentive for a poorer region in a state to break off and form a 'new' state. If it does so, with its lower per capita income, it would ensure a higher per capita share in the transfer mechanism. Such fissiparous tendencies can however be neutralized by providing a mechanism of allocation of resources, which is neutral to the organization of the states. However, even with such an intra-state mechanism, some of the devolution criteria may not be neutral to the organization of the states under certain conditions. Consequently, they may encourage either disintegration of states into smaller units or their integration into larger units. It is a desirable property for a devolution criteria to be neutral to the organization of states. The conditions required for this purpose may be stated as below:

If, for any state  $i$ , if there are two regions 1 and 2, with per capita income  $y^1_i$  and  $y^2_i$ , and population  $N^1_i$  and  $N^2_i$ , such that

$$N_i = N^1_i + N^2_i$$

$$y_i N_i = y^1_i N^1_i + y^2_i N^2_i$$

Neutrality of an allocation formula would require that the sum of transfer received by the two regions as separate states should be equal to the transfer received by the undivided state. We have

$$s^1_i = \theta f^1_i(.) N^1_i$$

$$s^2_i = \theta f^2_i(.) N^2_i$$

The total number of states now being  $(n+1)$ , neutrality thus requires;

$$s^1_i + s^2_i = s_i$$

$$\text{or } \theta [f^1_i(.) N^1_i + f^2_i(.) N^2_i] = \theta f_i(.) N_i \quad \dots(A9)$$

An alternative way, in which this axiom could be stated is that under the allocation mechanism, no two states should either gain or lose if they joined up to form an integrated state. The neutrality axiom ensures that by itself, the devolution criteria do not give any incentives for states to bifurcate themselves or for two states to join together. The devolution criterion should be neutral to the existing organization of states as a datum.

Considering two important examples of specific criteria in use, namely the population criterion and distance criterion, we can specify the values of  $\theta$  and  $f_i(.)$  for each criterion as given below.

For Population Criterion:

$$s_i = q_i; f(.) = 1; \theta = 1/\sum N_i$$

For Distance Criterion

$$s_i = a_i; f(.) = y_n - y_i; \theta = 1/\sum (y_n - y_i) N_i$$

Using these axioms for analyzing the devolution criteria used by recent Commissions it can be ascertained that all criteria used by TFC, namely, population, distance, area, tax effort, and fiscal discipline meet the two normalization axioms. These also meet the comprehensiveness axiom in the sense that information about all states is used to determine

the share of any one state under all the criteria. The distance criterion meets the horizontal equity axiom. The population criterion and the pure form (where highest per capita income gets a zero share) of the distance criterion also meet the neutrality axiom under certain conditions (for a detailed discussion, see Srivastava and Aggarwal, 2000).

It may be noted that tax shares of different states under individual criterion are not published in some of the other transfer exercises such as those under the Gadgil formula. While in some components, the axioms may be satisfied, in other cases, these may not be satisfied. It will be useful if the Planning Commission makes public the state-wise indices under different components of the criteria used under the Gadgil formula for a more informed debate on the subject.

**Appendix Table 1: Comparison of Equalization Transfers Based on Available Data with TFC Recommended Transfers**

	Average Tax Ratio		Vertical Component: <b>746.67</b>			
	Population (2001)	Per capita GSDP (average 1999-00 to 2001-02)	Equalization Transfers based on Data centered in 2000-01		Total per capita Bench-mark Transfers	Actual Per Capita Recommended Transfer
States	(Crore)	(Rs.)	Per Capita Gap (Rs.)	Per Capita Transfer (Rs.)	(Rs.)	(Rs.)
1	2	3	4	5	6	7
Bihar	8.300	6539	20455	1337.8	2084	1821.5
Uttar Pradesh	16.620	10798	16196	1059.2	1806	1605.0
Orissa	3.680	11234	15760	1030.7	1777	2006.0
Jharkhand	2.695	11717	15277	999.1	1746	1754.6
Assam	2.666	12288	14706	961.8	1708	1824.2
Madhya Pradesh	6.035	13340	13654	893.0	1640	1534.0
Chhattisgarh	2.083	13710	13284	868.8	1615	1752.9
Rajasthan	5.651	15059	11935	780.5	1527	1381.5
Meghalaya	0.232	16035	10959	716.7	1463	3765.5
Arunachal Pradesh	0.110	16579	10415	681.1	1428	6419.1
Uttaranchal	0.849	16998	9996	653.7	1400	2871.7
Manipur	0.217	17264	9730	636.3	1383	6339.5
West Bengal	8.018	17377	9617	629.0	1376	1268.2
Jammu & Kashmir	1.014	18132	8862	579.6	1326	4217.5
Andhra Pradesh	7.621	18869	8125	531.4	1278	1320.4
Tripura	0.320	18974	8020	524.5	1271	5260.7
Nagaland	0.199	20469	6525	426.7	1173	7489.5
Karnataka	5.285	20703	6291	411.4	1158	1188.0
Sikkim	0.054	20929	6065	396.7	1143	6759.6
Mizoram	0.089	21245	5749	376.0	1123	10488.1
Tamil Nadu	6.241	22587	4407	288.2	1035	1174.9
Gujarat	5.067	22708	4286	280.3	1027	1010.1
Kerala	3.184	22824	4170	272.7	1019	1230.7
Himachal Pradesh	0.608	24762	2232	146.0	893	4754.1
Haryana	2.114	26256	738	48.3	795	760.2
Maharashtra	9.688	26994	0	0.0	747	746.7
Punjab	2.436	28030	0	0.0	747	1057.3
Goa	0.135	56599	0	0.0	747	2557.6
Total						

**Source (Basic Data):** Report of the Twelfth Finance Commission, 2004.

**Note:** Vertical component is equal to the per capita recommended transfer to Maharashtra. This is the minimum per capita transfer among all states. Equalization transfers are calculated by applying the average all-state tax-rate to the difference between the three state average per capita GSDP (Maharashtra, Punjab and Goa) and the per capita GSDP of any given state.

**Appendix Table 2: Decomposition of Recommended Per capita Transfers**

(Rupees)

States	Actual Recommended Transfer	Vertical Component	Equalization Component	Residual (for Special Needs and Cost Disabilities)	Shortfall in Equalization
1	2	3	4	5	6
Bihar	1821.5	746.7	1074.8	0.0	263.0
Uttar Pradesh	1605.0	746.7	858.3	0.0	200.9
Orissa	2006.0	746.7	1030.7	228.7	0.0
Jharkhand	1754.6	746.7	999.1	8.8	0.0
Assam	1824.2	746.7	961.8	115.8	0.0
Madhya Pradesh	1534.0	746.7	787.3	0.0	105.6
Chhattisgarh	1752.9	746.7	868.8	137.5	0.0
Rajasthan	1381.5	746.7	634.9	0.0	145.7
Meghalaya	3765.5	746.7	716.7	2302.1	0.0
Arunachal Pradesh	6419.1	746.7	681.1	4991.2	0.0
Uttaranchal	2871.7	746.7	653.7	1471.2	0.0
Manipur	6339.5	746.7	636.3	4956.5	0.0
West Bengal	1268.2	746.7	521.6	0.0	107.4
Jammu & Kashmir	4217.5	746.7	579.6	2891.3	0.0
Andhra Pradesh	1320.4	746.7	531.4	42.4	0.0
Tripura	5260.7	746.7	524.5	3989.5	0.0
Nagaland	7489.5	746.7	426.7	6316.1	0.0
Karnataka	1188.0	746.7	411.4	29.9	0.0
Sikkim	6759.6	746.7	396.7	5616.3	0.0
Mizoram	10488.1	746.7	376.0	9365.4	0.0
Tamil Nadu	1174.9	746.7	288.2	140.0	0.0
Gujarat	1010.1	746.7	263.4	0.0	16.9
Kerala	1230.7	746.7	272.7	211.3	0.0
Himachal Pradesh	4754.1	746.7	146.0	3861.5	0.0
Haryana	760.2	746.7	13.5	0.0	34.7
Maharashtra	746.7	746.7	0.0	0.0	0.0
Punjab	1057.3	746.7	0.0	310.7	0.0
Goa	2557.6	746.7	0.0	1810.9	0.0

Source (Basic Data): TFC Report and Estimates.

Note: Equalization component is calculated by comparing actual recommended transfer net of vertical component with benchmark equalization transfer (col. 5 of Appendix Table 1). If the actual transfer net of vertical component is more than benchmark equalization transfer, the benchmark equalization transfer is entered in column 4. The excess becomes the residual given in column 5.

**Appendix Table 3: Decomposition of Per Capita Grants and Devolution into Vertical, Equalizing Horizontal and Residual Components**

(Rs. crore)

	Grants			Devolution		
	Vertical	Equalizing Horizontal	Residual	Vertical	Equalizing Horizontal	Residual
1	2	3	4	5	6	7
Bihar	114.2	78.0	0.0	632.5	996.8	0.0
Uttar Pradesh	114.2	69.5	0.0	632.5	788.8	0.0
Orissa	114.2	60.1	112.3	632.5	970.6	116.4
Jharkhand	114.2	102.1	8.8	632.5	897.0	0.0
Assam	114.2	106.1	115.8	632.5	855.7	0.0
Madhya Pradesh	114.2	56.2	0.0	632.5	731.1	0.0
Chhattisgarh	114.2	50.7	26.0	632.5	818.1	111.5
Rajasthan	114.2	50.2	0.0	632.5	584.7	0.0
Meghalaya	114.2	41.8	1647.6	632.5	674.9	654.5
Arunachal Pradesh	114.2	39.7	3048.7	632.5	641.4	1942.5
Uttaranchal	114.2	38.1	1363.0	632.5	615.6	108.2
Manipur	114.2	37.1	4139.6	632.5	599.2	816.9
West Bengal	114.2	74.7	0.0	632.5	446.8	0.0
Jammu and Kashmir	114.2	33.8	2501.7	632.5	545.8	389.6
Andhra Pradesh	114.2	31.0	-8.3	632.5	500.4	50.7
Tripura	114.2	30.6	3475.5	632.5	493.9	514.1
Nagaland	114.2	24.9	5729.9	632.5	401.9	586.2
Karnataka	114.2	24.0	15.3	632.5	387.4	14.6
Sikkim	114.2	23.1	1475.7	632.5	373.5	4140.6
Mizoram	114.2	21.9	7053.8	632.5	354.1	2311.6
Tamil Nadu	114.2	16.8	1.5	632.5	271.4	138.5
Gujarat	114.2	32.2	0.0	632.5	231.2	0.0
Kerala	114.2	15.9	74.3	632.5	256.8	137.0
Himachal Pradesh	114.2	8.5	3578.3	632.5	137.5	283.2
Haryana	114.2	22.6	0.0	632.5	-9.1	0.0
Maharashtra	114.2	0.0	0.0	632.5	0.0	0.0
Punjab	114.2	0.0	289.2	632.5	0.0	21.4
Goa	114.2	0.0	86.8	632.5	0.0	1724.1
<b>Average (Population weighted)</b>	<b>114.2</b>	<b>46.9</b>	<b>120.8</b>	<b>632.5</b>	<b>533.4</b>	<b>45.7</b>

Source (Basic Data): TFC Report, 2004.



**Notes:** The per capita vertical transfer (column 3 of Appendix Table 2) is split between per capita vertical grant (equal to the lowest per capita grant among all states (for Maharashtra) and per capita vertical devolution (equal to the lowest per capita devolution, also for Maharashtra). All states get these amounts. The equalizing components of grants and devolution are calculated in two steps. As a first step, per capita equalizing grants for all states are calculated by applying the ratio of Bihar's per capita horizontal grant (per capita total grant minus vertical component of grant) to benchmark equalizing transfer (column 5 of Appendix Table 1). Per capita devolution is also decomposed into three components: vertical, equalizing horizontal, and residual.

The equalizing component of devolution is taken by comparing two series. The first series is per capita total devolution minus vertical component of devolution. The other is the excess of the equalizing total per capita transfer (column 4 of Appendix Table 2) over equalizing grant referred to above. The equalizing component of devolution consists of the lower number of the two series. This gives series 6 of Appendix Table 3. The residual of the devolution column is calculated as the total per capita devolution minus vertical component of devolution (column 5 of Appendix Table 3) and equalizing component of devolution (column 6) of Appendix Table 3.

Since the residual of grants and devolution should add to the overall residual as shown by column 5 of Appendix Table 2, the residual series for grants is derived as the difference between the overall residual

and the residual of the per capita devolution series (column 5 of Appendix Table 2 minus column 7 of Appendix Table 3. This gives the residual grant series (column 4 of Appendix Table A3).

Finally adjusted equalizing grant series (column 2 of Appendix Table 3) is derived as per capita total grant minus per capita vertical grant minus per capita residual grant. These procedures satisfy the conditions of equation 7 in the text.

There are two negative numbers in columns 4 and 7 of Appendix Table 3. These numbers may be adjusted by following a suitable rule in calculating the residuals, but since the magnitudes involved are small, further adjustment has not been done.

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